

WCRIBMA
THE WORKERS' COMPENSATION RATING
AND INSPECTION BUREAU OF MASSACHUSETTS

December 22, 2017

The Honorable Gary Anderson
Commissioner of Insurance
Massachusetts Division of Insurance
1000 Washington Street, Suite 810
Boston MA 02118-6200

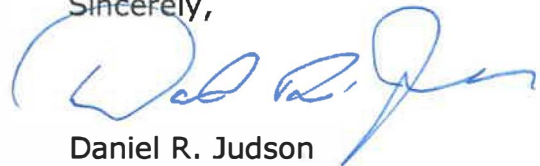
Dear Commissioner Anderson:

In accordance with General Laws, Chapter 152, Sections 52 and 53A, as amended by St. 1985, c. 572, I submit, on behalf of all members and subscribers of The Workers' Compensation Rating and Inspection Bureau of Massachusetts (WCRIBMA), a General Revision of Workers' Compensation Insurance Rates and Rating Values.

With this letter, I am submitting the technical support for the analysis underlying the proposed statewide decrease in average rates of 11.1%. Our Cost Containment filing is attached as Volume 3 of the filing.

We propose the manual rates to be effective 12:01 A.M., July 1, 2018, and to apply to each risk as of the policy effective date following that effective date.

Sincerely,



Daniel R. Judson
President

**COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE**

Docket No. 17-

In re:

**APPLICATION OF THE WORKERS'
COMPENSATION RATING AND INSPECTION
BUREAU OF MASSACHUSETTS FOR APPROVAL
OF A GENERAL RATE REVISION TO BE
EFFECTIVE ON AND AFTER July 1, 2018**

PRE-FILED DIRECT TESTIMONY OF DAVID APPEL

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of David Appel in support of its application for a general rate revision to be effective on and after July 1, 2018.

Q. Please state your full name.

A. David Appel.

Q. What are your professional qualifications?

A. I am a Principal and Director of Economics Consulting with the firm of Milliman, Inc. Milliman is one of the nation's largest independently owned consulting firms specializing in the areas of risk and insurance. The company operates offices in more than 60 cities in the U.S., Europe, Latin America, Asia and Australia. Our employees number over 2,600, and our clients number in the thousands. They include insurers, self-insured entities, Federal and State Governments, private corporations, non-profit organizations, unions, and many others. A complete description of my academic and professional credentials can be found in my curriculum vitae, which is attached to this testimony.

Q. What was your role in the preparation of the current WCRIBMA filing for a general rate revision?

A. I was responsible for and sponsor the materials in Section VII of the WCRIBMA's filing dealing with the estimation of the cost of capital, portfolio rate of return and the use of discounted cash flow models to derive the underwriting profit provision proposed by the WCRIBMA this year. I have relied upon the WCRIBMA to provide the underwriting cash flows (for losses, expenses and premiums) that are used in the discounted cash flow models. To the best of my knowledge, information and belief, the data and calculations underlying Section VII of the filing are complete and accurate, and the narrative statements offered in support of Section VII are also accurate and correct.

Q. Are you familiar with the underwriting profit provision used by the WCRIBMA in calculating the proposed rates?

A. Yes.

Q. Are you familiar with the statutory standard that must be applied by the Commissioner in reviewing the rates proposed in the WCRIBMA's current filing – that they “are not excessive, inadequate or unfairly discriminatory” and that they “fall within a range of reasonableness”?

A. Yes. That is the standard typically applied by regulators in assessing insurance rates.

Q. Do you have an opinion as to whether the rates proposed in the WCRIBMA's current filing satisfy the statutory standard?

A. Yes.

Q. What is your opinion?

A. For the reasons offered in Section VII, it is my professional opinion that if the actuarial projections of losses, expenses and premiums in the filing are reasonable, then the proposed rates satisfy the statutory standard because the underwriting profit provision has been calculated so that the rates will yield a fair return to the insurers who have invested their capital in the Massachusetts workers' compensation market.

Q. Do you have anything to add to the text of Section VII of the filing at this time?

A. Yes. While I have concluded that the rates as filed by the WCRIBMA are reasonable and not excessive, I must also note that I believe that the calculations used to derive the indicated profit provision are extremely conservative in the sense that they overstate the income insurers would reasonably expect to earn from the sale of workers' compensation insurance in Massachusetts. To the extent that income is overstated, of course, the required rate change will be set too low. There are three principal reasons for this.

First, the discounted cash flow modes used to derive the underwriting profit provision in the filing do not reflect the true cost of policyholder dividends. Policyholder dividends are refunds of premium paid at the end of the policy period (and are frequently tied to the loss experience of the insured). Dividend payments definitively reduce insurer income, and should be reflected in the derivation of underwriting profit provisions. However, in her Decision on 2003 Rates, the Commissioner rejected consideration of dividends in any fashion, and hence in this year's model the WCRIBMA has not considered policyholder dividends in any form. (I understand that previous practice in Massachusetts had been to simply reflect the reduction in investible funds due to the payment of policyholder dividends,

but not to reflect the dividend expense itself. In this filing neither the dividend expense nor the reduction in investible funds has been reflected.)

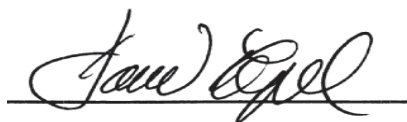
Second, the WCRIBMA has included a provision for the cost of reinsurance in the current filing, but its provision is restricted solely to the reinsurer's expense costs. That is, it does not consider the true net cost of reinsurance, which includes not only the reinsurer's expenses, but also the reinsurer's required profit. Had the reinsurer's required profit been reflected, the required rate change would have been higher.

Third, the WCRIBMA has assumed that all special revenue bonds are tax-exempt, an assumption known to be untrue. A portion of such bonds – approximately half based on recent research – are subject to Federal tax, which, if recognized, would reduce the after tax yield on the investment portfolio. Had a lower after tax portfolio yield been used in the model, the required rate change would have been higher.

It is evident that each of these assumptions provides a degree of conservatism in the filing, in that each works to lower the profit provision estimated by the WCRIBMA.

I would add that I have not adjusted the target rate of return to reflect the arguably greater risk of workers' compensation relative to the average line of property/casualty insurance. I note that had I set the target return higher, a higher underwriting profit would have been indicated as well.

Signed this 14th day of December 2017 under the pains and penalties of perjury.

A handwritten signature in black ink, appearing to read "David Appel", written over a horizontal line.

David Appel

DAVID APPEL

One Pennsylvania Plaza
New York, NY 10119
(646) 473-3000

PROFESSIONAL EXPERIENCE:

1989 to present 2017 1989 to 2016	MILLIMAN, INC. Senior Consultant Principal & Director - Economics Consulting Responsible for the formation, development and management of a national consulting practice in insurance economics.
1980 to 1989 1985 to 1989 1983	NATIONAL COUNCIL ON COMPENSATION INSURANCE Economic and Social Research Division Vice President Assistant Vice President Responsible for all economic and social research of NCCI
1982 1981 1980	Director of Economic and Social Research Senior Research Economist Associate Research Economist
1976 to 1997	RUTGERS UNIVERSITY
1981-97	Associate of the Graduate Faculty, Department of Economics, Newark, New Jersey
1981-93	Teach variety of graduate courses including: Microeconomic Theory, Industrial Organization, Public Finance
1978-80	Instructor, Department of Economics, New Brunswick, New Jersey
1976-78	Adjunct Instructor, Department of Economics, Newark, New Jersey

EDUCATION:

1980	Ph.D., Economics, Rutgers University
1976	M.A., Economics, Rutgers University
1972	B.A., Economics, Brooklyn College, CUNY Fellow: National Academy of Social Insurance

PAPERS AND PUBLICATIONS

“Comment on Jaffee and Russell” in Deregulating Property-Liability Insurance, J. David Cummins, Editor, Brookings Institution Press, Washington, DC, 2002

"Dynamic Financial Analysis of a Workers Compensation Insurer", CAS Call Papers Program, 1997 (with Susan Witcraft and Mark Mulvaney)

"The Impact of Managed Care on Workers Compensation Claim Costs," in a volume of conference proceedings published by the Workers' Compensation Research Institute, September 1994, (with Philip Borba).

"Health Care Costs in Workers' Compensation", Benefits Quarterly, Vol. 9, No. 4, Fourth Quarter, 1993

"The Transition From Temporary to Permanent Disability: A Longitudinal Analysis" in Workers' Compensation Insurance: Claims Costs, Prices and Regulation, David Durbin and Philip Borba, Editors, Kluwer Academic Publishers, Boston, 1992, (with Richard Butler, David Durbin and John Worrall)

"Leverage, Interest Rates and Workers' Compensation Survival" in Workers' Compensation Insurance: Claims Costs, Prices and Regulation, David Durbin and Philip Borba, Editors, Kluwer Academic Publishers, Boston, 1992, (with Richard Butler, David Durbin and John Worrall)

Benefits, Costs and Cycles in Workers' Compensation, Kluwer Academic Publishers, Boston, 1990, (co-editor with Philip Borba)

"Benefit Increases in Workers' Compensation", Southern Economics Journal, January 1990, (with Richard J. Butler)

"Internal Rate of Return Criteria in Ratemaking", NCCI Digest, Vol. IV, Issue III, September 1990, (with Richard J. Butler).

"Social Inflation in Workers' Compensation: The Phenomenon of Benefit Utilization", Proceedings of the Casualty Loss Reserve Seminar, 1988. Also in Contingencies, Nov./Dec., 1989.

Workers' Compensation Insurance Pricing: Current Programs and Proposed Reforms, Kluwer Academic Publishers, Boston, 1988,(co-editor with Philip Borba)

"Prices and Costs of Workers' Compensation" in Workers' Compensation Insurance Pricing: Current Programs and Proposed Reforms, Kluwer Academic Publishers, Boston, 1988, (with Philip Borba)

“1986 Tax Reform Act: Effects on Workers' Compensation Profitability”, NCCI Digest, Vol. II, Issue II, July 1987 (with James Gerofsky)

"The Propensity for Permanently Disabled Workers' to Hire Legal Services", Industrial and Labor Relations Review, April 1987, (with Philip Borba)

"Sex, Marital Status, and Medical Utilization by Injured Workers", Journal of Risk and Insurance, Vol. LIV, No. 1, March 1987, (with John Worrall and Richard Butler)

"The Impact of Workers' Compensation Benefits on Low Back Claims" in Clinical Concepts in Regional Musculoskeletal Illness, Nordin M. Hadler, ed. (Boston: 1986, Grune and Stratton), (with John Worrall)

"Workers' Compensation and Employment: An Industry Analysis" in Disability and the Labor Market: Economic Problems, Policies and Programs, M. Anne Hill and Monroe Berkowitz, eds., (Ithaca:1986 ILR Press), (with James Lambrinos)

"Some Benefit Issues in Workers' Compensation", in Workers' Compensation Benefits: Adequacy, Equity, Efficiency. (Ithaca:1985 ILR Press), (with John Worrall)

Workers' Compensation Benefits: Adequacy, Equity, Efficiency. (co-editor with John Worrall), (Ithaca:1985 ILR Press)

"Survivorship and the Size Distribution of the Property-Liability Insurance Industry", Journal of Risk and Insurance, October 1985, (with John Worrall and Richard Butler).

"Regulating Competition-The Case of Workers' Compensation Insurance", Journal of Insurance Regulation, (with James Gerofsky), June 1985.

"The Wage Replacement Rate and Benefit Utilization in Workers' Compensation Insurance", Journal of Risk and Insurance, September 1982 (with John Worrall)

"Property Damages", in Joseph Seneca and Peter Asch, The Benefits of Air Pollution Control in New Jersey, Center for Coastal and Environmental Studies, Rutgers University, 1979

WORKING PAPERS

"Workers' Compensation Pricing: The Role of Policyholder Dividends" (with David Durbin)

"The Impact of Lifetime Work on Mortality: Do Unisex Pensions Matter?" (with Richard J. Butler)

"Regulatory Survival: Rate Changes in Workers' Compensation" (with Richard J. Butler and John D. Worrall)

"Framing, Firm Size and Financial Incentives in Workers' Compensation Insurance" (with Richard J. Butler and John D. Worrall)

"Application of NAIC Profitability Models to Long Tailed Lines of Insurance" (with James Gerofsky)

INVITED PRESENTATIONS

Huntington Beach, California, March 11, 2013

CAS RPM Seminar

“Risk Loads for Property Catastrophe Covers: Primary and Reinsurer Perspectives”

Huntington Beach, California, March 11, 2013

CAS RPM Seminar

“The Actuary as Expert Witness”

Philadelphia, Pennsylvania, March 20, 2012

CAS Ratemaking Seminar

“How Reinsurers Consider Risk Loads and Cost of Capital for Property Cat Covers”

Chicago, IL , March 17, 2010

CAS Ratemaking Seminar

“Logic, Fallacies and Paradoxes in Risk/Profit Loading in Ratemaking: A Socratic Dialogue”

Chicago, IL , March 16, 2010

CAS Ratemaking Seminar

“Quantifying Risk Loads for Property Catastrophe Exposure”

Las Vegas, NV, March 10, 2009

CAS Ratemaking Seminar

“Using Catastrophe Bonds to Infer Risk Loads/Profit Margins/Reinsurance Costs”

Boston, MA, March 17, 2008

CAS Ratemaking Seminar

“Using Catastrophe Bonds to Infer Risk Loads/Profit Margins/Reinsurance Costs”

Pinehurst, North Carolina, May 21, 2007

Workers Compensation Insurance Organizations Annual Meeting

“Enterprise Risk Management: What Is It and Why Is It Important?”

Salt Lake City, Utah, March 13, 2006

CAS Ratemaking Seminar

“Including Reinsurance Costs in Primary Insurance Rates”

New Orleans, Louisiana, March 11, 2005

CAS Ratemaking Seminar

“Including Reinsurance Costs in Primary Insurance Rates”

Philadelphia, Pennsylvania, March 11, 2004

CAS Ratemaking Seminar

“The Consideration of Risk Loads and Reinsurance Costs in Primary Insurance Ratemaking”

New York, New York, December 12, 2003

Goldman Sachs Insurance Conference

“Interest Rate Changes and Insurance Underwriting”

San Antonio, Texas, March 28, 2003

CAS Ratemaking Seminar

"The Consideration of Risk Loads and Reinsurance Costs in Primary Insurance Ratemaking"

San Antonio, Texas, March 27, 2003

CAS Ratemaking Seminar

"Rate of Return Models in Insurance Ratemaking"

San Diego, California, May 20, 2002
CAS Annual Meeting
"The Actuary as an Expert Witness"

Tampa, Florida, March 7, 2002
CAS Ratemaking Seminar
"Parameterizing Rate of Return Models in Insurance Ratemaking"

Chicago, Illinois, December 10, 2001
NAIC Meeting
"The Impact of Proposition 103 in California"

Kansas City, Missouri, April 30, 2001
NAIC Meeting
"Personal Lines Regulation"

Las Vegas, Nevada, March 12, 2001
CAS Ratemaking Seminar
"Parameterizing Rate of Return Models in Insurance Ratemaking"

Washington DC, January 18, 2001
Brookings Institution Conference on Insurance Regulation
"Auto Insurance Experience in California"

Bermuda, September 14, 2000
Ace Insurance Worldwide Actuarial Conference
"Rate of Return Models In Property Casualty Insurance Ratemaking"

Orlando, Florida, June 9, 1998
Florida Managed Care Institute Annual Conference
"Issues in Integrated Health Care"

Seattle, Washington, July 21, 1997
CAS Dynamic Financial Analysis Seminar
"Dynamic Financial Analysis of a Workers Compensation Insurer"

Boston, Massachusetts, March 14, 1997
CAS Ratemaking Seminar
"Discounted Cash Flow Models in Insurance Ratemaking"

East Lansing, Michigan, July 15, 1996
National Symposium on Workers Compensation
"Managed Care in Workers Compensation"

New Orleans, Louisiana, March 20, 1996
Global Business Research Seminar: Partnerships Between Insurers and Providers
"Integrating the Data Systems"

Orlando, Florida, November 15, 1995
Global Business Research Seminar: Documenting Savings From Managed Care
"Evaluating Savings From Managed Care"

Orlando, Florida, October 27, 1995

Self Insurance Association of America Annual Meeting
"Managed Care in Workers Compensation: A Magic Act or Humbug?"

San Diego, California, October 16, 1995
Global Business Research Seminar: Documenting Savings From Managed Care
"Technical Issues in Measuring Savings From Managed Care"

Durham, North Carolina, September 6, 1995
North Carolina HMO Association Annual Meeting
"Workers Compensation in North Carolina: Risks and Opportunities for HMO's"

Washington, DC, May 22, 1995
Global Business Research Seminar: Outcomes for Workers' Compensation Managed Care
"Measuring and Reporting the Savings"
Orlando, Florida, April 13, 1995
NCCI Annual Meeting
"Managed Care in Workers Compensation"

Phoenix, Arizona, April 3, 1995
Casualty Actuarial Society Seminar on Profitability
"Rate of Return Models - Selecting the Parameters"

New Orleans, Louisiana, March 16, 1995
Casualty Actuarial Society Ratemaking Seminar
"Discounted Cash Flow Models for Insurance Ratemaking"

Orlando, Florida, March 14, 1995
Standard & Poor's Rating Conference
"Consolidation in the Property/Casualty Insurance Industry"

Minneapolis, Minnesota, October 11, 1994
Casualty Actuarial Society Seminar on Medical Cost Containment
"Managed Care and Workers' Compensation"

Toronto, Ontario, August 22, 1994
American Risk and Insurance Association Annual Meeting
"Current Issues in Workers' Compensation"

Boston, Massachusetts, May 17, 1994
Casualty Actuarial Society Annual Meeting
"Standard Of Practice on Profit and Contingency"

Hartford, Connecticut, April 20, 1994
University of Connecticut Blue Cross/Blue Shield Symposium
"24 Hour Coverage - What Will It Involve"

Atlanta, Georgia, March 10, 1994
Casualty Actuarial Society Ratemaking Seminar
"Cash Flow Models for Insurance Ratemaking"

Cambridge, Massachusetts, March 2, 1994
Workers' Compensation Research Institute Health Care Reform Conference
"Early Results of the Florida Pilot Project"

Phoenix, Arizona, November 15, 1993
Casualty Actuarial Society Annual Meeting

"The Use Of Managed Care in Workers' Compensation"

New York, New York, October 20, 1993

Insurance Information Institute/Reinsurance Association of America Research Conference
The Impact of Health Care Reform on Casualty Insurance"

Somerset, New Jersey, July 13, 1993

National Symposium on Workers' Compensation
"Economic Analysis of Workers' Compensation Issues"

Boston, Massachusetts, June 30, 1993

Institute of Actuaries of Japan Special Meeting
"Health Care Costs in Workers' Compensation"

Dallas, Texas, June 15, 1993

Stirling-Cooke Workers' Compensation Seminar
"Workers' Compensation Medical Costs: Trends, Causes and Solutions"

New York, New York, June 3, 1993

New York Business Group On Health
"The Crisis in Workers' Compensation Health Care"

Mauna Lani Bay, Hawaii, May 3, 1993

Western Association of Insurance Brokers Annual Meeting
"Trends in Insurance Insolvency"

Kingston, Ontario, April 28, 1993

Queen's University Workers' Compensation Conference
"Exposure Bases for Workers' Compensation: Equity vs. Practicality"

Sanibel Island, Florida, March 29, 1993

Workers' Compensation Reinsurance Bureau Annual Meeting
"The Use of Managed Care in Workers' Compensation"

Baltimore, Maryland, March 23, 1993

CAMAR Annual Meeting
"Estimating the Cost of Capital in Insurance Ratemaking"

Philadelphia, Pennsylvania, December 1, 1992

Economic Issues in Workers' Compensation Seminar,
"Rate of Return Regulation in Workers' Compensation"

Seattle, Washington, October 16, 1992

Casualty Actuarial Society Seminar on Profitability
"Risk Based Capital Standards for Property Casualty Insurers"

Washington, DC, August 18, 1992

American Risk and Insurance Association Annual Meeting
"The Crisis in Workers' Compensation"

New York, New York, May 19, 1992

Executive Enterprises Institute Seminar: Winning Approval of Rate and Form Filings
"Determining a Fair Rate of Return for Property/Casualty Insurers"

Palm Beach, Florida, April 23, 1992

NCCI Annual Meeting
"Is the Workers' Compensation Industry Competitive?"

Philadelphia, Pennsylvania, March 20, 1992
University of Pennsylvania/Duncanson & Holt Special Seminar
"Current Issues in Workers' Compensation"

Dallas, Texas, March 12, 1992
Casualty Actuarial Society Ratemaking Seminar
"Profitability Models in Insurance Ratemaking: Estimating the Parameters"

Houston, Texas, December 11, 1991
NCCI/NAIC Commissioners Symposium
"Rate Adequacy: Solvency and Safety Implications"

New York, New York, November 17, 1991
Executive Enterprises Institute Seminar: Winning Approval of Rate and Form Filings
"Determining a Fair Rate of Return for Property/Casualty Insurers"

Philadelphia, Pennsylvania, November 12, 1991
Casualty Actuarial Society Annual Meeting
"The Impact of Medical Costs on Casualty Coverages"

New York, New York, May 17, 1991
Executive Enterprises Institute Seminar: Winning Approval of Rate and Form Filings
"Determining a Fair Rate of Return for Property/Casualty Insurers"

Kiawah Island, South Carolina, April 15 & 16, 1991
Casualty Actuarial Society Seminar on Profitability
"Cost of Capital Estimation: Lessons From Public Utilities"
Chicago, Illinois, March 14, 1991
Casualty Actuarial Society Ratemaking Seminar
"The Use of Profitability Models in Insurance Ratemaking"

Orlando, Florida, October 24, 1990,
Financial Management Association Annual Meeting,
"Current Issues in Insurance Rate Regulation: California Prop. 103 and Pennsylvania Act 6"

New Brunswick, New Jersey, May 18, 1990,
Joint Conference on Workers' Compensation,
"Current State Issues and Benefit Reforms"

Orlando, Florida, May 8, 1990,
National Association of Insurance Commissioners Southeast Zone Raters Conference,
"Loss Cost Rating for Workers' Compensation"

Orlando, Florida, April 3, 1990,
Workers' Compensation Reinsurance Bureau Annual Meeting,
"Medical Costs in Workers' Compensation: Recent Trends in Cost Containment"

Philadelphia, Pennsylvania, March 15, 1990,
CAS Ratemaking Seminar,
"Rate of Return Models in Insurance Regulation: Return on Sales vs. Return on Equity"

Chicago, Illinois, November 10, 1989,
Alliance of American Insurers Research Committee,
"Recent Developments in Rate Regulation: California Proposition 103"

New York, New York, October 5, 1989,
NCCI Legal Trends Seminar,
"Medical Cost Containment in Workers' Compensation"

Philadelphia, Pennsylvania, September 7, 1989,
Workers' Compensation Congress,
"Medical Cost Containment in Workers' Compensation"

Denver, Colorado, August 21, 1989,
American Risk and Insurance Association Annual Meeting,
"Regulatory Survival: Rate Changes in Workers' Compensation" (with Richard J. Butler)

Hilton Head, South Carolina, April 4, 1989,
Workers' Compensation Reinsurance Bureau Annual Meeting,
"Prospects for Workers' Compensation in the 1990's"

Mountain Lakes, New Jersey, March 29, 1989,
St. Clares-Riverside Medical Center,
"Stress in the Workplace"

Dallas, Texas, March 16, 1989,
Casualty Actuarial Society Ratemaking Seminar,
"The Impact of Tax Reform on Insurance Profitability"

New Orleans, Louisiana, December 15, 1988,
NAIC-NCCI Commissioners School,
"A Forecast for Workers' Compensation"

Philadelphia, Pennsylvania, November 17, 1988,
Economic Issues in Workers' Compensation Seminar,
"The Impact of Regulation on the Probability of Insolvency" (with John D. Worrall and David Durbin)

Boston, Massachusetts, November 14, 1988,
American Public Health Association Annual Meeting,
"Stress in the Workplace"

Atlanta, Georgia, September 14, 1988,
Casualty Loss Reserve Seminar,
"Estimating the Cost of Social Inflation in Workers' Compensation"

Reno, Nevada, August 15, 1988,
American Risk and Insurance Association Annual Meeting,
"Benefit Increases in Workers' Compensation"

New York, New York, June 13, 1988,
National Association Of Insurance Commissioners Annual Meeting,
"Alternative Rate of Return Models for Insurance Regulation"

Syracuse, New York, May 5, 1988,
Current Issues in Workers' Compensation Symposium,
"Workers' Compensation Stress Claims"

Hilton Head, South Carolina, April 22, 1988,
Workers' Compensation Reinsurance Bureau Annual Meeting,
"A Forecast for Workers' Compensation Insurers"

Absecon, New Jersey, April 19, 1988,
Pennsylvania Coal Mine Rating Bureau Annual Meeting,
"The Use of Rate of Return Models in Insurance Rate Regulation"

Philadelphia, Pennsylvania, November 17, 1987,
Economic Issues in Workers' Compensation Seminar,
"The Transition to Permanent Disability Status" (with John D. Worrall and David Durbin)

Charlotte, North Carolina, October 20, 1987,
American Insurance Association Government Affairs Conference,
"Prospects for Workers' Compensation in 1988"

Minneapolis, Minnesota, September 29, 1987,
Minnesota Workers' Compensation Reinsurance Association Annual Meeting,
"Economic and Demographic Characteristics of Workers' Compensation Claims"

Airlie, Virginia, July 7, 1987,
National Symposium on Workers' Compensation,
"Forecasting Workers' Compensation Experience"

Santa Clara, California, June 30, 1987,
Symposium on Recent Advances in Ratemaking,
"Econometric Models of Workers' Compensation Losses"

Storrs, Connecticut, May 1, 1987,
University of Connecticut Symposium on Current Issues in Workers' Compensation,
"Current Research in Workers' Compensation"

Philadelphia, Pennsylvania, April 16, 1987,
Wharton School Graduate Seminar Series,
"Impact of Tax Reform on Workers' Compensation Profitability"

Boca Raton, Florida, December 4, 1986,
National Association of Insurance Commissioners/NCCI Commissioners School,
Panel Discussion on Current Issues in Workers' Compensation

Philadelphia, Pennsylvania, November 7, 1985,
Wharton School, University of Pennsylvania, Graduate Seminar Series,
"Litigation in Workers' Compensation"

Vancouver, British Columbia, August 19, 1985,
American Risk and Insurance Association Annual Meeting,
"Earnings Loss and Permanent Disability"

Washington, D.C., April 23, 1985,
Washington Conference on the Economics of Disability,
"Employment Effects of Workers' Compensation Insurance"

Schenectady, New York, January 18, 1985,
Union University Graduate Business Seminar Series,
"The Use of Modern Portfolio Theory in Insurance Regulation"

EXPERT TESTIMONY

Utica, New York, July 6, 2016

Village of Ilion, et.al., v. County of Herkimer, et.al.

San Francisco, California, November 19, 2015

State Farm General Homeowners Insurance Rate Hearing

Tallahassee, Florida, October 21, 2015

NCCI Workers Compensation Insurance Rate Hearing

Raleigh, North Carolina, October 27, 2014

Homeowners Insurance Rate Hearing

Tallahassee, Florida, October 14, 2014

NCCI Workers Compensation Insurance Rate Hearing

New York, NY, June 24, 2014

Omar Tigbao and Dorothy Tigbao, et. al., v. QBE Financial Institutions Risk Services, Deposition

New York, NY, March 7, 2014

Thrift Development Corporation v. American International Group, et. al., Deposition

New York, New York, January 28, 2014

Cheryl Hall, et. al. v. Bank of America, N.A., et. al., Deposition

Santa Fe, New Mexico, November 7, 2013

Biennial Title Insurance Rate Hearing

Tallahassee, Florida, October 1, 2013

NCCI Workers Compensation Insurance Rate Hearing

New York, New York, July 10, 2013

Larry Arnett and Ronda Arnett, et. al. v. Bank of America, N.A., et. al., Deposition

Austin, Texas, April 25, 2013

State Farm Lloyds Homeowners Rate Hearing

Tallahassee, Florida, October 4, 2012

NCCI Workers Compensation Insurance Rate Hearing

Boston, Massachusetts, May 14, 2012

Massachusetts Workers Compensation Rate Hearing

New York, New York, February 17, 2012

Temporary Services, Inc. et. al. v. American International Group, et. al., Deposition

San Francisco, California, January 19, 2012

Mercury Insurance Company Homeowners Insurance Rate Hearing

Santa Fe, New Mexico, November 16, 2011

Biennial Title Insurance Rate Hearing

Tallahassee, Florida, October 11, 2011

NCCI Workers Compensation Insurance Rate Hearing

Tampa, Florida, September 13, 2011
Citizens Property Insurance Corporation Homeowners Insurance Hearing

Raleigh, North Carolina, July 25, 2011
Dwelling Fire and Extended Coverage Insurance Rate Hearing

Tallahassee, Florida, October 6, 2010
NCCI Workers Compensation Insurance Rate Hearing

Irvine, CA, April 21, 2010
Eastwood Insurance Services, Inc. et. al., vs. Titan Auto Insurance of NM, et. al. Deposition

San Francisco, California, March 9, 2010
Century National Insurance Company Proposition 103 Rollback Hearing

Santa Fe, New Mexico, November 18, 2009
Annual Title Insurance Rate Hearing

Tallahassee, Florida, October 29, 2009
NCCI Workers Compensation Insurance Rate Hearing

Austin, Texas, September 14, 2009
Biennial Title Insurance Rate Hearing

Austin, Texas, April 1, 2009
State Farm Lloyds Homeowners Rate Hearing

Santa Fe, New Mexico, November 19, 2008
Annual Title Insurance Rate Hearing

New York, New York, November 13, 2008
Georgia Hensley, et. al., vs. Computer Sciences Corp. et. al., Deposition

Tallahassee, Florida, October 29, 2008
State Farm Florida Homeowners Insurance Hearing

Raleigh, North Carolina, July 1, 2008
Auto Insurance Rate Hearing

San Francisco, California, May 5, 2008
GeoVera Insurance Company Earthquake Rate Hearing

Tallahassee, Florida, January 23, 2008
Hartford Insurance Group Homeowners Insurance Rate Hearing

Boston, Massachusetts, January 9, 2008
Commerce Insurance Group Auto Insurance Rate Hearing

San Francisco, California, November 29, 2007
Explorer Insurance Company Automobile Rate Hearing

Santa Fe, New Mexico, November 19, 2007
Annual Title Insurance Rate Hearing

Reno, Nevada, June 14, 2007
Public Hearing Regarding Merger Between UnitedHealth Group and Sierra Health Systems

Austin, Texas, May 31, 2007
State Farm Lloyds Homeowners Rate Hearing

Reno, Nevada, October 26, 2006
Public Hearing Regarding Demutualization of Employers Insurance Group

San Francisco, California, August 30, 2006
Hearing on Proposed Title Insurance Rate Regulations

Austin, Texas, August 14, 2006
Biennial Title Insurance Rate Hearing

Raleigh, North Carolina, September 28, 2005
Auto Insurance Rate Hearing
Providence, Rhode Island, September 27, 2005
Norcal Medical Malpractice Insurance Rate Hearing

San Francisco, California, August 23, 2005
Safeco Insurance Company Earthquake Rate Hearing

Boston, Massachusetts, April 15, 2005
Massachusetts Workers Compensation Rate Hearing

Lawrence, Massachusetts, February 14, 2005
Highground, Inc. v. Mazonson

New York, NY, January 21, 2005
NFHA v. Prudential Deposition

Austin, Texas, July 13, 2004
Medical Protective Insurance Company Medical Malpractice Insurance Rate Hearing

Austin, Texas, December 16, 2003
Biennial Title Insurance Rate Hearing

Providence, Rhode Island, November 17, 2003
Norcal Medical Malpractice Insurance Rate Hearing

San Francisco, California, September 16, 2003
Century National Proposition 103 Rollback Hearing

Austin, Texas, September 11, 2003
Farmers Insurance Exchange Homeowner Rate Rollback Hearing

Austin, Texas, September 2, 2003
State Farm Lloyds Homeowners Rate Rollback Hearing

Austin, Texas, May 21, 2003
Farmers Insurance Group Settlement Hearing

Boston, Massachusetts, April 29, 2003
Massachusetts Workers Compensation Rate Hearing

Los Angeles, California, March 12, 2003
SCPIE Medical Malpractice Rate Hearing

Raleigh, North Carolina, July 17, 2002
Auto Insurance Rate Hearing

Tallahassee, Florida, February 25, 2002
NCCI Workers Compensation Insurance Rate Hearing

Austin, Texas, February 5, 2002
Biennial Title Insurance Rate Hearing

Raleigh, North Carolina, September 24, 2001
Auto Insurance Rate Hearing

Boston, Massachusetts, August 14, 2001
Massachusetts Auto Insurance Bureau Rate Hearing

Austin, Texas, March 6, 2001
Texas Auto Benchmark Rate Hearing

Boston, Massachusetts, August 23, 2000
Massachusetts Auto Insurance Bureau Rate Hearing

Austin, Texas, December 7, 1999
Texas Auto Insurance Plan Association Rate Hearing

Raleigh, North Carolina, December 3, 1999
Auto Insurance Rate Hearing

Austin, Texas, November 3, 1999
Biennial Title Insurance Rate Hearing

Austin, Texas, September 8, 1999
Texas Auto Benchmark Rate Hearing

Boston, Massachusetts, August 13, 1999
Massachusetts Auto Insurance Bureau Rate Hearing

Austin, Texas, June 22, 1999
Texas Property Benchmark Rate Hearing

Honolulu, Hawaii, December 16, 1998
NCCI Workers Compensation Insurance Rate Hearing

Richmond, Virginia, November 15, 1998
NCCI Workers Compensation Insurance Rate Hearing

Boston, Massachusetts, October 9, 1998
Massachusetts Auto Insurance Bureau Rate Hearing

Austin, Texas, May 19, 1998
Texas Auto Insurance Plan Association Rate Hearing

Austin, Texas, April 7, 1998
Auto Insurance Benchmark Rate Hearing

Austin, Texas, February 17, 1998
Property Insurance Benchmark Rate Hearing

Austin, Texas, November 18, 1997
Biennial Title Insurance Rate Hearing

Tallahassee, Florida, September 8, 1997
NCCI Workers Compensation Insurance Rate Hearing

Austin, Texas, April 8, 1997
Texas Auto Insurance Plan Association Rate Hearing

Austin, Texas, March 10, 1997
Auto Insurance Benchmark Rate Hearing

San Francisco, California, March 4, 1997
Insurance Department Hearing on Rating Factors

Raleigh, North Carolina, July 16, 1996
Auto Insurance Rate Hearing

San Francisco, California, March 11, 1996
Century National Proposition 103 Rollback Hearing

Sacramento, California, January 30, 1996
Hartford Steam Boiler Proposition 103 Rollback Hearing

San Francisco, California, January 8, 1996
SAFECO Insurance Company Earthquake Rate Hearing
Austin, Texas, December 21, 1995
Residential Property Insurance Benchmark Rate Hearing

Clearwater, Florida, December 8, 1995
Florida Windstorm Underwriting Association Rate Hearing

Austin, Texas, November 28, 1995
Private Passenger Auto Insurance Benchmark Rate Hearing

Austin, Texas, October 31, 1995
Texas Automobile Insurance Plan Association Rate Hearing

Sacramento, California, April 18, 1995
California Insurance Department Hearing on Auto Insurance Rating Factors

Portland, Maine, April 13, 1995
Workers Compensation Assigned Risk Pool Fresh Start Hearing

San Francisco, California, February 6, 1995
Farmers Insurance Group Earthquake Insurance Rate Hearing

Austin, Texas, January 6, 1995
Special Hearing on Classification Rules for Automobile Insurance

Austin, Texas, December 15, 1994
Residential Property Insurance Benchmark Rate Hearing

Austin, Texas, October 4, 1994
Texas Automobile Insurance Plan Association Rate Hearing

Austin, Texas, September 27, 1994
Private Passenger Auto Insurance Benchmark Rate Hearing

Raleigh, North Carolina, July 19, 1994
Private Passenger Auto Insurance Rate Hearing

San Francisco, California, December 22, 1993
Century National Homeowner's Insurance Rate Hearing

Raleigh, North Carolina, October 13, 1993
Homeowners/Farmowners Insurance Rate Hearing

Tallahassee, Florida, October 4, 1993
Workers' Compensation Insurance Rate Hearing

Boston, Massachusetts, September 9, 1993
Automobile Insurance Rate Hearing

Austin, Texas, March 4, 1993
Residential Property Insurance Benchmark Rate Hearing

Austin, Texas, February 10, 1993
Automobile Insurance Benchmark Rate Hearing

Honolulu, Hawaii, November 18, 1992
Liberty Mutual Insurance Automobile Rate Hearing

Raleigh, North Carolina, November 13, 1992
Workers' Compensation Insurance Rate Hearing

Tallahassee, Florida, October 29, 1992
Workers' Compensation Insurance Rate Hearing

San Francisco, California, October 14, 1992
Workers' Compensation Insurance Rate Hearing

Atlanta, Georgia, September 24, 1992
Workers' Compensation Insurance Rate Hearing

Nashville, Tennessee, May 27, 1992
Workers' Compensation Insurance Rate Hearing

San Francisco, California, May 13, 1992
Workers' Compensation Insurance Rate Hearing

Los Angeles, California, April 10, 1992
Mercury General Proposition 103 Rollback Proceedings

Austin, Texas, January 27, 1992
Texas Automobile Insurance Plan Rate Hearing

Austin, Texas, December 17, 1991
Automobile Insurance Rate Hearing

Raleigh, North Carolina, December 16, 1991
Workers' Compensation Insurance Rate Hearing

San Francisco, California, October 22, 1991
Workers' Compensation Rate Hearing

Los Angeles, California, May 23, 1991,
Proposition 103 RCD-2 Proceedings

San Francisco, California, April 9, 1991
California Workers' Compensation Rate Study Commission

Nashville, Tennessee, March 20, 1991
Workers' Compensation Insurance Rate Hearing

Los Angeles, California, March 12, 1991,
California Workers' Compensation Rate Study Commission

Olympia, Washington, February 26, 1991,
House Financial Institutions/Insurance Committee Hearing on Rules for Insurance Regulatory Legislation

Olympia, Washington, November 27, 1990,
Insurance Department Public Hearing on Proposed Rules for Ratemaking

Harrisburg, Pennsylvania, November 12, 1990,
Allstate Insurance Company Automobile Insurance Rate Hearing

Tallahassee, Florida, November 1, 1990,
Scanlan v. Martinez, et.al., Superior Court of Leon County

San Bruno, California, October 1, 1990,
SAFECO Insurance Group Proposition 103 Rate Rollback Hearing

Austin, Texas, July 23, 1990,
Texas State Board of Insurance Special Hearing on Investment Income in Ratemaking

Harrisburg, Pennsylvania, July 18, 1990,
Pennsylvania National Mutual Insurance Company Automobile Insurance Rate Hearing

Harrisburg, Pennsylvania, June 28, 1990,
Harleysville Mutual Insurance Company Automobile Insurance Rate Hearing

Columbia, South Carolina, March 30, 1990,
Workers' Compensation Insurance Rate Hearing

San Bruno, California, March 19, 1990,
California Proposition 103 Generic Hearing

Denver, Colorado, December 12, 1989,
Workers' Compensation Insurance Rate Hearing

Tampa, Florida, October 23, 1989,
Workers' Compensation Insurance Rate Hearing

Austin, Texas, October 17, 1989,

Workers' Compensation Insurance Rate Hearing

Los Angeles, California, September 25, 1989,
SAFECO Insurance Company of America Proposition 103 Rate Hearing

Austin, Texas, August 29, 1989,
Texas Insurance Advisory Association Property Insurance Rate Hearing

Providence, Rhode Island, April 13, 1989,
Workers' Compensation Insurance Rate Hearing

Augusta, Maine, January 24, 1989,
Workers' Compensation Insurance Rate Hearing

Hartford, Connecticut, November 14, 1988,
Workers' Compensation Insurance Rate Hearing

Tallahassee, Florida, November 3, 1988,
Workers' Compensation Insurance Rate Hearing

Austin, Texas, November 2, 1988,
Workers' Compensation Insurance Rate Hearing

Montgomery, Alabama, June 30, 1988,
Workers' Compensation Insurance Rate Hearing

Augusta, Maine, March 24, 1988,
Workers' Compensation Insurance Rate Hearing

Austin, Texas, October 27, 1987,
Workers' Compensation Insurance Rate Hearing

Tallahassee, Florida, October 9, 1987,
Workers' Compensation Insurance Rate Hearing

Atlanta, Georgia, August 6, 1987,
Workers' Compensation Insurance Rate Hearing

Augusta, Maine, February 24, 1987,
Workers' Compensation Insurance Rate Hearing

Tallahassee, Florida, November 14, 1986,
Workers' Compensation Insurance Rate Hearing

Austin, Texas, November 18, 1986,
Workers' Compensation Insurance Rate Hearing

Augusta, Maine, May 28, 1986,
Workers' Compensation Insurance Rate Hearing

Tallahassee, Florida, December 6, 1985,
Workers' Compensation Insurance Rate Hearing

Oklahoma City, Oklahoma, October 10, 1985,
Workers' Compensation Insurance Rate Hearing

Austin, Texas, July 23, 1985,
Workers' Compensation Insurance Rate Hearing

Austin Texas, June 14, 1985,
Workers' Compensation Insurance Rate Hearing

Tallahassee, Florida, November 18, 1984,
Workers' Compensation Insurance Rate Hearing

Austin, Texas, August 29, 1984,
Workers' Compensation Insurance Rate Hearing

Portland, Oregon, March 6, 1984,
NA IC Public Hearing on Investment Income and Insurance Profitability

Tallahassee, Florida, February 25, 1984,
Workers' Compensation Insurance Rate Hearing

Tallahassee, Florida, August 18, 1983,
Workers' Compensation Insurance Rate Hearing

Austin Texas, July 13, 1983,
Workers' Compensation Insurance Rate Hearing

Oklahoma City, Oklahoma, March 6, 1983,
Workers' Compensation Insurance Rate Hearing

Baton Rouge, Louisiana, March 16, 1982,
Louisiana Insurance Commission Public Hearing on Investment Income

Providence, Rhode Island, February 3, 1982,
Workers' Compensation Insurance Rate Hearing

Augusta, Maine, October 1, 1981,
Workers' Compensation Insurance Rate Hearing

**COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE**

Docket No. 17-

In re:

**APPLICATION OF THE WORKERS'
COMPENSATION RATING AND INSPECTION
BUREAU OF MASSACHUSETTS FOR APPROVAL
OF A GENERAL RATE REVISION TO BE
EFFECTIVE ON AND AFTER JULY 1, 2018**

PRE-FILED DIRECT TESTIMONY OF ROBERT F. CONGER

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of Robert F. Conger in support of its application for a general rate revision to be effective on and after July 1, 2018.

Q. Please state your full name.

A. Robert Frederick Conger.

Q. What are your professional qualifications?

A. I am a consulting actuary in the Insurance, Consulting and Technology line of business with Willis Towers Watson. My consulting practice covers the full range of issues facing property/casualty insurers, with a particular expertise in the workers' compensation line. I have assisted clients with pricing, reserving, operational reviews, financial analysis, reinsurance structures, mergers and acquisitions, strategy, and litigation involving business and regulatory issues. These clients include insurance companies, state funds, industry bureaus, self-insured entities and regulators. I have served as Professional Standards Officer for the firm, as manager of the firm's Midwest offices, and as a leader of the firm's property/casualty insurance industry practice.

Before joining the firm in 1986, I served as senior vice president and actuary at the Massachusetts Rating Bureau (which at that time carried on both the work presently performed by the WCRIBMA and the work now conducted by the Automobile Insurers Bureau or "AIB"). I was responsible for all ratemaking, research and statistical functions of the Bureau and testified at numerous rate hearings before the Division of Insurance on workers' compensation and automobile insurance rates. Before that, I worked for the American Mutual Liability Insurance Group.

I am a Fellow of the Casualty Actuarial Society ("CAS"), a Member of the American Academy of Actuaries, and an Honorary Fellow of the UK Institute of Actuaries. I served as President of the CAS and also served the CAS as Chairman of the Board, as Vice President-Administration, as Vice President-International, and as an elected Board member. Currently, I am serving the CAS as its International Ambassador. I have chaired and served on numerous CAS committees over the years, and I continue to serve on various CAS committees. I am also a past president of Casualty Actuaries of New England and of the Casualty Actuaries of the Southeast. I served on the Board of Directors of the American Academy of Actuaries; and I served on the Board of Trustees of The Actuarial Foundation here in the United States. I also have served, and continue to chair and serve, on various committees of the International Actuarial Association.

I have written various articles and professional papers, and co-authored "Estimating ULAE Liabilities: Rediscovering and Expanding Kittel's Approach," the winner of the 2003 James C.H. Anderson Award for the advancement of current actuarial practice.

I have a B.A., with honors, in economics and mathematics from Amherst College. My curriculum vitae is attached to this testimony.

Q. What was your role in the preparation of the current WCRIBMA filing for a general rate revision?

A. With respect to Sections I (Rate Recommendation), II (Loss Development), III (Premiums), IV (Benefit Change Adjustments), V (Trend), and VI (Expenses) of the filing, I evaluated and advised WCRIBMA as to whether the filing is complete and comprehensive in developing an actuarially sound set of rate and rating factor proposals for the specified prospective period; whether the filing relies on appropriate types and sources of data; whether the methods, assumptions and judgments used in the filing are reasonable and appropriate; whether the filing provides sufficient documentation of the foregoing elements; and whether the proposed rate level, rates, and rating factors are reasonable – and are neither excessive, inadequate, nor unfairly discriminatory. Claudia Cunniff of the WCRIBMA was primarily responsible for the preparation of each of these sections, and I collaborated closely with her.

My review also included a peer and technical review of all sections of the filing, except Section VII (Profit) and Volume 3 (the WCRIBMA's Cost Containment filing). The technical review focused on the mechanical accuracy of the calculations, i.e., checking whether the formulas and calculations are performing as intended and as documented throughout the filing. The peer review did not include auditing the data used by the WCRIBMA, but the WCRIBMA has advised me of the processes it uses to collect and validate data and I believe those processes to be actuarially sound and reasonable.

Q. Did you perform this work on the filing yourself?

A. I did not perform the work entirely alone: several of my colleagues also peer reviewed various sections of the filing, shared their observations and findings with me, and discussed my observations and findings. I did not perform the detailed technical review of the filing;

that review was conducted by several of our analysts, operating under the guidance and supervision of our peer review team.

Q. What is your overall opinion as to the WCRIBMA filing and the rate and rating values it proposes?

A. The filing is comprehensive, complete, clear, and well-documented. As part of our review, we did ask WCRIBMA staff to explain various judgments that are incorporated in the filing. In each case, I was satisfied that the judgments and calculations in the filing are actuarially sound and contribute to a filed set of recommendations that falls within a range of reasonableness; and is neither inadequate, excessive, nor unfairly discriminatory.

In my opinion, assuming that the underwriting profit provision is reasonable and appropriate, the rates and rating values proposed in the WCRIBMA filing fall within a range of reasonableness; and are neither inadequate, excessive, nor unfairly discriminatory.

Signed this 18th day of December 2017 under the pains and penalties of perjury.



Robert F. Conger, FCAS, MAAA

ROBERT F. CONGER
Curriculum Vitae

Contact Information	+1 (404) 791 9375 bob.conger@willistowerswatson.com
Home Address	655 Michigan Avenue NE, Apartment 308, Washington DC 20017
Current Employment	Consulting Actuary (part-time) Insurance, Consulting and Technology Willis Towers Watson 800 N. Glebe Road, Arlington, VA 22203
Employment History	<p>Willis Towers Watson (and predecessor orgs) 1986-current Principal and Consultant Manager of Midwest insurance practice Manager of Chicago insurance practice Leader of US property/casualty insurance practice Co-leader of Atlanta property/casualty insurance practice Professional Standards Officer Member of Actuarial Council Member of Practice Council</p> <p><i>Consulting on the full range of issues facing property/casualty insurers, with a particular expertise in the workers' compensation line. Engagements have included pricing, reserving, operational reviews, actuarial function effectiveness improvement, financial analysis, reinsurance structures, mergers and acquisitions, strategy, and litigation involving business and regulatory issues.</i></p> <p>Massachusetts Rating Bureaus (Auto & WC) 1979-1986 Senior Vice President & Actuary Vice President & Actuary <i>Responsible for all ratemaking, research and statistical functions of the Bureau.</i></p> <p>American Mutual Insurance Companies 1975-1979 Associate Actuary – <i>Loss Reserving, all P/C lines</i> Actuarial Assistant – <i>Pricing, all P/C lines</i></p>
Professional Credentials	Fellow, Casualty Actuarial Society 1979 Member, American Academy of Actuaries 1980
Professional Honors	Membre d'Honneur of the French Institut des Actuaire 2015 CAS Above and Beyond Achievement Award 2014 Honorary Fellow, Institute of Actuaries (UK) 2003
Education	Amherst College, Amherst, Massachusetts 1975

BA in Economics and Mathematics, magna cum laude

Publications See addendum

Expert Testimony See addendum

Professional Activities

Casualty Actuarial Society

President	2001-2002
Board of Directors	1994-1997, 2000-2003
Chairman	2002-2003
International Ambassador	2013-current
Vice President – International	2012-2013
Vice President – Administration	1988-1991
Asia Regional Meeting Coordination Committee	2017-current
Co-Chair	2017-current
ASTIN Task Force	2016-current
Latin America Regional Committee	2016-current
Agricultural Insurance in Asia Working Party	2016-2017
Leadership Development Committee – Mentor	2015-current
Malaysia Workshop Committee	2014-current
Co-Chair	2014-current
Strategic Review of CAS Literature Advisory Panel	2015-current
University Engagement Committee	2013-2014
General Insurance Actuaries Network Task Force	2013
International Leadership Committee	2012-current
Chair	2012-2013
Vice Chair	2014-current
CAS Delegate to IAA Council	2012-2016
Joint CAS/SOA Committee on Actuarial Diversity	2009-2014
East Asia Task Force	2009-2013
International Liaison – China	2008-2010
International Member Services Ctee	2003-2008; 2012-current
Asia Regional Committee	2002-current
Chairman	2002-2005
Nominating Committee	2002-2004
Chairman	2003-2004
IAA Liaison/Delegates Committee	2002-current
Chairman	2003-2004; 2012-2016
Task Force on Mutual Recognition	2002-2003
Long Range Planning Committee	1999-2000
Audit Committee	1994-1997
Chairman	1996-1997
Search Committee (for Executive Director)	1991, 2001
MIS Task Force	1991-1992
Membership Survey Task Force	1986-1987
Editorial Committee	1980-1988

Chairman	1987-1988
<i>Proceedings</i> Editor	1984-1985
Examination Committee	1980-1984, 2001, 2003
International Congress of Actuaries 2014 (Washington DC)	
Chairman of the Organizing Committee	2003-2015
The Actuarial Foundation	
Modeling the Future Challenge	2017-current
Chairman's Think Tank	2016-current
Mauro Mentor	2015-current
Board of Trustees	2008-2013
Liaison to Actuarial Foundation of Canada	2011-2013
Scholarship Committee – Chairman	2010-2013
Actuarial Diversity Scholarship – Chairman	2009-2013
Consumer Education Committee	2004-2009
International Actuarial Association	
Development of Sections Task Force	2016-current
Chairman	2016-current
General Insurance Committee	2016-current
Chairman	2016-current
Leader of Proposing Team	2014-2016
ICA 2018 Advisory Board	2016-current
Strategic Planning Subcommittee	2014-2015
Nominations Committee	2014-2015
Advice & Assistance Committee	2003-2010, 2012-current
Chairman	2008-2010
China Subcommittee	2003-2007
IAA Fund Committee	2008-2010
Social Security Committee	2011-2016
Member Services Committee	2003-2008
Actuaries Without Borders Committee	
IAA Delegate	2008-2010
Elected Member	2004-2008
Formulating Task Force	2002-2004
American Academy of Actuaries	
Volunteer Resource Committee	2007-2009
Chairman	2007-2008
Board of Directors	2001-2002
ARECA – Asia Region Casualty Actuaries (Regional Affiliate)	
Advisory Board	2016-current
Casualty Actuaries of the Southeast (Regional Affiliate)	
President	1995-1996
VP – Programs	1987-1989
Co-founder	1987

Casualty Actuaries of the Northeast (Regional Affiliate)
President

1985-1986

Personal Mentor to Various Young Actuaries

2009-current

Civic Organizations (current involvements)

Heartwood Regional Theater Company, Maine
Board Member; Treasurer

Pemaquid Trail Association, Maine
President; Board Member

Rotary Club of Damariscotta / Newcastle, Maine
Karl's Club Committee Member
Providing sports equipment to needy kids

Amherst College
Alumni Fund – Associate Agent

Gizmo Garden – STEM Program for Middle Schoolers
Faculty Member

ROBERT F. CONGER

Publications – 2001 through present

“Applying Insurance Pricing Theory for Pricing Alternative Dispute Resolution as an Insurance Product”, accepted for publication in an American Society of Civil Engineers journal. Co-authored with Xinyi Song, Carol Menassa, Feniosky Pena Mora.

“TANSTAAFL”, address to new CAS Members, published in the 2008 Casualty Actuarial Society *Proceedings*.

“An Extension Model of Financially-balanced Bonus-Malus System”, *ASTIN Bulletin*, 2008. Co-authored with Yugu Xiao and Shengwang Meng.

“Predictive Modeling in Workers Compensation”, article published in Tillinghast’s *Emphasis* magazine, 2006 – 4. Co-authored with Russell Greig.

“All the Pieces Matter – the State of the Workers Comp Market”, article published in *Risk Management Magazine*, November 2006. Co-authored with Bruce Hockman.

“Time Travelers Return To Assess Forecasts, Find Some Errors and Some Encouraging Developments”, article revisiting a five year forecast from 2001, published in *National Underwriter* magazine, 2006, co-authored with Stephen D’Arcy.

“Top Ten Stories of 2005”, article published in Casualty Actuarial Society *Actuarial Review*, February 2006. Co-authored with Vince Yezzi. Similar articles in the same publication in 2005, 2004, 2003, 2002, 2001, 2000, 1999, with various co-authors.

“Managing Overconfidence in Pricing”, article published in Tillinghast’s *Emphasis* magazine, 2004 – 2. Co-authored with Charles Wolstein.

“How Might the Presentation of Liabilities at Fair Value Have Affected the Reported Results of U.S. Property Casualty Insurers?”, research monograph commissioned by the Casualty Actuarial Society, published in *Fair Value of P&C Liabilities: Practical Implications*, 2004. Co-authored with Stephen Lowe and James Hurley.

“Beat the Spread”, article about winning and losing workers compensation insurance companies, published in *Best’s Review*, March 2004. Co-authored with Russell Greig.

“What’s Happening with WC Costs and What To Do About Them,” published in *Financial Executive* magazine, November 2003. Co-authored with Ann Conway.

“Estimating ULAE Liabilities: Rediscovering and Expanding Kittel’s Approach” article published in Casualty Actuarial Society *Forum*, Fall 2003. Winner of the 2003 James C. H. Anderson Award for the advancement of current actuarial practice. Co-authored with Alejandra Nolibos.

“Managing Overconfidence”, article published in Tillinghast’s *Emphasis* magazine, 2003 – 3. Co-authored with Stephen Lowe.

“Oh, The Places You’ll Go!” Presidential Address published in Casualty Actuarial Society *Proceedings*, 2002.

“From the President” column published in the Casualty Actuarial Society *Actuarial Review*

- “Developing Knowledge on a Worldwide Basis”, February 2002
- “Educating Actuaries for the Future”, May 2002
- “Think Small”, August 2002
- “Our Place in the World”, November 2002

“The Value of Interacting with the Claim Department”, article published in Casualty Actuarial Society *Forum*, Fall 2001. Co-authored with Robert Grove.

“TANSTAAFL”, column published in the Casualty Actuarial Society *Actuarial Review*, August 2001.

“Top Ten Stories of 2005”, article providing a five year forecast of major trends and factors affecting the property/casualty insurance industry, published in *National Underwriter* magazine, 2001, co-authored with Stephen D’Arcy.

ROBERT F. CONGER

Expert Testimony

- (1) July 1979, Workers Compensation Rating and Inspection Bureau of Massachusetts Rate Filing, Massachusetts Division of Insurance.
- (2) September-November 1979, Fix and Establish 1980 Automobile Insurance Rates, Massachusetts Division of Insurance.
- (3) September-November 1980, Fix and Establish 1981 Automobile Insurance Rates, Massachusetts Division of Insurance.
- (4) October-November 1980, Remand Hearing to Fix and Establish 1980 Automobile Insurance Rates, Massachusetts Division of Insurance.
- (5) October-November 1981, Fix and Establish 1982 Private Passenger Automobile Insurance Rates, Massachusetts Division of Insurance.
- (6) March-July 1982, Workers Compensation Rating and Inspection Bureau of Massachusetts Rate Filing, Massachusetts Division of Insurance.
- (7) October-November 1982, Fix and Establish 1983 Private Passenger Automobile Insurance Rate, Massachusetts Division of Insurance.
- (8) June-November 1983, Workers Compensation Rating and Inspection Bureau of Massachusetts Rate Filing (Widow Bill), Massachusetts Division of Insurance.
- (9) September-November 1983, Fix and Establish 1984 Private Passenger Automobile Insurance Rates, Massachusetts Division of Insurance.
- (10) October-December 1984, Fix and Establish 1985 Private Passenger Automobile Insurance Rate, Massachusetts Division of Insurance.
- (11) September-November 1985, Fix and Establish 1986 Private Passenger Automobile Insurance Rates, Massachusetts Division of Insurance.
- (12) March-June 1987, Workers Compensation Rating and Inspection Bureau of Massachusetts Rate Filing (Docket 87-9), Massachusetts Division of Insurance.

- (13) November 1987, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (14) November 1988, National Council on Compensation Insurance, Florida Rate Filing, Florida Department of Insurance.
- (15) October 1989, Tennessee Workers Compensation Advisory Committee Review of Workers Compensation Rate Filing, Tennessee Commissioner of Insurance.
- (16) December 1989, Mississippi Insurance Commission Review of Workers Compensation Rate Filing, Mississippi Insurance Commission.
- (17) May 1991, Beacon Insurance Company in Rehabilitation versus various parties. (Litigation settled out of court.)
- (18) August 1991, Accident Fund of Michigan versus various parties. Litigation.
- (19) November 1991, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (20) May 1992, Workers Compensation Insurance Rating Bureau of California Rate Filing, California Department of Insurance.
- (21) November 1992, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (22) April 1993, Civil litigation between major insurer and major policyholder.
- (23) September 1993, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (24) August 1995, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (25) October 1995, Nevada State Industrial Insurance System Rate Filing, Nevada Division of Insurance.
- (26) August 1996, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.

- (27) August 1997, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (28) September-November 1998, Employers Insurance Company of Nevada Rate Filing/Transition Plan, Nevada Division of Insurance.
- (29) August 1999, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (30) August 2000, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (31) August 2001, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (32) September 2001, for a Managing General Agent in a suit filed against a major national property/casualty insurer.
- (33) September 2002, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (34) September 2003, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (35) September 2004, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (36) October 2004, National Council on Compensation Insurance, Filing for Revised Florida Workers Compensation Rates, Florida Insurance Commissioner.
- (37) March-April 2005, Workers' Compensation Rating and Inspection Bureau of Massachusetts, Filing for General Rate Revision, Massachusetts Division of Insurance.
- (38) September 2005, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (39) October 2005, National Council on Compensation Insurance, Filing for Revised Florida Workers Compensation Rates, Florida Insurance Commissioner.

- (40) April 2006, National Council on Compensation Insurance, Filing for Revised South Carolina Workers Compensation Loss Costs, State of South Carolina Administrative Law Court.
- (41) July 2006, Major pharmaceutical company, Dispute with insurance company regarding coverage in mass tort personal injury case, Illinois.
- (42) September 2006, Property/casualty insurance company, Dispute with policyholder regarding workers compensation retrospective rating policy, Delaware State Court.
- (43) September 2006, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (44) October 2006, National Council on Compensation Insurance, Filing for Revised Florida Workers Compensation Rates, Florida Insurance Commissioner.
- (45) October 2006, Employers Insurance Group, Hearing on proposed demutualization of EIG. Conger testimony focused on allocation of consideration among mutual company's members, Nevada Division of Insurance.
- (46) March-April 2007, Workers' Compensation Rating and Inspection Bureau of Massachusetts, Filing for General Rate Revision, Massachusetts Division of Insurance.
- (47) September 2007, North Carolina Rate Bureau Workers Compensation Filing, North Carolina Department of Insurance.
- (48) March-April 2008, Workers' Compensation Rating and Inspection Bureau of Massachusetts, Filing for General Rate Revision, Massachusetts Division of Insurance.
- (49) March-April 2010, Workers' Compensation Rating and Inspection Bureau of Massachusetts, Filing for General Rate Revision, Massachusetts Division of Insurance.
- (50) January-October 2012, Ohio Bureau of Workers' Compensation, Class Action litigation relating to pricing plans, in the Court of Common Pleas, Cuyahoga County, Ohio.
- (51) December 2017, Workers' Compensation Rating and Inspection Bureau of Massachusetts, Filing for General Rate Revision, Massachusetts Division of Insurance.

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE

Docket No. 17-

In re:

APPLICATION OF THE WORKERS'
COMPENSATION RATING AND INSPECTION
BUREAU OF MASSACHUSETTS FOR APPROVAL
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EFFECTIVE ON AND AFTER JULY 1, 2018

PRE-FILED DIRECT TESTIMONY OF CLAUDIA B. CUNNIFF

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of Claudia B. Cunniff in support of its application for a general rate revision to be effective on and after July 1, 2018.

Q. Please state your full name.

A. Claudia B. Cunniff.

Q. Ms. Cunniff, please describe your current employment and your educational and professional experience.

A. I am presently employed as Assistant Vice President and Actuary at the WCRIBMA. I hold a bachelors degree in biology from the College of the Holy Cross. I am a Fellow of the Casualty Actuarial Society and a member of the American Academy of Actuaries. Before joining the WCRIBMA in February 2000, I worked for ten years as an actuary in Massachusetts. My actuarial career began in 1990 at Liberty Mutual Insurance Company where I focused on ratemaking issues on both personal and commercial lines. In 1994, I moved to Trust Insurance Group, Inc., where I became a manager and actuary and worked

on a broad range of actuarial and financial matters. A copy of my curriculum vitae is attached to this testimony.

Q. What was your role in the preparation of the current WCRIBMA filing for a general rate revision?

A. I was responsible for preparation of all portions of Volume 1: Main Rate Level Filing and Volume 3: Cost Containment. I also oversaw preparation of, and peer reviewed, Volume 2 of the filing, which included consulting with and providing input to my colleague, Anthony Salido, regarding the data and methodology used in that volume. I also peer reviewed Volume 1, Section VII (Profit), which was prepared by the WCRIBMA's outside consulting expert David Appel, and I was responsible for developing the underwriting cash flows for losses and premiums used by Dr. Appel in the discounted cash flow models in that section. I worked with the WCRIBMA's outside consulting experts regarding their peer review and input on the other portions of the filing.

Q. Have you explained the basis of your derivation of each of the ratemaking factors that you are sponsoring in the text and accompanying exhibits found in the WCRIBMA's filing?

A. Yes.

Q. Are the data, calculations and narrative statements in the sections you are sponsoring complete and accurate?

A. To the best of my knowledge, information and belief, the data and calculations in the sections of the filing I am sponsoring are complete and accurate, and the narrative statements offered in support of these sections are also accurate and correct.

Q. What was your role in the preparation of the cost containment section of the current WCRIBMA filing?

A. I was responsible for the preparation of the cost containment section of the filing. I worked closely with WCRIBMA staff in reviewing the cost containment surveys for the participating companies and contacting those companies about any outstanding questions the WCRIBMA had regarding the survey responses.

In addition to compiling these ten survey responses, I also obtained updated data and information from the Insurance Fraud Bureau of Massachusetts. That information can be found in the cost containment filing. To the best of my knowledge, the information and exhibits in this section of the filing are complete and accurate.

Q. Are you familiar with the statutory provisions that require the WCRIBMA to make a cost containment filing?

A. Yes. It is my understanding that the legislature has mandated that the Commissioner make a finding, based on the information WCRIBMA submits in its filing, as to whether insurers employ acceptable “cost control programs and techniques ... which have had or are expected to have a substantial impact on fraudulent claim costs, unnecessary health care costs, and any other unreasonable costs and expenses, as well as the collection of appropriate premium charges owed” to the insurers the WCRIBMA represents.

Q. Does this filing provide the information the Commissioner would need to make a finding that the industry’s cost control programs and techniques satisfy the statutory standard?

A. Yes.

Q. Do you have an opinion on what his finding should be this year?

A. Yes.

Q. What is your opinion?

A. In my professional opinion, the information the WCRIBMA has submitted this year should lead the Commissioner to make the finding that there are acceptable cost control programs and techniques' presently in place which satisfy the statutory requirements.

Signed this _22nd_ day of December 2017 under the pains and penalties of perjury.

A handwritten signature in cursive script that reads "Claudia B. Cunniff". The signature is written in black ink and is positioned above a horizontal line.

Claudia B. Cunniff, FCAS, MAAA

Claudia B. Cunniff, FCAS, MAAA

101 Arch Street, 5th floor
Boston, MA 02110
(617) 646-7589

PROFESSIONAL EXPERIENCE:

WORKERS' COMPENSATION RATING & INSPECTION BUREAU OF MA, Boston, MA

2/00 – present

Assistant Vice President and Actuary

Directs development of rate indication and strategy of filing and approval process
Directs preparation of main rate filing and other filings
Supports filings with hearing testimony
Prepares and directs preparation of informational reports
Processes information requests, etc. from members, regulators, etc.

TRUST GROUP, INC., Taunton, MA

8/94-1/00

Manager - Actuary

Financial Modeling - Developed pro-forma income statement model and assisted with the preparation of projected balance sheet and cash flow items
Merger & Acquisition analysis - Performed due diligence analysis associated with various company investment opportunities
Corporate Reporting & Reserving - Responsible for coordinating the quarterly/annual loss reserve analysis, financial booking of company results by component, and Schedule P preparation for all lines of business
Reinsurance Treaty evaluation - Analyzed company reinsurance needs, prepared data for reinsurance pricing negotiations and provided recommendations to senior management regarding reinsurance purchases
Pricing - Responsible for monitoring the regulatory environment and tracking marketplace activity including preparation of competitor analyses, rate-setting, and pricing proposals
Cession strategy - Developed a sophisticated Massachusetts Involuntary Market cession strategy model incorporating the dynamics of the company and industry
Manager - Led a team of 12 professional and technical staff responsible for profitability studies, statistical reporting, statutory reporting, price setting/monitoring, data compilation and analysis

LIBERTY MUTUAL INSURANCE GROUP, Boston MA

6/90-8/94

Senior Actuarial Analyst - Personal Lines ratemaking

Presented actuarial recommendations to Sales, Marketing, and Underwriting
Evaluated loss ratios, retention, growth, competition, and legislation by state to be incorporated in pricing decisions
Completed rate indications and provided actuarial support to the field in over 20 states
Prepared rate filings consistent with state regulatory requirements
Organized training seminars for Actuarial Student Program

Actuarial Assistant/Analyst - Commercial Lines ratemaking

Implemented Loss Costs and rate filings: Commercial Lines Task Force
Prepared actuarial proposals for senior management to aid in rate adequacy decisions
Analyzed Involuntary Market mechanisms and results

EDUCATION:

F.C.A.S. 1999, M.A.A.A. 2000

College of the Holy Cross, Worcester, Massachusetts, B.A. Biology 1990

**COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE**

Docket No. 17-

In re:

**APPLICATION OF THE WORKERS'
COMPENSATION RATING AND INSPECTION
BUREAU OF MASSACHUSETTS FOR APPROVAL
OF A GENERAL RATE REVISION TO BE
EFFECTIVE ON AND AFTER JULY 1, 2018**

PRE-FILED DIRECT TESTIMONY OF ANTHONY SALIDO

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of Anthony Salido in support of Sections VIII, IX and X of its filing for a general rate revision to be effective on and after July 1, 2018.

Q. Please state your full name.

A. Anthony Salido.

Q. Mr. Salido, please describe your current employment and your educational and professional experience.

A. I am presently employed as Data Operations Director / Actuary at the WCRIBMA, 101 Arch Street, Boston, Massachusetts. My educational background includes a Bachelors degree in Mathematics and Economics from Boston College. I joined the WCRIBMA in June 1998. I am a Fellow of the Casualty Actuarial Society. A copy of my resume is attached to this testimony.

Q. What was your role in the preparation of the current WCRIBMA filing?

A. I was responsible for the preparation of Volume II of the filing. I had principal responsibility for the preparation of the following sections of the filing: Sections VIII (F-Class), IX (Classification), X (Experience Rating), XI (Miscellaneous Rating Values), XII (Retrospective Rating), and Section XIII (Data). These sections were also peer reviewed by my colleague, Claudia Cunniff, who oversaw preparation of the filing as a whole and consulted with and provided input to me regarding the data and methodology used in these sections of the filing. The WCRIBMA's outside consulting experts also conducted a technical and peer review of these sections.

Q. Have you explained the basis of your derivation of each of the ratemaking factors in the text and accompanying exhibits found in Sections VIII (F-Class), IX (Classification) and X (Experience Rating)?

A. Yes.

Q. Are the data, calculations and narrative statements in the sections you are sponsoring complete and accurate?

A. To the best of my knowledge, information and belief, the data and calculations underlying Sections VIII (F-Class), IX (Classification), and X (Experience Rating) are complete and accurate, and the narrative statements are also accurate and correct.

Signed this 18th day of December, 2017 under the pains and penalties of perjury.



Anthony Salido, FCAS, MAAA

Anthony D. Salido, FCAS, MAAA
Workers' Compensation Rating and Inspection Bureau of MA
101 Arch St. 5th Floor
Boston, MA 02110

Work experience

**The Workers' Compensation Rating and Inspection Bureau of MA
Boston, MA**

June 1998 - Present

Senior Actuarial Analyst

January 2004 - August 2010

Data Operations Director / Actuary

September 2010 - Present

- Directs the collection, editing, and correction of all Unit Statistical, Policy and Aggregate Financial Call data submitted to the WCRIBMA by its member carriers.
- Responsible for the preparation of various sections contained in the WCRIBMA's rate filings over the last 12 years, including loss development, premiums, benefit level adjustments, trend, expenses, experience rating, retrospective rating, class rates, and F-Class rates.
- Maintains the data structures and associated metadata for the Actuarial Department's Financial Call and Unit Stat plan databases.
- Responsible for the maintenance of the nightly batch process that populates the Actuarial Department's databases, runs the Actuarial Department's data edits, and creates content for the WCRIBMA's intranet and web site.
- Formalized and directed the process employed by the WCRIBMA for the data reconciliations mandated by the Massachusetts Workers Compensation Statistical Plan. Worked with other WCRIBMA departments and data reporters to explain and/or correct anomalies identified by the reconciliation process.
- Developed and maintains Actuarial Department's intranet site which includes a history of Massachusetts workers' compensation rate filing activity, reconciliation reports, edit reports, and other content to support the WCRIBMA's rate filing efforts.
- Prepares Circular Letters and Special Bulletins.
- Responds to information requests from members, regulators, etc.

Education

F.C.A.S. 2010, M.A.A.A. 2008

Boston College, Chestnut Hill MA

B.A. in Mathematics and Economics 1998

**COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE**

Docket No. 17-

In re:

**APPLICATION OF THE WORKERS'
COMPENSATION RATING AND INSPECTION
BUREAU OF MASSACHUSETTS FOR APPROVAL
OF A GENERAL RATE REVISION TO BE
EFFECTIVE ON AND AFTER JULY 1, 2018**

PRE-FILED DIRECT TESTIMONY OF SHARON TENNYSON

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of Sharon Tennyson in support of its application for a general rate revision to be effective on and after July 1, 2018.

Q. Please state your full name.

A. Sharon Tennyson.

Q. What are your professional qualifications?

A. I am an economist and Professor of Policy Analysis and Management at Cornell University. Before teaching at Cornell, I was on the faculty of the Department of Insurance and Risk Management at the Wharton School of the University of Pennsylvania. I have over 25 years' experience in research related to insurance markets. I serve on the editorial boards of the *Journal of Risk and Insurance* and the *Journal of Insurance Regulation*. I am a former president of the Risk Theory Society. My particular area of expertise is in the industrial organization and regulation of insurance markets, and I have published extensively on these topics. My curriculum vitae is attached to this testimony.

Q. What was your role in the preparation of the current WCRIBMA filing for a general rate revision?

A. I was retained by Anderson & Kreiger LLP, counsel for the WCRIBMA, to provide an analysis based on well-accepted economic theory that uses available insurance market data to determine whether the commission allowance recommended by the WCRIBMA is reasonable and reflects the actual cost to agents or brokers of the services they provide. I have completed such an analysis for the WCRIBMA and it is summarized in my report, reproduced in Section XIV of the WCRIBMA's rate filing. To the best of my knowledge, information and belief, the data and calculations underlying my report are complete and accurate, and the narrative statements offered in my report are also accurate and correct.

Q. Professor Tennyson, what conclusions did you reach as a result of your analysis?

A. It is my professional opinion that the commission allowance recommended by the WCRIBMA is reasonable and reflects the actual cost to agents and brokers of the services they provide as producers of workers' compensation insurance policies in Massachusetts.

Q. Have you explained in your report how you came to these conclusions?

A. Yes.

Q. Does your report contain all the data that you relied upon in reaching these conclusions?

A. Yes.

Signed this 14th day of December 2017 under the pains and penalties of perjury.



Sharon Tennyson

SHARON TENNYSON, Ph.D.

Department of Policy Analysis and Management
Cornell University
252 MVR Hall
Ithaca, NY 14853
(607) 255-2619

Email: sharon.tennyson@cornell.edu

Website: <http://www.human.cornell.edu/bio.cfm?netid=st96>

AREAS OF INTEREST

Insurance Law and Economics, Consumer Policy, Regulatory Economics, Household Finance

EDUCATION

Ph.D., Economics, Northwestern University (Fields: Industrial Organization, Public Economics)
B.A., Economics, University of California at Los Angeles

PRIMARY ACADEMIC APPOINTMENTS

2013 - *Professor*, Department of Policy Analysis and Management, Cornell University
1998-2012 *Associate Professor*, Department of Policy Analysis and Management, Cornell University
1990-1998 *Assistant Professor*, Department of Insurance and Risk Management, University of Pennsylvania

SECONDARY APPOINTMENTS

2017- *Advisory Board member*, Einaudi Center for International Studies, Cornell
2017- *Director of Graduate Studies*, Graduate Field of Public Affairs, Cornell
2014-2017 *Director*, Cornell Institute for Public Affairs
2014- *Faculty Affiliate*, Cornell Institute for Behavioral and Household Finance
2013 - *Core Faculty member*, Cornell Institute for Public Affairs
2012 - *Faculty Affiliate*, Bronfenbrenner Center for Translational Research, Cornell
2012 - *Senior Research Fellow*, Networks Financial Institute, Indiana State University
2006-2011 *Research Fellow*, Networks Financial Institute, Indiana State University
2003-2008 *Faculty Fellow*, Program on Pharmaceutical Policy Issues, Department of Policy Analysis and Management, Cornell
2003-2004 *Project Coordinator*, Program on Pharmaceutical Policy Issues, Department of Policy Analysis and Management, Cornell
2002-2003 *Director of Undergraduate Studies*, Department of Policy Analysis and Management, Cornell
1996-1998 *Senior Research Fellow*, Financial Institutions Center, Wharton School, University of Pennsylvania

EXTERNAL LEADERSHIP POSITIONS

2011-2017 *Editor*, *Journal of Consumer Affairs*
2016 - *Advisor*, *The International Review of Financial Consumers* (iafco.org)
2011 - *International Board of Advisors*, SKKU Graduate School of Insurance, SKKU

- School of Business, Seoul, Korea
- 2010 - Editorial Board member, *Insurance Markets and Companies: Analyses and Actuarial Computations*
- 2005 - Editorial Review Board member, *Journal of Insurance Regulation*
- 2004 - Associate Editor, *Journal of Risk and Insurance*
- 2003-2004 President, Risk Theory Society (Officer 2002-2005)

VISITING APPOINTMENTS

- June 2016 GenRe Distinguished Visitor, University of Cologne, Germany
- July 2011 Munich Risk and Insurance Center, Ludwig Maximilians-Universitat, Germany
- Feb 2011 Center for Insurance Research, Florida State University
- April 2000 Department of Insurance and Risk Management, University of Pennsylvania
- July 1999 Centre for Market and Public Organisation (CMPO), University of Bristol, U.K.

RECENT HONORS AND AWARDS

- 2016 Winner, 2015 Best Article, *Risk Management and Insurance Review*; “Product Ratings as a Market Reaction to Deregulation: Evidence from the German Insurance Market” (with Stephanie Meyr)
- 2014 Winner, 2013 Spencer L. Kimball Writing Award, *Journal of Insurance Regulation* Best Article award; “The Effects of Regulatory Reforms in the South Carolina Auto Insurance Market” (with Robert Klein and Martin F. Grace)
- 2013 Keynote Speaker, 13th Annual Regulatory Affairs Symposium, Insurance Bureau of Canada, Toronto; “Ontario Auto Insurance: Great Expectations”
- 2012 Winner, 2011 Casualty Actuarial Society Award for Best Article published by the American Risk and Insurance Association; “The Impact of Rate Regulation on Claims: Evidence from Massachusetts Automobile Insurance” (with Richard Derrig)
- 2012 Winner, 2011 Best Feature Article, *Risk Management and Insurance Review*; “The Impact of Rate Regulation on Claims: Evidence from Massachusetts Automobile Insurance” (with Richard Derrig)
- 2011 Winner, 2010 Best Article, *Geneva Risk and Insurance Review*; “Incentive Effects of Community Rating in Insurance Markets: Evidence from Massachusetts Automobile Insurance”
- 2011 Keynote Speaker, American Council on Consumer Interests; “Perspectives on Consumer Protection Regulation”
- 2010 Winner, 2009 Best Feature Article, *Risk Management and Insurance Review*; “Do State Cost Control Policies Reduce Medicaid Prescription Drug Spending?” (with Kosali I. Simon and Julie Hudman)
- 2010 Keynote Speaker, Louisiana Conference on Insurance Fraud and Vehicle Theft; “The Many Faces of Fraud: Moral, Social and Economic Catalysts”
- 2010 Keynote Speaker, China International Conference on Insurance and Risk Management, Xi Ning China; “Issues and Challenges in Consumer Protection Regulation”

REFEREED PUBLICATIONS

- “Effects of Informational Nudges on Consumer Debt Repayment Behaviors,” with Lauren Jones

and Caezilia Loibl, *Journal of Economic Psychology* 51 December 2015: 16-33.

“Directors’ and Officers’ Liability Insurance, Corporate Risk and Risk Taking: New Panel Data Evidence on the Role of Directors’ and Officers’ Liability Insurance,” with M. Martin Boyer, *Journal of Risk and Insurance* 82(4) December 2015: 753-791.

“Ontario Auto Insurance Reform: A Game of “Whack-A-Mole,” with Mary Kelly and Anne E. Kleffner, *Assurances* 82(4) December 2015: 43-74.

“The Law and Economics of Insurance Bad Faith Liability,” with Danial Asmat, Chapter 12 in *Research Handbook of the Economics of Insurance Law*, Daniel Schwartz and Peter Siegelman, eds. Edward Elgar Publishers 2015.

“Product Ratings as a Market Reaction to Deregulation: Evidence from the German Insurance Market”, with Stephanie Meyr, *Risk Management and Insurance Review* 18(1) Spring 2015: 77-100.

Winner, 2015 American Risk and Insurance Association Award for Best Article published in *RMIR*

“The Influence of FDA Advisory Information and Black Box Warnings on Individual Use of Prescription Antidepressants,” with Kristy Parkinson, Joseph Price and Kosali Simon, *Review of Economics of the Household* 12(4) December 2014: 771-790.

“The Development and Regulation of China’s Insurance Market: History and Perspectives,” with Bingzheng Chen, Maoqi Wang and Haizhen Zhou, *Risk Management and Insurance Review* 17(2) Fall 2014: 241-263.

“The Role of Life Experience in Long Term Care Insurance Decisions,” with HaeKyung Yang, *Journal of Economic Psychology* 42 June 2014: 175-188.

“Does the Threat of Insurer Liability for “Bad Faith” Affect Insurance Settlements?” with Danial P. Asmat, *Journal of Risk and Insurance* 81(1) March 2014: 1-23.

“The Effects of Regulatory Reforms in the South Carolina Auto Insurance Market,” with Robert W. Klein and Martin Grace, *Journal of Insurance Regulation* 32 2013: 1-30.

Winner, 2013 Spencer L. Kimball Writing Award, *Journal of Insurance Regulation* Best Article award

“Insurance Distribution,” with James I. Hilliard and Laureen Regan, chapter 23 in *Handbook of Insurance* 2nd edition, Georges Dionne, editor. Springer, 2013.

“The Effect of Prescription Drug Withdrawals on the Use of Competitor Drugs: The Case of Vioxx,” with J. Michael Collins and Kosali Simon, *Journal of Economic Behavior and Organization* 86(1) February 2013: 148-168.

“Determination of the Dates of Passage of the Married Women’s Property Acts and Earnings Acts,” with R. Richard Geddes, *Research in Economic History* Vol. 29 2013: 145-189.

“The Effects of Expanding Property Rights on Women’s Economic Activity,” with R. Richard Geddes and Dean Lueck, *Journal of Law and Economics* 55(4) November 2012: 839-867.

“Consumers’ Insurance Literacy: Evidence from Survey Data,” *Financial Services Review* 20(3) Fall 2011: 165-179.

“The Impact of Rate Regulation on Claims: Evidence from Massachusetts Automobile Insurance,” with Richard A. Derrig, *Risk Management and Insurance Review* 14(2) Fall 2011: 173-200.

Winner, 2011 American Risk and Insurance Association Award for Best Feature Article published in *RMIR*

Winner, 2011 Casualty Actuarial Society Award for Best Article Published by the American Risk and Insurance Association

“Challenges and Approaches to Consumer Protection in the Insurance Industry,” in *The Fundamentals of Future Insurance Regulation and Supervision: A Global Perspective*, Patrick M. Liedtke and Jan Monkiewicz, editors. Palgrave MacMillan, 2011.

“The Effects of Regulated Premium Subsidies on Insurance Costs: An Empirical Analysis of Automobile Insurance,” with Laureen Regan and Mary A. Weiss, *Journal of Risk and Insurance* 77(3) September 2010: 597-624.

“Incentive Effects of Community Rating in Insurance Markets: Evidence from Massachusetts Automobile Insurance,” *Geneva Risk and Insurance Review* 35(1) June 2010: 19-46.

Winner, 2010 European Group of Risk and Insurance Economists Award for Best Article published in *GRIR*

“The Law and Economics of First Party Insurance Bad Faith Liability,” with William J. Warfel, *Connecticut Insurance Law Journal* 16(1) 2009-2010: 203-242.

“State Prescription Drug Policies, Cost Barriers and the Use of Acute Care Services by Medicaid Beneficiaries,” with Hae Kyung Yang, *Journal of Consumer Affairs* 43(1) Spring 2009: 4-25.

“Do State Cost Control Policies Reduce Medicaid Prescription Drug Spending?” with Kosali I. Simon and Julie Hudman, *Risk Management and Insurance Review* 12(1) Winter 2009: 37-64.

Winner, 2009 American Risk and Insurance Association (ARIA) Award for Best Feature Article, *RMIR*

“The Emergence and Potential Consequences of First Party Insurance Bad Faith Liability,” with William J. Warfel, *Journal of Insurance Regulation* 28(2) Winter 2008: 3-20.

“The Relationship between Auto Insurance Rate Regulation and Insured Loss Costs: An Empirical Analysis,” with Laureen Regan and Mary A. Weiss, *Journal of Insurance Regulation* 27(1) Fall 2008: 23-46.

“Insurance Fraud and Optimal Claims Settlement Strategies,” with Keith J. Crocker, *Journal of Law and Economics* 45(2) October 2002: 469-508.

“Claims Auditing in Automobile Insurance: Fraud Detection and Deterrence Objectives,” with Pau Salsas-Forn, *Journal of Risk and Insurance* 69(3) September 2002: 289-308.

“Automobile Insurance Regulation: The Massachusetts Experience,” with Laureen Regan and Mary A. Weiss, in J. David Cummins, ed., *Deregulating Property-Liability Insurance: Restoring Competition and Increasing Market Efficiency*. Washington, DC: American Enterprise Institute-Brookings Institution Joint Center for Regulatory Studies, 2002: 25-80.

“Insurance Experience and Consumers’ Attitudes toward Insurance Fraud,” *Journal of Insurance Regulation* 21(2) Winter 2002: 35-56.

“State Curriculum Mandates and Student Knowledge of Personal Finance,” with Chau Nguyen, *Journal of Consumer Affairs* 25(2) Winter 2001: 241-262.

“Regulation, Political Influence and the Price of Automobile Insurance,” with J. David Cummins and Richard D. Phillips, *Journal of Insurance Regulation* 20(1) Fall 2001: 9-50.

“Insurance Distribution Systems,” with Laureen Regan, in Georges Dionne, ed., *Handbook of Insurance*, Kluwer Academic Publishers, 2000: 709-745.

“Efficiency, Scale Economies and Consolidation in the U.S. Life Insurance Industry,” with J. David Cummins and Mary A. Weiss, *Journal of Banking and Finance* 23(2-4) February 1999: 325-357.

“Life Insurance Mergers and Acquisitions,” with J. David Cummins and Mary A. Weiss, in J. David Cummins and Anthony Santomero, eds., *Changes in the Life Insurance Industry: Efficiency, Technology and Risk Management*, Kluwer Academic Publishers, 1999: 159-186.

“Costly State Falsification or Verification? Theory and Evidence from Bodily Injury Liability Claims,” with Keith J. Crocker, in Georges Dionne and Claire Laberge-Nadeau, eds., *Automobile Insurance: Road Safety, New Drivers, Risks, Insurance Fraud and Regulation*, Kluwer Academic Publishers, 1999: 120-130.

“Capital Shocks and Merger Activity in the Property-Liability Insurance Industry,” with Sandra L. Chamberlain, *Journal of Risk and Insurance* 65(4) December 1998: 563-595.

“The Coexistence of Distribution Systems under Price Search: Theory and some Evidence from Insurance,” with Lisa L. Posey, *Journal of Economic Behavior and Organization* 35(1) January 1998: 95-115.

“Rate Regulation and the Industrial Organization of Automobile Insurance,” with Susan J. Suponcic, in David Bradford, ed., *The Economics of Property-Casualty Insurance*, University of Chicago Press, 1998: 113-138.

“Moral Hazard, Adverse Selection and Community Monitored Insurance Programs,” with Neil A. Doherty, in Robert Klein, ed., *Alternative Approaches to Insurance Regulation*, National Association of Insurance Commissioners, 1998: 97-110.

“The Impact of Rate Regulation on State Automobile Insurance Markets,” *Journal of Insurance Regulation* 15(4) Summer 1997: 502-523.

“Economic Institutions and Individual Ethics: A Study of Consumer Attitudes Toward Insurance Fraud,” *Journal of Economic Behavior and Organization* 30(2) February 1997: 247-266.

“Agent Discretion and the Choice of Insurance Marketing System,” with Laureen Regan, *Journal of Law and Economics* 39(2) October 1996: 637-666.

“Moral Hazard in Insurance Claiming: Evidence from Automobile Insurance,” with J. David Cummins, *Journal of Risk and Uncertainty* 12(1) January 1996: 29-50.

“Regulatory Lag in Automobile Insurance,” *Journal of Risk and Insurance* 60(1) March 1993: 36-58.

“Reinsurance and the Liability Insurance Crisis,” with Lawrence A. Berger and J. David Cummins, *Journal of Risk and Uncertainty* 5(3) July 1992: 253-272.

“Labor Market Discrimination, Imperfect Information and Self-Employment,” with Stephen Coate, *Oxford Economic Papers* 44(2) April 1992: 272-288.

“Controlling Automobile Insurance Costs,” with J. David Cummins, *Journal of Economic Perspectives* 6(2) Spring 1992: 95-115.

PUBLISHED ESSAYS AND POLICY BRIEFS

How Risk and Insurance Experts View the Effectiveness of Prior Approval and Market-Oriented Rate Regulatory Policies in Auto Insurance, Insurance Research Council, August 2013.

Does Ontario Need a New Auto Insurance System? with Mary Kelly and Anne Kleffner, Insurance Bureau of Canada policy brief, September 2012.

Long Term Effects of Rate Regulatory Reforms in Automobile Insurance Markets, Insurance Research Council, March 2012.

Consumers’ Insurance Literacy, Policy Brief 2011-PB-06 Networks Financial Institute July 2011.

Rethinking Consumer Protection Regulation in Insurance Markets, Policy Brief 2010-PB-07 Networks Financial Institute September 2010.

Analyzing the Role for a Consumer Financial Protection Agency, Policy Brief 2009-PB-13 Networks Financial Institute December 2009.

State Regulation and Consumer Protection in the Insurance Industry, Policy Brief 2008-PB-03 Networks Financial Institute February 2008. Reprinted in *Consumer Protection: Diverging Perspectives*, G. Radhika, ed., Hyderabad: Icfai University Press, 2008-09

First-Party Insurance Bad Faith Liability: Law, Theory, and Economic Consequences, with William J. Warfel, National Association of Mutual Insurance Companies Issue Brief 2008.

Efficiency Consequences of Insurance Rate Regulation, Policy Brief 2007-PB-03 Networks Financial Institute March 2007. Reprinted in *The Icfai University Journal of Insurance Law* 6(3) 2008: 41-54

NON-REFEREED PUBLICATIONS

“Can Regulations Improve Financial Information and Advice?” *International Journal of Financial Consumers* 1(1) Oct 2016: 1-8 (invited article).

“Consumer Protection in Insurance Markets,” *Journal of Financial Consumers* 1(1) June 2011: 1-10 (invited article).

“Insurer Anti-Fraud Programs: Contracts and Detection versus Norms and Prevention,” *Journal of Financial Transformation*, Spring 2011.

“Bad-Faith Liability for Unfair Claims Settlement Practices in First-Party Insurance,” with William J. Warfel, *Pravartak: Journal of Insurance and Risk Management*, May 2009.

“Moral, Social and Economic Dimensions of Insurance Claims Fraud,” *Social Research*, 75(4) Winter 2008: 1181-1204 (invited article).

“Financial Literacy: A Public Policy Issue -- The Effect of Curriculum Mandates on Student Financial Knowledge,” with Chau Nguyen and B.J. Bristow, *Proceedings of the 2000 Annual Conference of the Association for Financial Planning and Counseling*, November 2000.

“Government Regulation of Insurer Sales Practice,” *Market and Public Organisation*, University of Bristol, Issue 2, December 1999: 7-10.

“The Effect of Rate Regulation on Underwriting Cycles,” *CPCU Journal* 44(1) Mar 1991:33-45.

SHORT ARTICLES IN TRADE PRESS

“Bad Faith Lawsuits: Raise Standard of Proof”, with William J. Warfel, *Fraud Focus* (newsletter published by The Coalition Against Insurance Fraud), Winter 2009.

“Curriculum Mandates: A Policy to Increase Financial Literacy?” with B.J. Bristow and Chau Nguyen, *Jumpstart Coalition Newsletter*, October 2000.

BOOK REVIEWS

The Liability Maze: The Impact of Liability Law on Safety and Innovation, Peter Huber and Robert Litan, eds., *Journal of Policy Analysis and Management*, V11, No.4 (Fall 1992): 728-731

WORKING PAPERS IN PROGRESS (drafts available)

“The Impact of Expanded Insurer Liability for Bad Faith: Evidence from the *Royal Globe Doctrine*,” with Brian Richman, invited to revise and resubmit to *Journal of Legal Studies*.

“Implementation of EU Intermediary Regulation: Intentions and Unintended Side Effects,” with Christoph Lex and Andreas Richter, invited to revise and resubmit to *Journal of Law and Economics*.

“Household Bargaining and the Purchase of Long Term Care Insurance,” with Hae Kyung Yang and Frances Woolley, under review.

“The Airline Passenger Protection Rule: Airline Response for On-Time Performance”, with Sra Chuenchoksan and Andrew M. McClintock, under review.

“Credible or Biased? An Analysis of Insurance Product Ratings,” with Stephanie Meyr and Patricia Born, in preparation for submission.

“Price Subsidies and the Demand for Automobile Insurance”, with BoHeng Su, in preparation for submission.

“Tort Liability and Settlement Failure: Evidence on Litigated Auto Insurance Claims”, with Danial P. Asmat, in preparation for submission.

UNPUBLISHED WORKING PAPERS

“State Regulations, Uninsured Driving and the Cost of Automobile Insurance,” with Mary A. Weiss, 2011.

“Trends in State Medicaid Prescription Drug Policies 1990-2004: What are the main policies the states are using?” with Kosali Simon and Julie Hudman, 2005.

“Medicaid Crowd-out Of Private Insurance: The Case of Long Term Care,” with Hyojin Kang and Alan Mathios, 2004.

CONFERENCE PARTICIPATION

Organizational Activities:

2015	Local organizer (host institution), Risk Theory Society
2013	Organizer, Editors’ Roundtable, ACCI annual meeting
2012	Plenary session co-organizer and moderator, panel on Consumer Protection Regulation, Asia-Pacific Risk and Insurance Association annual meeting
2009	Co-organizer, NAIC-Temple Symposium on Insurance Solvency Regulation
2008	Session organizer, American Economic Association meeting
2002	Program Chair, Risk Theory Society Seminar
1999	Session organizer, CSWEP session, Western Economic Association meeting

Research Presentations:

2016	7 th CEAR/MRIC Behavioral Insurance Workshop, Munich (discussant)
------	--

- 2015 IAFICO First Annual Congress (plenary session speaker), Jeju Korea
World Risk and Insurance Economics Congress (discussant), Munich
Public Choice Society annual meeting (presenter and discussant)
- 2014 Public Choice Society annual meeting (presenter and discussant)
- 2013 Casualty Actuarial Society national meeting (presenter), Vancouver, BC
American Risk and Insurance Association meeting (discussant)
- 2012 National Insurance Council of Canada annual meeting (panelist), Quebec City
Risk Theory Society seminar (presenter)
American Council on Consumer Interests meeting (presenter)
Webinar, National Association of Mutual Insurance Companies (presenter)
Asia-Pacific Risk and Insurance Association meeting (presenter)
- 2011 Allied Social Science Association meeting, session sponsored by American Risk
and Insurance Association (presenter)
American Risk and Insurance Association meeting (presenter)
- 2010 World Risk and Insurance Economics Congress, Singapore (presenter and
discussant)
Conference on Insurance Regulatory Reform Issues: A Regional Perspective,
Networks Financial Institute, Indianapolis (panelist)
C.D. Howe Institute Conference on Price Regulation and Social Welfare: The
Case of Automobile Insurance in Canada, Toronto (discussant)
- 2009 National Association of Mutual Insurance Companies Public Policy Summit
- 2008 American Society of Health Economists meeting (presenter)
American Economic Association meeting (presenter)
Searle Center Conference on Insurance Markets and Regulation, Northwestern
University (presenter)
American Risk and Insurance Association meeting, (presenter and discussant)
Insurance Bureau of Canada Regulatory Affairs Symposium, Toronto (presenter)
Fifth Insurance Reform Summit, Networks Financial Institute, Washington, D.C.
Conference on Empirical Legal Studies (discussant)
- 2007 American Risk and Insurance Association meeting (presenter and discussant)
Casualty Actuary Society Northeast Regional Meeting (presenter)
Fourth Insurance Reform Summit, Networks Financial Institute, Washington, D.C.
(presenter)
- 2006 International Society for New Institutional Economics meeting (presenter)
American Risk and Insurance Association meeting (discussant)
- 2002 Casualty Actuarial Society national meeting (presenter)
Insurance Research Council/Massachusetts Automobile Insurers' Bureau
Conference on Insurance Fraud (presenter)
- 2001 American Enterprise Institute-Brookings Joint Center for Regulatory Studies
Conference on Property-Liability Insurance Price Deregulation (presenter)
American Council on Consumer Interests meeting (presenter)
Risk Theory Society Seminar (presenter)
Casualty Actuarial Society national meeting (presenter)
- 2000 Seminar of the European Group of Risk and Insurance Economists (presenter,
discussant)
Insurance: Mathematics and Economics meeting (presenter)
- 1998 Economic Policy Institute Conference on Automobile Insurance (discussant)

- 1997 Fifth International Conference on Insurance Solvency and Finance (presenter)
International Conference on Automobile Insurance, University of Montreal (presenter)
- 1996 American Risk and Insurance Association meeting (presenter)
- 1995 American Risk and Insurance Association meeting (presenter)
- 1994 American Risk and Insurance Association meeting (presenter)
Econometric Society North American Summer Meeting (presenter)
Franco-American Economics Seminar (presenter)
National Bureau of Economic Research Conferences on Property-Casualty Insurance (presenter)
- 1993 American Economic Association meeting (presenter)
- 1992 American Risk and Insurance Association meeting (presenter)
Risk Theory Society Seminar (presenter)
- 1991 American Risk and Insurance Association meeting (presenter)

Educational Presentations:

- 2016 Cornell Cooperative Extension, Parenting Education In-Service, Panelist; "Enhancing Community Impacts of School-Based Health Clinics in Rural New York via Parenting Education: A Pilot Study"
- 2015 Sungkyunkwan University, Seoul Korea, Guest Lecturer on Consumer Protection Economics
- 2015 Huebner Foundation Faculty-PhD Seminar, Faculty Panelist, Munich, August
- 2012 Cornell Cooperative Extension, Family and Economic Resource Management In-Service, Panelist; "Improving Consumers' Use of Credit Cards: The Role of Policy"
- 2012 Casualty Actuarial Society Northeast Regional meeting (CANE), General Session Speaker; "Lessons for Actuaries from Behavioral Economics" (with James Guszca)
- 2012 Bad Faith and Beyond Conference, Rutgers-Camden Law School, Panelist; "Empirical Perspectives on Bad Faith Liability"
- 2012 American Council of Consumer Interests Webinar for Emerging Academics; "Publishing: Perspectives of an Editor"
- 2011 General Session Speaker, Casualty Actuarial Society InFocus Seminar; "Lessons for Insurance Actuaries from Behavioral Economics" (with James Guszca)
- 2010 Cornell University, Johnson Graduate School of Management, Faculty Panel "Financial Protections in the U.S. and Globally" (Andrew Ross Sorkin visit)
- 2010 Singapore College of Insurance, Distinguished Visiting Professor Lecture; "Understanding Consumer Behavior in Insurance Transactions"
- 2010 Cornell Human Ecology Alumni Association, annual meeting; "Financial Regulatory Reforms"
- 2010 National Conference of Insurance Legislators, Institute for Insurance Policy; "The Cost of Claims Fraud: Who Ultimately Pays?"
- 2008 National Association of Mutual Insurance Companies, annual meeting; "Consequences of First-Party Insurance Bad Faith Liability"
- 2001 Cooperative Extension Conference (ACCEE); "Life is a Risky Business: Making Insurance Choices Wisely"
- 2000 Cornell Cooperative Extension Inservice; "Improving Insurance Knowledge of

- New York State Consumers”
 1996 Minnesota Independent Insurance Agents Association; “The Future of Insurance Marketing Systems”

Other Conference Participation:

Moderator, Plenary Session of Best Paper Finalists, ACCI annual meeting, 2014, 2015, 2016; Session chair, Public Choice Society, 2014; Faculty participant, Insurance Economics Colloquium, Wildbad Kreuth Germany, 2013; Panelist, Editors’ Round Table, Marketing and Public Policy, 2013; Moderator, CAS Spring Meeting General Session, 2013; Panelist, Progrés International Insurance Seminar of the Geneva Association, Geneva Switzerland, Panel on Consumer Protection Regulation, 2012; Panelist, University of Wisconsin Center for Financial Security, Financial Literacy Workshop, 2011; Cornell Cooperative Extension FERM Project Working Team lunch, faculty speaker, 2011; Invited participant, Enterprise Risk Management Institute International (ERM-II), Symposium on Systemic Risk in the Insurance Industry, 2010; Resident academic, annual CEO Conference of Canadian property-casualty insurance companies 2007; Session moderator, American Risk and Insurance Association meetings 2000, 2004, 2006, 2007, 2008, 2015 (WRIEC); Session moderator, ACCI 2001, 2012, 2013

PUBLIC POLICY CONSULTING

- 2016 Expert witness, Massachusetts Division of Insurance hearings on workers compensation rates (consultant to Workers Compensation Rating and Inspection Bureau of Massachusetts)
- 2013 White Paper: *Commission Allowances in Workers’ Compensation Rates* (consultant to Workers Compensation Rating and Inspection Bureau of Massachusetts)
- 2012 White Paper: *Reforming Ontario’s Auto Insurance System: Research and Recommendations*, with Mary Kelly and Anne Kleffner (consultant to Insurance Bureau of Canada)
- 2011 Expert witness, Michigan Senate hearings on No-fault Insurance; White paper: *Excess Costs in Michigan Auto Insurance: Causes and Implications for Reform* (consultant to several insurance companies)
- 2011 White paper: *Long Term Consequences of Auto Insurance Rate Deregulation*; (consultant to Insurance Research Council)
- 2008 Expert witness, Massachusetts Special Commission on Auto Body Rates (consultant to the Massachusetts Insurance Federation)
- 2008 White Paper: *First-Party Insurance Bad Faith Liability: Law, Theory, and Economic Consequences*, with William J. Warfel (consultant to National Association of Mutual Insurance Companies)
- 2007 Expert witness, Massachusetts Automobile Insurance Competition hearing; White paper: *Evaluating Competition in Automobile Insurance Markets* (consultant to The Fairness for Good Drivers Coalition)
- 2007 White paper: *Unintended Consequences of Insurance Price Suppression* (consultant to Insurance Bureau of Canada)
- 2006 Expert witness, Alberta Automobile Insurance hearing (consultant to the Insurance Bureau of Canada)
- 1995 Expert witness, Maryland State Governor’s Commission on Reforming Baltimore

City Automobile Insurance

GRANT FUNDING

- 2016-2019 Principal Investigator (collaborative research with John Sipple and Kim Kopko) *CSREES Research-Extension Integration Grant*, “Enhancing the Community Impact of School-Based Health Centers in Building a Culture of Health in Rural New York”
- 2014-2015 Principal Investigator, *Cornell Institute for Social Science* Director’s Discretionary Grant, “Supplemental Funding for RTS Conference”
- 2011-2012 Principal Investigator, *Cornell Institute for Social Science* Small Grant, “Credit Card Reforms: Helping or Hurting Consumers?”
- 2006-2008 Principal Investigator, *Program on Consumers, Pharmaceutical Policy and Health* Grant, “Drug Choice, Negative Information and Consumer Behavior”
- 2003-2007 Co-Principal Investigator (with Kosali Simon), *Program on Consumers, Pharmaceutical Policy and Health* Grant, “State Regulation of Medicaid Pharmacy Benefits”
- 2003-2005 Initiative Team Member (with PAM Dept. colleagues), *Merck Company Foundation* Program on Pharmaceutical Policy Issues Grant, “Program on Consumers, Pharmaceutical Policy and Health”, John Rizzo, Principal Investigator
- 2000-2003 Principal Investigator, *College of Human Ecology* Grant, Cornell University: “Regulatory Issues in Insurance Markets”
- 1999-2001 Principal Investigator (collaborative research with B.J. Bristow), *CSREES Research-Extension Integration* Grant: “Insurance Choices: Knowledge, Confidence and Competence of New York State Consumers”
- 1998-2003 Principal Investigator, *Hatch Grant, USDA*: “Issues in the Regulation of Insurance Marketing and Distribution”
- 1995-1997 Principal Investigator (collaborative research with Keith J. Crocker), *National Science Foundation*, Economics Division Grant #SBR95-07768: “Contracting with Costly State Falsification: Theory and Empirical Results from Automobile Insurance”
- 1995-1996 Principal Investigator, *National Association of Insurance Commissioners Journal of Insurance Regulation* Grant: “The Effects of Rate Regulation on the Structure of Automobile Insurance Markets”
- 1994-1995 Principal Investigator, *University of Pennsylvania Research Foundation* Grant: “Regulation and Industrial Organization in Structurally Competitive Industries: The Case of Automobile Insurance”
- 1994-1995 Principal Investigator, *University of Pennsylvania Research Foundation* Grant: “Social Norms in Economic Settings: Consumer Attitudes Toward Insurance Fraud”
- 1993-1995 Co-Principal Investigator (collaborative research with J.D. Cummins), *Financial Institutions Center* Grant, The Wharton School: “The Management and Control of Fraud in Insurance Firms”
- 1993-1994 Co-Principal Investigator (collaborative research with S. Chamberlain), *Fishman-Davidson Center* Grant, The Wharton School: “The Risk and Efficiency Effects of Insurance Company Mergers”

- 1992-1993 Principal Investigator, *University of Pennsylvania Research Foundation Grant: “The Tort System and Insurance ‘Lotteries’”*
- 1989-1990 Principal Investigator, *Society of CPCU Grant: “The Effects of Rate Regulation on Underwriting Cycles”*
- 1988-1989 Doctoral Dissertation Fellowship, *State Farm Companies Foundation: “Supply Dynamics and Underwriting Cycles in Property Liability Insurance”*
- 1987-1988 Graduate Research Fellowship, *Center for Urban Affairs and Public Policy, Northwestern University*

PH.D. DISSERTATION COMMITTEES

- In progress Peter Wissoker (CRP)
- 2017 Liyuan Cui (Economics)
- 2015 Sra Chuenchoksan (Economics)
- 2014 Lauren E. Jones (PAM) (chair)
- 2014 José Balmori di la Miyar (PAM) (chair)
- 2008 J. Michael Collins (PAM) (chair)
- 2007 Sara Hoda (PAM)
- 2007 Hae Kyung Yang (PAM)
- 2007 Ajay Aseem Palvia (Economics)
- 2005 Sonja Afroz (Economics)
- 2003 Hyojin Kang (PAM)
- 1998 M. Martin Boyer (RMI) (chair)
- 1998 Susan J. Suponcic (Public Policy)
- 1997 David M. Russell (RMI)
- 1996 Jweeping Er (RMI)
- 1995 Sung Hun Seog (RMI)
- 1995 Tracy Shepard Allotey (RMI)
- 1994 Jeong D. Kim (Healthcare Systems)
- 1994 Richard A. Phillips (RMI)
- 1993 Laureen A. Regan (RMI)
- 1993 Anne E. Kleffner (RMI)
- 1993 David W. Sommer (RMI)
- 1992 Lisa L. Posey (RMI)

Mentor, Maria Jose Sanchez Arrieta, post-Fulbright research study, 2015-2016

Mentor, Cristoph Lex, visiting Ph.D. student, Ludwig Maximillion University, Spring 2013

Mentor, Maoqi Wang, visiting Ph.D. student, Tsinghua University, Fall 2011

MASTERS’ THESIS COMMITTEES CHAIRED

- 2016 Akiko Toya, CIPA (professional report)
- 2015 Xiaodi Li, CIPA (thesis)
- 2015 Rafael Morales, CIPA (thesis)
- 2013 Samir Kiuhan, CIPA (thesis)
- 2013 Cheng Chen, CIPA (professional report)
- 2011 Andrew McClintock, PAM (thesis)
- 2011 Scott Talaga, CIPA (thesis)

PROFESSIONAL SERVICE

Service to Government and Industry:

Member, Consumer Financial Education Committee, The Actuarial Foundation, 2012-2013; Member, Board of Trustees, Elizabeth Ann Clune Montessori School of Ithaca, 2004-2007; Economic Reviewer, Institute for Defense Analysis, 2003-2006; Cornell representative to Board of Directors, Ithaca Community Childcare Center, 2000-2004 (Vice President, 2002-2003; Secretary 2001-2002); Advisor, Consumer Information Task Force of the Coalition Against Insurance Fraud, 1996-1997

Service to American Risk and Insurance Association:

Program Committee 1993, 1996, 1997, 2000, 2006, 2007, 2008, 2010, 2013, 2014, 2015, 2016, 2017; Nominations Committee 1996, 2015; Best JRI Feature Article Awards Committee 1995, 1996, 1998, 2006, 2007, 2008, 2012, 2014; Best RMIR Feature Article Awards Committee 2013, 2014, 2017; Best RMIR Perspectives Article Awards Committee 2010 (Chair), 2011; Book Awards Committee, 1992, 1999 (Chair), 2003, 2004

Ad Hoc Reviewing:

Journal of Risk and Insurance (assistant editor award, 1996 and 1997), Journal of Economic Psychology, Journal of Economic History, Criminology, Journal of Financial Stability, Journal of Public Policy and Marketing, Natural Hazards, Review of Economics of the Household, Risk Management and Insurance Review, Geneva Risk and Insurance Review, Management Science, Asia-Pacific Journal of Risk and Insurance, Journal of Consumer Affairs, Journal of Policy Analysis and Management, Astin Bulletin, Journal of Law Economics and Organization, Journal of Banking and Finance, Journal of Political Economy, American Economic Review, Journal of Law and Economics, Journal of Business Ethics, National Science Foundation, Geneva Papers on Risk and Insurance: Issues and Practice, Journal of Legal Studies, Journal of Insurance Regulation, European Economic Review, Journal of Consumer Policy, International Review of Economics and Finance, Industrial and Labor Relations Review, Journal of Insurance Issues, Economic Journal, Journal of Financial Intermediation, Journal of Risk and Uncertainty, Review of Industrial Organization, MIT Press, Elsevier Press, Social Sciences and Humanities Research Council of Canada

CORNELL UNIVERSITY SERVICE

College and University Committees:

Faculty Committee on Program Review, 2013-2016; Committee on Academic Freedom and Professional Status of the Faculty, 2012-2015; External Member, AEM Hiring Committee for Nonprofit Management, 2014; Mann Library Committee, 2005-2009 (chair 2008-2009); Member, Hotel School Ad-hoc Tenure Review Committee, 2011; CAS Ad-hoc Tenure Review Committee, 2008, 2010; University Benefits Committee, 2002-2006; Grant Review Team, Hatfield Fund for the Enhancement of Economics Education, 2002-2005; CHE Nominations Committee, 2001-2004, 2010-2017; CHE Educational Policies Committee, 2002-2003; Review Team, Pre-proposals for Cornell Cooperative Extension Learning Centers, 2001

PAM Department Committees:

Liaison to Mann Library, 2005-2014; Executive Committee, 2002-2003; Undergraduate

Committee, 1998-2003 (Chair, 2002-2003); Sloan MHA Program Committee, 1998-2001; Faculty Search Committee, 1998-2002, 2002-2004 (Chair), 2005-2006, 2006-2007 (co-Chair), 2008-2009, 2009-2010, 2010-2011, 2012-2013, 2014-2015 (co-Chair); Search Committee for Sloan Program Associate Director, 1999-2000 (Chair); Graduate Field Committee, 2000-2002

CORNELL GRADUATE FIELD MEMBERSHIP

Public Affairs; Policy Analysis and Management; Economics; Risk Analysis, Communication and Policy

COURSES TAUGHT

Cornell: Regulating Financial Institutions, Economics of Consumer Policy, Economics of Consumer Law and Protection, Risk Management and Policy, PAM Honors Thesis Seminar, Economics of the Public Sector, Consumers, Information and Regulatory Policy (PhD), Seminar on Pharmaceutical Policy Issues (MHA), Microeconomics for Management and Policy (MHA)

Wharton: Principles of Risk and Insurance, Risk Management, Risk Management and Treatment (MBA), Industrial Organization of Insurance Markets (PhD)

MASSACHUSETTS WORKERS' COMPENSATION

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Introduction

On behalf of our more than three hundred member carriers, the Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits this Filing and recommends that average rates for workers' compensation insurance be decreased by 11.1% for policies effective on and after July 1, 2018 for the reasons set forth in this Filing.

Filing Summary

This filing is divided into three parts. The first is the main rate level filing, with explanatory text and actuarial exhibits underlying the calculation of the average rate indication. The second contains the rate level indication for F-Classes, revised Experience and Retrospective Rating Plan parameters, miscellaneous rating values, and classification rate displays. The third addresses cost containment. The pre-filed testimony of the two WCRIBMA actuaries supporting this filing, Claudia Cunniff, and Anthony Salido, and of the WCRIBMA's outside expert witnesses: Dr. David Appel of Milliman, Inc., Robert Conger of Willis Towers Watson, and Dr. Sharon Tennyson of Cornell University also included with this filing.

This filing presents the required testimony, data, and calculations supporting the WCRIBMA's recommended rate revisions. The rates the WCRIBMA recommends are neither excessive nor inadequate; they are not unfairly discriminatory; and they fall within a range of reasonableness. The Commissioner should, therefore, approve the WCRIBMA's filing.

This introduction presents a summary of the principal methods and ratemaking issues considered in the filing. Consistent with past practice, the WCRIBMA uses a loss ratio methodology to derive two separate rate indications that are then averaged to produce the final recommendation. This year, the WCRIBMA derived one indication from policy year 2014 data and the other from policy year 2015 data.¹ Each set of data consists of premium and loss experience generated by policies written during the applicable policy years. The WCRIBMA averages these two years of experience to produce the rate indication in this Filing.

Using a standard loss ratio method, the WCRIBMA calculates a permissible loss, Loss Adjustment Expense (“LAE”) and fixed expense ratio (“Target Cost Ratio”) and compares it to an adjusted loss, LAE and fixed expense ratio reflecting the past experience underlying this filing (the “Actual Cost Ratio”). The recommended rate change is designed to bring the Actual Cost Ratio into alignment with the Target Cost Ratio. The WCRIBMA then adjusts Aggregate Financial premium and loss data from the policy year 2014-2015 experience period so that the data reflect as accurately as possible the conditions that are expected to prevail during the period when the rates are expected to be in effect: July 1, 2018 to June 30, 2019.

The ratemaking methodology used in this filing is not a series of unrelated calculations, but rather an integrated series of adjustments to the reported experience

¹ Policy year data is used by the National Council on Compensation Insurance (“NCCI”) for determining indicated loss cost (or rate) changes in all 37 states and the District of Columbia where NCCI files loss costs or rates.

that, taken together, yield a reasonable rate level. Each of these adjustments is summarized below and further detailed in the body of the filing.

Losses

Workers' compensation payments may reflect claims for either (or both) indemnity (wage loss and survivor benefits) and medical benefits, and these are developed separately. The WCRIBMA calculates two different estimates of ultimate medical and indemnity losses, the first based on the development of paid losses, and the second based on the development of the sum of paid losses and case reserves. These estimates are averaged when the WCRIBMA calculates the experience period loss ratios.

Losses require three separate adjustments to rate period levels. The first, which is described in Section II of the filing, is loss development. Since the claims associated with policy year 2014 and policy year 2015 losses have not yet all been resolved, the WCRIBMA looks at past development patterns to estimate the ultimate value of losses. As in the prior filing, the data for American International Group (AIG) have been developed separately from the remainder of industry due to historical differences in AIG's loss development data coupled with material shifts in market share. The resulting estimates of developed losses for AIG and the remainder of industry are then summed to arrive at an industry total.² As demonstrated in Section II of the Filing, the differences in estimated ultimate losses for the industry in total, as compared to the sum of separate estimates of ultimate losses for AIG and the remainder of the industry are less pronounced than in the

² The separate development of AIG data was performed in accordance with the Commissioner's guidance in the 2012 Rate Decision to treat that data consistently between the different sections of the filing. Except for the estimation of tail factors, because of the limited claims activity beyond 252 months of development, the losses for AIG and the remainder of industry have been developed separately in Section II – Loss Development and Section V- Trend.

prior filing and we anticipate that it will no longer be necessary nor warranted to develop them separately in future filings. The estimated ultimate losses for the total industry, including AIG, are approximately 0.6% lower when the industry losses are developed in total. The impact on the overall indication is minimal.

Losses are next adjusted to current benefit levels. These calculations are displayed in Section IV of the filing. These adjustments are made to reflect the impact of recent changes in the Statewide Average Weekly Wage, Massachusetts workers' compensation law regarding funeral benefits,³ and the medical fee schedule. The WCRIBMA estimates the wage-based benefit effects using a version of the simulation model used by NCCI.

Finally, losses are adjusted for trend to account for expected changes in loss costs from the experience period to the time the recommended rates will be in effect. In this filing, regression techniques are used to analyze separately the distinct underlying components of observed loss trends: changes in claim frequency, claim severity and wages (which is used as a proxy for exposure because payroll is the predominant exposure base). Details of the loss trend calculations are found in Section V.

Premiums

For most workers' compensation policies, the final premium is not known until after the policy expires. Insurers base initial premiums on estimated payroll, subject to a post-expiration audit. As a result, policy year premium is developed using a technique much

³ M.G.L.A. 152 § 33 was revised effective March 24, 2015 such that the insurers "shall pay the reasonable expenses of burials, not exceeding 8 times the average weekly wage in the commonwealth as determined pursuant to subsection (a) of section 29 of chapter 151A."

like loss development. The WCRIBMA also adjusts reported premiums to current rate level. These adjustments are found in Section III.

Expenses

Section VI contains the calculations underlying the expense provisions in the filing. As in past years, these calculations are based on the methods specified by the Commissioner in the 1987 rate decision. Expenses are divided into fixed and variable categories. Variable expenses are proportional to either premium (premium taxes, commissions, and other acquisition expenses) or losses (loss adjustment expenses). Fixed expenses are divided into expense categories (salaries, postage, utilities, etc.). As was done in the last filing, the WCRIBMA uses a composite external index to estimate expense trends. The WCRIBMA also continues to include a provision to reflect the estimated net cost to insurers for the purchase of reinsurance.

Underwriting Profit

Discounted cash flow models are used to estimate the underwriting profit provision in Section VII. WCRIBMA uses the internal rate of return (“IRR”) model and the insurer capital cost (“ICC”) model. The IRR model is widely used in insurance ratemaking and in 2003 was approved by the Commissioner for use in workers’ compensation ratemaking in Massachusetts.⁴ The ICC model is mathematically equivalent to the IRR model and is used to explicitly quantify the capital costs in dollar terms.⁵

⁴ Actuarial Standard of Practice No. 30 (ASOP #30) - Treatment of Profit and Contingency Provisions and the Cost of Capital in Property/Casualty Insurance Ratemaking, published by the Actuarial Standards Board, lists examples of models that may be used to directly develop an underwriting profit provision, including the Net Present Value (NPV) Model. It states that the “internal rate of return (IRR) model, a specific application of the general NPV model, uses an iteration technique to calculate the rate(s) of return that will set the net present value of a risk transfer’s cash inflows and outflows equal to zero.”

⁵ According to ASOP #30, “Total financial needs models are used to develop the underwriting profit provision such that the sum of underwriting profit, miscellaneous (non-investment) income, investment

To implement the IRR and ICC models, the WCRIBMA first determines the various inputs needed by the models, such as the cost of capital (or target rate of return), the expected return on insurers' invested assets, the leverage ratio, and the cash flows associated with underwriting. Using the IRR and ICC models and their associated inputs, the WCRIBMA derives the premium level required to achieve the target return on capital.

Longshore and Harbor Workers

Section VIII describes the derivation of rate recommendations for risks covered by the United States Longshore and Harbor Workers Act, known as the F-Classes.

Classifications and Rating Plan Parameters

Section IX describes how the overall rate change is distributed among the more than four hundred classifications for which workers' compensation policies are written in Massachusetts. Section X presents D-Ratio and expected loss rate calculations for use in experience rating. Section XI details the derivation of miscellaneous rating values, including credit factors for both the Massachusetts Benefits Deductible Program and the Massachusetts Benefits Claim and Aggregate Deductible Program. Section XII contains the calculation of various retrospective rating parameters, including hazard group relativities and excess loss factors.

Data

Section XIII describes the process the WCRIBMA uses to validate and edit the data used in the filing. Section XIII also provides details about adjustments to the reported data, including the exclusion of data deemed necessary for purposes of this rate filing.

income from insurance operations, and investment income on capital, after income taxes, will equal the cost of capital. Each of these components is explicitly quantified.” The ICC model is an example of a total financial needs model.

Cost Containment

The WCRIBMA's cost containment filing once again includes the responses of ten representative carriers to a survey of cost containment practices. In 2013, the WCRIBMA revised its survey instrument to provide an expanded array of information.⁶ The WCRIBMA recommends that, as in the past, the Commissioner accept this filing as evidence of the industry's compliance with its statutory cost containment obligations.

⁶ In the 2012 Rate Decision, the Commissioner stated that the scope of the WCRIBMA's 2012 Cost Containment Survey "focuses on loss costs and premium collection and does not address other expenses that workers' compensation insurers incur, such as general expenses, overhead, and commissions." In response, the current survey has a broader scope and addresses general expenses, such as salaries, travel, advertising, and rent. The current survey also addresses commissions.

I 000008

Section I - Rate Recommendation
Subsection A - Introduction
7/1/2018

Section I - A
Exhibit 1

RATE INDICATION SUMMARY

Statewide Rate Change Summary		
<i>Indication Effective Date: 7/1/2018</i>		
(1)	Indicated Rate Change Based on Policy Year 2014 Data (Section I-B, Exhibit 1)	-8.5%
(2)	Indicated Rate Change Based on Policy Year 2015 Data (Section I-B, Exhibit 1)	-13.7%
(3)	Average Indicated Rate Change = [(1) + (2)] / 2.0	-11.1%

Expense Constants			
	Current	Recommended	
(4)	For Risks developing at least \$1,000 in Standard Premium (Section VI-D, Exhibit 1)	\$338	\$338
(5)	For Risks developing at least \$200 and less than \$1,000 in Standard Premium (Section VI-D, Exhibit 1)	\$250	\$250
(6)	For Risks developing less than \$200 in Standard Premium (Section VI-D, Exhibit 1)	\$159	\$159
(7)	Per Capita Risks (for each exposure, up to a maximum of 4)	\$64	\$64

I 000009

Section I - Rate Recommendation
 Subsection B - Calculation of Indicated Rate Change
 7/1/2018

Section I - B
 Exhibit 1

	Policy Year <u>2014</u>	Policy Year <u>2015</u>
(1) Standard Earned Premium plus Adjusted ARAP Premium (Section I-D, Exhibit 2)	1,089,030,715	1,152,664,308
(2) Composite Adjustment Factor (Section I-D, Exhibit 2)	1.035	1.043
(3) Adjusted Standard Earned Premium plus Adjusted ARAP = [(1) x (2)]	1,127,034,967	1,201,727,724
(4) Cumulative Premium Development Factor to Ultimate (Section I-D, Exhibit 2)	1.000	1.010
(5) Rate On-Level Factor (Section I-D, Exhibit 2)	1.015	1.015
(6) Factor to Remove Expense Constant (Section I-D, Exhibit 2)	0.958	0.959
(7) Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = [(3) x (4) x (5) x (6)]	1,095,560,696	1,181,786,575
(8) Annual Wage Trend (Section I-D, Exhibit 4)	0.027	0.027
(9) Wage Trend Factor to 7/1/2019 (based on Section I-D, Exhibit 4)	1.129	1.099
(10) Standard Earned Premium plus ARAP Projected to Prospective Effective Period = [(7) x (9)]	1,237,308,803	1,299,075,958
(11) Average On-Level Incurred Losses Projected to Prospective Effective Period (Section I-C Exhibit I, Page 1 Item (30), Page 2 Item (30))	718,357,754	708,739,123
(12) Loss Ratio Projected to Prospective Effective Period = [(11) / (10)]	0.581	0.546
(13) Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy (Section I-E)	1.000	1.000
(14) Loss Adjustment Expense Factor (Section I-D, Exhibit 5)	1.185	1.185
(15) Fixed Expense Ratio (Section I-D, Exhibit 5)	0.043	0.042
(16) Indicated Policy Year Loss, LAE, and Fixed Expense Ratio = { [(12) x (14)] + (15) } x (13)	0.731	0.689
(17) Commission and Other Acquisition Expense Ratio (Section I-D, Exhibit 5)	0.126	0.126
(18) Premium Tax Ratio (Section I-D, Exhibit 5)	0.022	0.022
(19) Premium Discount Ratio (Section I-D, Exhibit 5)	0.052	0.052
(20) Variable Expense Ratio = [(17) + (18) + (19)]	0.199	0.199
(21) Underwriting Profit Provision (Section VII-A)	0.003	0.003
(22) Permissible Loss, LAE, and Fixed Expense Ratio = [1.0 - (20) - (21)]	0.798	0.798
(23) Indicated Rate Change = [(16) / (22)] - 1.0	-8.5%	-13.7%
(24) Overall Indicated Rate Change = [(23) PY2014 + (23) PY2015] / 2.0		-11.1%

I 000010

Section I - Rate Recommendation
 Subsection C - Indicated Rate Change Detail
 7/1/2018

Section I - C
 Exhibit 1
 Page 1

Premium and Incurred Losses Projected to the Prospective Effective Period Policy Year 2014

Premium

(1)	Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate (Section I -D, Exhibit 2)	1,095,560,696
(2)	Annual Wage Trend (Section I-D, Exhibit 4)	0.027
(3)	Wage Trend Factor to Prospective Effective Period (7/1/2019)	1.129
(4)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period	1,237,308,803

Indemnity Losses

		<u>Paid</u>	<u>Paid + Case</u>
(5)	Indemnity Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	248,255,901	354,986,956
(6)	Indemnity Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.788	1.226
(7)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.036	1.022
(8)	Factor to Adjust for Escalated Benefits (Section I-D, Exhibit 1)	1.042	1.006
(9)	Estimated Ultimate Indemnity Loss = [(5) x (6) x (7) x (8)]	479,094,919	447,478,236
(10)	Annual Indemnity Loss Trend (Section I-D, Exhibit 4)	0.0003	0.0003
(11)	Indemnity Loss Trend Factor to 7/1/2019	1.001	1.001
(12)	Estimated Indemnity Losses Trended = [(9) x (11)]	479,737,139	448,078,075
(13)	Estimated Benefit Change Factor Prior to 1/1/2018 (Section I-D, Exhibit 3)	1.029	1.029
(14)	On Level Losses = [(12) x (13)]	493,796,648	461,209,761
(15)	Estimated Benefit Change Factor Subsequent to 1/1/2018 (Section I-D, Exhibit 3)	1.010	1.010
(16)	On-Level Incurred Losses Projected to Prospective Effective Period = [(14) x (15)]	498,575,053	465,672,827

Medical Losses

(17)	Medical Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	167,187,626	238,805,472
(18)	Medical Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.308	1.009
(19)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.057	1.025
(20)	Factor to Adjust for Escalated Benefits (1.000 for Medical Losses)	1.000	1.000
(21)	Estimated Ultimate Medical Loss = [(17) x (18) x (19) x (20)]	231,165,614	247,021,225
(22)	Annual Medical Loss Trend (Section I-D, Exhibit 4)	-0.003	-0.003
(23)	Medical Loss Trend Factor to 7/1/2019	0.988	0.988
(24)	Estimated Medical Losses Trended = [(21) x (23)]	228,400,827	244,066,801
(25)	Estimated Benefit Change Factor Prior to 1/1/2018 (Section I-D, Exhibit 3)	1.000	1.000
(26)	On Level Losses = [(24) x (25)]	228,400,827	244,066,801
(27)	Estimated Benefit Change Factor Subsequent to 1/1/2018 (Section I-D, Exhibit 3)	1.000	1.000
(28)	On-Level Incurred Losses Projected to Prospective Effective Period = [(26) x (27)]	228,400,827	244,066,801

Total Combined Medical and Indemnity Losses

(29)	Total Estimated Ultimate Losses Trended and On Level = [(16) + (28)]	726,975,880	709,739,628
(30)	Average On-Level Incurred Losses Projected to Prospective Effective Period	718,357,754	

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Premium and Incurred Losses Projected to the Prospective Effective Period Policy Year 2015

Premium

(1)	Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate (Section I -D, Exhibit 2)	1,181,786,575
(2)	Annual Wage Trend (Section I-D, Exhibit 4)	0.027
(3)	Wage Trend Factor to Prospective Effective Period (7/1/2019)	1.099
(4)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period	1,299,075,958

Indemnity Losses

		<u>Paid</u>	<u>Paid + Case</u>
(5)	Indemnity Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	135,805,533	251,318,679
(6)	Indemnity Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	3.378	1.715
(7)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.036	1.022
(8)	Factor to Adjust for Escalated Benefits (Section I-D, Exhibit 1)	1.042	1.006
(9)	Estimated Ultimate Indemnity Loss = [(5) x (6) x (7) x (8)]	495,132,269	442,916,868
(10)	Annual Indemnity Loss Trend (Section I-D, Exhibit 4)	0.0003	0.0003
(11)	Indemnity Loss Trend Factor to 7/1/2019	1.001	1.001
(12)	Estimated Indemnity Losses Trended = [(9) x (11)]	495,648,373	443,378,544
(13)	Estimated Benefit Change Factor Prior to 1/1/2018 (Section I-D, Exhibit 3)	1.021	1.021
(14)	On Level Losses = [(12) x (13)]	506,069,480	452,700,667
(15)	Estimated Benefit Change Factor Subsequent to 1/1/2018 (Section I-D, Exhibit 3)	1.010	1.010
(16)	On-Level Incurred Losses Projected to Prospective Effective Period = [(14) x (15)]	510,966,648	457,081,392

Medical Losses

(17)	Medical Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	126,959,971	209,806,226
(18)	Medical Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.689	1.055
(19)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.057	1.025
(20)	Factor to Adjust for Escalated Benefits (1.000 for Medical Losses)	1.000	1.000
(21)	Estimated Ultimate Medical Loss = [(17) x (18) x (19) x (20)]	226,662,866	226,992,687
(22)	Annual Medical Loss Trend (Section I-D, Exhibit 4)	-0.003	-0.003
(23)	Medical Loss Trend Factor to 7/1/2019	0.991	0.991
(24)	Estimated Medical Losses Trended = [(21) x (23)]	224,551,729	224,878,478
(25)	Estimated Benefit Change Factor Prior to 1/1/2018 (Section I-D, Exhibit 3)	1.000	1.000
(26)	On Level Losses = [(24) x (25)]	224,551,729	224,878,478
(27)	Estimated Benefit Change Factor Subsequent to 1/1/2018 (Section I-D, Exhibit 3)	1.000	1.000
(28)	On-Level Incurred Losses Projected to Prospective Effective Period = [(26) x (27)]	224,551,729	224,878,478

Total Combined Medical and Indemnity Losses

(29)	Total Estimated Ultimate Losses Trended and On Level = [(16) + (28)]	735,518,376	681,959,870
(30)	Average On-Level Incurred Losses Projected to Prospective Effective Period	708,739,123	

Summary of Estimated Ultimate Losses

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/16 (3)	Cumulative Factors from Latest Month to 252 Months (4)	Losses Developed to 252 Months (5)	Tail Factor from 252 Months to Ultimate (6)	Factor to Adjust for Escalated Benefits (7)	Estimated Ultimate Losses (8)
2014	Indemnity	248,255,901	1.788	443,855,172	1.036	1.042	479,094,919
2014	Medical	167,187,626	1.308	218,718,702	1.057	1.000	231,165,614
2014	Total	415,443,527		662,573,874			710,260,534
2015	Indemnity	135,805,533	3.378	458,712,897	1.036	1.042	495,132,269
2015	Medical	126,959,971	1.689	214,458,400	1.057	1.000	226,662,866
2015	Total	262,765,504		673,171,297			721,795,135

Paid Plus Case Loss Development Method

Policy Year (9)	Benefit Type (10)	Paid Plus Case Losses at 12/31/16 (11)	Cumulative Factors from Latest Month to 252 Months (12)	Losses Developed to 252 Months (13)	Tail Factor from 252 Months to Ultimate (14)	Factor to Adjust for Escalated Benefits (15)	Estimated Ultimate Losses (16)
2014	Indemnity	354,986,956	1.226	435,356,600	1.022	1.006	447,478,236
2014	Medical	238,805,472	1.009	240,891,655	1.025	1.000	247,021,225
2014	Total	593,792,428		676,248,255			694,499,461
2015	Indemnity	251,318,679	1.715	430,918,793	1.022	1.006	442,916,868
2015	Medical	209,806,226	1.055	221,360,104	1.025	1.000	226,992,687
2015	Total	461,124,905		652,278,898			669,909,555

Notes:

(3), (11): Aggregate Financial Data.

(4) = (5) / (3)

(5) Section II: Exhibit 1, Page 2, Column (5) + Exhibit 1, Page 3, Column (5).

(6): Section II - C, Exhibit 1, Page 1.

(7): Section II - D, Exhibit 1, Page 1.

(8) = (5) x (6) x (7)

(12) = (13) / (11)

(13) Section II: Exhibit 1, Page 2, Column (10) + Exhibit 1, Page 3, Column (10).

(14): Section II - C, Exhibit 2, Page 1.

(15): Section II - D, Exhibit 2, Page 1.

(16) = (13) x (14) x (15)

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Page 2

Summary of Estimated Ultimate Losses Remainder of Industry

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/16 (3)	Cumulative Factors from Latest Month to 252 Months (4)	Losses Developed to 252 Months (5)
2014	Indemnity	217,310,214	1.758	381,985,257
2014	Medical	149,244,179	1.300	194,039,418
2014	Total	366,554,393		576,024,676
2015	Indemnity	119,541,045	3.300	394,492,571
2015	Medical	113,151,657	1.665	188,400,690
2015	Total	232,692,702		582,893,261

Paid Plus Case Loss Development Method

Policy Year (6)	Benefit Type (7)	Paid Plus Case Losses at 12/31/16 (8)	Cumulative Factors from Latest Month to 252 Months (9)	Losses Developed to 252 Months (10)
2014	Indemnity	314,467,264	1.213	381,403,154
2014	Medical	216,161,495	1.008	217,820,663
2014	Total	530,628,759		599,223,818
2015	Indemnity	224,156,256	1.670	374,271,478
2015	Medical	187,990,447	1.044	196,183,796
2015	Total	412,146,703		570,455,274

Notes:

(3), (8): Aggregate Financial Data.

(4), (9): Section II - B, Exhibit 1, Page 1.

(5) = (3) x (4)

(10) = (8) x (9)

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Exhibit 1
Page 3

Summary of Estimated Ultimate Losses AIG

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/16 (3)	Cumulative Factors from Latest Month to 252 Months (4)	Losses Developed to 252 Months (5)
2014	Indemnity	30,945,687	1.999	61,869,914
2014	Medical	17,943,447	1.375	24,679,284
2014	Total	48,889,134		86,549,198
2015	Indemnity	16,264,488	3.948	64,220,326
2015	Medical	13,808,314	1.887	26,057,709
2015	Total	30,072,802		90,278,036

Paid Plus Case Loss Development Method

Policy Year (6)	Benefit Type (7)	Paid Plus Case Losses at 12/31/16 (8)	Cumulative Factors from Latest Month to 252 Months (9)	Losses Developed to 252 Months (10)
2014	Indemnity	40,519,692	1.332	53,953,446
2014	Medical	22,643,977	1.019	23,070,992
2014	Total	63,163,669		77,024,437
2015	Indemnity	27,162,423	2.086	56,647,315
2015	Medical	21,815,779	1.154	25,176,308
2015	Total	48,978,202		81,823,623

Notes:

(3), (8): Aggregate Financial Data.

(4), (9): Section II - B, Exhibit 1, Page 2.

(5) = (3) x (4)

(10) = (8) x (9)

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Section I - Rate Recommendation
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Section I - D
 Exhibit 2

Policy Year Aggregate Financial Data
 Calculation of Standard Premium plus Adjusted ARAP Premium Development Factors
 Industrywide

Summary Exhibit

	Policy Year as of 12/31/2016	
	2014	2015
(1) Standard Earned Premium plus Adjusted ARAP Premium	1,089,030,715	1,152,664,308
(2) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.036	1.045
(3) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	0.998
(4) Composite Adjustment Factor = (2) x (3)	1.035	1.043
(5) Adjusted Standard Earned Premium plus ARAP = (1) x (4)	1,127,034,967	1,201,727,724
(6) Cumulative Premium Development Factor to Ultimate (see Section III, Exhibit 1, Page 2)	1.000	1.010
(7) Rate On-Level Factor	1.015	1.015
(8) Factor to Remove Expense Constant	0.958	0.959
(9) Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = (5) x (6) x (7) x (8)	1,095,560,696	1,181,786,575

Notes:

- (1): Section III-B, Exhibit 2
- (2): Section III-B, Exhibit 1
- (3): Section III-C, Exhibit 1
- (6): Premiums are deemed to be fully developed at 252 months.
- (7): Section III-D, Exhibit 1
- (8): Section VI-F, Exhibit 2.

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 Exhibit 3

Benefit Level Adjustment Factors

All Injury Types

Time Period		Indemnity					Medical	Total
Beginning Period	Ending Period	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types	All Injury Types	All Injury Types
1/1/2018	Prosp. Eff. Period					1.010	1.000	
PY 2014	1/1/2018					1.029	1.000	
PY 2015	1/1/2018					1.021	1.000	
PY 2006	Prosp. Eff. Period	1.062	1.069	1.118	1.040	1.093	1.032	
PY 2007	Prosp. Eff. Period	1.056	1.061	1.102	1.036	1.081	1.032	
PY 2008	Prosp. Eff. Period	1.050	1.052	1.087	1.031	1.069	1.024	
PY 2009	Prosp. Eff. Period	1.047	1.049	1.081	1.029	1.064	1.002	
PY 2010	Prosp. Eff. Period	1.048	1.050	1.082	1.029	1.065	1.000	
PY 2011	Prosp. Eff. Period	1.044	1.045	1.073	1.027	1.059	1.000	
PY 2012	Prosp. Eff. Period	1.039	1.038	1.061	1.024	1.049	1.000	
PY 2013	Prosp. Eff. Period	1.037	1.035	1.056	1.022	1.045	1.000	
PY 2014	Prosp. Eff. Period	1.032	1.031	1.049	1.020	1.039	1.000	
PY 2015	Prosp. Eff. Period	1.020	1.025	1.038	1.016	1.031	1.000	
PY 2013	CPY 2014_07	1.012	1.007	1.012	1.004		1.000	
PY 2014	CPY 2015_07	1.014	1.010	1.016	1.005		1.000	
PY 2015	CPY 2016_07	1.009	1.011	1.017	1.007		1.000	
CPY 2014_07	Prosp. Eff. Period							1.023
CPY 2015_07	Prosp. Eff. Period							1.017
CPY 2016_07	Prosp. Eff. Period							1.011
CPY 2008_09	Prosp. Eff. Period							1.044
Prior Eff. Period (using benefit level projections from prior filing)	Prosp. Eff. Period					1.019	1.000	1.012

Trend Summary

		Indemnity		Medical				SAWW
		Severity	Frequency	Lost Time Medical		Medical Only		
				Severity	Frequency	Severity	Frequency	
(1)	Massachusetts Trend	2.9%	-1.9%	2.7%	-1.9%	1.9%	-4.9%	2.7%
	5 Year	3.2%	-2.3%	1.9%	-2.3%	2.1%	-5.4%	3.2%
	6 Year	3.5%	-2.5%	2.9%	-2.5%	2.3%	-5.5%	2.8%
	7 Year	2.7%	-1.8%	2.4%	-1.8%	2.1%	-4.9%	2.7%
	8 Year	2.5%	-1.5%	3.4%	-1.5%	1.6%	-4.6%	2.8%
	9 Year	2.6%	-1.6%	3.1%	-1.6%	1.5%	-4.7%	2.6%
	10 Year	2.5%	-1.6%	2.7%	-1.6%	1.5%	-4.5%	2.4%
(2)	Complement of Credibility	-0.2%	-2.3%	1.6%	-2.3%	3.6%	-4.3%	2.8%
(3)	Credibility Weighted Trend	2.1%	-2.0%	2.2%	-2.0%	1.9%	-4.8%	2.7%
	5 Year	1.6%	-2.3%	1.7%	-2.3%	2.4%	-5.3%	3.2%
	6 Year	2.6%	-2.5%	2.1%	-2.5%	2.3%	-5.5%	2.8%
	7 Year	1.6%	-2.0%	2.0%	-2.0%	2.1%	-4.7%	2.7%
	8 Year	1.9%	-1.7%	2.5%	-1.7%	1.6%	-4.5%	2.8%
	9 Year	2.3%	-1.8%	2.5%	-1.8%	1.5%	-4.5%	2.6%
	10 Year	2.5%	-1.7%	2.2%	-1.7%	1.5%	-4.5%	2.4%
(4)	Selected Trend	2.1%	-2.0%	2.2%	-2.0%	1.9%	-4.8%	2.7%

	Lost Time Medical	Medical Only
(5) Medical Loss Trend	0.1%	-3.0%
(6) Fraction of Total Medical	86.9%	13.1%
(7) Total Medical Loss Trend	-0.3%	

	Indemnity	Medical
(8) Total Loss Trend	0.0%	-0.3%
(9) SAWW Trend	2.7%	2.7%
(10) Total Net Trend	-2.6%	-2.9%

Notes:

- (1),(2),(3): Section V, Exhibit 2 Severity; Exhibit 3 Frequency and SAWW.
- (4) = Selected Trend
- (5) = [(1.0 + Credibility Weighted Severity Trend) x (1.0 + Credibility Weighted Frequency Trend)] - 1.0
- (6) Medical Only = Medical Only Fraction of Total Medical from Section IV-E, Exhibit 2
 Lost Time Medical = 1.0 - Medical Only
- (7) = Weighted Average of (5) using (6) as weights
- (8): Indemnity = (1.0 + Credibility Weighted Severity Trend) x (1.0 + Credibility Weighted Frequency Trend) - 1.0
 Medical = Row (7)
- (9): (4) for SAWW.
- (10) = [(1.0 + (8)) / (1.0 + (9))] - 1.0

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Subsection D - Expenses Summary
7/1/2018

Section I - D
Exhibit 5

Summary of Expense Ratios

(1)	Commission and Other Acquisition Expense Ratio	12.6%
(2)	Average Premium Discount as a % of Standard Premium + ARAP	5.2%
(3)	Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4)	Variable Expense Ratio = (1) + (2) + (3)	19.9%
(5)	Fixed Expense Ratio	4.2%
(6)	Total Loss Adjustment Expense Ratio (LAE / Loss)	18.5%

Notes:

(1): Section VI-G, Exhibit 1.

(2): Section VI-E, Exhibit 1.

(3): 2.28% from Section VI-B, Exhibit 3.

(5): Section VI-B, Exhibit 1.

(6): Section VI-H, Exhibit 1.

Derivation of Large Deductible Factor Applied to Remove the Benefit of the Residual Market Subsidy Paid by Large Deductible Insureds

The WCRIBMA makes rates based on the experience of both residual markets risks and voluntary market risks, excluding risks subject to large deductibles. Large deductible policies subsidize the residual market.¹ Consequently, for the purposes of the rate filing, the WCRIBMA must estimate the residual market subsidy attributable to large deductible policies, and then make an offset for this subsidy in the calculation of the indicated average rate change.

Derivation of Factor:

Definitions

W_{vol}	- Proportion of Voluntary Non-Large Deductible Exposure to the sum of Voluntary Non-Large Deductible Exposure plus Residual Market Exposure
W_{rm}	- $1 - W_{vol}$ - Proportion of Residual Market Exposure to the sum of Voluntary Non-Large Deductible Exposure plus Residual Market Exposure
Q_{vol}	- Average Voluntary Market Rate equivalent
Q_{rm}	- Average Residual Market Rate equivalent
Q_{oa-0}	- Average Rate equivalent for Voluntary and Residual Market in total assuming no subsidy paid for by large deductibles.
Q_{oa-1}	- Average Rate equivalent for Voluntary and Residual Market in total assuming a subsidy paid for by large deductibles
u	- Ratio of Non-Large Deductible Voluntary Assessable Premium to the Total Voluntary Assessable Premium

¹ The voluntary market subsidizes the residual market. The subsidy associated with non-large deductible voluntary policies is implicitly reflected in the rate indication, since the average indicated rate change is calculated exclusive of large deductibles.

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Subsection E – Reflecting the Impact of Large Deductibles
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Page 2

$$d = Q_{rm} / Q_{vol}$$

First, assume no residual market subsidy paid by anyone other than W_{vol} :

$$(1) W_{vol}Q_{vol} + W_{rm}Q_{rm} = Q_{oa-0}$$

This is a weighted average of the voluntary rate and the residual market rate. Now assume that large deductibles subsidize the residual market. The residual market subsidy would be:

$$(2) \text{Residual Market Subsidy} = w_{rm} (Q_{rm} - Q_{oa-0})$$

The large deductible share of the residual market subsidy would be:

$$(3) (1 - u) w_{rm} (Q_{rm} - Q_{oa-1})$$

The formula for the overall rate that reflects the subsidy paid by the large deductibles would be:

$$(4) W_{vol}Q_{vol} + W_{rm}Q_{rm} - (1 - u) w_{rm} (Q_{rm} - Q_{oa-1}) = Q_{oa-1}$$

Therefore Q_{oa-1} :

$$(5) Q_{oa-1} = W_{vol}Q_{vol} - (1 - u) w_{rm} (Q_{rm} - Q_{oa-1}) + W_{rm}Q_{rm}$$

$$(6) Q_{oa-1} / Q_{oa-0} = [W_{vol}Q_{vol} - (1 - u) w_{rm} (Q_{rm} - Q_{oa-1}) + W_{rm}Q_{rm}] / [W_{vol}Q_{vol} + W_{rm}Q_{rm}]$$

If we assume that the average rate equivalent for the total market is 1.00, such that:

$$(7) W_{vol}Q_{vol} + W_{rm}Q_{rm} = Q_{oa-0} = 1.00,$$

Then the factor Q_{oa-1} / Q_{oa-0} reduces to Q_{oa-1} . Also solving (7) for Q_{vol} and Q_{rm} and introducing the variable d , results in the following:

$$(8) d = Q_{rm} / Q_{vol}$$

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Subsection E – Reflecting the Impact of Large Deductibles
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Page 3

$$(9) Q_{vol}(w_{vol} + w_{rm}d) = 1.00$$

$$(10) Q_{vol} = 1 / (w_{vol} + w_{rm}d)$$

Similarly:

$$(11) Q_{rm} = d / (w_{vol} + w_{rm}d)$$

Given (5) and (7):

(12) $Q_{oa-1} = 1.0 - (1 - u) w_{rm} (Q_{rm} - Q_{oa-1})$, producing the following adjustment factor:

$$(13) \text{ Adjustment Factor} = Q_{oa-1} = [1.0 - w_{rm}Q_{rm}(1 - u)] / [1.0 - w_{rm}(1 - u)]$$

Calculation of the “d”

“d” is defined as: $d = Q_{rm} / Q_{vol}$

Define Q_{vol} and Q_{rm} as follows, based on the WCRIBMA’s formula for a rate:

$$(14) Q_{vol} = (L_{vol} + F) / (1 - V_{vol} - P)$$

$$(15) Q_{rm} = (L_{rm} + F) / (1 - V_{rm} - P)$$

$$(16) w_{vol}L_{vol} + w_{rm}L_{rm} = L_f$$

where

L_{vol}	- Voluntary Loss & LAE Ratio to the sum of Standard Premium plus ARAP
L_{rm}	- Residual Market Loss & LAE Ratio to the sum of Standard Premium plus ARAP
L_f	- Voluntary plus Residual Market Loss & LAE Ratio to the sum of Standard Premium plus ARAP
F	- Fixed Expense Ratio relative to the sum of Standard Premium plus ARAP
V_{vol}	- Voluntary Variable Expenses Ratio

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Subsection E – Reflecting the Impact of Large Deductibles
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Page 4

- V_{rm} - Residual Market Variable Expenses Ratio
- P - Profit provision relative to the sum of Standard Premium plus ARAP
- w_{vol} - Proportion of Voluntary Non-Large Deductible Exposure to the sum of Voluntary Non-Large Deductible Exposure plus Residual Market Exposure
- w_{rm} - $1 - w_{vol}$
- r - L_{rm} / L_{vol}

$$(17) w_{vol}L_{vol} + w_{rm}rL_{vol} = L_f$$

$$(18) L_{vol} = L_f / (w_{vol} + w_{rm}r)$$

$$(19) w_{vol}L_{rm} / r + w_{rm}L_{rm} = L_f$$

$$(20) L_{rm} = L_f r / (w_{vol} + w_{rm}r)$$

Consequently, if a loss ratio differential, r , is selected, the values of L_{vol} and L_{rm} can be derived.

Taking formulas (14) and (15) we can derive a formula for d :

$$(21) d = Q_{rm} / Q_{vol} = [(L_{rm} + F) / (1 - V_{rm} - P)] / [(L_{vol} + F) / (1 - V_{vol} - P)]$$

$$(22) d = Q_{rm} / Q_{vol} = [(L_{rm} + F) / (L_{vol} + F)] \times [(1 - V_{vol} - P) / (1 - V_{rm} - P)]$$

We can solve the first term given a loss ratio differential and formulas (18) and (20). This leaves the second term.

The V_{vol} and V_{rm} can be thought of as the following:

$$(23) V_{vol} = C_{vol} + A + T + D_{vol}$$

$$(24) V_{rm} = C_{rm} + A + T$$

where C_{vol} - Commission Ratio relative to the sum of Standard

I 000023

Premium plus ARAP for the Voluntary Market

C_{rm} - Commission Ratio relative to the sum of Standard Premium plus ARAP for the Residual Market

A - Other Acquisition Expense Ratio relative to the sum of Standard Premium plus ARAP

T - Premium Tax Ratio relative to the sum of Standard Premium plus ARAP

D_{vol} - Premium Discount relative to the sum of Standard Premium plus ARAP for the voluntary market

Then the second term in (22) becomes:

$$(25) [1 - (C_{vol} + A + T + D_{vol})] / [1 - (C_{rm} + A + T)]$$

and the remaining unknowns are C_{vol} and C_{rm} .

$$(26) w_{vol}C_{vol} + w_{rm}C_{rm} = C_f$$

Introducing a new variable k , the commission ratio differential between the Residual Market and the Voluntary Market, such that:

$$(27) k = C_{rm} / C_{vol},$$

Then equations can be derived for C_{vol} and C_{rm} as follows:

$$(28) C_{vol} = C_f / (w_{vol} + w_{rm}k)$$

$$(29) C_{rm} = C_f k / (w_{vol} + w_{rm}k)$$

“ k ” is the estimated commission differential. Given we have C_f as a known and we can solve for C_{vol} and C_{rm} , we now have all the variables needed to solve equation (13).

The detailed calculations for solving equation (13), the Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy, are located in Section I-D, Exhibit 1, Page 1. As demonstrated in that section, the resulting adjustment factor is **1.000**.

Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy

	Total Market	Residual Market ("rm")	Voluntary Market ("vol")
(1) Permissible Loss, LAE, and Fixed Expense Ratio	79.8%		
(2) Fixed Expense Ratio	4.2%		
(3) Permissible Loss and LAE Ratio = [(1) - (2)]	75.6%		
(4) Loss Ratio Differential, r	1.149		
(5) Market Weight - w_x		24%	76%
(6) Implied Permissible Loss and LAE Ratio		0.839	0.730
(7) Implied Permissible Loss, LAE, and Fixed Expense Ratio		0.881	0.772
(8) Implied Permissible Loss, LAE, and Fixed Expense Ratio Differential	1.141		
(9) Variable Expense Ratio	19.9%	10.9%	22.7%
(10) Underwriting Profit Provision	0.27%		
(11) Implied Rate Factor Equivalent		0.992	1.003
(12) Implied Rate Differential, d	0.989		
(13) Residual Market Rate equivalent, Q_{rm}	0.992		
(14) Proportion of Total Voluntary Assessable Premium Not from Large Deductibles, u	0.767		
(15) Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy	1.000		

Notes

(1): from Section VI-A, Exhibit 1 and Section VII-A, Exhibit 1

(2): Section VI-B, Exhibit 1, average of column (18).

(4): Loss Ratio Differential from Page 2, assumes LAE as % of loss is the same for Residual and Voluntary Market.

(5): Residual Market weight, w_{rm} , from Section I-E, Exhibit 2, Voluntary Market weight, $w_{vol} = 1.0 - w_{rm}$ (6): Voluntary Market Implied Permissible Loss and LAE Ratio = (3) / [(5 w_{rm}) x (4) + (5 w_{vol})]Residual Market Permissible Implied Loss and LAE Ratio = (4) x (6) $_{vol}$

(7) = (2) + (6)

(8) = (7) $_{rm}$ / (7) $_{vol}$

(9): Section VI-A, Exhibit 1, Total Market; Residual Market commission calculated based on the Residual Market - Pool Procedures - Producer Fee Schedule.

Premium discounts were discontinued in the Residual Market effective 1/1/1991.

(10): Section VII-A, Exhibit 1.

(11) = (7) / [1.0 - (9) - (10)]

(12) = (11) $_{rm}$ / (11) $_{vol}$ (13) = d / [$w_{vol} + (w_{rm} \times d)$]

(14): Exhibit 2.

(15) = [1.0 - $w_{rm} \times Q_{rm} \times (1.0 - u)$] / [1.0 - $w_{rm} \times (1.0 - u)$]

Calculation of Residual Market to Voluntary Loss Ratio Differential
 (\$ amounts in millions)

Policy Year	Total Market			Residual Market			Voluntary Market			Loss Ratio Differential LR _{rm} / LR _{vol} = (7) / (10)
	Standard Earned Premium plus ARAP	Paid Losses and Case Reserves	Paid + Case Loss Ratio = (3) / (2)	Standard Earned Premium Plus ARAP	Paid Losses and Case Reserves	Paid + Case Loss Ratio = (6) / (5)	Standard Earned Premium Plus ARAP	Paid Losses and Case Reserves	Paid + Case Loss Ratio = (9) / (8)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2009	821	515	62.7%	110	77	69.8%	711	438	61.6%	1.132
2010	893	548	61.4%	108	73	67.4%	785	475	60.5%	1.114
2011	961	583	60.7%	134	103	77.3%	827	480	58.0%	1.332
2012	980	581	59.3%	176	129	73.4%	804	452	56.2%	1.306
2013	1,029	563	54.8%	209	119	56.7%	819	445	54.3%	1.046
2014	1,087	594	54.6%	242	150	62.0%	845	444	52.5%	1.181
2015	1,151	461	40.1%	263	116	44.3%	887	345	38.8%	1.140
(12) Average Last 2 Years				252	133	52.8%	866	394	45.5%	1.159
(13) Average All Years				177	110	61.8%	811	440	54.2%	1.140
(14) Selected Loss Ratio Differential										1.149

Notes:
 Data as of 12/31/2016 from Aggregate Financial Database, excluding large deductible policies.

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Residual Market Weight "w_{rm}"
 Proportion of Voluntary Assessable Premium Not from Large Deductibles "u"
 (\$ amounts in millions)

Calendar Year	Voluntary Assessable Premium Basis Used to Determine Shares of the Residual Market	Take-Out Program Written Premium	Take-Out Credits	Residual Market Direct Written Premium	Large Deductible Standard + ARAP Written Premium	Voluntary Non-Large Deductible Not in Take-Out Program Written Premium = (2) - (3) - (6) + (4)	Residual Market Weight "w _{rm} " = (5) / [(3) + (5) + (7)]	"u" -- Proportion of Assessable Premium Not from Large Deductibles = (7) / [(7) + (6)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2015	1025	37	36	258	227	797	0.236	0.778
2016	1094	52	47	274	266	823	0.238	0.756
Selected	1060	44	42	266	247	810	0.237	0.767

Note:

Refers to the prospective effective period from 7/1/2018 through 7/1/2019.

(2),(3),(4),(5),(6): Massachusetts Workers' Compensation Assigned Risk Pool Special Bulletin No. SB-10-16 for Calendar Year 2015 and Special Bulletin No. SB-10-17 for Calendar Year 2016.

(2),(3),(4),(5),(6),(7): Selected based on two-year average of Calendar Year 2015 and 2016.

LOSS DEVELOPMENT

As explained in the Commissioner's 2003 decision, "[t]he ultimate value of losses cannot be determined from reported losses alone, because losses are not always reported immediately and loss values change over time as payments are made and reserves adjusted." Decision on 2003 Rates, p. 5. Loss development thus requires an actuarial method of estimating the ultimate settlement value of losses based on "reported losses"¹ and historical patterns of development, i.e. the change in the observed value of a loss between valuation dates. Loss development factors are mathematically derived by analyzing the development of losses from initial reporting and reserving to the ultimate value at the time of the final settlement. The assumption is that losses develop in a consistent pattern over time so that historical experience can be used to predict future development.

Reported losses are developed to their estimated "ultimate" level based on historical loss development patterns. The pattern of change in reported losses over time is observed at regular intervals and converted into age-to-age link ratios, each of which reflects the ratio of the loss valued as of time (T+1) to the loss valued as of time T. When applied successively, age-to-age link ratios yield cumulative loss development factors. Cumulative loss development factors are then applied to current reported losses to estimate what the ultimate value of losses will be when all associated claims are settled.

¹ The term "reported losses" refers to either paid losses or paid losses plus case reserves.

II 000002

In this section of the Filing, reported losses for policy years 2014 and 2015 are developed to their estimated ultimate levels. Consistent with the Casualty Actuarial Society Statement of Principles Regarding Property and Casualty Insurance Ratemaking, the WCRIBMA has examined the results of more than one method of estimating ultimate losses in an effort to derive a reasonable estimate of losses. The selected estimate of ultimate losses is the average of the estimates derived by developing paid losses and by developing the sum of paid losses and case reserves. The paid loss data used in this filing are the actual inception-to-date paid losses net of subrogation and second injury fund recoveries. The case reserve data used in this filing are the claim-specific amounts held as reserves for anticipated future claims payments.

The 2014 policy year and 2015 policy year ultimate loss estimates used in the rate indication are calculated by multiplying the reported losses by the applicable loss development factor to ultimate, which is the product of all age-to-age development factors (including the tail factor discussed below) from a given month (“age”) of development forward to the point at which we expect no further development.

One of the goals when using historical data as the basis for the ultimate loss predictions is to balance stability with responsiveness. Stability is a desirable quality to avoid large fluctuations that are not representative of the future. Here, the more years that are considered, the more stable the result is likely to be. We must, however, also consider responsiveness: we only want to include data that we believe represent current and ongoing conditions. This, in turn, weighs in favor of using the most recent data.

II 000003

Analysis of the development patterns of AIG reveal that the company's experience has in the past been materially different from the remainder of the industry. This, in combination with AIG's fluctuating market share over the 21-year period considered, could arguably result in distorted estimates of ultimate losses if AIG's experience were combined with the remainder of the industry in calculating development factors. In an abundance of caution, the AIG data are analyzed independently from the remainder of the industry data for purposes of estimating the development of losses to 252 months as they have been since 2012. The resulting estimates of losses at 252 months for AIG and the remainder of the industry are then summed together to produce the estimate of the total industrywide developed losses at 252 months.² Note that the differences in estimated ultimate losses for the industry in total, as compared to the sum of separate estimates of ultimate losses for AIG and the remainder of the industry, are less pronounced than in prior filings. The conditions that necessitated developing the remainder of the industry and AIG separately thus appear to no longer exist. Based on this, we anticipate that it will no longer be necessary nor warranted to develop them separately in the future filings. However, we will continue to evaluate this issue going forward.

Our selected age-to-age development factors for the remainder of the industry are the unweighted averages of the latest two indicated age-to-age link ratios. Because the AIG data are, compared to the rest of the industry, materially smaller, and therefore subject to

² The separate development of AIG data was performed in accordance with the Commissioner's guidance in the 2012 Rate Decision to treat that data consistently between the different sections of the filing. Except for the estimation of tail factors, because of the limited claims activity beyond 252 months of development, the losses for AIG and the remainder of industry have been developed separately in Section II – Loss Development and Section V- Trend.

II 000004

greater volatility, the selected age-to-age development factors for AIG are based on the unweighted averages of the latest five indicated age-to-age link ratios.

As in past filings, medical and indemnity losses are developed separately because of their differing development patterns. The use of separate medical and indemnity loss development factors avoids potential distortions that could arise from changes in the relative proportions of medical and indemnity losses over time. Section II-A, Exhibit 1 summarizes the results. The underlying details of the methodology are displayed in Section II-B.

Consistent with past filings, the historical experience of companies that have stopped writing new business in Massachusetts and that did not report policy experience valued as of the end of the latest calendar year has been excluded from our financial aggregate database in order to avoid distortions to the rate indication.

The WCRIBMA uses historical data and the resultant loss development factors to develop the policy year paid and the paid plus case losses to 252 months for AIG and the remainder of the industry, separately. The developed losses are then combined and an industry based "tail factor" accounts for development beyond 252 months to ultimate.

The indicated ultimate indemnity tail factor is then adjusted for escalation. We make this adjustment for escalated benefits because some of the losses in the loss development triangle do not reflect the change in the law that introduced inflation-based increases in indemnity benefits or lost wages. See St. 1986, c. 572. The development pattern of indemnity losses that are subject to escalation will differ from that of indemnity

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losses not subject to escalation (unless escalation is zero). See Section II-D for the details of the calculation.

TAIL FACTORS

Workers' compensation carriers in Massachusetts report aggregated financial policy year loss experience to the WCRIBMA at year-end valuation points for twenty-one consecutive years (252 months). As a result, the WCRIBMA can develop losses to 252 months using the age-to-age link ratios previously described. However, workers' compensation losses may continue to develop well beyond 252 months. For instance, a young person could suffer a severe work-related injury and collect workers' compensation benefits for the balance of his/her lifetime, in some cases forty years or more. The "tail factor" accounts for such instances by considering loss development from 252 months of development to ultimate.

Beyond 252 months of development, policy year loss experience is aggregated for statistical reporting purposes and reported in total as a single value. This loss experience is summarized and reported each year as an aggregate number "prior to" a given policy year. This experience does not lend itself to the calculation and application of age-to-age link ratios. However, these data can be used to develop a tail factor, which is essentially a loss development factor to ultimate intended to account for all remaining loss development beyond a given point. In this filing, we derive tail factor estimates for loss development from 252 months of development to ultimate (the point at which there is no further payment activity).

This filing uses the same method to develop the tail factor employed by the Commissioner in the 2003 Rate Decision and by the WCRIBMA in all subsequent rate

filings. The WCRIBMA's estimation of tail factors involves calculating the calendar year change in losses for all policy years included in the most recent "prior to" line and comparing that result to the reported losses for the oldest policy year not included in the "prior to" line.

We calculate separate tail factors directly for medical and indemnity losses in order to reflect their differing development patterns. Medical losses tend to develop differently than do indemnity losses (Section II-B). Application of separate tail factors captures the different development patterns and prevents the estimate of ultimate losses from being distorted by shifts in the proportions of medical and indemnity losses over time. Separate tail factors are also estimated for paid and paid-plus-case reported losses.

As in previous filings, the selected tail factor is based on the average of five observations in order to reduce volatility. In this filing, we use the link factor method (i.e., stating each factor as of the same month (age) of development) to bring each of the five valuations to a common report level, 252 months, so that the calculated tail factor is consistent with the losses to which it is applied. We then calculate a tail factor to project losses from 252 months to ultimate values. The tail factor calculation is detailed on Exhibit 1, Page 1 and Exhibit 2, Page 1 of Section II-C.

Growth Factor Adjustment

Changes in the level of ultimate losses over time can distort the calculation of the tail factor. Without a growth factor adjustment, the tail factor would aggregate all years beyond 252 months and calculate the factor based on the assumption that policy years

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prior to 1996 had the same level of ultimate losses as policy year 1996 – an assumption known to be false. Stated mathematically, if the ratios used to calculate the tail factor reflect losses in the numerator that relate to a different level of ultimate losses than do the losses used in the denominator,³ the tail factor will be distorted. This is not a problem for the age-to-age link ratios used through 252 months of development that only use the data for a given policy year in the calculation. However, the growth factor is intended to adjust for differences in the ultimate value of losses across policy years, thereby creating a more accurate estimate of development in the tail (see Section II-C, Exhibit 1, Page 2 and Exhibit 2, Page 2). Conceptually, the growth factor decomposes the calendar year development for policy years prior to 1996, into individual policy year components, and then adjusts based on each policy year's estimated contribution to the aggregate development. The data underlying the calculation of the growth factor are the historical policy year losses from the Aggregate Financial data, evaluated as of the latest common development point, 108 months⁴.

³ See Formula in Section II-C: [(Inception-to-date losses for PYs Prior to Policy Year 1996 at 12/31/[Y] - Inception-to-date losses for PYs Prior to Policy Year 1996 at 12/31/[Y] - 1 yr) / (Losses for policy year 1996 at 12/31/[Y])

⁴ The Aggregate Financial data has been used in lieu of Annual Statement data to eliminate potential distortions in the growth factor calculation due to the Annual Statement's inclusion of large deductible experience in the workers' compensation line of business. Aggregate Financial data valued as of 108 months was used because data for policy years 1969 through 1977 were only reported through 108 months of development.

ADJUSTMENT FOR ESCALATED BENEFITS

This section calculates factors that reflect the impact of the introduction of escalation (inflation-indexed wage loss benefit increases) on loss development. This adjustment for differences in development patterns is necessary because some of WCRIBMA's loss data predate the change in law introducing escalation of indemnity benefits. These older, unescalated losses exhibit a development pattern that will differ from the expected development of indemnity losses that are subject to escalation.

The statutory escalation of benefits became effective on October 1, 1986, following the passage of St. 1986, c. 582. Data collected for policy year 1987 and later years reflect the impact of escalation. In this filing, age-to-age link ratios are derived from experience for policy years 1996 and later to develop losses to 252 months. Beyond 252 months of development, loss development factors, including age-to-age link ratios and tail factors, are derived from experience for policy years 1995 and prior. Reported losses for policy years prior to 1987 do not reflect the impact of escalation and therefore the portion of the tail factor that is based on data from these years must be adjusted.

We have used the same simulation model to quantify the adjustment for escalated benefits at the WCRIBMA since our 2003 rate filing. The simulation model assumes that permanent total claimants experience impaired mortality.

Exhibits 1 and 2 estimate the differentials between the escalated and non-escalated development factors for both the paid and paid-plus-case loss development methods,

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respectively. The resulting factors are the basis for the selected escalation factor used in the estimation of ultimate losses.

ACCIDENT YEAR PAID LOSS DEVELOPMENT FACTORS**Used in Section VII - Profit**

Accident year loss flows are needed for purposes of estimating a profit provision in Section VII. Using the most recent available financial aggregate data, the WCRIBMA has updated the medical and the indemnity accident year paid losses used to derive an accident year payment pattern. The combined loss flow is a weighted average of the medical and indemnity paid loss flows.

Medical Paid Loss Flow

As with the policy year loss development, we develop accident year losses to 252 months for AIG and the remainder of the industry separately. We compute accident year medical paid loss development factors for AIG from the averages of the five latest link ratios and for the remainder of the industry from the averages of the two latest link ratios. Medical paid losses for AIG and the remainder of the industry are developed separately through a 252 months using their respective link ratios. The resulting values for AIG and the remainder of the industry are then summed, and the sum is multiplied by a medical paid loss tail factor. For purposes of modeling cash flows in Section VII, a policy year medical paid loss tail factor is used, in lieu of developing a separate accident year tail factor.

Indemnity Paid Loss Flow

The flow for indemnity paid losses has been derived from the financial aggregate data using a method identical to the method used for medical paid losses except that the indemnity paid losses have been adjusted for escalation of benefits.

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Summary of Estimated Ultimate Losses

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/16 (3)	Cumulative Factors from Latest Month to 252 Months (4)	Losses Developed to 252 Months (5)	Tail Factor from 252 Months to Ultimate (6)	Factor to Adjust for Escalated Benefits (7)	Estimated Ultimate Losses (8)
2014	Indemnity	248,255,901	1.788	443,855,172	1.036	1.042	479,094,919
2014	Medical	167,187,626	1.308	218,718,702	1.057	1.000	231,165,614
2014	Total	415,443,527		662,573,874			710,260,534
2015	Indemnity	135,805,533	3.378	458,712,897	1.036	1.042	495,132,269
2015	Medical	126,959,971	1.689	214,458,400	1.057	1.000	226,662,866
2015	Total	262,765,504		673,171,297			721,795,135

Paid Plus Case Loss Development Method

Policy Year (9)	Benefit Type (10)	Paid Plus Case Losses at 12/31/16 (11)	Cumulative Factors from Latest Month to 252 Months (12)	Losses Developed to 252 Months (13)	Tail Factor from 252 Months to Ultimate (14)	Factor to Adjust for Escalated Benefits (15)	Estimated Ultimate Losses (16)
2014	Indemnity	354,986,956	1.226	435,356,600	1.022	1.006	447,478,236
2014	Medical	238,805,472	1.009	240,891,655	1.025	1.000	247,021,225
2014	Total	593,792,428		676,248,255			694,499,461
2015	Indemnity	251,318,679	1.715	430,918,793	1.022	1.006	442,916,868
2015	Medical	209,806,226	1.055	221,360,104	1.025	1.000	226,992,687
2015	Total	461,124,905		652,278,898			669,909,555

Notes:

(3), (11): Aggregate Financial Data.

(4) = (5) / (3)

(5) Section II: Exhibit 1, Page 2, Column (5) + Exhibit 1, Page 3, Column (5).

(6): Section II - C, Exhibit 1, Page 1.

(7): Section II - D, Exhibit 1, Page 1.

(8) = (5) x (6) x (7)

(12) = (13) / (11)

(13) Section II: Exhibit 1, Page 2, Column (10) + Exhibit 1, Page 3, Column (10).

(14): Section II - C, Exhibit 2, Page 1.

(15): Section II - D, Exhibit 2, Page 1.

(16) = (13) x (14) x (15)

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Summary of Estimated Ultimate Losses Remainder of Industry

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/16 (3)	Cumulative Factors from Latest Month to 252 Months (4)	Losses Developed to 252 Months (5)
2014	Indemnity	217,310,214	1.758	381,985,257
2014	Medical	149,244,179	1.300	194,039,418
2014	Total	366,554,393		576,024,676

2015	Indemnity	119,541,045	3.300	394,492,571
2015	Medical	113,151,657	1.665	188,400,690
2015	Total	232,692,702		582,893,261

Paid Plus Case Loss Development Method

Policy Year (6)	Benefit Type (7)	Paid Plus Case Losses at 12/31/16 (8)	Cumulative Factors from Latest Month to 252 Months (9)	Losses Developed to 252 Months (10)
2014	Indemnity	314,467,264	1.213	381,403,154
2014	Medical	216,161,495	1.008	217,820,663
2014	Total	530,628,759		599,223,818

2015	Indemnity	224,156,256	1.670	374,271,478
2015	Medical	187,990,447	1.044	196,183,796
2015	Total	412,146,703		570,455,274

Notes:

(3), (8): Aggregate Financial Data.

(4), (9): Section II - B, Exhibit 1, Page 1.

(5) = (3) x (4)

(10) = (8) x (9)

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Exhibit 1
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Summary of Estimated Ultimate Losses AIG

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/16 (3)	Cumulative Factors from Latest Month to 252 Months (4)	Losses Developed to 252 Months (5)
2014	Indemnity	30,945,687	1.999	61,869,914
2014	Medical	17,943,447	1.375	24,679,284
2014	Total	48,889,134		86,549,198

2015	Indemnity	16,264,488	3.948	64,220,326
2015	Medical	13,808,314	1.887	26,057,709
2015	Total	30,072,802		90,278,036

Paid Plus Case Loss Development Method

Policy Year (6)	Benefit Type (7)	Paid Plus Case Losses at 12/31/16 (8)	Cumulative Factors from Latest Month to 252 Months (9)	Losses Developed to 252 Months (10)
2014	Indemnity	40,519,692	1.332	53,953,446
2014	Medical	22,643,977	1.019	23,070,992
2014	Total	63,163,669		77,024,437

2015	Indemnity	27,162,423	2.086	56,647,315
2015	Medical	21,815,779	1.154	25,176,308
2015	Total	48,978,202		81,823,623

Notes:

(3), (8): Aggregate Financial Data.

(4), (9): Section II - B, Exhibit 1, Page 2.

(5) = (3) x (4)

(10) = (8) x (9)

Policy Year Aggregate Financial Data
 Summary of Loss Development Factors
 Remainder of Industry

Loss Development Factors From																			
Months of Development	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252
(1) Indemnity Paid Losses																			
2 Year Average	1.877	1.312	1.143	1.055	1.028	1.016	1.015	1.006	1.005	1.007	1.007	1.004	1.002	1.005	1.002	1.003	1.002	1.001	1.001
Cumulative Factor to 252	3.300	1.758	1.340	1.173	1.111	1.081	1.063	1.048	1.041	1.036	1.028	1.021	1.017	1.015	1.010	1.008	1.005	1.003	1.001
(2) Medical Paid Losses																			
2 Year Average	1.281	1.080	1.034	1.020	1.017	1.009	1.011	1.009	1.009	1.006	1.007	1.009	1.008	1.008	1.012	1.007	1.006	1.007	1.006
Cumulative Factor to 252	1.665	1.300	1.204	1.164	1.141	1.122	1.112	1.099	1.090	1.080	1.073	1.065	1.056	1.047	1.039	1.027	1.020	1.013	1.006
(3) Indemnity Paid Plus Case Losses																			
2 Year Average	1.377	1.109	1.067	1.014	0.999	0.999	0.998	1.002	1.002	1.003	1.006	1.002	0.999	0.999	1.002	0.998	1.000	1.001	1.000
Cumulative Factor to 252	1.670	1.213	1.094	1.025	1.011	1.012	1.013	1.016	1.013	1.011	1.008	1.002	1.000	1.001	1.002	0.999	1.001	1.001	1.000
(4) Medical Paid Plus Case Losses																			
2 Year Average	1.036	1.015	1.004	1.004	0.998	0.997	0.994	1.000	1.003	0.996	0.998	1.006	1.003	0.985	1.003	1.000	1.007	1.000	0.995
Cumulative Factor to 252	1.044	1.008	0.993	0.989	0.985	0.987	0.990	0.996	0.996	0.993	0.997	0.999	0.993	0.990	1.005	1.002	1.002	0.996	0.995

- Notes:
 (1): Exhibit 2, Page 1.
 (2): Exhibit 2, Page 2.
 (3): Exhibit 3, Page 1.
 (4): Exhibit 3, Page 2.

Policy Year Aggregate Financial Data
 Summary of Loss Development Factors
 AIG

Loss Development Factors From																			
Months of Development	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252
<u>(1) Indemnity Paid Losses</u>																			
5 Year Average	1.975	1.414	1.175	1.071	1.024	1.015	1.006	1.005	1.008	1.004	1.007	1.007	1.009	1.005	1.002	1.011	1.004	1.008	1.002
Cumulative Factor to 252	3.948	1.999	1.414	1.203	1.123	1.097	1.081	1.075	1.070	1.062	1.057	1.050	1.043	1.033	1.028	1.026	1.014	1.011	1.002
<u>(2) Medical Paid Losses</u>																			
5 Year Average	1.372	1.115	1.048	1.022	1.016	1.003	1.014	1.013	1.013	1.011	1.010	1.009	1.011	1.009	1.007	1.012	1.009	1.003	1.002
Cumulative Factor to 252	1.887	1.375	1.233	1.177	1.151	1.132	1.129	1.113	1.099	1.085	1.074	1.063	1.054	1.042	1.033	1.025	1.014	1.005	1.002
<u>(3) Indemnity Paid Plus Case Losses</u>																			
5 Year Average	1.566	1.206	1.055	1.024	0.998	0.995	1.002	1.000	1.000	1.002	1.000	1.003	1.004	1.002	1.000	1.008	1.007	1.000	0.999
Cumulative Factor to 252	2.086	1.332	1.104	1.046	1.021	1.024	1.029	1.027	1.026	1.027	1.024	1.024	1.021	1.017	1.014	1.014	1.007	0.999	0.999
<u>(4) Medical Paid Plus Case Losses</u>																			
5 Year Average	1.133	1.048	0.996	0.980	0.989	0.975	1.003	0.999	0.993	1.003	0.994	1.013	0.994	1.004	1.014	1.045	0.990	1.000	0.982
Cumulative Factor to 252	1.154	1.019	0.972	0.976	0.996	1.008	1.033	1.030	1.031	1.038	1.035	1.041	1.028	1.034	1.031	1.016	0.972	0.982	0.982

Notes:

- (1): Exhibit 2, Page 3.
- (2): Exhibit 2, Page 4.
- (3): Exhibit 3, Page 3.
- (4): Exhibit 3, Page 4.

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Section II - Loss Development
 Subsection B - Policy Year Data
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Section II - B
 Exhibit 2
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Policy Year Aggregate Financial Data Calculation of Indemnity Paid Loss Development Factors Remainder of Industry

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	24	36			144	156	
2013	105,285	196,675	1.868	2003	228,844	230,584	1.008
2014	114,962	216,907	1.887	2004	232,176	233,871	1.007
Average			1.877	Average			1.007
	36	48			156	168	
2012	185,562	246,481	1.328	2002	243,527	244,323	1.003
2013	196,675	254,827	1.296	2003	230,584	231,563	1.004
Average			1.312	Average			1.004
	48	60			168	180	
2011	232,821	264,889	1.138	2001	250,383	250,865	1.002
2012	246,481	282,867	1.148	2002	244,323	244,599	1.001
Average			1.143	Average			1.002
	60	72			180	192	
2010	234,463	248,604	1.060	2000	252,115	252,700	1.002
2011	264,889	278,140	1.050	2001	250,865	252,660	1.007
Average			1.055	Average			1.005
	72	84			192	204	
2009	239,645	245,656	1.025	1999	231,346	231,951	1.003
2010	248,604	256,267	1.031	2000	252,700	253,111	1.002
Average			1.028	Average			1.002
	84	96			204	216	
2008	231,821	235,290	1.015	1998	216,891	217,485	1.003
2009	245,656	250,086	1.018	1999	231,951	232,938	1.004
Average			1.016	Average			1.003
	96	108			216	228	
2007	227,078	231,855	1.021	1997	187,533	188,094	1.003
2008	235,290	237,292	1.009	1998	217,485	217,792	1.001
Average			1.015	Average			1.002
	108	120			228	240	
2006	220,636	221,454	1.004	1996	189,908	190,221	1.002
2007	231,855	233,913	1.009	1997	188,094	188,319	1.001
Average			1.006	Average			1.001
	120	132			240	252	
2005	213,031	213,495	1.002	1996	190,221	190,432	1.001
2006	221,454	223,394	1.009	Average			1.001
Average			1.005				
	132	144					
2004	230,186	232,176	1.009				
2005	213,495	214,796	1.006				
Average			1.007				

Notes:
 Losses from Aggregate Financial Data.

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Section II - Loss Development
 Subsection B - Policy Year Data
 7/1/2018

Section II - B
 Exhibit 2
 Page 2

Policy Year Aggregate Financial Data Calculation of Medical Paid Loss Development Factors Remainder of Industry

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	24	36			144	156	
2013	105,864	134,217	1.268	2003	126,542	127,745	1.010
2014	115,146	148,938	1.293	2004	122,643	123,209	1.005
Average			1.281	Average			1.007
	36	48			156	168	
2012	133,123	144,553	1.086	2002	129,201	130,324	1.009
2013	134,217	144,147	1.074	2003	127,745	128,920	1.009
Average			1.080	Average			1.009
	48	60			168	180	
2011	133,709	138,522	1.036	2001	122,555	123,552	1.008
2012	144,553	149,145	1.032	2002	130,324	131,403	1.008
Average			1.034	Average			1.008
	60	72			180	192	
2010	129,986	132,332	1.018	2000	120,573	121,504	1.008
2011	138,522	141,631	1.022	2001	123,552	124,457	1.007
Average			1.020	Average			1.008
	72	84			192	204	
2009	126,670	127,980	1.010	1999	121,805	123,344	1.013
2010	132,332	135,520	1.024	2000	121,504	122,866	1.011
Average			1.017	Average			1.012
	84	96			204	216	
2008	120,678	121,689	1.008	1998	110,702	111,410	1.006
2009	127,980	129,324	1.011	1999	123,344	124,325	1.008
Average			1.009	Average			1.007
	96	108			216	228	
2007	131,039	133,015	1.015	1997	93,225	93,609	1.004
2008	121,689	122,573	1.007	1998	111,410	112,370	1.009
Average			1.011	Average			1.006
	108	120			228	240	
2006	117,320	118,366	1.009	1996	95,748	96,718	1.010
2007	133,015	134,190	1.009	1997	93,609	93,980	1.004
Average			1.009	Average			1.007
	120	132			240	252	
2005	114,485	115,457	1.008	1996	96,718	97,324	1.006
2006	118,366	119,549	1.010	Average			1.006
Average			1.009				
	132	144					
2004	122,181	122,643	1.004				
2005	115,457	116,499	1.009				
Average			1.006				

Notes:
 Losses from Aggregate Financial Data.

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Policy Year Aggregate Financial Data
 Calculation of Indemnity Paid Loss Development Factors
 AIG

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	24	36			132	144	
2010	20,443	42,929	2.100	2001	46,089	46,520	1.009
2011	20,863	40,920	1.961	2002	63,207	63,356	1.002
2012	13,493	25,762	1.909	2003	90,559	90,699	1.002
2013	15,133	29,616	1.957	2004	113,224	114,049	1.007
2014	15,893	30,946	1.947	2005	123,864	123,960	1.001
Average			1.975	Average			1.004
	36	48			144	156	
2009	34,477	48,407	1.404	2000	40,686	41,279	1.015
2010	42,929	60,274	1.404	2001	46,520	46,547	1.001
2011	40,920	56,176	1.373	2002	63,356	63,721	1.006
2012	25,762	37,570	1.458	2003	90,699	91,082	1.004
2013	29,616	42,335	1.429	2004	114,049	115,110	1.009
Average			1.414	Average			1.007
	48	60			156	168	
2008	68,669	79,105	1.152	1999	30,788	31,180	1.013
2009	48,407	58,408	1.207	2000	41,279	41,685	1.010
2010	60,274	71,166	1.181	2001	46,547	46,680	1.003
2011	56,176	64,773	1.153	2002	63,721	64,353	1.010
2012	37,570	44,510	1.185	2003	91,082	91,065	1.000
Average			1.175	Average			1.007
	60	72			168	180	
2007	92,581	98,923	1.069	1998	30,719	30,860	1.005
2008	79,105	84,736	1.071	1999	31,180	32,084	1.029
2009	58,408	62,216	1.065	2000	41,685	41,699	1.000
2010	71,166	77,056	1.083	2001	46,680	46,745	1.001
2011	64,773	69,149	1.068	2002	64,353	65,008	1.010
Average			1.071	Average			1.009
	72	84			180	192	
2006	99,664	101,288	1.016	1997	40,431	40,874	1.011
2007	98,923	102,517	1.036	1998	30,860	31,065	1.007
2008	84,736	88,242	1.041	1999	32,084	32,160	1.002
2009	62,216	62,936	1.012	2000	41,699	41,974	1.007
2010	77,056	78,072	1.013	2001	46,745	46,784	1.001
Average			1.024	Average			1.005
	84	96			192	204	
2005	120,229	121,421	1.010	1996	22,659	22,695	1.002
2006	101,288	104,367	1.030	1997	40,874	41,004	1.003
2007	102,517	104,718	1.021	1998	31,065	31,221	1.005
2008	88,242	89,059	1.009	1999	32,160	32,159	1.000
2009	62,936	63,254	1.005	2000	41,974	41,880	0.998
Average			1.015	Average			1.002
	96	108			204	216	
2004	109,696	111,668	1.018	1996	22,695	23,105	1.018
2005	121,421	122,807	1.011	1997	41,004	41,300	1.007
2006	104,367	104,609	1.002	1998	31,221	31,857	1.020
2007	104,718	104,452	0.997	1999	32,159	32,156	1.000
2008	89,059	88,938	0.999	Average			1.011
Average			1.006				
	108	120			216	228	
2003	90,174	90,537	1.004	1996	23,105	23,178	1.003
2004	111,668	112,776	1.010	1997	41,300	41,421	1.003
2005	122,807	122,864	1.000	1998	31,857	32,003	1.005
2006	104,609	105,208	1.006	Average			1.004
2007	104,452	104,783	1.003				
Average			1.005				
	120	132			228	240	
2002	62,120	63,207	1.018	1996	23,178	23,174	1.000
2003	90,537	90,559	1.000	1997	41,421	42,125	1.017
2004	112,776	113,224	1.004	Average			1.008
2005	122,864	123,864	1.008				
2006	105,208	106,135	1.009				
Average			1.008				
	132	144			240	252	
2002	62,120	63,207	1.018	1996	23,174	23,230	1.002
2003	90,537	90,559	1.000	Average			1.002
2004	112,776	113,224	1.004				
2005	122,864	123,864	1.008				
2006	105,208	106,135	1.009				
Average			1.008				

Notes:
 Losses from Aggregate Financial Data.

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Section II - Loss Development
 Subsection B - Policy Year Data
 7/1/2018

Section II - B
 Exhibit 3
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Policy Year Aggregate Financial Data Calculation of Indemnity Paid Plus Case Loss Development Factors Remainder of Industry

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	24	36			144	156	
2013	205,739	272,677	1.325	2003	234,185	235,774	1.007
2014	219,869	313,965	1.428	2004	236,692	237,949	1.005
Average			1.377	Average			1.006
	36	48			156	168	
2012	261,633	295,003	1.128	2002	248,252	248,907	1.003
2013	272,677	297,331	1.090	2003	235,774	236,052	1.001
Average			1.109	Average			1.002
	48	60			168	180	
2011	274,496	294,481	1.073	2001	255,417	255,539	1.000
2012	295,003	312,950	1.061	2002	248,907	248,429	0.998
Average			1.067	Average			0.999
	60	72			180	192	
2010	260,825	266,355	1.021	2000	256,627	256,739	1.000
2011	294,481	296,427	1.007	2001	255,539	255,160	0.999
Average			1.014	Average			0.999
	72	84			192	204	
2009	261,580	262,150	1.002	1999	235,820	236,565	1.003
2010	266,355	265,304	0.996	2000	256,739	256,971	1.001
Average			0.999	Average			1.002
	84	96			204	216	
2008	244,672	243,788	0.996	1998	220,116	219,912	0.999
2009	262,150	262,520	1.001	1999	236,565	236,024	0.998
Average			0.999	Average			0.998
	96	108			216	228	
2007	238,832	238,665	0.999	1997	190,379	190,203	0.999
2008	243,788	242,777	0.996	1998	219,912	220,284	1.002
Average			0.998	Average			1.000
	108	120			228	240	
2006	226,017	226,831	1.004	1996	193,199	193,422	1.001
2007	238,665	238,867	1.001	1997	190,203	190,304	1.001
Average			1.002	Average			1.001
	120	132			240	252	
2005	218,649	218,613	1.000	1996	193,422	193,397	1.000
2006	226,831	227,988	1.005	Average			1.000
Average			1.002				
	132	144					
2004	236,378	236,692	1.001				
2005	218,613	219,443	1.004				
Average			1.003				

Notes:
 Losses from Aggregate Financial Data.

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Section II - Loss Development
 Subsection B - Policy Year Data
 7/1/2018

Section II - B
 Exhibit 3
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Policy Year Aggregate Financial Data Calculation of Medical Paid Plus Case Loss Development Factors Remainder of Industry

Policy Year	Losses (in 000's)		Loss Development Factor	Policy Year	Losses (in 000's)		Loss Development Factor
	Evaluated at Month				Evaluated at Month		
	24	36			144	156	
2013	187,967	191,375	1.018	2003	145,523	145,270	0.998
2014	204,823	215,708	1.053	2004	141,589	141,256	0.998
Average			1.036	Average			0.998
	36	48			156	168	
2012	190,656	196,975	1.033	2002	150,342	151,836	1.010
2013	191,375	190,822	0.997	2003	145,270	145,524	1.002
Average			1.015	Average			1.006
	48	60			168	180	
2011	172,676	173,672	1.006	2001	147,234	147,451	1.001
2012	196,975	197,378	1.002	2002	151,836	152,563	1.005
Average			1.004	Average			1.003
	60	72			180	192	
2010	166,143	168,532	1.014	2000	153,925	149,950	0.974
2011	173,672	172,533	0.993	2001	147,451	146,784	0.995
Average			1.004	Average			0.985
	72	84			192	204	
2009	156,817	155,923	0.994	1999	144,951	146,328	1.009
2010	168,532	168,816	1.002	2000	149,950	149,527	0.997
Average			0.998	Average			1.003
	84	96			204	216	
2008	136,440	136,116	0.998	1998	135,397	134,711	0.995
2009	155,923	155,267	0.996	1999	146,328	147,016	1.005
Average			0.997	Average			1.000
	96	108			216	228	
2007	157,192	155,321	0.988	1997	102,466	103,072	1.006
2008	136,116	136,213	1.001	1998	134,711	135,698	1.007
Average			0.994	Average			1.007
	108	120			228	240	
2006	135,559	136,535	1.007	1996	108,244	108,857	1.006
2007	155,321	154,266	0.993	1997	103,072	102,546	0.995
Average			1.000	Average			1.000
	120	132			240	252	
2005	133,475	133,781	1.002	1996	108,857	108,347	0.995
2006	136,535	136,931	1.003	Average			0.995
Average			1.003				
	132	144					
2004	142,388	141,589	0.994				
2005	133,781	133,464	0.998				
Average			0.996				

Notes:
 Losses from Aggregate Financial Data.

Policy Year Aggregate Financial Data
 Calculation of Indemnity Paid Plus Case Loss Development Factors
 AIG

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	24	36			132	144	
2010	39,114	61,321	1.568	2001	46,896	47,083	1.004
2011	36,914	57,265	1.551	2002	65,395	65,784	1.006
2012	22,989	36,309	1.579	2003	91,939	91,649	0.997
2013	27,367	43,211	1.579	2004	117,321	117,874	1.005
2014	26,079	40,520	1.554	2005	125,293	125,222	0.999
Average			1.566	Average			1.002
	36	48			144	156	
2009	51,605	62,423	1.210	2000	41,785	41,580	0.995
2010	61,321	74,805	1.220	2001	47,083	47,072	1.000
2011	57,265	68,632	1.198	2002	65,784	65,698	0.999
2012	36,309	44,476	1.225	2003	91,649	91,718	1.001
2013	43,211	50,955	1.179	2004	117,874	118,711	1.007
Average			1.206	Average			1.000
	48	60			156	168	
2008	83,194	89,378	1.074	1999	31,778	31,698	0.997
2009	62,423	64,504	1.033	2000	41,580	42,025	1.011
2010	74,805	78,268	1.046	2001	47,072	46,979	0.998
2011	68,632	71,411	1.040	2002	65,698	66,442	1.011
2012	44,476	48,095	1.081	2003	91,718	91,621	0.999
Average			1.055	Average			1.003
	60	72			168	180	
2007	103,421	106,949	1.034	1998	32,656	32,898	1.007
2008	89,378	92,249	1.032	1999	31,698	32,090	1.012
2009	64,504	64,498	1.000	2000	42,025	41,892	0.997
2010	78,268	80,386	1.027	2001	46,979	46,998	1.000
2011	71,411	73,448	1.029	2002	66,442	66,646	1.003
Average			1.024	Average			1.004
	72	84			180	192	
2006	107,483	107,730	1.002	1997	43,045	42,924	0.997
2007	106,949	106,890	0.999	1998	32,898	33,211	1.010
2008	92,249	91,793	0.995	1999	32,090	32,160	1.002
2009	64,498	64,254	0.996	2000	41,892	41,974	1.002
2010	80,386	80,017	0.995	2001	46,998	47,014	1.000
Average			0.998	Average			1.002
	84	96			192	204	
2005	126,335	124,383	0.985	1996	23,669	23,357	0.987
2006	107,730	107,499	0.998	1997	42,924	43,358	1.010
2007	106,890	107,007	1.001	1998	33,211	33,401	1.006
2008	91,793	91,401	0.996	1999	32,160	32,159	1.000
2009	64,254	63,957	0.995	2000	41,974	41,880	0.998
Average			0.995	Average			1.000
	96	108			204	216	
2004	115,359	116,557	1.010	1996	23,357	23,818	1.020
2005	124,383	125,461	1.009	1997	43,358	43,387	1.001
2006	107,499	107,453	1.000	1998	33,401	33,728	1.010
2007	107,007	106,620	0.996	1999	32,159	32,156	1.000
2008	91,401	90,873	0.994	Average			1.008
Average			1.002				
	108	120			216	228	
2003	92,030	91,705	0.996	1996	23,818	24,092	1.012
2004	116,557	116,749	1.002	1997	43,387	43,472	1.002
2005	125,461	125,467	1.000	1998	33,728	34,013	1.008
2006	107,453	107,848	1.004	Average			1.007
2007	106,620	106,680	1.001				
Average			1.000				
	120	132			228	240	
2002	65,679	65,395	0.996	1996	24,092	23,762	0.986
2003	91,705	91,939	1.003	1997	43,472	44,065	1.014
2004	116,749	117,321	1.005	Average			1.000
2005	125,467	125,293	0.999				
2006	107,848	107,538	0.997				
Average			1.000				
	132	144			240	252	
2002	65,679	65,395	0.996	1996	23,762	23,748	0.999
2003	91,705	91,939	1.003	Average			0.999
2004	116,749	117,321	1.005				
2005	125,467	125,293	0.999				
2006	107,848	107,538	0.997				
Average			1.000				

Notes:
 Losses from Aggregate Financial Data.

II 000026

Paid Loss Tail Factors

Indemnity 252nd Month to Ultimate Loss Tail Development Factor

(1)	Valuation Date [Y]	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016
(2)	Prior to Policy Year 1996 at [Y]	9,790,271,640	9,811,763,191	9,831,335,822	9,846,163,790	9,860,186,749
(3)	Prior to Policy Year 1996 at [Y] - 1 yr	9,773,598,044	9,790,271,640	9,811,763,191	9,831,335,822	9,846,163,790
(4)	Difference = (2) - (3)	16,673,596	21,491,551	19,572,631	14,827,968	14,022,959
(5)	Policy Year 1996 at [Y]	211,733,480	212,028,936	213,085,974	213,394,447	213,662,298
(6)	Ratio = (4) / (5)	0.079	0.101	0.092	0.069	0.066
(7)	Growth Factor	0.500	0.500	0.500	0.500	0.500
(8)	Product = (6) x (7)	0.039	0.051	0.046	0.035	0.033
(9)	Factor to Ultimate = 1.000 + (8)	1.039	1.051	1.046	1.035	1.033
(10)	Month [M]	204	216	228	240	252
(11)	Factor to Ultimate = (9)	1.039	1.051	1.046	1.035	1.033
(12)	Factor from [252] to [M]	0.989	0.994	0.996	0.999	1.000
(13)	Indicated [252] to Ultimate Tail Factor = (11) x (12)	1.028	1.044	1.042	1.033	1.033
(14)	Five Year Average					1.036

Medical 252nd Month to Ultimate Loss Tail Development Factor

(15)	Valuation Date [Y]	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016
(16)	Prior to Policy Year 1996 at [Y]	3,118,340,197	3,135,688,170	3,150,519,623	3,164,288,842	3,176,552,690
(17)	Prior to Policy Year 1996 at [Y] - 1 yr	3,102,023,325	3,118,340,197	3,135,688,170	3,150,519,623	3,164,288,842
(18)	Difference = (16) - (17)	16,316,872	17,347,973	14,831,453	13,769,219	12,263,848
(19)	Policy Year 1996 at [Y]	104,210,881	105,110,447	105,973,765	106,968,943	107,592,359
(20)	Ratio = (18) / (19)	0.157	0.165	0.140	0.129	0.114
(21)	Growth Factor	0.500	0.500	0.500	0.500	0.500
(22)	Product = (20) x (21)	0.078	0.083	0.070	0.064	0.057
(23)	Factor to Ultimate = 1.000 + (22)	1.078	1.083	1.070	1.064	1.057
(24)	Month [M]	204	216	228	240	252
(25)	Factor to Ultimate = (23)	1.078	1.083	1.070	1.064	1.057
(26)	Factor from [252] to [M]	0.974	0.981	0.988	0.994	1.000
(27)	Indicated [252] to Ultimate Tail Factor = (25) x (26)	1.050	1.062	1.057	1.058	1.057
(28)	Five Year Average					1.057

Notes:

- (2), (3), (5): Indemnity Paid Losses from Aggregate Financial Data.
 (16), (17), (19): Medical Paid Losses from Aggregate Financial Data.
 (7), (21): Section II - C, Exhibit 1, Page 2.
 (12), (26): 1.0 / Cumulative LDF from Section II - B, weighted average of Remainder of Industry and AIG

II 000027

Section II - Loss Development
 Subsection C - Tail Factor Calculation
 7/1/2018

Section II - C
 Exhibit 1
 Page 2

Growth Factor Adjustment Paid Losses

Policy Year (1)	Incurred Losses (2)	Relative Development for Report Interval (3)	Prior to 1996 Dollar Development (4)	On-Level Prior to 1996 Dollar Development (5)
1971	94,976,425	0.015%	14,403	44,060
1972	101,973,366	0.030%	30,927	88,120
1973	122,533,804	0.045%	55,744	132,180
1974	125,138,370	0.061%	75,905	176,240
1975	129,523,874	0.076%	98,207	220,299
1976	150,991,674	0.091%	137,381	264,359
1977	172,661,308	0.106%	183,280	308,419
1978	232,830,184	0.121%	282,457	352,479
1979	268,273,946	0.136%	366,137	396,539
1980	297,248,722	0.152%	450,757	440,599
1981	355,713,276	0.167%	593,356	484,659
1982	375,695,513	0.182%	683,660	528,719
1983	425,367,012	0.197%	838,552	572,778
1984	498,629,874	0.212%	1,058,593	616,838
1985	609,732,750	0.227%	1,386,927	660,898
1986	753,357,857	0.243%	1,827,865	704,958
1987	931,585,048	0.258%	2,401,564	749,018
1988	1,016,351,862	0.273%	2,774,210	793,078
1989	1,086,491,801	0.288%	3,130,421	837,138
1990	999,727,163	0.303%	3,032,035	881,198
1991	710,903,018	0.318%	2,263,875	925,257
1992	473,640,514	0.334%	1,580,135	969,317
1993	392,024,364	0.349%	1,367,299	1,013,377
1994	334,649,675	0.364%	1,217,936	1,057,437
1995	308,487,792	0.379%	1,169,501	1,101,497
1996	290,549,773			
	11,259,058,965		27,021,129	14,319,460
(6) Indicated Growth Factor:				0.53
(7) Selected Growth Factor:				0.5

Notes:

A growth factor of 0.500 has been selected.

(2): Losses from Aggregate Financial Data evaluated as of 108 months.

(3): Estimated % paid loss emergence for the report interval.

(4) = (2) x (3)

(5) = (3) x [(2) 1996]

(6) = [Sum of (5)] / [Sum of (4)]

(7): Rounded to the nearest tenth

II 000028

Paid Plus Case Loss Tail Factors

Indemnity 252nd Month to Ultimate Loss Tail Development Factor

(1) Valuation Date [Y]	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016
(2) Prior to Policy Year 1996 at [Y]	9,929,921,275	9,943,866,723	9,951,706,280	9,960,650,655	9,968,607,453
(3) Prior to Policy Year 1996 at [Y] - 1 yr	9,920,348,445	9,929,921,275	9,943,866,723	9,951,706,280	9,960,650,655
(4) Difference = (2) - (3)	9,572,830	13,945,448	7,839,557	8,944,375	7,956,798
(5) Policy Year 1996 at [Y]	216,039,904	216,280,014	217,291,087	217,183,658	217,144,617
(6) Ratio = (4) / (5)	0.044	0.064	0.036	0.041	0.037
(7) Growth Factor	0.500	0.500	0.500	0.500	0.500
(8) Product = (6) x (7)	0.022	0.032	0.018	0.021	0.018
(9) Factor to Ultimate = 1.000 + (8)	1.022	1.032	1.018	1.021	1.018
(10) Month [M]	204	216	228	240	252
(11) Factor to Ultimate = (9)	1.022	1.032	1.018	1.021	1.018
(12) Factor from [252] to [M]	0.999	0.998	0.999	1.000	1.000
(13) Indicated [252] to Ultimate Tail Factor = (11) x (12)	1.021	1.030	1.017	1.021	1.018
(14) Five Year Average					1.022

Medical 252nd Month to Ultimate Loss Tail Development Factor

(15) Valuation Date [Y]	12/31/2012	12/31/2013	12/31/2014	12/31/2015	12/31/2016
(16) Prior to Policy Year 1996 at [Y]	3,317,156,719	3,321,365,844	3,331,667,936	3,343,340,240	3,341,532,292
(17) Prior to Policy Year 1996 at [Y] - 1 yr	3,313,598,280	3,317,156,719	3,321,365,844	3,331,667,936	3,343,340,240
(18) Difference = (16) - (17)	3,558,439	4,209,125	10,302,092	11,672,304	(1,807,948)
(19) Policy Year 1996 at [Y]	119,221,379	119,061,487	119,068,231	119,702,154	118,992,053
(20) Ratio = (18) / (19)	0.030	0.035	0.087	0.098	(0.015)
(21) Growth Factor	0.500	0.500	0.500	0.500	0.500
(22) Product = (20) x (21)	0.015	0.018	0.043	0.049	(0.008)
(23) Factor to Ultimate = 1.000 + (22)	1.015	1.018	1.043	1.049	0.992
(24) Month [M]	204	216	228	240	252
(25) Factor to Ultimate = (23)	1.015	1.018	1.043	1.049	0.992
(26) Factor from [252] to [M]	0.997	1.001	1.006	1.006	1.000
(27) Indicated [252] to Ultimate Tail Factor = (25) x (26)	1.011	1.019	1.049	1.055	0.992
(28) Five Year Average					1.025

Notes:

- (2), (3), (5): Indemnity Paid Plus Case Losses from Aggregate Financial Data.
- (16), (17), (19): Medical Paid Plus Case Losses from Aggregate Financial Data.
- (7), (21): Exhibit 2, Page 2.
- (12), (26): 1.0 / Cumulative LDF from Section II - B, weighted average of Reminder of Industry and AIG

II 000029

Section II - Loss Development
 Subsection C - Tail Factor Calculation
 7/1/2018

Section II - C
 Exhibit 2
 Page 2

Growth Factor Adjustment Paid Plus Case Losses

Policy Year (1)	Incurred Losses (2)	Percent Development for Report Interval (3)	Prior to 1996 Dollar Development (4)	On-Level Prior to 1996 Dollar Development (5)
1976	150,991,674	0.011%	16,222	31,215
1977	172,661,308	0.021%	37,100	62,431
1978	232,830,184	0.032%	75,043	93,646
1979	268,273,946	0.043%	115,289	124,862
1980	297,248,722	0.054%	159,676	156,077
1981	355,713,276	0.064%	229,298	187,293
1982	375,695,513	0.075%	282,542	218,508
1983	425,367,012	0.086%	365,598	249,724
1984	498,629,874	0.097%	482,137	280,939
1985	609,732,750	0.107%	655,072	312,155
1986	753,357,857	0.118%	890,315	343,370
1987	931,585,048	0.129%	1,201,028	374,586
1988	1,016,351,862	0.140%	1,419,505	405,801
1989	1,086,491,801	0.150%	1,634,196	437,017
1990	999,727,163	0.161%	1,611,099	468,232
1991	710,903,018	0.172%	1,222,024	499,448
1992	473,640,514	0.183%	865,062	530,663
1993	392,024,364	0.193%	758,115	561,879
1994	334,649,675	0.204%	683,115	593,094
1995	308,487,792	0.215%	662,853	624,310
1996	290,549,773		-	-
	10,684,913,126		13,365,290	6,555,252
(6) Indicated Growth Factor:				0.49
(7) Selected Growth Factor:				0.5

Notes:

A growth factor of 0.500 has been selected.

(2): Losses from Aggregate Financial Data evaluated as of 108 months.

(3): Estimated % paid plus case loss emergence for the report interval.

(4) = (2) x (3)

(5) = (3) x [(2) 1996]

(6) = [Sum of (5)] / [Sum of (4)]

(7): Rounded to the nearest tenth

II 000030

Section II - Loss Development
 Subsection D - Adjustment for Escalation of Benefits
 7/1/2018

Section II - D
 Exhibit 1
 Page 1

Differential in Indemnity Loss Development

Paid Loss Development Method Calculation of Adjustment for Differential in Loss Development

Escalated or Unescalated (1)	Injury Type (2)	Implicit LDF to Ultimate From Month				
		168	180	192 (3)	204	216
Escalated	Fatal	3.036	2.859	2.703	2.562	2.433
Escalated	Permanent Total	4.073	3.719	3.417	3.157	2.929
Escalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Escalated	Total Indemnity	1.102	1.098	1.095	1.091	1.088
Unescalated	Fatal	1.942	1.861	1.789	1.725	1.668
Unescalated	Permanent Total	2.452	2.295	2.160	2.043	1.941
Unescalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Unescalated	Total Indemnity	1.040	1.038	1.036	1.034	1.032

Escalated or Unescalated (4)	Injury Type (5)	Differential in Loss Development at Month				
		168	180	192 (6)	204	216
Escalated	Fatal	1.563	1.536	1.511	1.485	1.459
Escalated	Permanent Total	1.661	1.620	1.582	1.545	1.509
Escalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Escalated	Total Indemnity	1.060	1.058	1.057	1.055	1.054

Selected Differential in Indemnity Loss Development at Month 360 1.042

Notes:

(3) = [(8) Exhibit 1, Page 2] / [(9) Exhibit 1, Page 2]

(6) = [(3) for Escalated] / [(3) for Unescalated]

II 000031

Differential in Indemnity Loss Development

Paid Loss Development Method Calculation of Adjustment for Differential in Loss Development

Escalated or Unescalated (1)	Injury Type (2)	Losses at Month						Injury Type Weights @ Ultimate (5)
		Ultimate (3)	168	180	192 (4)	204	216	
Escalated	Fatal	874,958	288,217	306,023	323,680	341,550	359,626	1.50%
Escalated	Permanent Total	1,668,738	409,709	448,697	488,350	528,641	569,759	6.65%
Escalated	Other Indemnity							57.13%
Escalated	Total Indemnity							65.28%
Unescalated	Fatal	465,615	239,708	250,218	260,195	269,862	279,221	0.80%
Unescalated	Permanent Total	824,906	336,400	359,427	381,858	403,713	424,987	3.29%
Unescalated	Other Indemnity							57.13%
Unescalated	Total Indemnity							61.21%

Escalated or Unescalated (6)	Injury Type (7)	Estimated Losses at Month					
		Ultimate (8)	168	180	192 (9)	204	216
Escalated	Fatal	1,499	494	524	554	585	616
Escalated	Permanent Total	6,650	1,633	1,788	1,946	2,107	2,270
Escalated	Other Indemnity	57,128	57,128	57,128	57,128	57,128	57,128
Escalated	Total Indemnity	65,277	59,255	59,441	59,629	59,820	60,015
Unescalated	Fatal	797	411	429	446	462	478
Unescalated	Permanent Total	3,287	1,341	1,432	1,522	1,609	1,694
Unescalated	Other Indemnity	57,128	57,128	57,128	57,128	57,128	57,128
Unescalated	Total Indemnity	61,213	58,880	58,989	59,096	59,199	59,300

Notes:

Escalation calculation applied only to Fatal and Permanent Total Injury Types.

(4): Average discounted losses are calculated from Simulation Model loss flows using a 3.5% discount rate.

(5): Escalated: From Section IV-E, Exhibit 2. As a % of total losses, Indemnity and Medical.

Unescalated: [(5) for Escalated] x { [(3) for Unescalated] / [(3) for Escalated] }.

(8) = (5) x 100,000

(9) = (8) x [(4) / (3)]

II 000032

Section II - Loss Development
 Subsection D - Adjustment for Escalation of Benefits
 7/1/2018

Section II - D
 Exhibit 2
 Page 1

Differential in Indemnity Loss Development

Paid Plus Case Loss Development Method Calculation of Adjustment for Differential in Loss Development

Escalated or Unescalated (1)	Injury Type (2)	Implicit LDF to Ultimate From Month				
		168	180	192 (3)	204	216
Escalated	Fatal	1.364	1.340	1.317	1.295	1.274
Escalated	Permanent Total	1.398	1.368	1.340	1.313	1.288
Escalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Escalated	Total Indemnity	1.036	1.034	1.032	1.030	1.029
Unescalated	Fatal	1.212	1.198	1.184	1.171	1.159
Unescalated	Permanent Total	1.253	1.234	1.215	1.198	1.183
Unescalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Unescalated	Total Indemnity	1.013	1.012	1.012	1.011	1.010

Escalated or Unescalated (4)	Injury Type (5)	Differential in Loss Development at Month				
		168	180	192 (6)	204	216
Escalated	Fatal	1.125	1.119	1.112	1.105	1.099
Escalated	Permanent Total	1.115	1.109	1.102	1.096	1.089
Escalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Escalated	Total Indemnity	1.023	1.022	1.020	1.019	1.018

Selected Differential in Indemnity Loss Development at Month 360 1.006

Notes:

(3) = [(8) Exhibit 2, Page 2] / [(9) Exhibit 2, Page 2]

(6) = [(3) for Escalated] / [(3) for Unescalated]

II 000033

Differential in Indemnity Loss Development

Paid Plus Case Loss Development Method Calculation of Adjustment for Differential in Loss Development

Escalated or Unescalated (1)	Injury Type (2)	Losses at Month						Injury Type Weights @ Ultimate (5)
		Ultimate (3)	168	180	192 (4)	204	216	
Escalated	Fatal	874,958	641,246	652,979	664,504	675,808	686,874	1.50%
Escalated	Permanent Total	1,668,738	1,193,905	1,219,988	1,245,595	1,270,688	1,295,221	6.65%
Escalated	Other Indemnity							57.13%
Escalated	Total Indemnity							65.28%
Unescalated	Fatal	465,615	384,035	388,719	393,217	397,535	401,676	0.80%
Unescalated	Permanent Total	824,906	658,201	668,658	678,696	688,321	697,538	3.29%
Unescalated	Other Indemnity							57.13%
Unescalated	Total Indemnity							61.21%

Escalated or Unescalated (6)	Injury Type (7)	Estimated Losses at Month					
		Ultimate (8)	168	180	192 (9)	204	216
Escalated	Fatal	1,499	1,098	1,118	1,138	1,157	1,176
Escalated	Permanent Total	6,650	4,758	4,861	4,964	5,064	5,161
Escalated	Other Indemnity	57,128	57,128	57,128	57,128	57,128	57,128
Escalated	Total Indemnity	65,277	62,984	63,108	63,230	63,349	63,466
Unescalated	Fatal	797	658	666	673	681	688
Unescalated	Permanent Total	3,287	2,623	2,665	2,705	2,743	2,780
Unescalated	Other Indemnity	57,128	57,128	57,128	57,128	57,128	57,128
Unescalated	Total Indemnity	61,213	60,409	60,459	60,506	60,552	60,596

Notes:

Escalation calculation applied only to Fatal and Permanent Total Injury Types.

(4): Average discounted losses are calculated from Simulation Model loss flows using a 3.5% discount rate.

(5): Escalated: From Section IV-E, Exhibit 2. As a % of total losses, Indemnity and Medical.

Unescalated: [(5) for Escalated] x { [(3) for Unescalated] / [(3) for Escalated] }.

(8) = (5) x 100,000

(9) = (8) x [(4) / (3)]

Accident Year Aggregate Financial Data
 Summary of Loss Development Factors
 Remainder of Industry

Months of Development	Loss Development Factors From																			Tail Factor	Escalation Factor	
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240			240-252
<u>(1) Indemnity Paid Losses</u>																						
2 Year Average	2.915	1.581	1.216	1.091	1.037	1.021	1.015	1.010	1.005	1.007	1.009	1.005	1.002	1.002	1.005	1.002	1.004	1.002	1.002	1.001	1.036	1.042
Cumulative	7.505	2.575	1.629	1.339	1.227	1.183	1.158	1.141	1.130	1.124	1.116	1.106	1.100	1.098	1.096	1.091	1.089	1.084	1.083	1.081	1.079	1.042
<u>(2) Medical Paid Losses</u>																						
2 Yr Average	1.949	1.141	1.052	1.023	1.021	1.010	1.010	1.010	1.009	1.007	1.008	1.008	1.009	1.008	1.009	1.010	1.006	1.007	1.009	1.006	1.057	1.000
Cumulative	2.928	1.502	1.316	1.251	1.222	1.198	1.186	1.174	1.162	1.152	1.144	1.134	1.125	1.115	1.107	1.097	1.087	1.080	1.073	1.063	1.057	1.000

Notes:
 Tail Factors from Section II-C, Exhibit 1, page 1 (accident year tail factors, were approximated using policy year tail factors).
 Escalation Factor from Section II-D, Exhibit 1, page 1.

II 000035

Section II - Loss Development
 Subsection E - Accident Year Data
 7/1/2018

Section II - E
 Exhibit 1
 Page 2

Accident Year Aggregate Financial Data Calculation of Indemnity Paid Loss Development Factors Remainder of Industry

Accident Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Accident Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	12	24			132	144	
2014	50,937	147,096	2.888	2004	240,162	242,298	1.009
2015	56,958	167,536	2.941	2005	217,035	219,217	1.010
Average			2.915	Average			1.009
	24	36			144	156	
2013	149,375	236,334	1.582	2003	241,131	242,841	1.007
2014	147,096	232,390	1.580	2004	242,298	243,006	1.003
Average			1.581	Average			1.005
	36	48			156	168	
2012	201,661	248,548	1.233	2002	237,215	237,417	1.001
2013	236,334	283,621	1.200	2003	242,841	243,767	1.004
Average			1.216	Average			1.002
	48	60			168	180	
2011	247,031	269,168	1.090	2001	249,355	250,030	1.003
2012	248,548	271,652	1.093	2002	237,417	237,558	1.001
Average			1.091	Average			1.002
	60	72			180	192	
2010	233,183	240,480	1.031	2000	249,970	250,571	1.002
2011	269,168	280,725	1.043	2001	250,030	251,829	1.007
Average			1.037	Average			1.005
	72	84			192	204	
2009	233,203	238,120	1.021	1999	218,070	218,443	1.002
2010	240,480	245,717	1.022	2000	250,571	251,066	1.002
Average			1.021	Average			1.002
	84	96			204	216	
2008	238,018	242,939	1.021	1998	209,884	210,754	1.004
2009	238,120	240,570	1.010	1999	218,443	219,308	1.004
Average			1.015	Average			1.004
	96	108			216	228	
2007	226,245	228,550	1.010	1997	183,949	184,215	1.001
2008	242,939	245,185	1.009	1998	210,754	211,100	1.002
Average			1.010	Average			1.002
	108	120			228	240	
2006	207,625	208,415	1.004	1996	196,190	196,542	1.002
2007	228,550	230,051	1.007	1997	184,215	184,479	1.001
Average			1.005	Average			1.002
	120	132			240	252	
2005	216,105	217,035	1.004	1996	196,542	196,793	1.001
2006	208,415	210,413	1.010	Average			1.001
Average			1.007				

Notes:
 Losses from Aggregate Financial Data.

II 000036

Section II - Loss Development
 Subsection E - Accident Year Data
 7/1/2018

Section II - E
 Exhibit 1
 Page 3

Accident Year Aggregate Financial Data Calculation of Medical Paid Loss Development Factors Remainder of Industry

Accident Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Accident Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	12	24			132	144	
2014	66,288	129,272	1.950	2004	129,651	130,801	1.009
2015	67,732	131,997	1.949	2005	116,710	117,638	1.008
Average			1.949	Average			1.008
	24	36			144	156	
2013	128,424	146,697	1.142	2003	132,931	134,078	1.009
2014	129,272	147,449	1.141	2004	130,801	131,758	1.007
Average			1.141	Average			1.008
	36	48			156	168	
2012	128,487	135,703	1.056	2002	125,315	126,459	1.009
2013	146,697	153,672	1.048	2003	134,078	135,213	1.008
Average			1.052	Average			1.009
	48	60			168	180	
2011	135,274	138,349	1.023	2001	116,127	116,850	1.006
2012	135,703	138,987	1.024	2002	126,459	127,638	1.009
Average			1.023	Average			1.008
	60	72			180	192	
2010	128,148	129,725	1.012	2000	123,203	124,704	1.012
2011	138,349	142,352	1.029	2001	116,850	117,449	1.005
Average			1.021	Average			1.009
	72	84			192	204	
2009	120,516	121,487	1.008	1999	117,186	118,066	1.008
2010	129,725	131,149	1.011	2000	124,704	126,219	1.012
Average			1.010	Average			1.010
	84	96			204	216	
2008	128,306	129,777	1.011	1998	103,760	104,299	1.005
2009	121,487	122,618	1.009	1999	118,066	118,792	1.006
Average			1.010	Average			1.006
	96	108			216	228	
2007	127,635	129,397	1.014	1997	91,353	91,902	1.006
2008	129,777	130,671	1.007	1998	104,299	105,158	1.008
Average			1.010	Average			1.007
	108	120			228	240	
2006	112,202	113,038	1.007	1996	97,542	98,805	1.013
2007	129,397	130,726	1.010	1997	91,902	92,351	1.005
Average			1.009	Average			1.009
	120	132			240	252	
2005	116,027	116,710	1.006	1996	98,805	99,402	1.006
2006	113,038	114,006	1.009	Average			1.006
Average			1.007				

Notes:
 Losses from Aggregate Financial Data.

Accident Year Aggregate Financial Data
 Summary of Loss Development Factors
 AIG

Months of Development	Loss Development Factors From																			Tail Factor	Escalation Factor	
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240			240-252
<u>(1) Indemnity Paid Losses</u>																						
5 Yr Average	3.158	1.653	1.259	1.118	1.039	1.021	1.006	1.006	1.006	1.007	1.005	1.007	1.006	1.012	1.001	1.007	1.008	1.006	1.000	1.001	1.036	1.042
Cumulative	9.102	2.882	1.743	1.385	1.239	1.193	1.168	1.161	1.154	1.148	1.140	1.134	1.126	1.119	1.106	1.105	1.096	1.088	1.081	1.081	1.079	1.042
<u>(2) Medical Paid Losses</u>																						
5 Yr Average	2.153	1.182	1.072	1.033	1.021	1.004	1.011	1.013	1.013	1.010	1.010	1.010	1.011	1.011	1.007	1.008	1.010	1.003	1.003	1.006	1.057	1.000
Cumulative	3.470	1.612	1.364	1.272	1.231	1.206	1.201	1.188	1.172	1.156	1.145	1.133	1.121	1.109	1.097	1.089	1.081	1.069	1.066	1.063	1.057	1.000

Notes:
 Tail Factors from Section II-C, Exhibit 1, page 1 (accident year tail factors, were approximated using policy year tail factors).
 Escalation Factor from Section II-D, Exhibit 1, page 1.

PREMIUMS

Background

To derive a rate indication, this filing evaluates the adequacy of the current rate level by comparing an historical loss, LAE, and fixed expense ratio to a permissible loss, LAE, and fixed expense ratio. The historical loss ratio is the ratio of losses and loss adjustment expenses to earned premium. In the current ratemaking methodology, “earned premium” includes policy year earned standard premium and All Risk Adjustment Program (“ARAP”) premium. Policy year premiums are defined as the premiums associated with all policies taking effect in a given year. Policy Year earned premiums are the premiums related to the portion of the policy year that has already expired. Standard premium is defined as the premium resulting from standard rating procedures, using WCRIBMA rates, after the application of experience rating adjustments, Merit Rating Plan adjustments, Construction Classification Premium Adjustment Program (“CCPAP”) Credits, expense constants, and loss constants. Since the ARAP premium reported on the Aggregate Financial Policy Year Call is impacted by deviations and schedule rating credits, a factor is applied to the reported ARAP premium to adjust the premium from Company Level to Bureau Designated Statistical Reporting (DSR) Level. Adjustment factors applicable to policy year 2014 and policy year 2015 are calculated in Section III-A.

Policy years 2014 and 2015 earned standard and adjusted ARAP premiums are used in the indication and are brought to the current rate level in Section III.

III 000002

Summary

Initial workers' compensation insurance premiums are by necessity estimates. They are typically a function of the employer's payroll during the time the policy is in effect and consequently are not known definitively at policy inception. In addition to payroll audit adjustments, other adjustments may occur to the premium as a result of changes to the policy. For example, experience modification factors may change during the term of a policy or CCPAP credit applications may be filed up to six months after the termination date of a policy.

Insurance carriers typically try to estimate the impact of such premium adjustments. However, industry-wide policy year earned standard and ARAP premium historically develops until such time as all audits have been finalized and no further premium modifications can be made. Therefore, premiums must be developed to ultimate so that the premiums used in the indication properly reflect the actual exposure level which gave rise to the ultimate losses.

The currently-effective rates were derived using "estimated values" for the average experience modification, the average merit rating credit, the average ARAP surcharge, and the average CCPAP credit. However, the "actual values" for the policy years under review differ from the "estimated values" loaded into the current rates. The WCRIBMA applies factors to premiums to adjust the "actual values" of the experience modification, merit rating credit, ARAP surcharge, and Construction Classification Premium Adjustment Program credit to the "estimated values" loaded in the current rates. These offsets are necessary to ensure that the change in the current manual rates (which contain the same

“estimated values”) is consistent with the overall average indicated rate level change. Additionally, the loading for prior Insolvency Fund assessments is removed.

Premium Development

The WCRIBMA developed premium to 252 months utilizing historical premium development factors based on the average of the latest five age-to-age development factors, also known as link ratios.¹ For a given policy year, a premium development link ratio is the ratio of the premium valued as of time (T+1) to the premium valued as of time T. As in recent filings, annual age-to-age link ratios are calculated using the sum of earned standard premium and adjusted ARAP premium. The calculation of standard premium plus adjusted ARAP premium development factors is completed in Section III-A.

Impact of Experience and Merit Rating, ARAP and Construction Credit

The currently-effective rates contain an assumed load to reflect an estimated average experience modification and merit rating impact, ARAP impact, and Construction Credit impact. The actual experience modifications, merit rating debits or credits, ARAP surcharges, and Construction Credits for the policy years under review differ from the estimated values used in deriving the current rates. A factor is applied to premiums to adjust the impact of these programs to the level anticipated in the current rates. Adjustment factors applicable to policy year 2014 and policy year 2015 are calculated in Section III-B.

Consistent with past practice, the WCRIBMA uses the historical experience modification anticipated in the rates in the derivation of the adjustment factor. This is

¹ Although the WCRIBMA still believes that the method used in developing premiums in its 2012 Rate Filing is sound and reasonable as a matter of actuarial judgment, in response to the decision on 9/1/2012 rates, it has reflected development of premiums to 252 months and the use of 5-year average premium development factors.

III 000004

appropriate as the intention of the adjustment factor is to bring premium to the current rate level. The experience modification reflected in the rates for non-merit-rated risks is 1.00 and the average merit rating for merit-rated risks is -2.0%.

ARAP was introduced in Massachusetts for policies effective 1/1/1990 and after. The premium used to develop the rate indication is standard premium plus ARAP premium. An adjustment for the ARAP offset is included to reflect the fact that the ARAP surcharges during policy year 2014 and policy year 2015 were not precisely in balance with the ARAP surcharge anticipated by the offset in the rates.

An adjustment for the Construction Credit offset is necessary to reflect the fact that the extent to which Construction Credits were actually applied in the historical data for policy year 2014 and policy year 2015 differed from that which was anticipated in the rates.

Loading for Recoupment of Insolvency Fund Assessments

In Section III-C, factors are calculated to adjust the policy year 2014 and policy year 2015 premiums so that the one-time loadings for recoupment of Insolvency Fund assessments are excluded.

On-Level Adjustment

As part of the ratemaking, WCRIBMA tests the adequacy of the overall rate level to determine whether there is a need for change in the indicated rates. In doing so, historical reported premium data is utilized to estimate the amount of future premium needed in the prospective effective period. The historical premium is adjusted to the level of the current rates to account for rate changes that occurred since the historical experience period. Otherwise the projected premium would not be useful for calculating

III 000005

the current rate need. Further, workers' compensation premium is not written evenly throughout the year, and a disproportionate number of policies are effective on January 1 and July 1. To take this into account, the on-level factors derived in this filing use rate level weights based on USR data for the historical period. Premium on-level factors are calculated in Section III-D.

Premium Adjustment Factor

Premium adjustment factors are intended to bring historical standard premium data to the level applicable for a different policy period. They are used to estimate the percentage of premium eligible for experience rating, adjust the layers of standard premium for premium discount and expense constant calculations, and determine weights used in calculating the weighted average premium collection pattern used to estimate the profit provision. Premium adjustment factors are composite factors that meld adjustments related to exposure growth and trend, premium on-leveling, changes in rating programs and the proposed rate change. These adjustments are calculated in Section III-E.

III 000006

Section III - Premiums
 Subsection A - Summary
 7/1/2018

Section III - A
 Exhibit 1
 Page 1

Policy Year Aggregate Financial Data
 Calculation of Adjusted On-Level Standard Premium plus Adjusted ARAP at Ultimate
 Industrywide

Summary Exhibit

	Policy Year as of 12/31/2016	
	2014	2015
(1) Standard Earned Premium plus Adjusted ARAP Premium	1,089,030,715	1,152,664,308
(2) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.036	1.045
(3) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	0.998
(4) Composite Adjustment Factor = (2) x (3)	1.035	1.043
(5) Adjusted Standard Earned Premium plus ARAP = (1) x (4)	1,127,034,967	1,201,727,724
(6) Cumulative Premium Development Factor to Ultimate (see Page 2)	1.000	1.010
(7) Rate On-Level Factor	1.015	1.015
(8) Factor to Remove Expense Constant	0.958	0.959
(9) Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = (5) x (6) x (7) x (8)	1,095,560,696	1,181,786,575

Notes:

- (1): Section III-B, Exhibit 2
- (2): Section III-B, Exhibit 1
- (3): Section III-C, Exhibit 1
- (6): Premiums are deemed to be fully developed at 252 months.
- (7): Section III-D, Exhibit 1
- (8): Section VI-F, Exhibit 2.

Policy Year Aggregate Financial Data
 Calculation of Standard Premium plus Adjusted ARAP Premium Development Factors
 Industrywide

Premium Development Factors From:																			
Months of Development	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252
2 Year Average	1.011	0.999	1.003	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulative Factor to 252	1.014	1.002	1.003	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5 Year Average	1.010	0.998	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulative Factor to 252	1.010	1.000	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Notes:
 From Page 3

III 000008

Section III - Premiums
 Subsection A - Summary
 7/1/2018

Section III - A
 Exhibit 1
 Page 3

Policy Year Aggregate Financial Data
 Calculation of Standard Premium plus Adjusted ARAP Premium Development Factors
 Industrywide

Policy Year	Premium (in 000's) Evaluated at Month		Premium Development Factor	Policy Year	Premium (in 000's) Evaluated at Month		Premium Development Factor
	24	36			132	144	
2010	603,653	609,530	1.010	2001	553,966	553,966	1.000
2011	655,779	662,620	1.010	2002	619,012	619,012	1.000
2012	699,675	706,230	1.009	2003	611,906	611,906	1.000
2013	722,507	729,822	1.010	2004	575,321	575,321	1.000
2014	767,773	777,428	1.013	2005	594,447	594,446	1.000
2 yr Average			1.011	2 yr Average			1.000
5 yr Average			1.010	5 yr Average			1.000
	36	48			144	156	
2009	567,594	567,109	0.999	2000	518,906	518,858	1.000
2010	609,530	610,063	1.001	2001	553,966	553,965	1.000
2011	662,620	658,748	0.994	2002	619,012	619,012	1.000
2012	706,230	705,512	0.999	2003	611,906	611,906	1.000
2013	729,822	728,976	0.999	2004	575,321	575,318	1.000
2 yr Average			0.999	2 yr Average			1.000
5 yr Average			0.998	5 yr Average			1.000
	48	60			156	168	
2008	554,180	554,012	1.000	1999	543,774	543,774	1.000
2009	567,109	567,089	1.000	2000	518,858	518,858	1.000
2010	610,063	609,824	1.000	2001	553,965	553,965	1.000
2011	658,748	662,568	1.006	2002	619,012	619,014	1.000
2012	705,512	705,409	1.000	2003	611,906	611,906	1.000
2 yr Average			1.003	2 yr Average			1.000
5 yr Average			1.001	5 yr Average			1.000
	60	72			168	180	
2007	633,981	633,905	1.000	1998	556,688	556,688	1.000
2008	554,012	554,192	1.000	1999	543,774	543,775	1.000
2009	567,089	567,071	1.000	2000	518,858	518,858	1.000
2010	609,824	610,266	1.001	2001	553,965	553,965	1.000
2011	662,568	662,492	1.000	2002	619,014	619,014	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	72	84			180	192	
2006	636,039	636,090	1.000	1997	553,467	553,467	1.000
2007	633,905	633,869	1.000	1998	556,688	556,688	1.000
2008	554,192	554,185	1.000	1999	543,775	543,775	1.000
2009	567,071	567,132	1.000	2000	518,858	518,858	1.000
2010	610,266	610,258	1.000	2001	553,965	553,965	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	84	96			192	204	
2005	594,420	594,433	1.000	1996	584,329	584,329	1.000
2006	636,090	636,097	1.000	1997	553,467	553,467	1.000
2007	633,869	633,865	1.000	1998	556,688	556,688	1.000
2008	554,185	554,291	1.000	1999	543,775	543,775	1.000
2009	567,132	567,130	1.000	2000	518,858	518,858	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	96	108			204	216	
2004	575,313	575,321	1.000	1996	584,329	584,329	1.000
2005	594,433	594,426	1.000	1997	553,467	553,467	1.000
2006	636,097	636,096	1.000	1998	556,688	556,688	1.000
2007	633,865	633,872	1.000	1999	543,775	543,775	1.000
2008	554,291	554,372	1.000	2 yr Average			1.000
2 yr Average			1.000	5 yr Average			1.000
5 yr Average			1.000		216	228	
	108	120			204	216	
2003	611,850	611,911	1.000	1996	584,329	584,329	1.000
2004	575,321	575,320	1.000	1997	553,467	553,467	1.000
2005	594,426	594,439	1.000	1998	556,688	556,688	1.000
2006	636,096	636,095	1.000	2 yr Average			1.000
2007	633,872	633,859	1.000	5 yr Average			1.000
2 yr Average			1.000		228	240	
5 yr Average			1.000		216	228	
	120	132			204	216	
2002	619,012	619,012	1.000	1996	584,329	584,329	1.000
2003	611,911	611,906	1.000	1997	553,467	553,467	1.000
2004	575,320	575,321	1.000	2 yr Average			1.000
2005	594,439	594,447	1.000	5 yr Average			1.000
2006	636,095	636,096	1.000		240	252	
2 yr Average			1.000	1996	584,329	584,329	1.000
5 yr Average			1.000	2 yr Average			1.000
				5 yr Average			1.000

Adjustment for Experience and Merit Rating, ARAP and Construction Credit Off-Balance

Rate Level Effective Date (1)	Experience Mod for Non-Merit Rated Risks		Merit Rating Impact		Average Experience Mod and Merit Rating Factor (6)	ARAP Charge in Rates (7)	Construction Credit in Construction Rates (8)	Policy Year Written Weights		Calendar Year Earned Weights		
	Anticipated in Rates (2)	Percentage of Premium (3)	Anticipated in Rates (4)	Percentage of Premium (5)				2014 (9)	2015 (10)	2014 (11)	2015 (12)	2016 (13)
9/1/2010	1.000	0.860	-0.020	0.140	0.997	0.049	-0.053	29.4%		69.5%	2.1%	
4/1/2014	1.000	0.841	-0.019	0.159	0.997	0.052	-0.032	70.6%	100.0%	30.5%	97.9%	86.7%
7/1/2016	1.000	0.845	-0.020	0.155	0.997	0.052	-0.042					13.3%

	Policy Year		Calendar Year Earned		
	2014 (9)	2015 (10)	2014 (11)	2015 (12)	2016 (13)
(14) Weighted Average Experience and Merit Rating factor anticipated in rates	0.997	0.997	0.997	0.997	0.997
(15) Weighted ARAP Charge anticipated in rates	0.051	0.052	0.050	0.052	0.052
(16) Percentage of Premium for CCPAP Eligible Classes	0.347	0.358	0.340	0.353	0.353
(17) Weighted Average Construction Credit anticipated in rates	-0.013	-0.011	-0.016	-0.011	-0.012
(18) Combined Weighted Average impact anticipated in rates = (14) x [1.0 + (15)] x [1.0 + (17)]	1.034	1.036	1.030	1.036	1.036
(19) Manual Premium	1,053,034,050	1,126,797,408	1,018,292,994	1,089,915,729	
(20) Standard Earned Premium at DSR Level, excluding Expense Constants	1,001,173,136	1,068,822,694	972,723,159	1,034,997,915	
(21) ARAP Premium	47,158,506	47,074,092	47,850,955	47,116,299	
(22) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.045	1.045	1.046	1.043	
(23) Standard Earned Premium plus Adjusted ARAP = (20) + [(21) x (22)]	1,050,438,718	1,118,015,596	1,022,760,550	1,084,160,484	
(24) Combined Actual impact = (23) / (19)	0.998	0.992	1.004	0.995	0.995
(25) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance = (18) / (24)	1.036	1.045	1.026	1.042	1.042

Notes:
 (3) = 1.0 - (5)
 (2), (4), (5), (7), (8): Previous filings.
 (6) = [(2) x (3)] + [1.0 + (4)] x (5)
 (9),(10): Section III-D, Exhibit 2.
 (11),(12): Section III-D, Exhibit 3.
 (13): Section III-D, Exhibit 4.
 (14) = Sum [(6) x (9) through (13)]
 (15) = Sum [(7) x (9) through (13)]
 (17) = Sum [(8) x (9) through (13)] x (16)
 (16), (19), (20), (21): Unit Statistical Plan Data, Excluding Large Deductible Policies. CY 2016 uses CY 2015 values.
 (22): from Section III-B, Exhibit 2.

Policy Year Aggregate Financial Data
 Calculation of Standard Premium plus ARAP Premium
 Industrywide

	Policy Year valued as of 12/31/2016		Calendar Years		
	2014	2015	2014	2015	2016
(1) Aggregate Financial: Standard Earned Premium at DSR Level	1,040,185,123	1,104,804,922	1,004,210,253	1,058,511,885	1,151,953,085
(2) Aggregate Financial: Standard Earned Premium at Company Level	995,696,680	1,057,219,353	960,330,222	1,014,453,945	1,098,426,614
(3) Aggregate Financial: ARAP Premium	46,756,479	45,798,012	47,290,947	46,055,557	46,688,547
(4) Adjustment Factor to Adjust from Company Level to DSR Level Premium = (1) / (2)	1.045	1.045	1.046	1.043	1.049
(5) Adjusted ARAP Premium = (3) x (4)	48,845,592	47,859,386	49,451,796	48,055,759	48,963,686
(6) Standard Earned Premium plus adjusted ARAP Premium = (1) + (5)	1,089,030,715	1,152,664,308	1,053,662,049	1,106,567,644	1,200,916,771

Notes:

(1),(2),(3): Aggregate Financial Policy Year Calls

Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments

Rate Level Effective Date (1)	Loading for Recoupment of Insolvency Fund Assessments (2)	Policy Year Weights		Calendar Year Earned Weights		
		2014 (3)	2015 (4)	2014 (5)	2015 (6)	2016 (7)
9/1/2010	0.02%	29.4%		69.5%	2.1%	
4/1/2014	0.19%	70.6%	100.0%	30.5%	97.9%	86.7%
7/1/2016	-0.23%					13.3%

Policy Year		Calendar Year Earned		
2014	2015	2014	2015	2016

(8) Weighted Average Loading for Recoupment of Insolvency Fund Assessment in the Rates = Sum [(2) x (3) through (7)]	0.0014	0.0019	0.0007	0.0019	0.0014
(9) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments = [1.0 - (8)]	0.999	0.998	0.999	0.998	0.999

Notes:

- (2): Previous filings.
- (3),(4): Section III-D, Exhibit 2.
- (5),(6): Section III-D, Exhibit 3.
- (7): Section III-D, Exhibit 4.

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Section III - Premiums
 Subsection D - Rate On-Level Factors
 7/1/2018

Section III - D
 Exhibit 1

Rate On-Level Factors

Rate Level Effective Date (1)	Rate Change (2)	Cumulative Rate Level Change (3)	Factor to Current Rate Level (4)	Policy Year Weights	
				2014 (5)	2015 (6)
9/1/2010		1.000	1.015	29.4%	
4/1/2014	1.000	1.000	1.015	70.6%	100.0%
7/1/2016	1.015	1.015	1.000		

(7) Rate On-Level Factor
 = Sum [(4) x (5) through (6)]

Policy Year	
2014	2015
1.015	1.015

Notes:

(4): (3)_{latest rate level effective date} / (3).

(5),(6): From Exhibit 2.

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Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2018

Section III - D
 Exhibit 2

Policy Year Weights for On-Leveling Earned Premium

Policy Year (1)	Policy Month (2)	Standard Earned Premium plus ARAP at Rate Level Effective			Earned Premiums (6)
		9/1/2010 (3)	4/1/2014 (4)	7/1/2016 (5)	
2014	1	172,057,261			172,057,261
2014	2	69,556,857			69,556,857
2014	3	79,033,223			79,033,223
2014	4		102,821,340		102,821,340
2014	5		80,811,187		80,811,187
2014	6		102,797,392		102,797,392
2014	7		112,750,331		112,750,331
2014	8		61,357,676		61,357,676
2014	9		82,102,710		82,102,710
2014	10		83,402,226		83,402,226
2014	11		59,213,815		59,213,815
2014	12		86,436,988		86,436,988
2014	Total	320,647,341	771,693,664		1,092,341,005

2015	1		184,014,392		184,014,392
2015	2		70,854,917		70,854,917
2015	3		85,729,144		85,729,144
2015	4		109,545,887		109,545,887
2015	5		83,578,681		83,578,681
2015	6		106,254,670		106,254,670
2015	7		125,027,561		125,027,561
2015	8		67,686,302		67,686,302
2015	9		89,409,432		89,409,432
2015	10		85,440,648		85,440,648
2015	11		61,071,378		61,071,378
2015	12		92,378,471		92,378,471
2015	Total		1,160,991,480		1,160,991,480

2016	1		193,329,439		193,329,439
2016	2		74,454,752		74,454,752
2016	3		90,068,984		90,068,984
2016	4		115,091,317		115,091,317
2016	5		87,809,601		87,809,601
2016	6		111,633,550		111,633,550
2016	7			133,326,922	133,326,922
2016	8			72,179,525	72,179,525
2016	9			95,344,421	95,344,421
2016	10			91,112,210	91,112,210
2016	11			65,125,201	65,125,201
2016	12			98,510,469	98,510,469
2016	Total		672,387,643	555,598,748	1,227,986,391

Rate Level Effective Date (7)	Policy Year Weights		
	2014 (8)	2015 (9)	2016 (10)
9/1/2010	29.4%		
4/1/2014	70.6%	100.0%	54.8%
7/1/2016			45.2%

Notes:

(3),(4),(5): From Unit Statistical Plan Data. PY 2016 based on PY 2015 data subject to adjustments for rate level, exposure growth, and wage changes.

(6) = (3) + (4) + (5)

(8),(9),(10) = [PY Total of (3), (4) or (5)] / [PY Total of (6)]

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Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2018

Section III - D
 Exhibit 3

Calendar Year ("CY") Weights for On-Leveling Earned Premium

Policy Year (1)	Policy Month (2)	CY in which Premium is Earned (3)	Standard Earned Premium plus ARAP at Rate Level Effective			Earned Premiums (7)
			9/1/2010 (4)	4/1/2014 (5)	7/1/2016 (6)	
2012	12	2014				0
2013	1	2014	1,713,407			1,713,407
2013	2	2014	6,277,144			6,277,144
2013	3	2014	14,340,860			14,340,860
2013	4	2014	24,464,706			24,464,706
2013	5	2014	24,801,828			24,801,828
2013	6	2014	42,108,281			42,108,281
2013	7	2014	53,156,645			53,156,645
2013	8	2014	37,899,172			37,899,172
2013	9	2014	53,054,367			53,054,367
2013	10	2014	60,690,195			60,690,195
2013	11	2014	49,042,892			49,042,892
2013	12	2014	79,179,177			79,179,177
2014	1	2014	170,231,700			170,231,700
2014	2	2014	62,493,062			62,493,062
2014	3	2014	64,066,142			64,066,142
2014	4	2014		75,892,269		75,892,269
2014	5	2014		54,144,205		54,144,205
2014	6	2014		57,688,214		57,688,214
2014	7	2014		56,153,190		56,153,190
2014	8	2014		24,947,228		24,947,228
2014	9	2014		25,400,125		25,400,125
2014	10	2014		19,737,709		19,737,709
2014	11	2014		8,684,818		8,684,818
2014	12	2014		3,222,943		3,222,943
Total		2014	743,519,580	325,870,701		1,069,390,280

2013	12	2015	1,897			1,897
2014	1	2015	1,835,339			1,835,339
2014	2	2015	7,065,951			7,065,951
2014	3	2015	14,968,907			14,968,907
2014	4	2015		26,930,740		26,930,740
2014	5	2015		26,667,855		26,667,855
2014	6	2015		45,109,278		45,109,278
2014	7	2015		56,596,434		56,596,434
2014	8	2015		36,409,555		36,409,555
2014	9	2015		56,700,426		56,700,426
2014	10	2015		63,661,975		63,661,975
2014	11	2015		50,526,917		50,526,917
2014	12	2015		83,210,590		83,210,590
2015	1	2015		182,066,352		182,066,352
2015	2	2015		63,565,065		63,565,065
2015	3	2015		69,217,363		69,217,363
2015	4	2015		80,602,333		80,602,333
2015	5	2015		54,756,089		54,756,089
2015	6	2015		59,931,552		59,931,552
2015	7	2015		62,104,563		62,104,563
2015	8	2015		27,206,061		27,206,061
2015	9	2015		27,163,924		27,163,924
2015	10	2015		20,330,545		20,330,545
2015	11	2015		9,059,784		9,059,784
2015	12	2015		3,415,905		3,415,905
Total		2015	23,872,094	1,105,233,305		1,129,105,399

Rate Level Effective Date (8)	Calendar Year Earned Weights	
	2014 (9)	2015 (10)
9/1/2010	69.5%	2.1%
4/1/2014	30.5%	97.9%
7/1/2016		

Notes:

(4),(5),(6): From Unit Statistical Plan Data.

(7) = (4) + (5) + (6)

(9),(10) = [CY Total of (4), (5) or (6)] / [CY Total of (7)]

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Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2018

Section III - D
 Exhibit 4

Calendar Year ("CY") Weights for On-Leveling Earned Premium

Policy Year (1)	Policy Month (2)	CY in which Premium is Earned (3)	Standard Earned Premium plus ARAP at Rate Level Effective			PY Premiums Earned During CY (7)
			9/1/2010 (4)	4/1/2014 (5)	7/1/2016 (6)	
2014	12	2016				0
2015	1	2016		1,932,433		1,932,433
2015	2	2016		7,287,389		7,287,389
2015	3	2016		16,510,123		16,510,123
2015	4	2016		28,942,830		28,942,830
2015	5	2016		28,823,168		28,823,168
2015	6	2016		46,325,797		46,325,797
2015	7	2016		62,930,121		62,930,121
2015	8	2016		40,484,412		40,484,412
2015	9	2016		62,253,900		62,253,900
2015	10	2016		65,118,699		65,118,699
2015	11	2016		52,017,332		52,017,332
2015	12	2016		88,972,921		88,972,921
2016	1	2016		191,344,333		191,344,333
2016	2	2016		66,827,630		66,827,630
2016	3	2016		72,925,470		72,925,470
2016	4	2016		84,921,083		84,921,083
2016	5	2016		57,687,330		57,687,330
2016	6	2016		63,140,215		63,140,215
2016	7	2016			66,421,053	66,421,053
2016	8	2016			29,094,423	29,094,423
2016	9	2016			29,052,152	29,052,152
2016	10	2016			21,742,634	21,742,634
2016	11	2016			9,688,917	9,688,917
2016	12	2016			3,654,198	3,654,198
	Total	2016		1,038,445,185	159,653,378	1,198,098,563

Rate Level Effective Date (8)	Calendar Year Earned Weights
	2016 (9)
9/1/2010	
4/1/2014	86.7%
7/1/2016	13.3%

Notes:

(4),(5),(6): From Unit Statistical Plan Data. PY 2016 based on PY 2015 data subject to adjustments for rate level, exposure growth, and wage changes.

(7) = (4) + (5) + (6)

(9) = [CY Total of (4), (5) or (6)] / [CY Total of (7)]

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Section III - Premiums
 Subsection E - Premium Adjustment Factors
 7/1/2018

Section III - E
 Exhibit 1

Calculation of Premium Adjustment Factor PY 2015 to Prospective Effective Period 7/1/2018 - 6/30/2019

(1)	Wage Trend from PY 2015 to Prospective Effective Period 7/1/2018 - 6/30/2019	1.106
(2)	Exposure Growth	1.076
(3)	Rate On-Level Factor	1.015
(4)	Overall Indicated Rate Change for Policies Effective 7/1/2018	0.889
(5)	Adjustment Factor to Balance Experience Rating, ARAP, and Construction Credits	1.045
(6)	Impact of Change in Indicated Loading for Recoupment of Insolvency Fund Assessments	1.001
(7)	Adjustment Factor = (1) x (2) x (3) x (4) x (5) x (6)	1.122
(8)	Selected Factor	1.12

Notes:

(1):	Statewide Average Weekly Wage for PY 2015 (Section V-G, Exhibit 2)	1,303.66
	Statewide Average Weekly Wage for 10/1/2017, based on data period 4/1/16 to 4/1/17 (Section V-G, Exhibit 2)	1,338.05
	Statewide Average Weekly Wage at 7/1/2019 (using wage trend of 2.7%, Section V-A, Exhibit 1)	1,441.44
(2):	Exposure growth from PY 2015 to Prospective Effective Period 7/1/2018 - 6/30/2019 (Section V-H, Exhibit 3)	
(3):	Section III-D Exhibit 1.	
(4):	Section I-B Exhibit 1.	
(5):	Exhibit 2.	
(6):	PY 2015 factor to load for Recoupment of Insolvency Fund (Section III-C, Exhibit 1: [1.0 + (8)]).	1.002
	Policy Effective factor to load for Recoupment of Insolvency Fund Assessments (Section IX-K, Exhibit 1).	1.003

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Section III - Premiums
Subsection E - Premium Adjustment Factors
7/1/2018

Section III - E
Exhibit 2

Factor to Balance Experience Rating, ARAP, and Construction Credit

Beginning Period - PY 2015

(1)	Anticipated Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	1.036
(2)	Actual Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	0.992
(3)	Ratio of Anticipated to Actual = (1) / (2)	1.045

Ending Period - Prospective Effective Period 7/1/2018 - 6/30/2019

(4)	Anticipated Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	1.036
(5)	Actual is Assumed to be equal to the Anticipated, Since the Actual Impact has yet to be Determined	1.036
(6)	Ratio of Anticipated to Actual is Assumed to be 1.000	1.000
(7)	Adjustment Factor to Balance Experience Rating, ARAP, and Construction Credits = (3) / (6)	1.045

Notes:

(1),(2): PY 2015, Section III-B, Exhibit 1.

(4),(5): Prospective Effective Period, Section IX-K, Exhibit 1.

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BENEFIT CHANGE ADJUSTMENTS

In Section IV we calculate benefit change adjustment factors that are used in Sections I, II, V, VIII, IX, X, XI, and XII of the rate filing. Benefit change adjustment factors are used to adjust loss experience to the benefit level as of a given period or point in time.

Benefit Change Adjustments

The benefit change adjustments are summarized in Section IV-A, Exhibit 1. We calculate separate adjustments to bring indemnity and medical losses for policy years 2014 and 2015 to the July 1, 2018 benefit level, and additional adjustments to bring losses from the July 1, 2018 benefit level to the projected benefit level for the period the rates will be in effect. These benefit change adjustments are used in Section I of the filing. In the same exhibit we also present additional benefit level adjustments used in other sections of the filing.

Benefit changes considered in this section are the result of the reevaluations of the Statewide Average Weekly Wage (“SAWW”) made every October 1st by the Commonwealth’s Division of Unemployment Assistance.

In Section IV-B, we display in detail the derivation of our estimates of the effects of the changes in the SAWW announced in 2017 and projected for 2018 and 2019. Section IV-C summarizes the provisions of Chapter 398, showing benefits that are tied to the SAWW. Section IV-D contains backup data used in the evaluations. The model underlying

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the estimates is described below. Section IV-E includes injury type weights, and Section IV-F details the USL&HW benefit level changes.

Section IV-B - Determination of the Effect of Announced SAWW Changes

Introduction

We use a version of the NCCI's "Automatics Model" to evaluate the effects of changes in the SAWW. The Automatics Model, a traditional approach, used in the WCRIBMA rate filings since 2003, looks at benefits paid to average claimants.

Description of the Model

NCCI's "Automatics Model" is used to evaluate benefit changes that are dependent on changes in the SAWW. In Massachusetts, SAWW changes are announced every October. Indemnity benefits are generally determined as a percentage of the SAWW, subject to maximum and minimum amounts.

For each injury type, the indemnity benefits payable to an average claimant are determined before and after each announced SAWW change. The estimated impact of the change in the SAWW is calculated by comparing the "before" and "after" costs.

Section IV-B details the estimation of changes in the costs of benefits arising from changes in the SAWW effective October 1, 2017, and the projected SAWW changes of October 1, 2018 and October 1, 2019. Exhibit 1, pages 1 and 2, estimate the effect on fatal benefits. Exhibit 2 evaluates the effect on permanent total benefits. Exhibit 3 evaluates the effect on permanent partial benefits. Exhibit 4 looks at temporary total benefits.

Section IV-B, Exhibit 1 – Benefits for Fatal Claims

Fatal benefits are the sum of dependent survivor benefits plus burial payments, both of which are functions of the SAWW.¹ Expected dependent survivor payments are valued on page 1. The NCCI provided the WCRIBMA with the distribution of dependents by category - none, widow alone, widow with children, etc. For each category of dependents, the cost is estimated as the product of a contingent annuity value and an average weekly benefit.

The contingent annuity values represent the present value of a stream of payments of \$1 discounted to reflect not only the time value of money, but also the possible occurrence of a contingent event that would cause the payment stream to cease. Examples of contingent events that would affect dependent survivor benefits for workers' compensation include death or remarriage of the dependent survivor. The WCRIBMA estimated annuity values using the model that underlies the currently approved pension tables in the Massachusetts' Workers' Compensation Statistical Plan which assume an interest rate of 3.5% and COLA adjustments of 2.9%. The annuities reflect the appropriate U.S. life tables in all cases except for the category of "three orphans" and "widow with child(ren)," where an annuity certain was used to approximate joint survivorship.

Average weekly benefits before and after the SAWW revision are evaluated on page 2. The estimated average weekly benefit depends on the proportions of workers whose wages result in either the application of the statutory minimum benefit, the application of the

¹ According to the National Funeral Directors Association, the "national median cost of a funeral for calendar year 2014 was \$7,181. If a vault is included, something that is typically required by a cemetery, the median cost is \$8,508. The cost does not take into account cemetery, monument or marker costs or miscellaneous cash-advance charges, such as for flowers or an obituary."

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statutory maximum benefit, or a benefit that falls somewhere between the minimum and the maximum. As in the last filing these proportions come from the Massachusetts Wage Table (“Wage Table”). As shown in Section IV-D Exhibit 1, the Wage Table is based on the NCCI 2009 Standard Wage Distribution Table.

Section IV-B, Exhibit 2 – Benefits for Permanent Total Cases

To evaluate the effect of announced SAWW changes on permanent total losses, we consider weekly wage loss benefits and specific injury payments separately, and then we weigh those benefits and payments together. Most permanent total payments are associated with weekly wage loss benefits. The statutory weekly wage loss benefit is two thirds of the pre-injury wage subject to a minimum and maximum. The minimum and maximum are a function of the promulgated SAWW. Therefore changes to the SAWW affect the average benefit paid. The second component we consider is specific injury payments. These benefits vary directly with the SAWW. Specific injury payments are made for the loss of use of body parts and determined as various multiples of the SAWW as listed in Section 36 of M.G.L. Chapter 152.

Section IV-B, Exhibit 3 – Benefits for Permanent Partial Cases

Permanent partial disability cases typically include a temporary period of total disability, referred to as the “healing period,” followed by a period of partial disability during which the worker has a wage earning capacity at a level below his pre-injury wage. Different benefit structures apply to the two periods. In addition, under M.G.L. c. 152, § 36, specific injury payments are made for the loss of use of various body parts. In this exhibit, we weigh

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together the effect of the SAWW on wage loss, specific injury payments, and healing period payments, using weights provided by the NCCI.

Section IV-B, Exhibit 4 – Benefits for Temporary Total Cases

We evaluate the effect on temporary total benefits in Exhibit 4. Temporary total wage loss benefits under Section 34 of M.G.L. Chapter 152 provide an injured worker sixty percent of their pre-injury average weekly wage subject to a cap, the statutory maximum compensation rate, and a floor, the statutory minimum compensation rate. However, if the average weekly wage of the employee is less than the minimum compensation rate, his wage compensation rate is set equal to his average weekly wage.

Section IV-C – Provisions of the Law

Section IV-C summarizes the benefit changes due to the increase in the maximum and minimum weekly benefits. It includes both historical changes and projected changes.

Section IV-D – Massachusetts Data

Historical data used in the estimation of benefit change adjustments are shown in Section IV-D, along with the derivation of projected SAWW values. The WCRIBMA utilizes both historical DCI data and NCCI data.

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Section IV-E – Injury Type Weights

Unit Statistical Plan Data are used in Section IV-E to calculate the relative weights for indemnity and medical benefits for the various injury types. Injury type weights are estimated at two valuation points, ultimate and at fifth-report.

Section IV-F – Effects of USL&HW Benefit Changes

Section IV-F contains the derivation of benefit change adjustment factors related to claims paid or payable under the USL&HW Act. The calculations are analogous to those for state workers' compensation benefits in Section IV-A. The assumed changes in benefit levels used in Section IV-F are provided by NCCI.

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Section IV - Benefit Change Adjustments
 Subsection A - Summary
 7/1/2018

Section IV - A
 Exhibit 1

Benefit Level Adjustment Factors

All Injury Types

Time Period		Indemnity					Medical	Total
Beginning Period	Ending Period	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types	All Injury Types	All Injury Types
1/1/2018	Prosp. Eff. Period					1.010	1.000	
PY 2014	1/1/2018					1.029	1.000	
PY 2015	1/1/2018					1.021	1.000	
PY 2006	Prosp. Eff. Period	1.062	1.069	1.118	1.040	1.093	1.032	
PY 2007	Prosp. Eff. Period	1.056	1.061	1.102	1.036	1.081	1.032	
PY 2008	Prosp. Eff. Period	1.050	1.052	1.087	1.031	1.069	1.024	
PY 2009	Prosp. Eff. Period	1.047	1.049	1.081	1.029	1.064	1.002	
PY 2010	Prosp. Eff. Period	1.048	1.050	1.082	1.029	1.065	1.000	
PY 2011	Prosp. Eff. Period	1.044	1.045	1.073	1.027	1.059	1.000	
PY 2012	Prosp. Eff. Period	1.039	1.038	1.061	1.024	1.049	1.000	
PY 2013	Prosp. Eff. Period	1.037	1.035	1.056	1.022	1.045	1.000	
PY 2014	Prosp. Eff. Period	1.032	1.031	1.049	1.020	1.039	1.000	
PY 2015	Prosp. Eff. Period	1.020	1.025	1.038	1.016	1.031	1.000	
PY 2013	CPY 2014_07	1.012	1.007	1.012	1.004		1.000	
PY 2014	CPY 2015_07	1.014	1.010	1.016	1.005		1.000	
PY 2015	CPY 2016_07	1.009	1.011	1.017	1.007		1.000	
CPY 2014_07	Prosp. Eff. Period							1.023
CPY 2015_07	Prosp. Eff. Period							1.017
CPY 2016_07	Prosp. Eff. Period							1.011
CPY 2008_09	Prosp. Eff. Period							1.044
Prior Eff. Period (using benefit level projections from prior filing)	Prosp. Eff. Period					1.019	1.000	1.012

Notes:

1/1/2018 refers to a point in time. All other time periods refer to Policy Years.

Example: PY 2007 to Prosp. Eff. Period for Permanent Partial = $1.102 = 1.129 / 1.025$

where 1.129 is the Index Factor for Prosp. Eff. Period and 1.025 is the Index Factor for PY 2007 for Indemnity Permanent Partial, from Exhibit 2.

Benefit Level Changes and Weights

Date of Change	Injury Type: Death																	Weighted Average Benefit Level		
	10/1/2005	10/1/2006	10/1/2007	10/1/2008	4/1/2009	10/1/2009	10/1/2010	10/1/2011	10/1/2012	10/1/2013	10/1/2014	3/24/2015	10/1/2015	10/1/2016	10/1/2017	10/1/2018	10/1/2019			
Benefit Level Change	1.000	1.005	1.006	1.006	1.000	1.000	0.999	1.006	1.004	1.001	1.004	1.009	1.005	1.005	1.007	1.005	1.004			
Cumulative Benefit Level Change	1.000	1.005	1.011	1.017	1.017	1.017	1.016	1.022	1.026	1.027	1.031	1.041	1.046	1.052	1.059	1.064	1.069			
Time Period																				
PY 2006	0.341	0.631	0.027																	1.003
PY 2007		0.343	0.630	0.027																1.009
PY 2008			0.350	0.417	0.208	0.025														1.015
PY 2009				0.055	0.290	0.629	0.026													1.017
PY 2010						0.333	0.640	0.027												1.017
PY 2011							0.343	0.632	0.025											1.020
PY 2012								0.341	0.634	0.025										1.025
PY 2013									0.341	0.635	0.025									1.027
PY 2014										0.341	0.408	0.227	0.025							1.032
PY 2015											0.045	0.295	0.636	0.024						1.044
CPY 2014_07											0.035	0.230	0.453	0.281						1.040
CPY 2015_07													0.043	0.674	0.283					1.047
CPY 2016_07														0.043	0.674	0.283				1.053
CPY 2008_09			0.004	0.180	0.426	0.391														1.017
Prior Eff. Period														0.043	0.674	0.283				1.053
Prosp. Eff. Period															0.043	0.674	0.283			1.065
1/1/2018															1.000	0.673	0.283			1.059

Indemnity All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2016 (using benefit level projections from prior filing).

Date of Change	10/1/2005	10/1/2006	10/1/2007	10/1/2008	4/1/2009	10/1/2009	10/1/2010	10/1/2011	10/1/2012	10/1/2013	10/1/2014	3/24/2015	10/1/2015	10/1/2016	10/1/2017	Weighted Average Benefit Level
Benefit Level Change	1.000	1.011	1.011	1.012	1.000	1.000	0.998	1.011	1.008	1.002	1.007	1.000	1.008	1.008	1.006	
Cumulative Benefit Level Change	1.000	1.011	1.022	1.034	1.034	1.034	1.032	1.044	1.052	1.054	1.062	1.062	1.071	1.079	1.086	1.081

Medical All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2016 (using benefit level projections from prior filing).

Date of Change	10/1/2005	10/1/2006	10/1/2007	10/1/2008	4/1/2009	10/1/2009	10/1/2010	10/1/2011	10/1/2012	10/1/2013	10/1/2014	3/24/2015	10/1/2015	10/1/2016	10/1/2017	Weighted Average Benefit Level
Benefit Level Change	1.000	1.000	1.000	1.000	1.032	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Cumulative Benefit Level Change	1.000	1.000	1.000	1.000	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032

All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2016 (using benefit level projections from prior filing).

Date of Change	10/1/2005	10/1/2006	10/1/2007	10/1/2008	4/1/2009	10/1/2009	10/1/2010	10/1/2011	10/1/2012	10/1/2013	10/1/2014	3/24/2015	10/1/2015	10/1/2016	10/1/2017	Weighted Average Benefit Level
Benefit Level Change	1.000	1.007	1.007	1.007	1.013	1.000	0.999	1.007	1.005	1.001	1.005	1.000	1.005	1.005	1.004	
Cumulative Benefit Level Change	1.000	1.007	1.014	1.021	1.034	1.034	1.033	1.041	1.046	1.047	1.052	1.052	1.058	1.063	1.067	1.064

Index Factors for All Injury Types

Time Period	Indemnity				All Injury Types	Medical	Total
	Death	Permanent Total	Permanent Partial	Temporary Total		All Injury Types	All Injury Types
PY 2006	1.003	1.005	1.010	1.003	1.008	1.000	1.005
PY 2007	1.009	1.013	1.025	1.007	1.019	1.000	1.012
PY 2008	1.015	1.021	1.039	1.012	1.030	1.007	1.022
PY 2009	1.017	1.024	1.045	1.014	1.034	1.030	1.034
PY 2010	1.017	1.024	1.044	1.013	1.033	1.032	1.034
PY 2011	1.020	1.029	1.052	1.016	1.040	1.032	1.038
PY 2012	1.025	1.035	1.064	1.019	1.049	1.032	1.044
PY 2013	1.027	1.038	1.069	1.021	1.054	1.032	1.047
PY 2014	1.032	1.042	1.077	1.023	1.059	1.032	1.050
PY 2015	1.044	1.049	1.087	1.027	1.068	1.032	1.056
CPY 2014_07	1.040	1.046	1.082	1.025	1.064	1.032	1.053
CPY 2015_07	1.047	1.052	1.094	1.029	1.073	1.032	1.059
CPY 2016_07	1.053	1.060	1.105	1.034	1.082	1.032	1.065
CPY 2008_09	1.017	1.024	1.045	1.014	1.034	1.026	1.032
Prior Eff. Period	1.053	1.060	1.105	1.034	1.082	1.032	1.065
Prosp. Eff. Period	1.065	1.075	1.129	1.043	1.101	1.032	1.077
1/1/2018	1.059	1.066	1.116	1.038	1.090	1.032	1.070

Notes:

1/1/2018 refers to a point in time. All other time periods refer to Policy Years.
 Index Factors for All Injury Types Table is a Excel Data Table that repeats the calculation of the Weighted Average Benefit Level for all Injury Types.

IV 000009

Section IV - Benefit Change Adjustments
 Subsection A - Summary
 7/1/2018

Section IV - A
 Exhibit 3

Historical and Estimated Benefit Level Changes

Effective Date (1)	Indemnity					Medical	Total
	Death (2)	Permanent Total (3)	Permanent Partial (4)	Temporary Total (5)	All Injury Types (6)	All Injury Types (7)	All Injury Types (8)
10/1/2005	0.5%	0.8%	1.5%	0.4%	1.1%	0.0%	0.7%
10/1/2006	0.5%	0.7%	1.5%	0.4%	1.1%	0.0%	0.7%
10/1/2007	0.6%	0.9%	1.4%	0.5%	1.1%	0.0%	0.7%
10/1/2008	0.6%	0.8%	1.5%	0.5%	1.2%	0.0%	0.7%
4/1/2009	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	1.3%
10/1/2009	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10/1/2010	-0.1%	-0.1%	-0.2%	-0.1%	-0.2%	0.0%	-0.1%
10/1/2011	0.6%	0.8%	1.4%	0.4%	1.1%	0.0%	0.7%
10/1/2012	0.4%	0.6%	1.0%	0.3%	0.8%	0.0%	0.5%
10/1/2013	0.1%	0.1%	0.2%	0.1%	0.2%	0.0%	0.1%
10/1/2014	0.4%	0.5%	0.9%	0.3%	0.7%	0.0%	0.5%
3/24/2015	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10/1/2015	0.5%	0.6%	1.1%	0.3%	0.8%	0.0%	0.5%
10/1/2016	0.5%	0.7%	1.0%	0.4%	0.8%	0.0%	0.5%
10/1/2017	0.7%	0.8%	1.3%	0.6%	1.0%	0.0%	0.7%
10/1/2018	0.5%	0.6%	1.0%	0.4%	0.8%	0.0%	0.5%
10/1/2019	0.4%	0.6%	1.0%	0.4%	0.8%	0.0%	0.5%

Notes:

Estimated changes for 10/1/2018 and 10/1/2019 use projected SAWW values for 10/1/2018 and 10/1/2019 .

Effects of SAWW Change

Person(s) Receiving Benefits (1)	Number of Cases (2)	Average Number of Dependents (3)	Average Arithmetic Age (4)	Annuity Symbol (5)	Annuity Value (6)	Effects of SAWW Change of 10/1/2016		Effects of SAWW Change of 10/1/2017		Effects of SAWW Change of 10/1/2018		Effects of SAWW Change of 10/1/2019	
						10/1/2015	10/1/2016	10/1/2016	10/1/2017	10/1/2017	10/1/2018	10/1/2018	10/1/2019
						Cost (7)	Cost (8)	Cost (9)	Cost (10)	Cost (11)	Cost (12)	Cost (13)	Cost (14)
None	204	0	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Spouse, No Children	212	1	40	$a_{40:\overline{Life}}$	25.70	200,820,213	201,865,351	206,343,260	207,685,276	212,317,915	213,372,854	202,311,657	203,103,769
Spouse with Children	407	1	38	$a_{38:\overline{Life}}$	25.71	385,709,050	387,716,413	396,316,992	398,894,560	407,792,324	409,818,511	388,573,619	390,095,005
Child(ren)		1.9	10	$a_{\overline{8}}$	7.41								
Orphan, No Sibling	21	1	13	$a_{13:\overline{5}}$	4.72	3,649,681	3,668,675	3,750,056	3,774,446	3,858,639	3,877,811	3,676,787	3,691,182
Orphan with Sibling(s)	15	2.5	12	$a_{\overline{6}}$	5.63	3,112,714	3,128,914	3,198,322	3,219,123	3,290,929	3,307,280	3,135,832	3,148,109
Other Dependents (No Spouse)	141	1.7	58	$a_{58:\overline{Life}}$	19.93	19,343,318	19,343,318	19,345,124	19,345,124	19,346,980	19,346,980	19,382,879	19,382,879
(15) Total Survivor Benefits	1,000					612,634,976	615,722,671	628,953,753	632,918,530	646,606,788	649,723,437	617,080,773	619,420,945
(16) Cost of Burial (1,000 cases)						10,051,760	10,333,920	10,333,920	10,704,400	10,704,400	10,998,072	10,998,072	11,299,800
(17) Total Monetary Cost [= (15) + (16)]						622,686,736	626,056,591	639,287,673	643,622,930	657,311,188	660,721,508	628,078,844	630,720,744
(18) Fatal Benefit Change Factors							1.005		1.007		1.005		1.004

Notes:

- (2), (3): Section IV-D, Exhibit 2.
- (4): Section IV-D, Exhibit 2, Column(4) rounded to nearest whole number.
- (5): For two or more dependents, benefits are last-survivor contingent. An annuity certain is used to approximate the joint-survivor annuity for "Child(ren)" and "Orphan with Sibling(s)".
- (6): Life annuity values from *Massachusetts Workers' Compensation Statistical Plan*, Part I, Section IX (Effective 7/1/2017).
- Annuity certain values assume the same discount rate and elevation rate used in the derivation of the Pension Tables contained in the *Massachusetts Workers' Compensation Statistical Plan*.
- (7), (9), (11), (13) = $52 \times (2) \times (6) \times [\text{Page 2, (14)}]$ for Spouses and Orphans and = $52 \times (2) \times (3) \times (6) \times [\text{Page 2, (30)}]$ for All Others Dependents
- (8), (10), (12), (14) = $52 \times (2) \times (6) \times [\text{Page 2, (15)}]$ for Spouses and Orphans and = $52 \times (2) \times (3) \times (6) \times [\text{Page 2, (31)}]$ for All Others Dependents
- (16) = 8 x SAWW
- (18): Ratio of (17) for later date to (17) for earlier date.

IV 000011

Determination of the Average Weekly Survivor Benefit for Fatalities

Fatal: Spouse and Orphans - Effective 10/1/2016

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	66.67%
(2)	Min Weekly Compensation	110.00
(3)	Max Weekly Compensation	1,291.74
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2016	1,121.75

Wage Intervals (5)	Benefit (6)	Wage Distribution Entry Ratios = (5) / (4) (7)		Percentage in Interval		Average Wage in Interval = (9) / (8) x (4) (10)	Average Benefit in Interval (11)
				Workers (8)	Wages (9)		
0.00 - 165.00	Statutory Minimum	0.00	0.15	1.19%	0.11%	99.70	110.00
165.00 - 1,937.61	Actual Wage x Comp. Rate	0.15	1.75	89.33%	78.72%	988.56	659.04
1,937.61 - over	Statutory Maximum	1.75	over	9.48%	21.17%	2,505.24	1,291.74

(12) Average Weekly Benefit **712.47**

(13) Starting date of 12 month period for AIWWW	Effects of SAWW Change			
	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(14) Benefits Effective Average Weekly Benefits	10/1/2015 708.79	10/1/2016 728.28	10/1/2017 749.37	10/1/2018 714.05
(15) Benefits Effective Average Weekly Benefits	10/1/2016 712.47	10/1/2017 733.02	10/1/2018 753.09	10/1/2019 716.85
(16) Fatal: Spouse and Orphans Benefit Change Factors	1.005	1.007	1.005	1.004

Fatal: All Others - Effective 10/1/2016

(17)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	66.67%
(18)	Min Weekly Compensation	0.00
(19)	Max Weekly Compensation	80.00
(20)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2016	1,121.75

Wage Intervals (21)	Benefit (22)	Wage Distribution Entry Ratios = (21) / (20) (23)		Percentage in Interval		Average Wage in Interval = (25) / (24) x (20) (26)	Average Benefit in Interval (27)
				Workers (24)	Wages (25)		
0.00 - 0.00	Statutory Minimum	0.00	0.00	0.00%	0.00%	0.00	0.00
0.00 - 120.00	Actual Wage x Comp. Rate	0.00	0.10	0.64%	0.04%	63.47	42.31
120.00 - over	Statutory Maximum	0.10	over	99.36%	99.96%	1,128.58	80.00

(28) Average Weekly Benefit **79.76**

(29) Starting date of 12 month period for AIWWW	Effects of SAWW Change			
	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(30) Benefits Effective Average Weekly Benefits	10/1/2015 79.76	10/1/2016 79.77	10/1/2017 79.77	10/1/2018 79.92
(31) Benefits Effective Average Weekly Benefits	10/1/2016 79.76	10/1/2017 79.77	10/1/2018 79.77	10/1/2019 79.92
(32) Fatal: All Others Benefit Change Factors	1.000	1.000	1.000	1.000

Notes:

- (1)-(3), (17)-(19): Section IV-C, Exhibit 1.
- (4), (20): Section IV-D, Exhibit 3.
- (5), (21): Wage Intervals follow Massachusetts General Law.
- (7), (23): Rounded to nearest 0.05.
- (8), (24): Section IV-D, Exhibit 1, column (2).
- (9), (25): Section IV-D, Exhibit 1, column (3).
- (11), (27): Comp Rate x Average Wage in Interval, subject to a statutory maximum and statutory minimum.
- (12) = Sum [(8) x (11)]
- (14), (15): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (12) for different dates.
- (16) = (15) / (14)
- (28) = Sum [(24) x (27)]
- (30), (31): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (28) for different dates.
- (32) = (31) / (30)

IV 000012

Section IV - Benefit Change Adjustments
 Subsection B - Effects of SAWW Change
 7/1/2018

Section IV-B
 Exhibit 2

Determination of the Average Weekly Benefit for Permanent Totals

Permanent Total - Effective 10/1/2016

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	66.67%
(2)	Min Weekly Compensation	258.35
(3)	Max Weekly Compensation	1,291.74
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2016	1121.75

Wage Intervals (5)	Benefit (6)	Wage Distribution Entry Ratios = (5) / (4) (7)		Percentage in Interval		Average Wage in Interval = (9) / (8) x (4) (10)	Average Benefit in Interval (11)
		0.00	0.35	Workers (8)	Wages (9)		
0.00 - 387.52	Statutory Minimum	0.00	0.35	6.21%	1.46%	262.88	258.35
387.52 - 1,937.61	Actual Wage x Comp. Rate	0.35	1.75	84.31%	77.37%	1,029.46	686.31
1,937.61 over	Statutory Maximum	1.75	over	9.48%	21.17%	2,505.24	1,291.74

(12) Average Weekly Benefit **717.12**

	Effects of SAWW Change			
	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(13) Starting date of 12 month period for AIWWW	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(14) Benefits Effective	10/1/2015	10/1/2016	10/1/2017	10/1/2018
Average Weekly Wage Loss Benefit	712.99	732.65	754.02	774.71
(15) Benefits Effective	10/1/2016	10/1/2017	10/1/2018	10/1/2019
Average Weekly Wage Loss Benefit	717.12	737.96	758.20	779.00
(16) Permanent Total Wage Loss Benefit Change Factors	1.006	1.007	1.006	1.006
(17) Specific Injury Benefits				
SAWW Effect on Specific Injury Benefits	1.028	1.036	1.027	1.027
(18) Benefit Proportions Associated with Permanent Total Claims				
(a) Permanent Total Wage Loss Benefits	96.50%	96.50%	96.50%	96.50%
(b) Specific Injury Benefits	3.50%	3.50%	3.50%	3.50%
(19) Permanent Total Benefit Change Factors	1.007	1.008	1.006	1.006
= [(16) x (18a)] + [(17) x (18b)]				

Notes:

- (1), (2), (3): Section IV-C, Exhibit 1.
- (4): Section IV-D, Exhibit 3.
- (5): Wage Intervals follow Massachusetts General Law.
- (7): Rounded to nearest 0.05.
- (8): Section IV-D, Exhibit 1, column (2).
- (9): Section IV-D, Exhibit 1, column (3).
- (11): Comp Rate x Average Wage in Interval, subject to a statutory maximum and statutory minimum.
- (12) = Sum [(8) x (11)]
- (14), (15): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (12) for different dates.
- (16) = (15) / (14)
- (17): Ratio of SAWW from Section IV-D, Exhibit 3.
 Example: Effect of SAWW Change of 10/1/2017 = SAWW 10/1/2017 / SAWW 10/1/2016 = 1.036 = 1,338.05 / 1,291.74
- (18): Estimated Average Schedule Benefit compared to Average Indemnity Cost per Claim.
 DCI data for Permanent Total Claims in Massachusetts.

IV 000013

Section IV - Benefit Change Adjustments
 Subsection B - Effects of SAWW Change
 7/1/2018

Section IV-B
 Exhibit 3

Determination of the Average Weekly Benefit for Permanent Partials

Permanent Partial - Effective 10/1/2016

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	37.20%
(2)	Min Weekly Compensation	0.00
(3)	Max Weekly Compensation	968.81
(4)	Average Injured Worker Weekly Wage ("AIWW") for 12 months starting 10/1/2016	1,121.75
(5)	SAWW effective 10/1/2016	1,291.74

Wage Intervals (6)	Benefit (7)	Wage Distribution Entry Ratios = (6) / (4) (8)	Percentage in Interval		Average Wage in Interval =(10) / (9) x (4) (11)	Average Benefit in Interval (12)
			Workers (9)	Wages (10)		
0.00 2,604.31	Actual Wage x Comp. Rate	0.00 2.30	97.00%	91.62%	1,059.51	394.14
2,604.31 4,249.14	Statutory Maximum	2.30 3.80	2.85%	7.72%	3,040.93	968.81
4,249.14 6,798.63	Statutorily Reduced	3.80 6.05	0.15%	0.64%	4,836.02	745.79
6,798.63 over	Exceeds Statutory Limit	6.05 over	0.00%	0.02%	7,489.31	0.00

(13) Average Weekly Benefit 411.00

	Effects of SAWW Change			
	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(14) Starting date of 12 month period for AIWW	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(15) Benefits Effective	10/1/2015	10/1/2016	10/1/2017	10/1/2018
Average Weekly Wage Loss Benefit	410.12	421.39	433.24	445.13
(16) Benefits Effective	10/1/2016	10/1/2017	10/1/2018	10/1/2019
Average Weekly Wage Loss Benefit	411.00	422.53	434.12	446.03
(17) Permanent Partial Wage Loss Benefit Change Factors	1.002	1.003	1.002	1.002
(18) Specific Injury Benefits				
SAWW Effect on Specific Injury Benefits	1.028	1.036	1.027	1.027
(19) Permanent Partial Healing Period				
Effect on Healing Period Benefits	1.004	1.006	1.004	1.004
(20) Benefit Proportions Associated with Permanent Partial Claims				
(a) Permanent Partial Wage Loss Benefits	27%	27%	27%	27%
(b) Specific Injury Benefits	26%	26%	26%	26%
(c) Healing Period - Temporary Total Benefits	47%	47%	47%	47%
(21) Permanent Partial Benefit Change Factors	1.010	1.013	1.010	1.010
= [(17) x (20a)] + [(18) x (20b)] + [(19) x (20c)]				

Notes:

(1), (2), (3): Section IV-C, Exhibit 1.

(4), (5): Section IV-D, Exhibit 3.

(6): Wage Intervals follow Massachusetts General Law.

(7): Statutory Maximum: Insurer may reduce benefit to level at which benefits + earnings = 2 x SAWW.

(8): Rounded to nearest 0.05.

(9): Section IV-D, Exhibit 1, column (2).

(10): Section IV-D, Exhibit 1, column (3).

(12): Comp Rate x Average Wage in Interval, subject to a statutory maximum and a statutory limitation.

(13) = Sum [(9) x (12)]

(15), (16): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (13) for different dates.

(17) = (16) / (15)

(18): Ratio of SAWW from Section IV-D, Exhibit 3.

Example: Effect of SAWW Change of 10/1/2017 = 1.036 = 1,338.05 / 1,291.74

(19): Temporary Total Benefit Change Factors, Exhibit 4.

(20): DCI data for Permanent Partial Claims in Massachusetts.

IV 000014

Section IV - Benefit Change Adjustments
 Subsection B - Effects of SAWW Change
 7/1/2018

Section IV-B
 Exhibit 4

Determination of the Average Weekly Benefit for Temporary Totals

Temporary Total - Effective 10/1/2016

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	60.00%
(2)	Min Weekly Compensation	258.35
(3)	Max Weekly Compensation	1,291.74
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2016	1,121.75

Wage Intervals (5)	Benefit (6)	Wage Distribution Entry Ratios = (5) / (4) (7)		Percentage in Interval		Average Wage in Interval = (9) / (8) x (4) (10)	Average Benefit in Interval (11)
				Workers (8)	Wages (9)		
0.00 258.35	Actual Wage	0.00	0.25	2.99%	0.48%	178.07	178.07
258.35 430.58	Statutory Minimum	0.25	0.40	5.58%	1.87%	375.54	258.35
430.58 2,152.90	Actual Wage x Comp. Rate	0.40	1.90	84.49%	81.12%	1,076.99	646.19
2,152.90 over	Statutory Maximum	1.90	over	6.93%	16.53%	2,675.13	1,291.74

(12) Average Weekly Benefit **655.30**

	Effects of SAWW Change			
	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(13) Starting date of 12 month period for AIWW	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(14) Benefits Effective Average Weekly Benefits	10/1/2015 652.44	10/1/2016 670.40	10/1/2017 689.69	10/1/2018 708.61
(15) Benefits Effective Average Weekly Benefits	10/1/2016 655.30	10/1/2017 674.10	10/1/2018 692.60	10/1/2019 711.60
(16) Temporary Total Benefit Change Factors	1.004	1.006	1.004	1.004

Notes:

- (1), (2), (3): Section IV-C, Exhibit 1.
- (4): Section IV-D, Exhibit 3.
- (5): Wage Intervals follow Massachusetts General Law.
- (7): Rounded to nearest 0.05.
- (8): Section IV-D, Exhibit 1, column (2).
- (9): Section IV-D, Exhibit 1, column (3).
- (11): Comp Rate x Average Wage in Interval, subject to a statutory maximum and statutory minimum, unless the actual wage is less than the statutory minimum.
- (12) = Sum [(8) x (11)]
- (14), (15): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (12) for different dates.
- (16) = (15) / (14)

Summary of Principal Benefit Changes Due to the Increase in the Maximum and Minimum Weekly Benefits

	10/1/2015	10/1/2016	10/1/2017	10/1/2018	10/1/2019
(1) Fatal					
% Rate of Compensation	66.67%	66.67%	66.67%	66.67%	66.67%
Minimum Weekly Benefit					
Widow/Orphan	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00
Others	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Maximum Weekly Benefit					
Widow/Orphan	\$1,256.47	\$1,291.74	\$1,338.05	<i>\$1,374.76</i>	<i>\$1,412.47</i>
Others	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00
Each Additional Child	\$6.00, if benefit under \$150.00	\$6.00, if benefit under \$150.00	\$6.00, if benefit under \$150.00	\$6.00, if benefit under \$150.00	\$6.00, if benefit under \$150.00
Maximum Aggregate Payable	250 x SAWW	250 x SAWW	250 x SAWW	250 x SAWW	250 x SAWW
Burial Allowance	8 X SAWW	8 X SAWW	8 X SAWW	8 X SAWW	8 X SAWW
Cost of Living Adjustment - benefits increase annually by:	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW
(2) Total Disability					
Permanent Total					
% Rate of Compensation	66.67%	66.67%	66.67%	66.67%	66.67%
Minimum Weekly Benefit	\$251.29	\$258.35	\$267.61	<i>\$274.95</i>	<i>\$282.49</i>
Maximum Weekly Benefit	\$1,256.47	\$1,291.74	\$1,338.05	<i>\$1,374.76</i>	<i>\$1,412.47</i>
Duration	Lifetime	Lifetime	Lifetime	Lifetime	Lifetime
Cost of Living Adjustment - benefits increase annually by:	Same as Fatal	Same as Fatal	Same as Fatal	Same as Fatal	Same as Fatal
Temporary Total					
% Rate of Compensation	60.00%	60.00%	60.00%	60.00%	60.00%
Minimum Weekly Benefit	\$251.29	\$258.35	\$267.61	<i>\$274.95</i>	<i>\$282.49</i>
Maximum Weekly Benefit	\$1,256.47	\$1,291.74	\$1,338.05	<i>\$1,374.76</i>	<i>\$1,412.47</i>
Waiting Period/Retroactive After	5 days/21 days	5 days/21 days	5 days/21 days	5 days/21 days	5 days/21 days
(3) Permanent Partial Disability					
% Rate of Compensation	37.20%	37.20%	37.20%	37.20%	37.20%
Minimum Weekly Benefit	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Maximum Weekly Benefit	\$942.35	\$968.81	\$1,003.54	<i>\$1,031.07</i>	<i>\$1,059.36</i>
(4) Specific Injury Payments					
Scheduled Injuries	According to the injury, a scheduled number multiplied by the SAWW	According to the injury, a scheduled number multiplied by the SAWW	According to the injury, a scheduled number multiplied by the SAWW	According to the injury, a scheduled number multiplied by the SAWW	According to the injury, a scheduled number multiplied by the SAWW
Non-Scheduled Injuries	32 x SAWW	32 x SAWW	32 x SAWW	32 x SAWW	32 x SAWW
Disfigurement					
Maximum Benefit	\$15,000	\$15,000.00	\$15,000.00	\$15,000.00	\$15,000.00
Benefit	As determined by the reviewing board	As determined by the reviewing board	As determined by the reviewing board	As determined by the reviewing board	As determined by the reviewing board

Notes:
 Source: The General Laws of Massachusetts, Chapter 152, Sections 31-36.
 (1), (2): Maximum Weekly Benefit for Fatalities and Total Disabilities is 100% of the SAWW.
 (2): Minimum Weekly Benefit for Total Disability is 20% of the SAWW.
 (3): Maximum Weekly Benefit for Permanent Partial is 75% of the SAWW. There is no Minimum Weekly Benefit for Permanent Partial Disability.
 (3): Permanent Partial % Rate of Compensation is 60% of 62%, the lost wage-earning capacity, Section IV-D, Exhibit 4.

Values in Italics are Projected

IV 000015

IV 000016

Section IV - Benefit Change Adjustments
 Subsection D - Massachusetts Data
 7/1/2018

Section IV-D
 Exhibit 1

Standard Wage Distribution Table

R = Ratio to Average Wage
 A = Cumulative Percentage of Workers
 B = Cumulative Percentage of Wages

R (1)	A (2)	B (3)	R (1)	A (2)	B (3)	R (1)	A (2)	B (3)
0.05	0.2575	0.0069	2.40	97.5655	92.9442	4.75	99.9722	99.8509
0.10	0.6416	0.0363	2.45	97.8056	93.5264	4.80	99.9745	99.8618
0.15	1.1926	0.1060	2.50	98.0216	94.0607	4.85	99.9766	99.8719
0.20	1.9563	0.2406	2.55	98.2157	94.5509	4.90	99.9785	99.8812
0.25	2.9922	0.4750	2.60	98.3904	95.0005	4.95	99.9802	99.8897
0.30	4.3800	0.8583	2.65	98.5474	95.4128	5.00	99.9818	99.8977
0.35	6.2125	1.4559	2.70	98.6888	95.7907	5.05	99.9833	99.9050
0.40	8.5723	2.3431	2.75	98.8159	96.1372	5.10	99.9846	99.9118
0.45	11.5064	3.5926	2.80	98.9304	96.4548	5.15	99.9858	99.9181
0.50	15.0106	5.2593	2.85	99.0334	96.7458	5.20	99.9870	99.9239
0.55	19.0259	7.3693	2.90	99.1262	97.0125	5.25	99.9880	99.9293
0.60	23.4487	9.9139	2.95	99.2098	97.2570	5.30	99.9889	99.9343
0.65	28.1475	12.8515	3.00	99.2851	97.4810	5.35	99.9898	99.9389
0.70	32.9823	16.1152	3.05	99.3530	97.6863	5.40	99.9906	99.9432
0.75	37.8216	19.6235	3.10	99.4142	97.8745	5.45	99.9913	99.9471
0.80	42.5554	23.2915	3.15	99.4694	98.0469	5.50	99.9920	99.9508
0.85	47.1012	27.0409	3.20	99.5192	98.2050	5.55	99.9926	99.9542
0.90	51.4058	30.8063	3.25	99.5641	98.3500	5.60	99.9932	99.9574
0.95	55.4411	34.5379	3.30	99.6047	98.4828	5.65	99.9937	99.9603
1.00	59.1992	38.2009	3.35	99.6414	98.6047	5.70	99.9942	99.9630
1.05	62.6854	41.7731	3.40	99.6745	98.7165	5.75	99.9946	99.9656
1.10	65.9126	45.2413	3.45	99.7044	98.8190	5.80	99.9950	99.9679
1.15	68.8968	48.5975	3.50	99.7315	98.9131	5.85	99.9954	99.9701
1.20	71.6541	51.8365	3.55	99.7560	98.9994	5.90	99.9958	99.9721
1.25	74.1997	54.9540	3.60	99.7782	99.0786	5.95	99.9961	99.9740
1.30	76.5470	57.9460	3.65	99.7982	99.1514	6.00	99.9964	99.9757
1.35	78.7079	60.8084	3.70	99.8164	99.2181	6.05	99.9966	99.9773
1.40	80.6934	63.5378	3.75	99.8329	99.2795	6.10	99.9969	99.9789
1.45	82.5138	66.1312	3.80	99.8478	99.3358	6.15	99.9971	99.9803
1.50	84.1791	68.5868	3.85	99.8613	99.3876	6.20	99.9973	99.9816
1.55	85.6991	70.9043	3.90	99.8736	99.4352	6.25	99.9975	99.9828
1.60	87.0837	73.0845	3.95	99.8848	99.4789	6.30	99.9977	99.9839
1.65	88.3424	75.1293	4.00	99.8949	99.5191	6.35	99.9979	99.9850
1.70	89.4847	77.0422	4.05	99.9041	99.5561	6.40	99.9980	99.9860
1.75	90.5197	78.8273	4.10	99.9124	99.5902	6.45	99.9982	99.9869
1.80	91.4563	80.4893	4.15	99.9200	99.6215	6.50	99.9983	99.9877
1.85	92.3028	82.0338	4.20	99.9269	99.6503	6.55	99.9984	99.9885
1.90	93.0671	83.4665	4.25	99.9332	99.6768	6.60	99.9985	99.9893
1.95	93.7565	84.7934	4.30	99.9389	99.7013	6.65	99.9986	99.9899
2.00	94.3780	86.0206	4.35	99.9441	99.7238	6.70	99.9987	99.9906
2.05	94.9379	87.1541	4.40	99.9489	99.7445	6.75	99.9988	99.9912
2.10	95.4420	88.1999	4.45	99.9532	99.7637	6.80	99.9989	99.9918
2.15	95.8958	89.1639	4.50	99.9571	99.7813	6.85	99.9990	99.9923
2.20	96.3040	90.0517	4.55	99.9607	99.7975	6.90	99.9991	99.9928
2.25	96.6712	90.8686	4.60	99.9640	99.8125	6.95	99.9991	99.9932
2.30	97.0015	91.6198	4.65	99.9670	99.8264	7.00	99.9992	99.9936
2.35	97.2985	92.3101	4.70	99.9697	99.8391			

Notes:
 Source: NCCI - The 2009 Standard Wage Distribution Table.

IV 000017

Section IV - Benefit Change Adjustments
 Subsection D - Massachusetts Data
 7/1/2018

Section IV-D
 Exhibit 2

Dependency Table

Dependency Class (1)	Number of Cases (2)	Average Number of Dependents (3)	Average Dependent Age (4)
No Dependents	204	0	N/A
Spouse, No Children	212	1	40
Spouse with Children	153	1	38
1 Child		1	11
Spouse with Children	166	1	38
2 Children		2	10
Spouse with Children	63	1	37
3 Children		3	10
Spouse with Children	18	1	37
4 Children		4	10
Spouse with Children	5	1	37
5 Children		5	10
Spouse with Children	2	1	38
More than 5 Children		7	10
Spouse with Children	407	1	38
Summary		1.9	10
Orphan, No Sibling	21	1	13
1 Child			
Orphans with Sibling(s)	10	2	12
2 Children		3	12
3 Children	3	3	12
4 Children	1	4	12
More than 4 Children	1	5	12
Orphans with Sibling(s)	15	2.5	12
Summary			
Other Dependents (No Spouse)	41	1	62
1 Parent			
2 Parents	91	2	58
Sibling	7	1	37
Other	2	2	31
Other Dependents	141	1.7	58
Summary			

Notes:

Source: NCCI, CPS data, 1989-1993, reweighted using DCI Data for Fatalities, 1984-1993.

(2): Dependent count includes working adult household members standardized to a total of 1,000 cases.

Derivation of Estimated SAWW (Statewide Average Weekly Wage) and AIWWW (Average Injured Worker Weekly Wage)

SAWW Effective Date (1)	SAWW Based on Data (2)	Midpoint of the SAWW Data (3)	Actual SAWW (4)	Estimated Annual SAWW Trend Factor (5)	Actual and Projected SAWW (6)	AIWWW Period (7)	Actual and Projected Effective AIWWW (8)
10/1/2015	4/1/14 to 4/1/15	10/1/2014	1,256.47		1,256.47	10/1/15 to 10/1/16	1,087.42
10/1/2016	4/1/15 to 4/1/16	10/1/2015	1,291.74		1,291.74	10/1/16 to 10/1/17	1,121.75
10/1/2017	4/1/16 to 4/1/17	10/1/2016	1,338.05		1,338.05	10/1/17 to 10/1/18	1,152.52
10/1/2018	4/1/17 to 4/1/18	10/1/2017		1.027	1,374.76	10/1/18 to 10/1/19	1,184.14
10/1/2019	4/1/18 to 4/1/19	10/1/2018		1.027	1,412.47	10/1/19 to 10/1/20	1,216.63

Notes:

(4): Section V-G, Exhibit 2.

(5): 2.7% Estimated Annual Trend in SAWW, Section V-A, Exhibit 1.

(6): For SAWW Effective Date 10/1/2015 - 10/1/2017, (6) = (4)

For SAWW Effective Date 10/1/2018 & 10/1/2019, (6) = (5) x (6 from Prior Period)

(8): For the AIWWW Period 10/1/15 to 10/1/16, (8) is the product of .827 and the average of the SAWWs effective 10/1/2016 and 10/1/2017, respectively.

For the AIWWW Period 10/1/16 to 10/1/17, (8) is the product of .827 and the average of the SAWWs effective 10/1/2017 and 10/1/2018, respectively.

For the AIWWW Period 10/1/17 to 10/1/18, (8) is the product of .827 and the average of the SAWWs effective 10/1/2018 and 10/1/2019, respectively.

For the AIWWW Periods 10/1/18 to 10/1/19 and 10/1/19 to 10/1/20, (8) = (5) x (8 from Prior Period).

Historical Relationship of .827 for the ratio of AIWWW to SAWW is selected based on DCI data.

IV 000019

Section IV - Benefit Change Adjustments
 Subsection D - Massachusetts Data
 7/1/2018

Section IV-D
 Exhibit 4

Average Wage Loss for Permanent Partial Claimants

DCI Report Level	(Pre-Injury - Post-Injury) / Pre-Injury Wage					Average
	1979 (1)	1980 (2)	1981 (3)	1982 (4)	1983 (5)	
Average Wage Loss for Major Permanent Partial Claimants						
1	0.61	0.62	0.60	0.62	0.60	0.61
2	0.62	0.62	0.59	0.63	0.62	0.62
3	0.64	0.60	0.65	0.60		0.62
4	0.60	0.64	0.62			0.62
(6) Selected Average Wage Loss for Major Permanent Partial Claimants						0.62

Average Wage Loss for Minor Permanent Partial Claimants						
1	0.58	0.58	0.58	0.60	0.59	0.59
2	0.62	0.60	0.59	0.58	0.64	0.61
3	0.66	0.64	0.65	0.56		0.63
4	0.62	0.70	0.66			0.66
(7) Selected Average Wage Loss for Minor Permanent Partial Claimants						0.62

Notes:

Source: Detail Claim Information ("DCI") Data, compiled as of 10/1/1985.

(6), (7): These data were compiled prior to Chapter 398. To be consistent with Chapter 398, 62% will be used as the wage loss as a percent of pre-injury wage.

The percent of that that is paid is 60% subject to maximums.

Post-Chapter 398 Injury Type Weights at 5th Report

Injury Type (1)	Policy Year (2)	Indemnity - Likely to Develop			Indemnity - Not Likely to Develop			Indemnity On-level Losses at Fifth Report = (5) + (8) (9)	Weights at 5th report (10)
		Losses at Fifth Report (3)	Benefit On-Level Factor to Prosp. Eff. Period (4)	On-level Losses at Fifth Report = (3) x (4) (5)	Losses at Fifth Report (6)	Benefit On-Level Factor to Prosp. Eff. Period (7)	On-level Losses at Fifth Report = (6) x (7) (8)		
Death	2007	2,468,356	1.056	2,605,719	6,414,478	1.056	6,771,441	9,377,161	
Death	2008	4,210,956	1.050	4,419,657	5,014,691	1.050	5,263,226	9,682,883	
Death	2009	1,354,447	1.047	1,418,646	6,993,542	1.047	7,325,024	8,743,670	
Death	2010	1,811,505	1.048	1,898,281	4,451,222	1.048	4,664,447	6,562,727	
Death	2011	399,738	1.044	417,404	7,241,840	1.044	7,561,891	7,979,296	
Total Death		10,245,002		10,759,706	30,115,773		31,586,029	42,345,736	1.50%
Permanent Total	2007	30,565,556	1.061	32,419,690	0	1.061	0	32,419,690	
Permanent Total	2008	31,852,598	1.052	33,514,178	0	1.052	0	33,514,178	
Permanent Total	2009	35,861,920	1.049	37,628,845	0	1.049	0	37,628,845	
Permanent Total	2010	31,791,964	1.050	33,372,636	0	1.050	0	33,372,636	
Permanent Total	2011	41,440,402	1.045	43,290,290	0	1.045	0	43,290,290	
Total Permanent Total		171,512,440		180,225,639	0		0	180,225,639	6.38%
Permanent Partial	2007	97,333,496	1.102	107,267,468	114,757,556	1.102	126,469,848	233,737,315	
Permanent Partial	2008	85,558,700	1.087	92,974,679	119,596,998	1.087	129,963,317	222,937,996	
Permanent Partial	2009	78,811,154	1.081	85,203,872	117,002,427	1.081	126,493,007	211,696,879	
Permanent Partial	2010	81,905,717	1.082	88,630,039	129,821,447	1.082	140,479,569	229,109,608	
Permanent Partial	2011	86,978,753	1.073	93,334,618	124,156,888	1.073	133,229,499	226,564,117	
Total Permanent Partial		430,587,820		467,410,675	605,335,316		656,635,240	1,124,045,915	39.81%
Temporary Total	2007	26,368,929	1.036	27,309,925	61,167,245	1.036	63,350,045	90,659,970	
Temporary Total	2008	25,666,921	1.031	26,454,977	62,264,189	1.031	64,175,897	90,630,874	
Temporary Total	2009	27,258,036	1.029	28,046,766	57,482,697	1.029	59,145,998	87,192,764	
Temporary Total	2010	30,922,945	1.029	31,834,738	63,547,054	1.029	65,420,799	97,255,537	
Temporary Total	2011	32,344,653	1.027	33,223,128	77,358,314	1.027	79,459,352	112,682,480	
Total Temporary Total		142,561,484		146,869,533	321,819,499		331,552,092	478,421,625	16.94%
(11) Total Indemnity		754,906,746		805,265,553	957,270,588		1,019,773,362	1,825,038,915	64.63%

IV 000020

- (12) Aggregate Financial Policy Year Call, Indemnity Fifth to Ultimate Development Factor Paid + Case 1.040
- (13) Tail Development Attributed to Likely to Develop Claims 0.8
- (14) Percentage Likely to Develop 0.441
- (15) Indemnity Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(12) - 1.0] \times (13) \} / (14)$ 1.073
- (16) Indemnity Not Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(12) - 1.0] \times [1.0 - (13)] \} / [1.0 - (14)]$ 1.014

Post-Chapter 398 Injury Type Weights at 5th Report

Injury Type (1)	Policy Year (2)	Medical - Likely to Develop			Medical - Not Likely to Develop			Medical On-level Losses at Fifth Report = (5) + (8) (9)	Weights at 5th report (10)
		Losses at Fifth Report (3)	Benefit On-Level Factor to Prosp. Eff. Period (4)	On-level Losses at Fifth Report = (3) x (4) (5)	Losses at Fifth Report (6)	Benefit On-Level Factor to Prosp. Eff. Period (7)	On-level Losses at Fifth Report = (6) x (7) (8)		
Death	2007	3,926,760	1.032	4,052,416	713,159	1.032	735,980	4,788,396	
Death	2008	38,596	1.024	39,536	278,090	1.024	284,865	324,402	
Death	2009	777,286	1.002	778,623	378,555	1.002	379,206	1,157,829	
Death	2010	63,834	1.000	63,834	203,538	1.000	203,538	267,372	
Death	2011	13,739	1.000	13,739	271,119	1.000	271,119	284,858	
Total Death		4,820,215		4,948,149	1,844,461		1,874,708	6,822,857	0.24%
Permanent Total	2007	12,081,585	1.032	12,468,196	0	1.032	0	12,468,196	
Permanent Total	2008	14,227,715	1.024	14,574,350	0	1.024	0	14,574,350	
Permanent Total	2009	19,483,006	1.002	19,516,515	0	1.002	0	19,516,515	
Permanent Total	2010	32,148,026	1.000	32,148,026	0	1.000	0	32,148,026	
Permanent Total	2011	29,282,596	1.000	29,282,596	0	1.000	0	29,282,596	
Total Permanent Total		107,222,928		107,989,683	0		0	107,989,683	3.82%
Permanent Partial	2007	44,426,211	1.032	45,847,850	44,482,182	1.032	45,905,612	91,753,462	
Permanent Partial	2008	33,587,322	1.024	34,405,622	45,058,485	1.024	46,156,261	80,561,882	
Permanent Partial	2009	37,872,500	1.002	37,937,638	50,764,237	1.002	50,851,547	88,789,185	
Permanent Partial	2010	28,190,867	1.000	28,190,867	51,794,222	1.000	51,794,222	79,985,089	
Permanent Partial	2011	40,688,327	1.000	40,688,327	47,602,882	1.000	47,602,882	88,291,209	
Total Permanent Partial		184,765,227		187,070,303	239,702,008		242,310,524	429,380,827	15.21%
Temporary Total	2007	13,830,995	1.032	14,273,587	50,291,385	1.032	51,900,709	66,174,296	
Temporary Total	2008	14,348,179	1.024	14,697,749	46,279,932	1.024	47,407,466	62,105,215	
Temporary Total	2009	13,192,788	1.002	13,215,478	45,508,272	1.002	45,586,542	58,802,021	
Temporary Total	2010	15,099,908	1.000	15,099,908	48,473,726	1.000	48,473,726	63,573,634	
Temporary Total	2011	16,698,276	1.000	16,698,276	55,273,771	1.000	55,273,771	71,972,047	
Total Temporary Total		73,170,146		73,984,998	245,827,086		248,642,215	322,627,213	11.43%
Medical Only	2007	0	1.032	0	28,902,246	1.032	29,827,118	29,827,118	
Medical Only	2008	0	1.024	0	26,429,229	1.024	27,073,134	27,073,134	
Medical Only	2009	0	1.002	0	23,927,297	1.002	23,968,450	23,968,450	
Medical Only	2010	0	1.000	0	25,521,980	1.000	25,521,980	25,521,980	
Medical Only	2011	0	1.000	0	25,602,177	1.000	25,602,177	25,602,177	
Total Medical Only		0		0	130,382,929		131,992,858	131,992,858	4.67%
(11) Total Medical		369,978,516		373,993,132	617,756,484		624,820,305	998,813,438	35.37%
(12) Total Medical & Indemnity		1,124,885,262		1,179,258,685	1,575,027,072		1,644,593,667	2,823,852,352	
(13) Medical Only fraction of Total Medical									13.21%

- (14) Aggregate Financial Policy Year Call, Medical Fifth to Ultimate Development Factor Paid + Case 1.011
- (15) Tail Development Attributed to Likely to Develop Claims 0.8
- (16) Percentage Likely to Develop 0.374
- (17) Medical Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(14) - 1.0] \times (15) \} / (16)$ 1.024
- (18) Medical Not Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(14) - 1.0] \times [1.0 - (15)] \} / [1.0 - (16)]$ 1.004
- (19) Indemnity Likely Weight at 5th Report 28.52%
- (20) Indemnity Not Likely Weight at 5th Report 36.11%
- (21) Medical Likely Weight at 5th Report 13.24%
- (22) Medical Not Likely Weight at 5th Report 22.13%

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Post-Chapter 398 Injury Type Weights at Ultimate

Injury Type (1)	Policy Year (2)	Indemnity - Likely to Develop			Indemnity - Not Likely to Develop			Indemnity Ult. On-level Losses at Ultimate = (5) + (8) (9)	Weights at Ultimate (10)
		On-level Losses at Fifth Report (3)	Development Factors 5th to Ultimate (4)	Est. Ult On-level Losses = (3) x (4) (5)	On-level Losses at Fifth Report (6)	Development Factors 5th to Ultimate (7)	Est. Ult On-level Losses = (6) x (7) (8)		
Death	2007	2,605,719	1.073	2,796,576	6,771,441	1.014	6,869,354	9,665,930	1.50%
Death	2008	4,419,657	1.073	4,743,377	5,263,226	1.014	5,339,330	10,082,707	
Death	2009	1,418,646	1.073	1,522,555	7,325,024	1.014	7,430,941	8,953,496	
Death	2010	1,898,281	1.073	2,037,321	4,664,447	1.014	4,731,893	6,769,214	
Death	2011	417,404	1.073	447,977	7,561,891	1.014	7,671,233	8,119,211	
Total Death		10,759,706		11,547,807	31,586,029		32,042,751	43,590,558	
Permanent Total	2007	32,419,690	1.073	34,794,288	0	1.014	0	34,794,288	6.65%
Permanent Total	2008	33,514,178	1.073	35,968,942	0	1.014	0	35,968,942	
Permanent Total	2009	37,628,845	1.073	40,384,990	0	1.014	0	40,384,990	
Permanent Total	2010	33,372,636	1.073	35,817,034	0	1.014	0	35,817,034	
Permanent Total	2011	43,290,290	1.073	46,461,111	0	1.014	0	46,461,111	
Total Permanent Total		180,225,639		193,426,366	0		0	193,426,366	
Permanent Partial	2007	107,267,468	1.073	115,124,333	126,469,848	1.014	128,298,553	243,422,886	40.15%
Permanent Partial	2008	92,974,679	1.073	99,784,661	129,963,317	1.014	131,842,537	231,627,198	
Permanent Partial	2009	85,203,872	1.073	91,444,677	126,493,007	1.014	128,322,047	219,766,725	
Permanent Partial	2010	88,630,039	1.073	95,121,795	140,479,569	1.014	142,510,850	237,632,645	
Permanent Partial	2011	93,334,618	1.073	100,170,964	133,229,499	1.014	135,155,946	235,326,910	
Total Permanent Partial		467,410,675		501,646,430	656,635,240		666,129,933	1,167,776,364	
Temporary Total	2007	27,309,925	1.073	29,310,255	63,350,045	1.014	64,266,063	93,576,318	16.98%
Temporary Total	2008	26,454,977	1.073	28,392,686	64,175,897	1.014	65,103,856	93,496,542	
Temporary Total	2009	28,046,766	1.073	30,101,067	59,145,998	1.014	60,001,227	90,102,294	
Temporary Total	2010	31,834,738	1.073	34,166,491	65,420,799	1.014	66,366,759	100,533,250	
Temporary Total	2011	33,223,128	1.073	35,656,575	79,459,352	1.014	80,608,304	116,264,878	
Total Temporary Total		146,869,533		157,627,074	331,552,092		336,346,208	493,973,282	
(11) Total Indemnity		805,265,553		864,247,677	1,019,773,362		1,034,518,893	1,898,766,570	65.28%

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Post-Chapter 398 Injury Type Weights at Ultimate

Injury Type (1)	Policy Year (2)	Medical - Likely to Develop			Medical - Not Likely to Develop			Medical On-level Losses at Ultimate = (5) + (8) (9)	Weights at Ultimate (10)
		On-level Losses at Fifth Report (3)	Development Factors 5th to Ultimate (4)	Est. Ult On-level Losses = (3) x (4) (5)	On-level Losses at Fifth Report (6)	Development Factors 5th to Ultimate (7)	Est. Ult On-level Losses = (6) x (7) (8)		
Death	2007	4,052,416	1.024	4,149,622	735,980	1.004	738,622	4,888,244	
Death	2008	39,536	1.024	40,485	284,865	1.004	285,888	326,372	
Death	2009	778,623	1.024	797,300	379,206	1.004	380,567	1,177,867	
Death	2010	63,834	1.024	65,365	203,538	1.004	204,269	269,634	
Death	2011	13,739	1.024	14,069	271,119	1.004	272,092	286,161	
Total Death		4,948,149		5,066,840	1,874,708		1,881,438	6,948,278	0.24%
Permanent Total	2007	12,468,196	1.024	12,767,272	0	1.004	0	12,767,272	
Permanent Total	2008	14,574,350	1.024	14,923,947	0	1.004	0	14,923,947	
Permanent Total	2009	19,516,515	1.024	19,984,661	0	1.004	0	19,984,661	
Permanent Total	2010	32,148,026	1.024	32,919,165	0	1.004	0	32,919,165	
Permanent Total	2011	29,282,596	1.024	29,985,002	0	1.004	0	29,985,002	
total Permanent Total		107,989,683		110,580,047	0		0	110,580,047	3.80%
Permanent Partial	2007	45,847,850	1.024	46,947,609	45,905,612	1.004	46,070,387	93,017,996	
Permanent Partial	2008	34,405,622	1.024	35,230,914	46,156,261	1.004	46,321,936	81,552,850	
Permanent Partial	2009	37,937,638	1.024	38,847,653	50,851,547	1.004	51,034,076	89,881,729	
Permanent Partial	2010	28,190,867	1.024	28,867,085	51,794,222	1.004	51,980,134	80,847,220	
Permanent Partial	2011	40,688,327	1.024	41,664,324	47,602,882	1.004	47,773,750	89,438,074	
total Permanent Partial		187,070,303		191,557,585	242,310,524		243,180,284	434,737,869	14.95%
Temporary Total	2007	14,273,587	1.024	14,615,969	51,900,709	1.004	52,087,004	66,702,973	
Temporary Total	2008	14,697,749	1.024	15,050,306	47,407,466	1.004	47,577,633	62,627,938	
Temporary Total	2009	13,215,478	1.024	13,532,480	45,586,542	1.004	45,750,173	59,282,653	
Temporary Total	2010	15,099,908	1.024	15,462,112	48,473,726	1.004	48,647,720	64,109,831	
Temporary Total	2011	16,698,276	1.024	17,098,820	55,273,771	1.004	55,472,173	72,570,993	
total Temporary Total		73,984,998		75,759,687	248,642,215		249,534,702	325,294,389	11.18%
Medical Only	2007	0	1.024	0	29,827,118	1.004	29,934,181	29,934,181	
Medical Only	2008	0	1.024	0	27,073,134	1.004	27,170,311	27,170,311	
Medical Only	2009	0	1.024	0	23,968,450	1.004	24,054,483	24,054,483	
Medical Only	2010	0	1.024	0	25,521,980	1.004	25,613,590	25,613,590	
Medical Only	2011	0	1.024	0	25,602,177	1.004	25,694,075	25,694,075	
Total Medical Only		0		0	131,992,858		132,466,639	132,466,639	4.55%
(11) Total Medical		373,993,132		382,964,160	624,820,305		627,063,062	1,010,027,222	34.72%
(12) Total Medical & Indemnity		1,179,258,685		1,247,211,837	1,644,593,667		1,661,581,955	2,908,793,792	
(13) Medical Only fraction of Total Medical									13.12%

Ind & Med N/L Weights at Ult	
Indemnity Likely	29.71%
Indemnity Not Likely	35.57%
Medical Likely	13.17%
Medical Not Likely	21.56%

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USL&HW Benefit Level Factors

All Injury Types

Time Period		Indemnity					Medical	Total
Beginning Period	Ending Period	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types	All Injury Types	All Injury Types
PY 2011	Prosp. Eff. Period	1.033	1.027	1.010	1.027		1.000	
PY 2012	Prosp. Eff. Period	1.027	1.022	1.008	1.022		1.000	
PY 2013	Prosp. Eff. Period	1.023	1.019	1.007	1.019		1.000	
PY 2014	Prosp. Eff. Period	1.019	1.015	1.005	1.015		1.000	
PY 2015	Prosp. Eff. Period	1.015	1.011	1.004	1.011		1.000	
CPY 2014_07	Prosp. Eff. Period							1.004
CPY 2015_07	Prosp. Eff. Period							1.003
CPY 2016_07	Prosp. Eff. Period							1.002
Prior Eff. Period (using benefit level projections from prior filing) Prosp. Eff. Period						1.002	1.000	1.000

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Notes:

All time periods refer to Policy Years.

Example: PY 2015 to Prosp. Eff. Period for Indemnity Permanent Partial = 1.004 = 1.012 / 1.008

where 1.012 is the Index Factor of Prosp. Eff. Period and 1.008 is the Index Factor of PY 2015 for Indemnity Permanent Partial, from Exhibit 2.

USL&HW Benefit Level Changes and Weights

Death											
Benefit Level Change	10/1/2010	10/1/2011	10/1/2012	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	10/1/2018	10/1/2019	Weighted Average Benefit Level
Benefit Level Change	1.000	1.006	1.006	1.003	1.004	1.004	1.004	1.004	1.004	1.004	
Cumulative Benefit Level Change	1.000	1.006	1.012	1.015	1.019	1.023	1.027	1.031	1.036	1.040	
Time Period											
PY 2011	0.376	0.616	0.008								1.004
PY 2012		0.338	0.650	0.013							1.010
PY 2013			0.364	0.620	0.016						1.014
PY 2014				0.377	0.614	0.009					1.018
PY 2015					0.353	0.641	0.006				1.022
CPY 2014_07				0.008	0.472	0.521					1.021
CPY 2015_07					0.025	0.497	0.478				1.025
CPY 2016_07						0.025	0.497	0.478			1.029
Prior Eff. Period						0.025	0.497	0.478			1.029
Prosp. Eff. Period							0.025	0.496	0.479		1.037

Indemnity All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2016 (using benefit level projections from prior filing).

Date of Change	10/1/2010	10/1/2011	10/1/2012	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	Weighted Average Benefit Level
Benefit Level Change	1.000	1.003	1.003	1.002	1.003	1.003	1.003	1.003	
Cumulative Level Change	1.000	1.003	1.006	1.008	1.011	1.014	1.017	1.020	1.019

Medical All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2016 (using benefit level projections from prior filing).

Date of Change	10/1/2010	10/1/2011	10/1/2012	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	Weighted Average Benefit Level
Benefit Level Change	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Cumulative Level Change	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2016 (using benefit level projections from prior filing).

Date of Change	10/1/2010	10/1/2011	10/1/2012	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	Weighted Average Benefit Level
Benefit Level Change	1.000	1.001	1.002	1.001	1.002	1.002	1.002	1.002	
Cumulative Level Change	1.000	1.001	1.003	1.004	1.006	1.008	1.010	1.012	1.011

Index Factors for All Injury Types

Time Period	Indemnity					Medical	Total
	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types	All Injury Types	All Injury Types
PY 2011	1.004	1.003	1.001	1.003	1.002	1.000	1.001
PY 2012	1.010	1.008	1.003	1.008	1.005	1.000	1.002
PY 2013	1.014	1.011	1.005	1.011	1.007	1.000	1.004
PY 2014	1.018	1.015	1.006	1.015	1.010	1.000	1.005
PY 2015	1.022	1.018	1.008	1.018	1.012	1.000	1.007
CPY 2014_07	1.021	1.018	1.008	1.018	1.012	1.000	1.007
CPY 2015_07	1.025	1.021	1.008	1.021	1.014	1.000	1.007
CPY 2016_07	1.029	1.024	1.009	1.024	1.016	1.000	1.008
Prior Eff. Period	1.029	1.024	1.009	1.024	1.016	1.000	1.008
Prosp. Eff. Period	1.037	1.030	1.012	1.030	1.020	1.000	1.011

Notes:

All time periods refer to Policy Years.

Index Factors for All Injury Types is an Excel Data Table that repeats the calculation of the Weighted Average Benefit Level for all Injury Types.

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Section IV - Benefit Change Adjustments
 Subsection F - Effects of USL&HW Benefit Changes
 7/1/2018

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 Exhibit 3

USL&HW Historical and Estimated Benefit Level Changes

Effective Date (1)	Indemnity					Medical	Total
	Death (2)	Permanent Total (3)	Permanent Partial (4)	Temporary Total (5)	All Injury Types (6)	All Injury Types (7)	All Injury Types (8)
10/1/2010	0.2%	0.2%	0.0%	0.2%	0.1%	0.0%	0.0%
10/1/2011	0.6%	0.5%	0.2%	0.5%	0.3%	0.0%	0.1%
10/1/2012	0.6%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2013	0.3%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%
10/1/2014	0.4%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2015	0.4%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%
10/1/2016	0.4%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%
10/1/2017	0.4%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%
10/1/2018	0.4%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%
10/1/2019	0.4%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%

Notes:

Values prior to 10/1/2016 are from NCCI's Annual Statistical Bulletin, 2017 Edition, Exhibit 3.

Values for 10/1/2016 are from NCCI CT-2017-04, Appendix C-IV.

Changes for 10/1/2017 - 10/1/2019 are assumed to be the same as 10/1/2016.

NET TREND**The Role of Trend**

The rate level indication in this filing is based on recent historical Massachusetts premium and loss data. Since the filing develops rates for a future period (beginning with policies issued July 1, 2018), basic principles of ratemaking require that historical losses and premiums be adjusted to the levels expected during the prospective rate period. The trend factors used represent the expected change from the experience period (in this filing, policy years 2014 and 2015) to July 1, 2019, the midpoint of the policy period for which rates are being set. The trend factors reflect expected movements in the frequency of claims, the average cost of claims (also called “severity”), and payroll levels (which drive the amount of premium collected). Trend factors exclude certain other changes over time such as statutorily-mandated changes in benefits and on-level factors for historical rate changes, which are considered elsewhere in the filing.

WCRIBMA Recommendation

The composite trend factor developed in this section is expressed as a “net” trend, meaning that it incorporates the combined effects on loss ratios of claim frequency movements, claim severity movements, and wage inflation – which may offset one another. Net trends are developed in this section separately for indemnity losses and medical losses (including medical only claims and medical on lost-time claims). Based on the methodology documented in this section, the WCRIBMA has used net trend factors of -2.6% per year for indemnity losses, and

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-2.9% per year for medical losses.¹ The indicated trend factors and their key components are summarized in Section V-A Exhibit 1.

Indemnity Net Trend	-2.6%
Medical Net Trend	-2.9%

We are projecting that average claim costs for workers' compensation will continue to rise, as they have in recent years in both Massachusetts and elsewhere, at annual rates of 2.1% and 2.2% for indemnity and lost-time medical benefits, respectively and 1.9% for medical-only benefits. We are projecting downward movement in claim frequency per worker week, at a pace of 2.0% annually for lost-time indemnity and medical claims and 4.8% for medical-only claims. Finally, we are projecting an increase of 2.7% annually in average wages.

Trend	Indemnity	Lost-time Medical	Medical Only
Severity	2.1%	2.2%	1.9%
Frequency	-2.0%	-2.0%	-4.8%
SAWW	2.7%		
Net	-2.6%	-2.9%	

The annual net trends used in this filing reflect our expectations about the extent to which growth in the average cost of claims will be offset by declining claim frequencies and by the growth of premium that results from wage inflation.

General Methodology

The WCRIBMA has separately calculated claim severity trends (for indemnity benefits, for medical on lost-time claims, and for medical only claims);

¹ Based on NCCI's latest pending and approved filings as of December 1, 2017, with respect to medical net trend, twenty-five NCCI states filed higher medical trends than the WCRIBMA is proposing in this filing. With respect to indemnity net trend, twelve NCCI states filed higher indemnity trends than the WCRIBMA is proposing in this filing.

claim frequency trends (for lost-time claims and for medical only claims); and average weekly wage trends.²

The WCRIBMA recommends that the calculation of trend factors be based on movements in the underlying factors of claim severity, claim frequency, and wages – rather than fitting time trends to loss ratios themselves. Given the differences in the behavior of claim severity, claim frequency and wage trends, we are confident that analyzing them separately provides better insights into the drivers of net trend.

For each component (claim severity, frequency, and wage trend), our primary method of measuring trends is an exponential least squares regression fit to the historical Massachusetts Unit Statistical Plan Data. We performed regressions using data series of varying lengths, spanning from five to ten policy years, all ending with Policy Year 2015.³ A summary of the results is shown in the attached exhibits. The results of each of these regressions indicate an annual rate of change. Next, we tested the credibility of each of these indicated trends on the basis of the consistency between the historical data and the fitted exponential curves. Using a methodology from the actuarial literature,⁴ we assigned higher credibility to the indicated trend if the trend line more closely fit the data, and a

² The Commissioner noted in her 2003 Decision that SRB's witness, Ms. Mays, testified that it is appropriate to review historical changes in payroll, frequency and claim severity separately, rather than base a trend on the ratio of losses to premium.

³ In the 2012 rate filing, the WCRIBMA utilized a single regression for each component of net trend. In the 2014 rate filing, the WCRIBMA introduced an expanded number of regressions from one to six for each component of net trend to address concerns about distortions in the claim data resulting from the Great Recession and the ensuing recovery. By averaging results from six regressions using data series of varying lengths, the WCRIBMA reduces the risk of giving undue weight to uncharacteristic results.

⁴ Venter, Gary, "Classical Partial Credibility with Application to Trend," *PCAS LXXIII* (the "Venter Paper") (1986) pp. 27-51.

lower credibility if the data displayed wide departures from the fitted trend line. Third, to the extent that this credibility test suggested that the indicated trend from the historical data sets should be given less than 100% weight, we complemented the Massachusetts indication with an indicated trend from a larger database. In the case of claim severity trends, we looked to national trends in workers' compensation claim severities to provide the complementary trend indication. In the case of claim frequency trends and average weekly wage trends, we looked to longer term (15 year) Massachusetts trends to provide the complementary trend indications. For each of the components of claim severity trend detailed above, the process generates six trend estimates, one each for the 5, 6, 7, 8, 9, and 10 year data series underlying the Massachusetts indicated trends. We then selected the average of these six trend indications for each component of claim severity trend. The various results of our calculations and the selections we have made are summarized in Exhibits 1 through 3 of Section V-A for claim severity, claim frequency, and average weekly wage, respectively.

Section V-A – Net Trend Calculation

Section V-A documents the calculation of the separate trends for claim severity, claim frequency, and average weekly wage.

Exhibit 1 in this section summarizes and combines all of the trend components, beginning with the indicated trend based on the historical Massachusetts data (Row (1)), applying the credibility parameter to each based on how well the indicated trend fits the underlying data (Row (10), Exhibits 2 and

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3), and applying the complement of the credibility to the trend indications that are based on broader or longer data series (Row (2)). The claim severity trend and the claim frequency trend are then combined to produce total loss trends (Row (8)). The medical trends for lost-time claims and medical only claims are weighted together, based on the relative volume of claim dollars by type of claim, to produce an overall medical loss trend. Finally, the loss trends for indemnity and medical losses are offset by the credibility-weighted average weekly wage trend to produce the total net annual trend.

Exhibits 2 and 3 of Section V-A document the calculation of the severity trends, frequency trends, and average weekly wage trends. In each of these exhibits, the first step is to calculate the exponential fits to the historical Massachusetts data, using data series of varying lengths, spanning from five to ten policy years, all ending with Policy Year 2015. The exponential method yields fitted values for each year in the data series and also an indicated annual rate of change in the data series. The exponential fits here and elsewhere in this section were calculated using a standard function within Microsoft Excel.

Next, these exhibits document the calculation of the credibility associated with each of the fitted annual trends. This calculation uses a procedure described in the Venter Paper, which requires that the parameters of a confidence interval be chosen. Based on the Venter Paper, actuarial judgment, and sensitivity testing, we defined the confidence interval to achieve at least a 90% probability that the trend observed in the future will be within 6% of the projected trend in this filing. Selecting a higher required degree of confidence (probability) or a lower tolerance

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for error would reduce the amount of credibility assigned to the trend estimates derived from the historical Massachusetts data, while a lower required degree of confidence (probability) or higher tolerance for error would increase the credibility assigned to indications derived from the latest historical Massachusetts data.

The specific steps and calculations that implement Venter's procedure to calculate the credibility assigned to the historical Massachusetts trend (Row (1)) are detailed in Exhibits 2 and 3 of Section V-A, in Rows numbered (3) through (11). Row (2), denoted "n," is the number of years, data points, used in the exponential fitting of the historical data. Row (3), denoted "s," quantifies the goodness of fit of the exponential curve to the "n" years of Massachusetts data. $S = \text{SQRT} (\text{SSR} / (n-2))$, where SSR is the sum of the squared differences between the observed and fitted points over the years of Massachusetts data analyzed, and n-2 is an adjustment for degrees of freedom. Row (4), denoted "t," is the 95th percentile of the t-distribution with n-2 degrees of freedom. We use the 95th percentile one-sided distribution to correspond to the selected 90% probability of being within a specified tolerance in either direction. Row (6) implements the formula that Venter provides for a component element of the standard deviation of the projected point, given the distance into the future that we are projecting, and Row (7) then calculates the confidence interval for the projection. The confidence interval incorporates both the uncertainty about the parameters of the trend line and the potential variability of the actual future point from its expected value on the line. Row (9) expresses this confidence interval as a percentage of the projected value of frequency, severity, or average weekly wage, which is calculated in Row (8). If

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Row (9) is less than the selected error tolerance (i.e., 6% in this filing), then there is at least 90% probability that the actual value is within 6% of the fitted value, and the credibility procedure assigns 100% to the indicated historical Massachusetts trend. If the ratio in Row (9) is greater than the selected error tolerance, then the credibility assigned to the historical Massachusetts trend must be less than 100%. Specifically, the credibility is calculated in Row (10) as the ratio of the selected error tolerance divided by the calculated confidence interval.

To the extent that the credibility assigned to each of the fitted trends based on the historical Massachusetts data is less than 100%, the balance of the credibility is assigned to a longer-term Massachusetts trend (for frequency and average weekly wage) or countrywide trend (for claim severity). The calculations of the annual trend rates from these complementary data series are documented at the foot of Section V-A, Exhibit 2 (severity), Section V-B (frequency) and Section V-G, Exhibit 2 (average weekly wage), and use the same exponential fit function within Microsoft Excel.

The complementary data set to be given weight when the historical Massachusetts indications are not fully credible provides a trend indication for a particular component (severity, frequency, average weekly wage) that would be reasonable to use if we had no recent local data. For severity, the WCRIBMA expects that trends will tend to vary more over time than across state lines. Thus, it is our expectation that severity trends recently observed in other states will provide useful information about severity trends to be expected in Massachusetts. The actual level of claim costs is likely to vary by state (depending on benefit levels,

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demographics, industry mix, and social factors), but we would expect that the average trend across a broad mix of states creates a reasonable basis for a baseline expectation of Massachusetts severity trends. Consequently, we have selected a multi-state severity trend as the complement of credibility for Massachusetts severity trends. The multi-state severities are shown at the foot of Section V-A Exhibit 2 and supporting information is provided in Section V-G.

For claim frequency and average weekly wages, it is our expectation that Massachusetts trends observed in the short term will tend to revert to long term Massachusetts averages, and that these long-term Massachusetts averages would thus represent a reasonable expectation of future trends in the absence of recent observations. Consequently, we have selected a long-term Massachusetts trend as the complement of credibility for the historical Massachusetts frequency and average weekly wage trends. We then selected fifteen years of data to calculate the long-term Massachusetts trends.

Finally, Section V-A Exhibits 2 and 3 Row (12) calculate the credibility-weighted annual trend, which is:

Credibility-weighted annual trend =

[Z] x [indicated annual trend based on historical n-years of Massachusetts data]

+ [1.0 minus Z] x [indicated annual trend based on complementary data],

Where Z = credibility

These various components of the final net trend calculation are shown graphically on Exhibits 4 through 5 of Section V-A and are brought forward to Exhibit 1.

Data Used in the WCRIBMA Trend Analysis

For the trend analysis, the WCRIBMA has continued to use Unit Statistical Plan Data. The WCRIBMA selected this data source because it provides detailed, matching payroll, claim count, and claim dollar data that can be used to calculate historical claim frequencies and claim severities. Unit Statistical Plan Data are reported on a policy-by-policy basis and in individual claim detail (except for the smallest claims, which previously could be reported in a batch for an individual employer and policy period).

Unit Statistical Plan Data are available for policies written through December 2015. As in the filings beginning with 2010 Filing, the Unit Statistical Plan Data used in this trend analysis have been compiled on a “policy year” basis. Policy year 2015, for example, includes all policies with inception dates between January 1, 2015 and December 31, 2015. For policy year 2015, the average policy inception date is assumed to be July 1, 2015 and the average accident date is assumed to be January 1, 2016.

Unit Statistical Plan Data include coding that designates the “injury type” of a claim (i.e., fatal, permanent total, permanent partial, temporary total, medical only). We have used separate data for lost-time claims and medical only claims as the starting point for our analysis because the medical only claims are quite

numerous but small in average severity, and thus could mask important trends if combined with the lost-time claims. The Unit Statistical Plan Data also report medical loss dollars separately from indemnity loss dollars, and we have preserved this separation in the data we used in our analysis.

The Unit Statistical Plan Data for a particular policy are first reported to the WCRIBMA eighteen months after policy inception (i.e., six months after a twelve month policy expires). Subsequent experience on each policy is reported at successive twelve month intervals, 30, 42, 54, 66, 78, 90, 102, 114, and 126 months after policy inception.⁵ These successive reports are compiled in order to evaluate each policy year at various maturities. This in turn enables us to aggregate loss development histories that allow us to develop the most recent, least mature policy years to the same tenth-report maturity as the older, more mature policy years.

Unit Statistical Plan Data have been compiled out to tenth report for each of the years included in the analysis. For purposes of the trend analysis, we have used each of the policy years developed to tenth report. While it is possible to use other data sources to derive development factors from tenth report to ultimate, the same (or very similar) tenth-to-ultimate development factors would likely apply to all policy years, and thus would not produce a different trend indication. Consequently, in the interest of not adding unnecessary complexity to the filing, we opted to use the data for all policy years at tenth report.

⁵ The Unit Statistical Plan Data reporting timeline thus differs from some other policy year data in which all policies are reported at a common calendar date, such as December 31.

Overview of Sections V-B – V-D

Section V-B documents the calculation of historical claim counts developed to tenth report, which are used in the calculation of claim frequencies and average claim severities. Section V-C and Section V-D document the calculation of historical loss dollars for indemnity and medical, respectively, developed to tenth report and adjusted to current benefit levels; the resulting on-level developed losses are used in the calculation of average claim severities.

These sections use standard loss development techniques to develop the claim counts and losses to a tenth-report basis. We have developed indemnity losses separately from medical, and medical only losses separately from lost-time medical.

Consistent with the 2012 Rate Decision and the methodology used to calculate the loss development factors in Section II - Loss Development used to determine the overall indication, the AIG data are evaluated separately from the remainder of the industry data for purposes of estimating losses to tenth report. The selected age-to-age development factors for the remainder of the industry are the unweighted averages of the latest two indicated age-to-age link ratios and the selected age-to-age development factors for AIG are the unweighted averages of the latest five indicated age-to-age link ratios. The resulting estimates of losses at tenth report for AIG and the remainder of the industry are then summed before on-leveling and calculating severities.

For purposes of the trend calculations, we have developed the claim counts and loss dollars to tenth report, since the Unit Statistical Plan Data provides information as far as a tenth report.

After the losses and claim counts are developed to tenth report, as described above, Sections V-B, V-C and V-D of the filing calculate the historical year-by-year average claim severities and claim frequencies that are used in the calculation of the indicated Massachusetts loss trends in Section V-A.

Section V-B – Massachusetts Claim Frequency

The historical claim frequencies derived in Section V-B for each year are the ratio of:

- (a) the reported claim counts as of the most recent Unit Statistical Plan Data compilation, developed to tenth report, and adjusted to the current mix of Massachusetts payrolls by employment classification, divided by
- (b) estimated worker weeks underlying the Unit Statistical Plan Data (described below in Section V-E).

For purposes of the trend calculations, we calculate claim frequencies separately for lost-time claims and for medical only claims.

The adjustment to the current mix of Massachusetts payrolls by employment classification is intended to remove any trend in claim frequency that is attributable to historical shifts in the mix of employment in Massachusetts. We make this adjustment because our objective is to estimate the level of premiums that would be adequate for the *current* mix of classes, not the historical mix of classes. Any future shifts in the mix of employment would be adjusted for

automatically in the premium base because these shifts would move payroll to differently-rated classifications. Details of the class mix adjustment calculations are provided in Section V-F.

Section V-B also displays the indicated claim frequency trend based on the exponential fit to fifteen years of Massachusetts data, calculated using the claim frequencies as shown, and the standard function in Microsoft Excel. This long term claim frequency trend is used as the complement of credibility in Section V-A.

Sections V-C and V-D – Massachusetts Average Claim Severities

The historical average claim severities derived in Section V-C and Section V-D for each year are simply the ratio of: reported losses as of the most recent Unit Statistical Plan Data compilation, developed to tenth report, and adjusted to current benefit levels, divided by

- (a) reported claim counts as of the most recent Unit Statistical Plan Data compilation, developed to tenth report.

The reported Unit Statistical Plan Data reflect the statutory benefit provisions that applied to each individual claim. Thus, claims from the 2006 policy year were handled and reported based on the benefits in effect at that time. Similarly, claims from the 2015 policy year were handled and reported based on the benefits in effect at that time. The changes in statutory benefits over time would contribute to a trend in the average claim severity data. However, the statutory benefit changes are specifically addressed in another section of the filing and their impact should not be reflected here. Therefore, before the Unit Statistical

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Plan Data are used in our trend analysis, the losses are all adjusted to a common benefit level. In Sections V-C and V-D the developed loss dollars are placed “on-level” to the current Massachusetts benefit levels. By placing all of the loss data on current benefit level, we avoid a distortion in the trend analysis.

The resulting Massachusetts historical average claim severities in the final columns of Sections V-C and V-D are carried forward to Section V-A for use in calculating the historical fitted Massachusetts trends.

Section V-E – Payroll Development and Worker-Weeks

Section V-E documents the estimation of worker weeks, which is used as the denominator of the claim frequency calculation in Section V-B, as described above.

In summary, worker weeks for a particular time period are estimated by dividing total covered payroll for that period by the statewide average weekly wage corresponding to that same period. More specifically, the historical worker weeks estimated in Section V-E for each policy year are derived as the ratio of: the reported payroll as of the most recent Unit Statistical Plan Data compilation, developed to tenth report, divided by the state average weekly wage corresponding to the same period.⁶

As with claim counts and frequency, we have consistently developed the payrolls to tenth report.

⁶ In response to the 2012 Decision, we have used the actual values for the state average weekly wage in the corresponding periods, as opposed to utilizing a smoothed value.

The state average weekly wage is based on Massachusetts wage data compiled by the Department of Unemployment Assistance (DUA). Although it is not compiled for workers' compensation purposes and is defined in a slightly different way than payrolls used in workers' compensation calculations, the overall movement over time in this series is reasonably representative of the overall movement to be expected in the average wages used to calculate workers' compensation premiums. The underlying Massachusetts average wage series is documented in Section V-G, Exhibit 2.

Section V-F – Adjustment Factor for Class Mix

Section V-F documents the quantification of the estimated effect of a shifting mix of payrolls by classification over time. This effect is estimated by examining the proportion of payrolls that are in high-rated classifications versus low-rated classifications; specifically by calculating a weighted average of the current average rates, weighted by each year's payrolls by classification. For example, using the 2015 distribution of payrolls by classification, the weighted average of the current rates is \$0.978, while using the 2001 distribution of payrolls by classification against the same current rates produces an average rate of \$1.102. Since the average rate in each classification is based on the workers' compensation claims experience within that classification, this movement in average rates indicates that the insured employment mix in Massachusetts has shifted towards less hazardous occupations. The claim trends caused by this shift should not be included in the trend factors because other sections of the filing

(specifically the classification rate section) incorporate an explicit distribution of payrolls. Any further movement in the insured employment mix towards less hazardous occupations will automatically produce premium reductions by means of the lower rates that apply to those less hazardous occupations.

While the class mix change may affect the average severity of claims as well as the frequency of claims, we have made the assumption that all of the effect is related to claim frequency, and we have applied the class mix adjustment to the claim frequency series developed in Section V-B.

Section V-G – External Data

Section V-G Exhibit 1 displays details underlying the countrywide severity data used to develop the complementary average claim severity trends.

Section V-G Exhibit 2 displays the Massachusetts average weekly wage data used in our analysis.

Section V-H – Expense Trends

Section V-H displays fixed expenses trended over two separate time periods. Fixed expenses are first trended from the historical periods for which they are reported to the periods on which the rate indication is based. Next, fixed expenses are trended forward to the period for which the rates are being set. For the first trend period, reported external index values (such as the CPI) are available that span the time period over which the WCRIBMA is trending. Consequently, the first trend factor is taken as a ratio of index values for the corresponding time

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periods, Section V-H, Exhibit 1. We projected values for the proposed effective period of the rates since comparable Index values are not yet available. The WCRIBMA used an exponential least squares regression to project expense trends into the future.

The trends in the individual components of insurance company expenses have been estimated by using government indices that reflect changes in the prices of the goods and services used in operating an insurance company.

Specifically, the selected indices are:

Expense	Index
Average Weekly Earnings ⁷	Average Weekly Earnings of Massachusetts Private Fire, Marine, and Casualty Insurance Employees. This series is provided on an annual basis.
Food Away From Home	Consumer Price Index for Food Away from Home
Private Transportation	Consumer Price Index for Private Transportation
Telephone Services	Consumer Price Index for Telephone
Postage	Consumer Price Index for Postage
Office and Store Machines and Equipment	Producer Price Index for Office and Store Machines and Equipment
Paper	Producer Price Index for Paper

First, we calculate the year-to-year changes in each of the component economic indices. We then calculate the yearly weighted averages of the percentage changes in the economic indices, using the weights shown in Section V-H, Exhibit 2, Page 3 for calendar year 2015, Exhibit 3, Page 4 for calendar year 2016, and weights from prior filings for all other years to derive the overall average

⁷ The WCRIBMA believes using the Average Weekly Earnings of Massachusetts Private Fire, Marine, and Casualty Insurance Employees in estimating expense trends is preferable to using SAWW because it more accurately reflects insurers' expenses, as opposed to payroll trends in the market as a whole.

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percentage change in costs. The weights attributed to the various components of insurance company expenses for the workers' compensation line are based on the experience of the "Commercial Casualty" line as compiled in Best's Aggregates and Averages. These are then accumulated into indices that are normalized to a value of 100 with Calendar Year 2016 serving as the base, for the calculation of expense trend. Premium taxes, which are not incorporated in the expenses to which the expense trends and projection factors apply, are excluded from the determination of the component weights.

Trend Summary

		Indemnity		Medical				SAWW
		Severity	Frequency	Lost-Time Medical		Medical Only		
				Severity	Frequency	Severity	Frequency	
(1)	Massachusetts Trend	2.9%	-1.9%	2.7%	-1.9%	1.9%	-4.9%	2.7%
	5 Year	3.2%	-2.3%	1.9%	-2.3%	2.1%	-5.4%	3.2%
	6 Year	3.5%	-2.5%	2.9%	-2.5%	2.3%	-5.5%	2.8%
	7 Year	2.7%	-1.8%	2.4%	-1.8%	2.1%	-4.9%	2.7%
	8 Year	2.5%	-1.5%	3.4%	-1.5%	1.6%	-4.6%	2.8%
	9 Year	2.6%	-1.6%	3.1%	-1.6%	1.5%	-4.7%	2.6%
	10 Year	2.5%	-1.6%	2.7%	-1.6%	1.5%	-4.5%	2.4%
(2)	Complement of Credibility	-0.2%	-2.3%	1.6%	-2.3%	3.6%	-4.3%	2.8%
(3)	Credibility Weighted Trend	2.1%	-2.0%	2.2%	-2.0%	1.9%	-4.8%	2.7%
	5 Year	1.6%	-2.3%	1.7%	-2.3%	2.4%	-5.3%	3.2%
	6 Year	2.6%	-2.5%	2.1%	-2.5%	2.3%	-5.5%	2.8%
	7 Year	1.6%	-2.0%	2.0%	-2.0%	2.1%	-4.7%	2.7%
	8 Year	1.9%	-1.7%	2.5%	-1.7%	1.6%	-4.5%	2.8%
	9 Year	2.3%	-1.8%	2.5%	-1.8%	1.5%	-4.5%	2.6%
	10 Year	2.5%	-1.7%	2.2%	-1.7%	1.5%	-4.5%	2.4%
(4)	Selected Trend	2.1%	-2.0%	2.2%	-2.0%	1.9%	-4.8%	2.7%

	Lost-Time Medical	Medical Only
(5) Medical Loss Trend	0.1%	-3.0%
(6) Fraction of Total Medical	86.9%	13.1%
(7) Total Medical Loss Trend	-0.3%	

	Indemnity	Medical
(8) Total Loss Trend	0.0%	-0.3%
(9) SAWW Trend	2.7%	2.7%
(10) Total Net Trend	-2.6%	-2.9%

Notes:

(1),(2),(3): Section V, Exhibit 2 Severity; Exhibit 3 Frequency and SAWW.

(4) = Selected Trend

(5) = [(1.0 + Credibility Weighted Severity Trend) x (1.0 + Credibility Weighted Frequency Trend)] - 1.0

(6) Medical Only = Medical Only Fraction of Total Medical from Section IV-E, Exhibit 2

Lost Time Medical = 1.0 - Medical Only

(7) = Weighted Average of (5) using (6) as weights

(8): Indemnity = (1.0 + Credibility Weighted Severity Trend) x (1.0 + Credibility Weighted Frequency Trend) - 1.0

Medical = Row (7)

(9): (4) for SAWW.

(10) = { [1.0 + (8)] / [1.0 + (9)] } - 1.0

Medical Only Severity Trend Calculation

Policy Year	Massachusetts Medical Only Severity	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
2006	767											775	66
2007	803									791	148	787	251
2008	823							796	704	802	418	799	551
2009	803					794	74	809	41	814	127	812	79
2010	799			805	30	811	127	822	518	826	694	824	608
2011	819	828	85	824	22	828	78	835	276	838	357	837	321
2012	853	845	52	843	103	845	59	849	14	850	8	850	9
2013	880	863	265	862	305	863	284	863	284	862	300	863	283
2014	865	881	256	882	275	881	235	877	126	875	87	876	112
2015	902	900	4	903	0	899	8	891	125	888	212	890	156
(1)	Massachusetts Trend		2.1%		2.3%		2.1%		1.6%		1.5%		1.5%
(2)	n		5		6		7		8		9		10
(3)	s		14.86		13.56		13.16		18.65		18.32		17.45
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.49		6.00		6.49		7.00		7.50		8.00
(6)	$[1 + 1/n + 12 \times m^2/(n^3-n)]^{.5}$		2.05		1.80		1.63		1.51		1.43		1.37
(7)	Confidence Interval		71.83		51.90		43.14		54.86		49.68		44.44
(8)	Projected Value Prospective Period		968.08		977.87		966.91		942.43		933.45		938.58
(9)	CI/Projected Severity		0.07		0.05		0.04		0.06		0.05		0.05
(10)	Credibility - MA Trend (Z)		81%		100%		100%		100%		100%		100%
				NCCI Annual Statistical Bulletin		CW Medical Only Severity							
						MO Medical Severity	On-Level Factors	On-Level MO Medical Severity					
						2013	0.997	1,125					
						2014	1.008	1,180					
						2015	1.009	1,207					
						2016	1.012	1,249					
						2017	1.014	1,301					
(11)	Complement of Credibility						3.6%						
(12)	Credibility Weighted Severity Trend		2.4%		2.3%		2.1%		1.6%		1.5%		1.5%

- Notes:
- (1): Massachusetts Trend from exponential fit to Severities.
 - (2): Number of data points used in the exponential fitting of the severities.
 - (3): $\sqrt{SSR/(n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
 - (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
 - (5): Number of years between midpoint of data and projected point.
 - (7) = (3) x (4) x (6)
 - (8): Severity projected to policy effective period using exponential fit to data.
 - (9) = (7) / (8)
 - (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
 - (11): Complement of credibility is based on a countrywide data for severities.
 - (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

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Lost Time Frequency Trend Calculation

Policy Year	Adjusted Claim Frequency	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
2006	199.56											200	0
2007	199.22											196	8
2008	187.97									197	7	193	28
2009	184.22					191	52	189	24	193	29	190	35
2010	194.26			193	2	188	39	186	62	190	35	187	52
2011	187.56	187	0	188	0	185	8	184	16	187	51	184	12
2012	181.39	183	2	183	4	181	0	181	0	184	12	181	0
2013	178.40	178	0	179	0	178	0	178	0	181	0	178	0
2014	176.17	174	4	174	4	175	1	176	0	178	0	175	1
2015	169.16	170	1	170	0	172	8	173	15	175	1	172	11
(1)	Massachusetts Trend		-2.3%		-2.5%		-1.8%		-1.5%		-1.6%		-1.6%
(2)	n		5		6		7		8		9		10
(3)	s		1.49		1.59		4.65		4.72		4.58		4.28
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.49		6.00		6.49		7.00		7.50		8.00
(6)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$		2.05		1.80		1.63		1.51		1.43		1.37
(7)	Confidence Interval		7.20		6.10		15.24		13.89		12.41		10.90
(8)	Projected Value Prospective Period		156.75		155.21		161.51		164.21		162.81		162.86
(9)	CI/Projected Frequency		0.05		0.04		0.09		0.08		0.08		0.07
(10)	Credibility - MA Trend (Z)		100%		100%		64%		71%		79%		90%
(11)	Complement of Credibility		-2.3%		-2.3%		-2.3%		-2.3%		-2.3%		-2.3%
(12)	Credibility Weighted Frequency Trend		-2.3%		-2.5%		-2.0%		-1.7%		-1.8%		-1.7%

Notes:

- (1): Massachusetts Trend from exponential fit to Adjusted Claim Frequencies
- (2): Number of data points used in the exponential fitting of the adjusted claim frequencies.
- (3): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
- (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
- (5): Number of years between midpoint of data and projected point.
- (7) = (3) x (4) x (6)
- (8): Frequency projected to policy effective period using exponential fit to data.
- (9) = (7) / (8)
- (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
- (11): Complement of credibility is based on a fifteen-year exponential fit to Adjusted Claim Frequencies.
- (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

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Medical Only Frequency Trend Calculation

Policy Year	Adjusted MedOnly Claim Frequency	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
2006	477.11											486	74
2007	469.95									467	6	464	38
2008	433.84							445	115	446	141	443	81
2009	416.77					430	176	424	53	425	67	423	37
2010	418.78			417	2	409	99	405	202	405	185	404	226
2011	396.13	393	8	394	3	389	56	386	104	386	97	386	112
2012	367.06	372	24	373	30	369	6	368	1	368	2	368	1
2013	352.35	352	0	352	0	351	1	351	1	351	1	352	1
2014	335.26	333	7	332	8	334	2	335	0	335	0	336	0
2015	313.41	315	1	314	0	317	16	320	39	319	34	320	50
(1)	Massachusetts Trend		-5.4%		-5.5%		-4.9%		-4.6%		-4.7%		-4.5%
(2)	n		5		6		7		8		9		10
(3)	s		3.67		3.29		8.44		9.27		8.73		8.80
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.49		6.00		6.49		7.00		7.50		8.00
(6)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$		2.05		1.80		1.63		1.51		1.43		1.37
(7)	Confidence Interval		17.73		12.60		27.69		27.26		23.66		22.42
(8)	Projected Value Prospective Period		258.69		257.54		265.96		271.13		270.19		272.70
(9)	CI/Projected Frequency		0.07		0.05		0.10		0.10		0.09		0.08
(10)	Credibility - MA Trend (Z)		88%		100%		58%		60%		69%		73%
(11)	Complement of Credibility		-4.3%		-4.3%		-4.3%		-4.3%		-4.3%		-4.3%
(12)	Credibility Weighted Frequency Trend		-5.3%		-5.5%		-4.7%		-4.5%		-4.5%		-4.5%

Notes:

- (1): Massachusetts Trend from exponential fit to Adjusted Claim Frequencies
- (2): Number of data points used in the exponential fitting of the adjusted claim frequencies.
- (3): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
- (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
- (5): Number of years between midpoint of data and projected point.
- (7) = (3) x (4) x (6)
- (8): Frequency projected to policy effective period using exponential fit to data.
- (9) = (7) / (8)
- (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
- (11): Complement of credibility is based on a fifteen-year exponential fit to Adjusted Claim Frequencies.
- (12) = [(1) x (10)] + [(11) x [1.0 - (10)]]

V 000024

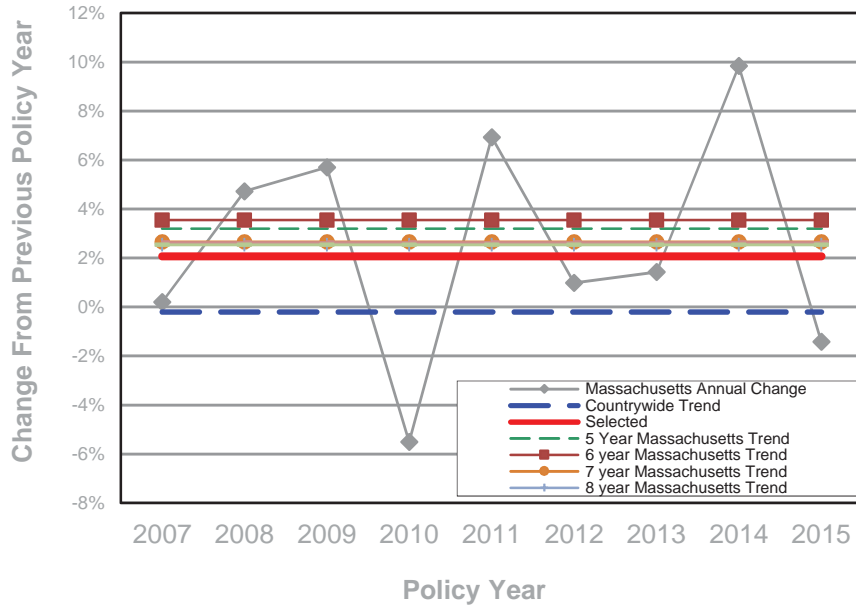
Statewide Average Weekly Wage Trend Calculation

Data Period	Statewide Average Weekly Wage	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
4/1/07 to 4/1/08	1,093.27											1,064.25	842.18
4/1/08 to 4/1/09	1,094.70											1,089.74	24.59
4/1/09 to 4/1/10	1,088.06											1,115.84	771.92
4/1/10 to 4/1/11	1,135.82											1,142.57	45.58
4/1/11 to 4/1/12	1,173.06											1,163.83	9.74
4/1/12 to 4/1/13	1,181.28	1,179.71	2.45	1,158.96	198.77	1,161.97	123.06	1,158.36	216.04	1,163.83	85.11	1,169.94	1,197.96
4/1/13 to 4/1/14	1,214.99	1,216.92	3.71	1,224.30	86.61	1,225.57	111.83	1,224.30	86.61	1,225.74	115.56	1,226.66	136.10
4/1/14 to 4/1/15	1,256.47	1,255.29	1.39	1,258.33	3.47	1,258.66	4.79	1,258.66	4.79	1,257.92	2.09	1,256.04	0.19
4/1/15 to 4/1/16	1,291.74	1,294.88	9.85	1,293.31	2.48	1,292.64	0.82	1,293.98	5.04	1,290.94	0.64	1,286.12	31.55
4/1/16 to 4/1/17	1,338.05	1,335.71	5.46	1,329.27	77.11	1,327.55	110.28	1,330.30	60.04	1,324.83	174.86	1,316.93	446.07
(1)	Massachusetts Trend		3.2%		2.8%		2.7%		2.8%		2.6%		2.4%
(2)	n		5		6		7		8		9		10
(3)	s		2.76		10.80		10.16		10.08		12.89		17.98
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		4.75		5.25		5.75		6.25		6.75		7.25
(6)	$[1 + 1/n + 12 \times m^2/(n^3-n)]^{.5}$		1.86		1.66		1.52		1.43		1.37		1.32
(7)	Confidence Interval		12.08		38.12		31.19		28.08		33.40		44.07
(8)	Projected Value Prospective Period		1,454.77		1,433.52		1,428.47		1,435.65		1,422.68		1,405.60
(9)	CI/Projected Wage		0.01		0.03		0.02		0.02		0.02		0.03
(10)	Credibility - MA Trend (Z)		100%		100%		100%		100%		100%		100%
(11)	Complement of Credibility		2.8%		2.8%		2.8%		2.8%		2.8%		2.8%
(12)	Credibility Weighted Wage Trend		3.2%		2.8%		2.7%		2.8%		2.6%		2.4%

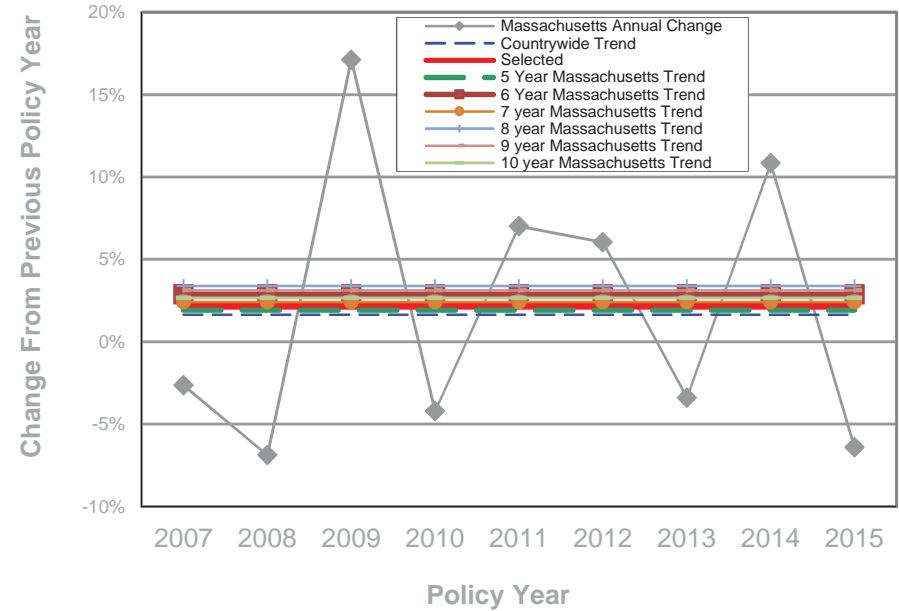
- Notes:
- (1): Massachusetts Trend from exponential fit to the SAWW.
 - (2): Number of data points used in the exponential fitting of the statewide average weekly wages.
 - (3): $\sqrt{SSR/(n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
 - (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
 - (5): Number of years between midpoint of data and projected point.
 - (7) = (3) x (4) x (6)
 - (8): SAWW projected to policy effective period using exponential fit to data.
 - (9) = (7) / (8)
 - (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
 - (11): Complement of credibility is based on a fifteen-year exponential fit to the SAWWs.
 - (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

V 000025

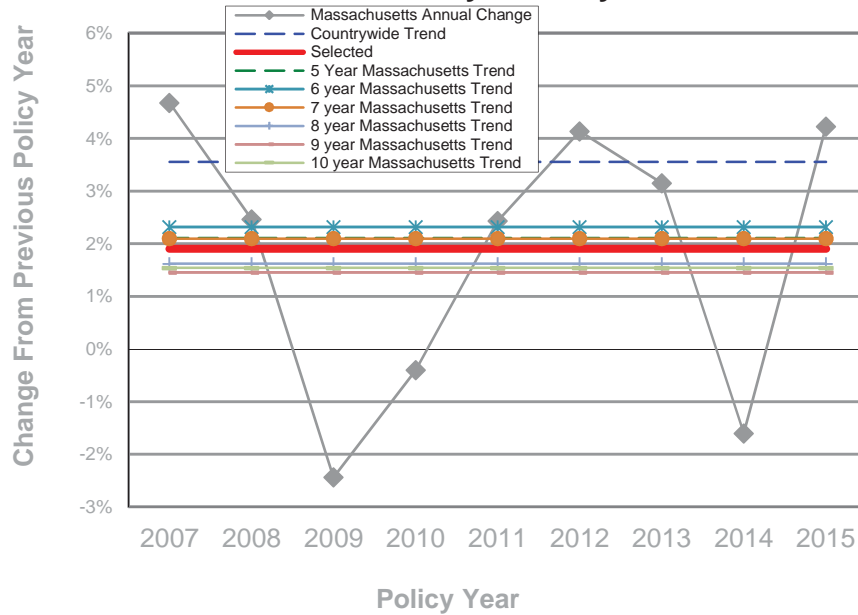
Indemnity Severity Trend



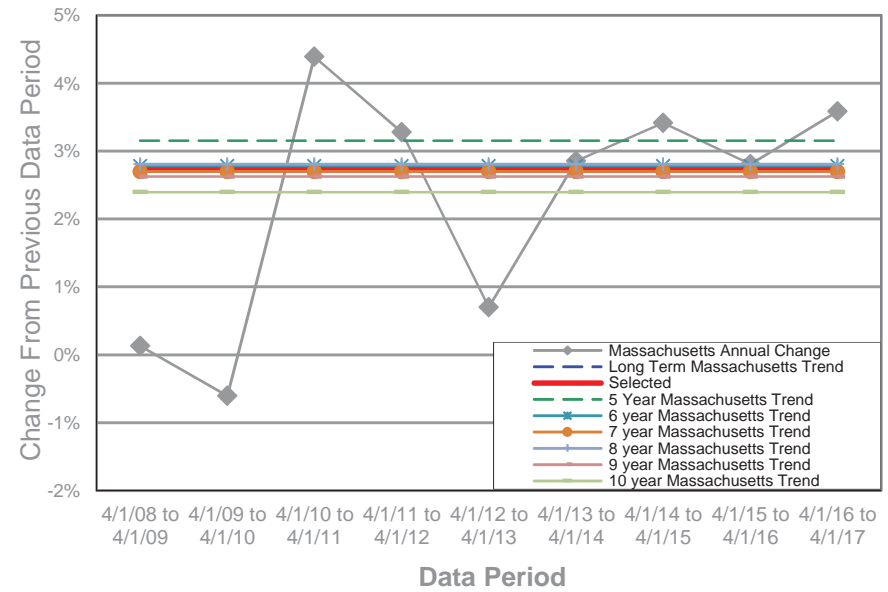
Lost Time Medical Severity Trend



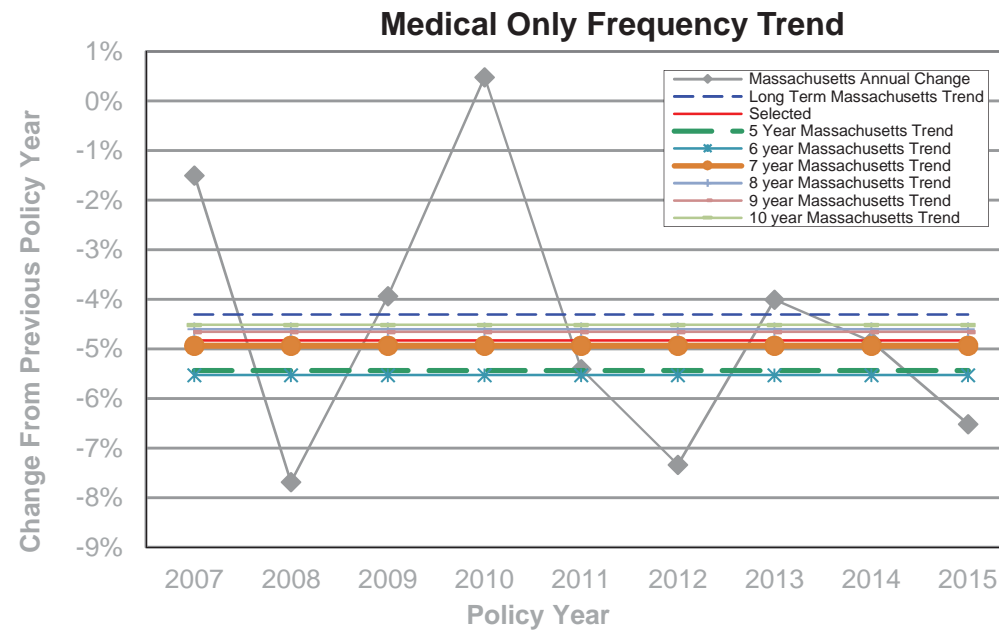
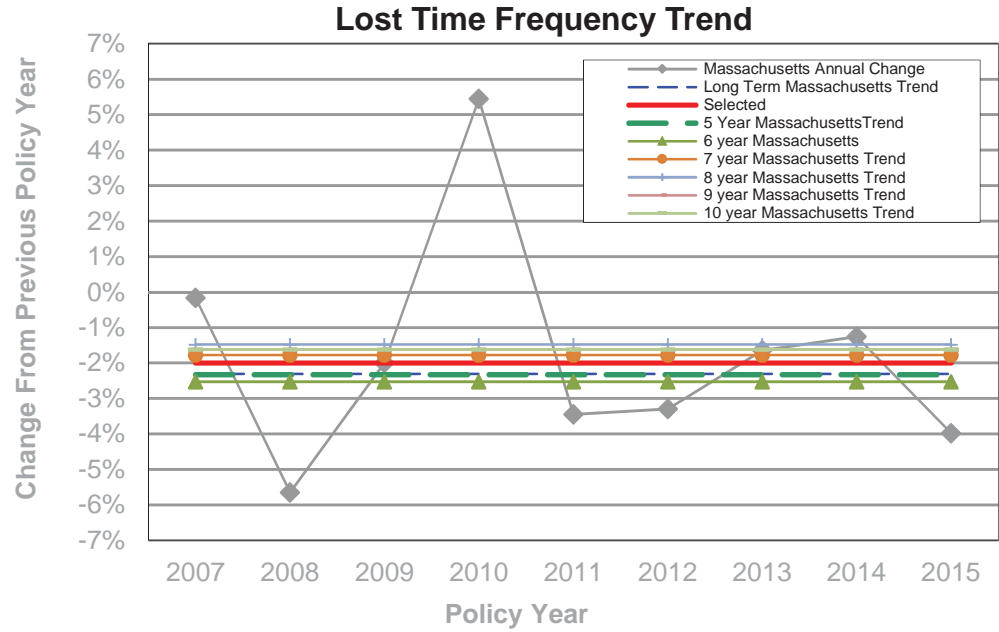
Medical Only Severity Trend



SAWW Trend



V 000026



V 000027

Lost Time Reported Claim Counts - Industrywide

Policy Year (1)	Lost Time Reported Claim Counts										Developed to Tenth Report (3)	Estimated Million Worker-Weeks (4)	Unadjusted Claim Frequency = (3) / (4) (5)	Class Mix Adjustment (6)	Adjusted Claim Frequency = (5) x (6) (7)
	Age of Development														
	18	30	42	54	66	78	90	102	114	126					
	(2)														
2001_01	20,823	21,129	21,287	21,307	21,322	21,330	21,336	21,343	21,349	21,348	21,348	77.06	277.02	0.888	246.00
2002_01	20,156	20,511	20,564	20,603	20,615	20,622	20,630	20,629	20,640	20,638	20,638	77.14	267.55	0.871	233.04
2003_01	18,948	19,162	19,234	19,274	19,304	19,319	19,328	19,336	19,345	19,344	19,344	74.30	260.36	0.855	222.67
2004_01	17,495	17,733	17,781	17,836	17,865	17,872	17,882	17,886	17,880	17,882	17,882	71.62	249.68	0.861	215.00
2005_01	16,774	17,058	17,138	17,174	17,199	17,208	17,215	17,218	17,230	17,237	17,237	73.57	234.29	0.891	208.66
2006_01	15,489	15,766	15,865	15,914	15,925	15,942	15,943	15,943	15,962	15,968	15,968	75.65	211.07	0.945	199.56
2007_01	15,211	15,548	15,655	15,698	15,720	15,729	15,733	15,740	15,746		15,752	78.30	201.17	0.990	199.22
2008_01	13,908	14,174	14,264	14,313	14,352	14,364	14,365	14,371			14,388	78.58	183.11	1.027	187.97
2009_01	12,975	13,210	13,270	13,305	13,317	13,327	13,334				13,356	75.29	177.38	1.039	184.22
2010_01	14,381	14,659	14,727	14,774	14,800	14,815					14,843	79.77	186.07	1.044	194.26
2011_01	14,459	14,689	14,782	14,821	14,858						14,900	82.98	179.56	1.045	187.56
2012_01	14,206	14,460	14,527	14,560							14,632	83.63	174.95	1.037	181.39
2013_01	14,410	14,672	14,748								14,857	85.11	174.55	1.022	178.40
2014_01	14,799	15,070									15,256	87.07	175.22	1.005	176.17
2015_01	14,817										15,274	90.29	169.16	1.000	169.16
	Age-to-Age Development Factors														
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126			15 Year Lost Time Frequency Trend			-2.3%
2 Yr Weighted Average	1.018	1.005	1.002	1.002	1.001	1.000	1.000	1.001	1.000						
Selected	1.018	1.005	1.002	1.002	1.001	1.000	1.000	1.001	1.000						
Cumulative	1.031	1.012	1.007	1.005	1.003	1.002	1.002	1.001	1.000						

Notes:
 Development factors are claim count weighted averages from latest two years.
 (4): Section V-E, Exhibit 1.
 (6): Section V-F, Exhibit 1.

Medical Only Reported Claim Counts - Industrywide

Policy Year (1)	Medical Only Reported Claim Counts										Developed to Tenth Report (3)	Estimated Million Worker-Weeks (4)	Unadjusted Claim Frequency = (3) / (4) (5)	Class Mix Adjustment (6)	Adjusted Claim Frequency = (5) x (6) (7)
	Age of Development														
	18	30	42	54	66	78	90	102	114	126					
	(2)														
2001_01	51,365	52,970	53,409	53,522	53,556	53,549	53,580	53,589	53,586	53,590	53,590	77.06	695.41	0.888	617.54
2002_01	47,699	49,556	49,805	49,856	49,894	49,892	49,897	49,914	49,919	49,923	49,923	77.14	647.20	0.871	563.73
2003_01	44,219	45,421	45,641	45,676	45,693	45,698	45,701	45,704	45,701	45,707	45,707	74.30	615.20	0.855	526.14
2004_01	41,844	42,823	42,924	42,980	42,989	42,998	43,004	43,003	43,008	43,016	43,016	71.62	600.61	0.861	517.18
2005_01	40,395	41,188	41,301	41,315	41,320	41,323	41,320	41,328	41,331	41,332	41,332	73.57	561.79	0.891	500.33
2006_01	37,304	38,011	38,090	38,118	38,117	38,118	38,123	38,146	38,177	38,176	38,176	75.65	504.63	0.945	477.11
2007_01	36,549	37,074	37,122	37,121	37,129	37,119	37,122	37,159	37,158	37,158	37,158	78.30	474.54	0.990	469.95
2008_01	32,712	33,075	33,139	33,154	33,175	33,172	33,191	33,194			33,207	78.58	422.61	1.027	433.84
2009_01	29,840	30,131	30,165	30,173	30,179	30,186	30,185				30,214	75.29	401.28	1.039	416.77
2010_01	31,537	31,909	31,960	31,967	31,960	31,958					31,998	79.77	401.13	1.044	418.78
2011_01	30,928	31,359	31,410	31,432	31,426						31,468	82.98	379.24	1.045	396.13
2012_01	29,119	29,500	29,553	29,576							29,609	83.63	354.04	1.037	367.06
2013_01	28,896	29,225	29,288								29,343	85.11	344.74	1.022	352.35
2014_01	28,525	28,922									29,033	87.07	333.47	1.005	335.26
2015_01	27,838										28,298	90.29	313.41	1.000	313.41
	Age-to-Age Development Factors														
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126						
2 Yr Weighted Average	1.013	1.002	1.001	1.000	1.000	1.000	1.001	1.000	1.000						
Selected	1.013	1.002	1.001	1.000	1.000	1.000	1.001	1.000	1.000						
Cumulative	1.017	1.004	1.002	1.001	1.001	1.001	1.001	1.000	1.000						
													15 Year Medical Only Frequency Trend		-4.3%

Notes:
 Development factors are claim count weighted averages from latest two years.
 (4): Section V-E, Exhibit 1.
 (6): Section V-F, Exhibit 1.

Indemnity Paid + Case Losses (in 000's)

Policy Year (1)	Developed to Tenth Report (2)	Indemnity On-Level Factor (3)	On-Level Indemnity Losses (in 000's) Developed to Tenth Report = (2) x (3) (4)	Developed Claim Counts (5)	Severity = 1,000 x (4) / (5) (6)
2006_01	349,147	1.093	381,514	15,968	23,892
2007_01	348,912	1.081	377,112	15,752	23,940
2008_01	337,478	1.069	360,693	14,388	25,069
2009_01	332,464	1.064	353,878	13,356	26,497
2010_01	348,801	1.065	371,635	14,843	25,037
2011_01	376,790	1.059	398,876	14,900	26,771
2012_01	376,962	1.049	395,547	14,632	27,033
2013_01	389,839	1.045	407,363	14,857	27,419
2014_01	442,119	1.039	459,480	15,256	30,118
2015_01	439,858	1.031	453,452	15,274	29,689

Notes:

(2): (3) Exhibit 1, Page 2 + (3) Exhibit 1, Page 3.

(3): Section IV-A, Exhibit 1.

(5): Section V-B, Exhibit 1.

V 000030

Indemnity Paid + Case Losses (in 000's)
 Remainder of Industry

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2004_01	152,544	201,434	219,967	230,840	235,133	238,539	240,804	241,677	243,255	242,610	
2005_01	148,633	187,024	203,004	212,951	218,402	218,924	221,316	221,097	222,066	222,429	
2006_01	137,012	186,997	207,357	217,635	221,888	224,111	227,039	228,366	229,508	230,838	230,838
2007_01	148,548	195,594	215,792	225,934	233,141	237,969	240,701	240,597	240,985		241,889
2008_01	149,438	199,642	218,746	234,387	242,413	243,208	243,031	243,870			245,584
2009_01	161,101	209,630	236,253	256,635	259,887	264,274	264,387				266,649
2010_01	156,736	210,732	244,794	259,562	264,407	265,442					267,680
2011_01	173,172	236,508	271,738	291,433	297,150						302,753
2012_01	186,577	262,147	295,933	315,472							327,582
2013_01	202,888	267,655	300,562								333,670
2014_01	224,473	310,474									388,063
2015_01	225,777										381,756
	Age-to-Age Development Factors										
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126		
2 Yr Weighted Average	1.353	1.126	1.069	1.019	1.010	1.000	1.002	1.003	1.004		
Selected	1.353	1.126	1.069	1.019	1.010	1.000	1.002	1.003	1.004		
Cumulative	1.691	1.250	1.110	1.038	1.019	1.008	1.009	1.007	1.004		

Notes:
 Development factors are loss weighted average from latest two years.

Indemnity Paid + Case Losses (in 000's)
 AIG

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2002_01	36,409	53,190	60,642	66,299	72,227	72,372	74,476	75,524	76,138	75,931	
2003_01	43,821	68,420	80,731	90,837	99,150	100,087	100,705	101,411	100,735	100,931	
2004_01	47,919	76,133	95,459	108,333	118,675	122,375	123,017	125,191	125,918	127,205	
2005_01	54,650	87,579	107,954	124,909	133,685	134,035	133,361	134,387	134,360	134,426	
2006_01	53,994	82,291	100,466	113,457	115,944	117,397	117,087	117,804	118,618	118,310	118,310
2007_01	48,586	77,897	90,937	101,775	105,793	106,952	107,014	106,728	106,825		107,023
2008_01	45,948	70,734	83,376	89,207	91,668	92,487	92,109	91,578			91,895
2009_01	31,461	50,250	61,038	63,507	64,532	65,025	65,235				65,815
2010_01	38,086	60,838	72,983	76,817	79,639	80,577					81,122
2011_01	36,413	55,547	66,056	70,192	72,766						74,037
2012_01	23,219	35,521	43,789	47,022							49,380
2013_01	27,605	42,790	50,478								56,169
2014_01	26,329	40,427									54,057
2015_01	28,027										58,103
Age-to-Age Development Factors											
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126		
5 Yr Weighted Average	1.550	1.202	1.060	1.032	1.011	0.998	1.005	1.002	1.002		
Selected	1.550	1.202	1.060	1.032	1.011	0.998	1.005	1.002	1.002		
Cumulative	2.073	1.337	1.113	1.050	1.017	1.007	1.009	1.003	1.002		

Notes:
 Development factors are loss weighted average from latest five years.

Lost Time Medical Paid + Case Losses (in 000's)

Policy Year (1)	Developed to Tenth Report (2)	Medical On-Level Factor (3)	On-Level Lost Time Medical Losses (in 000's) Developed to Tenth Report = (2) x (3) (4)	Developed Claim Counts (5)	Severity = 1,000 x (4) / (5) (6)
2006_01	181,238	1.032	187,038	15,968	11,713
2007_01	174,060	1.032	179,630	15,752	11,403
2008_01	149,143	1.024	152,777	14,388	10,618
2009_01	165,793	1.002	166,078	13,356	12,435
2010_01	176,810	1.000	176,810	14,843	11,912
2011_01	189,927	1.000	189,927	14,900	12,747
2012_01	197,790	1.000	197,790	14,632	13,518
2013_01	193,999	1.000	193,999	14,857	13,058
2014_01	220,794	1.000	220,794	15,256	14,473
2015_01	206,871	1.000	206,871	15,274	13,544

Notes:

(2): (3) Exhibit 1, Page 2 + (3) Exhibit 1, Page 3.

(3): Section IV-A, Exhibit 1.

(5): Section V-B, Exhibit 1.

V 000033

Lost Time Medical Paid + Case Losses (in 000's)
 Remainder of Industry

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2004_01	106,767	112,777	121,463	121,354	122,571	123,857	124,388	125,967	125,461	125,910	
2005_01	93,918	99,129	104,028	107,227	111,585	112,988	113,097	113,217	113,888	113,993	
2006_01	95,718	104,141	109,449	111,397	113,469	115,724	117,128	116,593	118,754	118,013	118,013
2007_01	113,646	122,083	124,171	127,636	128,344	132,488	135,818	135,444	134,294		133,926
2008_01	103,732	111,716	115,502	118,121	117,810	115,664	116,140	115,649			115,795
2009_01	120,316	128,413	133,370	136,756	136,601	135,985	135,811				135,515
2010_01	125,974	135,982	143,410	143,737	146,461	147,637					147,493
2011_01	128,044	143,399	149,091	151,696	151,393						151,544
2012_01	154,568	171,490	174,045	177,629							179,264
2013_01	163,554	166,664	169,009								173,832
2014_01	187,403	191,784									200,114
2015_01	172,308										183,630
	Age-to-Age Development Factors										
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126		
2 Yr Weighted Average	1.021	1.014	1.019	1.008	1.002	1.001	0.997	1.004	0.997		
Selected	1.021	1.014	1.019	1.008	1.002	1.001	0.997	1.004	0.997		
Cumulative	1.066	1.043	1.029	1.009	1.001	0.999	0.998	1.001	0.997		

Notes:
 Development factors are loss weighted average from latest two years.

Lost Time Medical Paid + Case Losses (in 000's)
 AIG

Policy Year (1)	Age of Development											Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126		
	(2)											
2002_01	23,634	26,109	28,763	31,026	33,040	33,414	30,977	31,742	30,830	30,487		
2003_01	31,184	35,047	39,176	42,506	44,773	43,925	42,026	39,541	39,628	39,725		
2004_01	35,081	43,887	48,865	57,885	60,525	60,098	57,589	59,569	59,481	59,271		
2005_01	42,152	48,433	54,893	60,015	64,158	62,309	62,119	62,785	60,676	60,917		
2006_01	44,790	49,521	54,128	57,554	57,283	57,018	56,674	63,755	63,934	63,225	63,225	
2007_01	34,688	39,316	41,485	41,433	41,304	41,205	40,239	39,871	40,280		40,133	
2008_01	31,386	35,972	36,850	36,641	36,135	36,133	34,386	33,663			33,348	
2009_01	24,512	29,814	30,277	30,770	31,304	30,904	29,547				30,278	
2010_01	25,342	28,071	29,976	30,192	29,446	29,199					29,316	
2011_01	26,857	33,040	38,248	38,825	38,429						38,383	
2012_01	15,692	17,685	18,717	18,679							18,526	
2013_01	17,681	19,984	20,198								20,168	
2014_01	17,607	19,381									20,680	
2015_01	19,019										23,240	

	Age-to-Age Development Factors									
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126	
5 Yr Weighted Average	1.145	1.069	1.007	0.993	0.995	0.980	1.034	0.994	0.996	
Selected	1.145	1.069	1.007	0.993	0.995	0.980	1.034	0.994	0.996	
Cumulative	1.222	1.067	0.999	0.992	0.999	1.004	1.025	0.991	0.996	

Notes:
 Development factors are loss weighted average from latest five years.

Medical Only Paid + Case Losses (in 000's)

Policy Year (1)	Developed to Tenth Report (2)	Medical On-Level Factor (3)	On-Level Medical Only Losses (in 000's) Developed to Tenth Report = (2) x (3) (4)	Developed Claim Counts (5)	Severity = 1,000 x (4) / (5) (6)
2006_01	28,373	1.032	29,281	38,176	767
2007_01	28,909	1.032	29,834	37,158	803
2008_01	26,669	1.024	27,319	33,207	823
2009_01	24,209	1.002	24,250	30,214	803
2010_01	25,579	1.000	25,579	31,998	799
2011_01	25,767	1.000	25,767	31,468	819
2012_01	25,249	1.000	25,249	29,609	853
2013_01	25,810	1.000	25,810	29,343	880
2014_01	25,128	1.000	25,128	29,033	865
2015_01	25,528	1.000	25,528	28,298	902

Notes:

- (2): (3) Exhibit 2, Page 2 + (3) Exhibit 2, Page 3.
- (3): Section IV-A, Exhibit 1.
- (5): Section V-B, Exhibit 2.

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Medical Only Paid + Case Losses (in 000's)
 Remainder of Industry

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2004_01	19,423	20,020	20,162	20,152	20,260	20,319	20,300	20,276	20,194	20,206	
2005_01	20,012	20,431	20,487	20,602	20,506	20,487	20,432	20,441	20,472	20,484	
2006_01	20,322	20,614	20,651	20,580	20,596	20,600	20,426	20,521	20,607	20,585	20,585
2007_01	21,212	21,696	21,760	21,884	21,887	21,786	21,788	21,840	21,834		21,829
2008_01	20,740	20,807	20,921	20,881	20,914	21,039	21,006	21,063			21,098
2009_01	19,861	19,846	19,795	19,820	19,901	20,107	20,061				20,146
2010_01	21,185	21,104	21,037	21,028	21,012	21,038					21,085
2011_01	21,743	21,701	21,654	21,848	21,629						21,801
2012_01	22,527	22,318	22,412	22,444							22,498
2013_01	23,622	23,023	22,858								23,031
2014_01	22,763	22,144									22,277
2015_01	23,005										22,535
	Age-to-Age Development Factors										
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126		
2 Yr Weighted Average	0.974	0.998	1.005	0.994	1.006	0.998	1.003	1.002	1.000		
Selected	0.974	0.998	1.005	0.994	1.006	0.998	1.003	1.002	1.000		
Cumulative	0.980	1.006	1.008	1.002	1.008	1.002	1.004	1.002	1.000		

Notes:
 Development factors are loss weighted average from latest two years.

Medical Only Paid + Case Losses (in 000's)
 AIG

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2002_01	3,856	4,115	4,248	4,191	4,214	4,296	4,348	4,384	4,269	4,262	
2003_01	5,262	5,395	5,474	5,440	5,422	5,561	5,510	5,512	5,610	5,590	
2004_01	6,949	7,715	7,485	7,353	7,358	7,358	7,335	7,334	7,334	7,339	
2005_01	8,176	8,431	8,421	8,484	8,487	8,462	8,403	8,397	8,395	8,395	
2006_01	7,519	7,784	7,795	7,779	7,812	7,769	7,768	7,768	7,788	7,788	7,788
2007_01	6,848	6,920	6,944	6,946	6,946	6,940	6,973	7,005	7,085		7,080
2008_01	5,122	5,398	5,421	5,475	5,493	5,462	5,483	5,545			5,571
2009_01	3,754	3,947	3,961	4,000	4,019	4,046	4,034				4,063
2010_01	4,382	4,471	4,461	4,494	4,497	4,464					4,493
2011_01	3,790	3,917	3,982	3,971	3,952						3,967
2012_01	2,672	2,719	2,682	2,738							2,750
2013_01	2,699	2,706	2,743								2,778
2014_01	2,766	2,804									2,851
2015_01	2,888										2,992
	Age-to-Age Development Factors										
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126		
5 Yr Weighted Average	1.019	1.004	1.008	1.001	0.997	0.999	1.002	1.005	0.999		
Selected	1.019	1.004	1.008	1.001	0.997	0.999	1.002	1.005	0.999		
Cumulative	1.036	1.017	1.013	1.004	1.004	1.007	1.007	1.005	0.999		

Notes:
 Development factors are loss weighted average from latest five years.

Worker Weeks by Policy Year

Policy Year (1)	Payroll (in millions of dollars)									Developed to Tenth Report (3)	State Average Weekly Wage (4)	Estimated Million Worker-Weeks = (3) / (4) (5)	
	Age of Development												
	18	30	42	54	66	78	90	102	114				126
	(2)												
2001_01										68,074	68,074	883.36	77.06
2002_01										68,965	68,965	894.05	77.14
2003_01										69,014	69,014	928.90	74.30
2004_01									69,408	69,408	969.11	71.62	
2005_01								74,392	74,392	74,399	1,011.25	73.57	
2006_01							79,893	79,893	79,901	79,901	1,056.18	75.65	
2007_01						85,512	85,512	85,512	85,512	85,516	1,092.12	78.30	
2008_01					85,857	85,858	85,857	85,859		85,867	1,092.79	78.58	
2009_01				82,945	82,946	82,945	82,942			82,952	1,101.70	75.29	
2010_01			91,437	91,385	91,319	91,313				91,321	1,144.80	79.77	
2011_01		97,533	97,506	97,435	97,427					97,431	1,174.21	82.98	
2012_01	99,353	99,683	99,610	99,600						99,565	1,190.50	83.63	
2013_01	104,347	104,387	104,396							104,316	1,225.60	85.11	
2014_01	110,287	110,264								110,146	1,265.09	87.07	
2015_01	117,826									117,709	1,303.66	90.29	

Age-to-Age Development Factors

	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126
2 Yr Weighted Average	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Selected	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulative	0.999	0.999	0.999	1.000	1.000	1.000	1.000	1.000	1.000

Notes:
 Development factors are payroll weighted average from latest two years.
 (4): Section V-G, Exhibit 2.
 For all policy years the following class codes are excluded from reported Schedule Z payrolls: 0059, 0065, 0066, 0067, 0088, 0770, 0773, 0774, 0775, 0776, 0779, 0799, 0908, 0909, 0912, 0913, 7445, 7453, and 9985.

V 000040

Section V - Trend
Subsection F - Calculation of Class Mix Adjustment Factor
7/1/2018

Section V - F
Exhibit 1

Class Mix Adjustment Factors

Policy Year (1)	Average Rates Based on Rates Effective 7/1/16 (2)	Class Mix Adjustment Factor = 0.978 / (2) (3)
2001_01	1.102	0.888
2002_01	1.123	0.871
2003_01	1.144	0.855
2004_01	1.136	0.861
2005_01	1.098	0.891
2006_01	1.035	0.945
2007_01	0.988	0.990
2008_01	0.953	1.027
2009_01	0.942	1.039
2010_01	0.937	1.044
2011_01	0.937	1.045
2012_01	0.944	1.037
2013_01	0.957	1.022
2014_01	0.973	1.005
2015_01	0.978	1.000

Notes:

(2): Current rates (Effective 7/1/16) averaged over class payrolls (excluding large deductibles) by Policy Year.

(3): Adjustment to 2015_01 Policy Year level.

Periods from which NCCI Data is Taken

State	Annual Statistical Bulletin - Weights					Annual Statistical Bulletin - Policy Period Beginning Dates				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Alabama	1.9%	1.4%	1.7%	1.5%	1.5%	5/1/2009	5/1/2010	5/1/2011	5/1/2012	5/1/2013
Alaska	0.8%	0.8%	0.8%	0.8%	1.0%	4/1/2009	4/1/2010	4/1/2011	4/1/2012	4/1/2013
Arizona	2.2%	2.3%	2.3%	2.5%	2.4%	3/1/2009	3/1/2010	3/1/2011	3/1/2012	3/1/2013
Arkansas	0.8%	0.8%	0.8%	0.8%	0.6%	2/1/2010	2/1/2011	2/1/2012	2/1/2013	2/1/2014
Colorado	3.3%	3.6%	3.5%	3.7%	4.0%	3/1/2009	3/1/2010	3/1/2011	3/1/2012	3/1/2013
Connecticut	3.5%	3.5%	3.3%	3.3%	2.9%	8/1/2009	8/1/2010	8/1/2011	8/1/2012	8/1/2013
District Of Columbia	0.3%	0.3%	0.5%	0.4%	0.4%	2/1/2009	2/1/2010	2/1/2011	2/1/2012	2/1/2013
Florida	8.9%	8.8%	8.6%	9.0%	10.1%	1/1/2009	1/1/2010	1/1/2011	1/1/2012	1/1/2013
Georgia	4.7%	4.6%	4.9%	5.6%	5.7%	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
Hawaii	0.7%	0.7%	0.7%	0.7%	0.8%	6/1/2009	6/1/2010	6/1/2011	6/1/2012	6/1/2013
Idaho	1.2%	1.1%	1.2%	1.3%	1.3%	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
Illinois	12.0%	12.2%	11.1%	10.3%	10.2%	4/1/2009	4/1/2010	4/1/2011	4/1/2012	4/1/2013
Indiana	3.0%	3.1%	3.2%	3.2%	3.2%	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
Iowa	2.9%	2.8%	2.8%	2.8%	2.9%	3/1/2009	3/1/2010	3/1/2011	3/1/2012	3/1/2013
Kansas	1.9%	2.0%	1.7%	1.5%	1.7%	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
Kentucky	2.2%	2.1%	1.7%	1.7%	1.7%	5/1/2009	5/1/2010	5/1/2011	5/1/2012	5/1/2013
Louisiana	3.0%	3.0%	3.3%	3.1%	3.2%	9/1/2009	9/1/2010	9/1/2011	9/1/2012	9/1/2013
Maine	0.8%	0.7%	0.9%	0.7%	0.6%	6/1/2009	6/1/2010	6/1/2011	6/1/2012	6/1/2013
Maryland	3.2%	3.3%	3.4%	2.9%	2.9%	4/1/2009	4/1/2010	4/1/2011	4/1/2012	4/1/2013
Mississippi	1.4%	1.3%	1.3%	1.3%	1.3%	9/1/2009	9/1/2010	9/1/2011	9/1/2012	9/1/2013
Missouri	3.2%	3.5%	3.5%	3.7%	3.6%	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
Montana	1.2%	0.9%	0.8%	0.7%	0.8%	1/1/2010	1/1/2011	1/1/2012	1/1/2013	1/1/2014
Nebraska	1.4%	1.2%	1.2%	1.5%	1.3%	8/1/2009	8/1/2010	8/1/2011	8/1/2012	8/1/2013
Nevada	1.3%	1.2%	1.2%	1.1%	1.2%	1/1/2009	1/1/2010	1/1/2011	1/1/2012	1/1/2013
New Hampshire	1.2%	1.0%	1.0%	0.9%	1.0%	4/1/2009	4/1/2010	4/1/2011	4/1/2012	4/1/2013
New Mexico	1.1%	1.1%	1.2%	1.2%	1.0%	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
North Carolina	5.8%	5.6%	6.3%	6.0%	5.2%	1/1/2009	1/1/2010	1/1/2011	1/1/2012	1/1/2013
Oklahoma	3.7%	3.5%	3.4%	3.0%	2.7%	6/1/2009	6/1/2010	6/1/2011	6/1/2012	6/1/2013
Oregon	2.6%	2.5%	2.3%	2.4%	2.3%	1/1/2009	1/1/2010	1/1/2011	1/1/2012	1/1/2013
Rhode Island	0.8%	0.7%	0.7%	0.6%	0.6%	1/1/2009	1/1/2010	1/1/2011	1/1/2012	1/1/2013
South Carolina	2.7%	3.0%	2.8%	2.8%	2.9%	5/1/2009	5/1/2010	5/1/2011	5/1/2012	5/1/2013
South Dakota	0.5%	0.6%	0.5%	0.5%	0.6%	1/1/2010	1/1/2011	1/1/2012	1/1/2013	1/1/2014
Tennessee	3.6%	3.7%	3.6%	3.6%	3.3%	6/1/2009	6/1/2010	6/1/2011	6/1/2012	6/1/2013
Texas	6.8%	7.1%	7.9%	7.9%	8.3%	1/1/2009	1/1/2010	1/1/2011	1/1/2012	1/1/2013
Utah	1.2%	1.6%	1.5%	1.7%	1.4%	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
Vermont	0.6%	0.7%	0.6%	0.6%	0.7%	7/1/2009	7/1/2010	7/1/2011	7/1/2012	7/1/2013
Virginia	3.5%	3.4%	3.7%	3.6%	4.1%	2/1/2009	2/1/2010	2/1/2011	2/1/2012	2/1/2013
West Virginia				0.9%	0.6%				7/1/2012	7/1/2013
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%					
				Policy Period Start Date	4/15/2009	4/15/2010	4/13/2011	4/14/2012	4/14/2013	
				Average Earned Date	4/15/2010	4/15/2011	4/13/2012	4/14/2013	4/14/2014	
				Years	1.00	2.00	3.00	4.00	5.00	

Notes:
 Weights are derived from data obtained from NCCI that underlies the NCCI Annual Statistical Bulletins.

V 000042

Section V - Trend
 Subsection G - External Data
 7/1/2018

Section V - G
 Exhibit 2

Summary of Statewide Average Weekly Wage (SAWW) Data

Date Promulgated by DUA (1)	Period of Data Used by DUA (2)	SAWW (3)
10/1/99	4/1/98 to 4/1/99	749.69
10/1/00	4/1/99 to 4/1/00	830.89
10/1/01	4/1/00 to 4/1/01	890.94
10/1/02	4/1/01 to 4/1/02	882.57
10/1/03	4/1/02 to 4/1/03	884.46
10/1/04	4/1/03 to 4/1/04	918.78
10/1/05	4/1/04 to 4/1/05	958.58
10/1/06	4/1/05 to 4/1/06	1,000.43
10/1/07	4/1/06 to 4/1/07	1,043.54
10/1/08	4/1/07 to 4/1/08	1,093.27
10/1/09	4/1/08 to 4/1/09	1,094.70
10/1/10	4/1/09 to 4/1/10	1,088.06
10/1/11	4/1/10 to 4/1/11	1,135.82
10/1/12	4/1/11 to 4/1/12	1,173.06
10/1/13	4/1/12 to 4/1/13	1,181.28
10/1/14	4/1/13 to 4/1/14	1,214.99
10/1/15	4/1/14 to 4/1/15	1,256.47
10/1/16	4/1/15 to 4/1/16	1,291.74
10/1/17	4/1/16 to 4/1/17	1,338.05
15 Year Exponential Fit, Trend =		2.8%

Policy Year (4)	SAWW (5)
2001_01	883.36
2002_01	894.05
2003_01	928.90
2004_01	969.11
2005_01	1,011.25
2006_01	1,056.18
2007_01	1,092.12
2008_01	1,092.79
2009_01	1,101.70
2010_01	1,144.80
2011_01	1,174.21
2012_01	1,190.50
2013_01	1,225.60
2014_01	1,265.09
2015_01	1,303.66

Notes:

(5): SAWW for Policy Year $i = [0.03125 \times \text{SAWW during period } 4/1/(i-1) \text{ to } 4/1/i] + [0.6875 \times \text{SAWW during period } 4/1/i \text{ to } 4/1/(i+1)] + [0.28125 \times \text{SAWW during period } 4/1/(i+1) \text{ to } 4/1/(i+2)]$

The DUA is the Department of Unemployment Assistance; previously this data was compiled by the DET (Division of Employment and Training).

V 000043

Section V - Trend
 Subsection H - Expense Trends
 7/1/2018

Section V - H
 Exhibit 1

Calculation of Expense Trend Index

Time Interval (1)	Time Index (2)	Expense Trend Index (3)	Expense Trend Factors		
			PY2014 (4)	PY2015 (5)	7/1/2018 (6)
CY2002	7/1/2002	58.15			
CY2003	7/1/2003	62.19			
CY2004	7/1/2004	67.87			
CY2005	7/1/2005	76.04			
CY2006	7/1/2006	74.42			
CY2007	7/1/2007	82.04			
CY2008	7/1/2008	87.23			
CY2009	7/1/2009	87.59			
CY2010	7/1/2010	90.07			
CY2011	7/1/2011	86.83			
CY2012	7/1/2012	87.06			
CY2013	7/1/2013	92.29			
CY2014	7/1/2014	92.66	1.031	1.070	1.163
CY2015	7/1/2015	98.34	0.971	1.008	1.096
CY2016	7/1/2016	100.00	0.955	0.992	1.078

15 Year Exponential Fit, Trend: 3.4%

PY2014	1/1/2015	95.50			1.129
PY2015	1/1/2016	99.17			1.087
7/1/2017	7/1/2018	105.12			1.025
7/1/2018	7/1/2019	107.78			

Notes:

- (1): 7/1/17 and 7/1/18 are time intervals comparable to the policy years.
- (2): Midpoint of the time interval used for determination of Expense Trend Index exponential trend rate of 2.5%.
- (3): Calendar Years: Exhibit 2, Page 2, col (17), Converted to Index with 2016 = 100
 PY2014 - Average of indices for CY2014 and CY2015.
 PY2015 - Average of indices for CY2015 and CY2016.
 The exponential trend rate derived from an exponential regression of the Expense Trend Index for CY2010 - CY2016 is applied to the CY2016 Expense Trend Index value to derive the Expense Trend Index values for 7/1/2017 and 7/1/2018.
- (4) = [(3) for PY2014] / (3)
- (5) = [(3) for PY2015] / (3)
- (6) = [(3) for 7/1/2018] / (3)

Calculation of Credibility Weighted Expense Trend

Calendar Year (1)	Expense Index (2)	7 Year Exponential Fit (3)	Difference Squared (4)
2010	90.07	86.36	13.72
2011	86.83	88.31	2.19
2012	87.06	90.31	10.51
2013	92.29	92.34	0.00
2014	92.66	94.43	3.11
2015	98.34	96.56	3.15
2016	100.00	98.74	1.59

(5)	7 Year Expense Index Trend	2.3%
(6)	n	7
(7)	s	2.62
(8)	t	2.02
(9)	m	6.00
(10)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$	1.56
(11)	Confidence Interval	8.22
(12)	Projected Value Prospective Period	105.58
(13)	CI/Projected Expense Index	0.08
(14)	Credibility - 7 Year Expense Index Trend (Z)	77%
(15)	Complement of Credibility - 15 year	3.4%
(16)	Credibility Weighted Expense Trend	2.5%

Notes:

(2): Exhibit 1.

(5): 7 Year Massachusetts Trend from seven-year exponential fit to expense trend indices.

(6): Number of data points used in the exponential fitting of the 7 Year Massachusetts Trend.

(7): $\sqrt{SSR/(n-2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.

(8): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with 5 (= n - 2) degrees of freedom.

(9): Number of years between midpoint of data and projected point.

(11) = (7) x (8) x (10)

(12): Projected to prospective effective period using exponential fit to data.

(13) = (11) / (12)

(14): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%.

Numerically, (14) = the minimum of k / (13) and 100%.

(15): Complement of credibility is based on a 15-year exponential fit, Exhibit 1.

(16) = [(5) x (14)] + { (15) x [1.0 - (14)] }

Calculation of Expense Trend Index

Economic Indices							
Calendar Year (1)	Average Weekly Earnings (2)	Food (3)	Private Transportation (4)	Phone (5)	Postage (6)	Machines & Equipment (7)	Paper (8)
2002	1,166.00	178.20	149.00	99.90	182.60	112.50	144.70
2003	1,265.00	182.00	153.50	98.50	191.70	112.30	146.10
2004	1,406.00	187.40	158.80	96.00	191.70	113.20	149.40
2005	1,609.00	193.30	170.30	95.00	191.70	115.10	159.60
2006	1,559.00	199.10	177.50	95.90	201.90	114.70	167.40
2007	1,752.00	206.41	181.50	98.37	206.88	114.60	169.30
2008	1,865.00	215.61	192.49	100.50	213.86	122.10	184.30
2009	1,873.00	223.38	173.49	102.34	224.22	123.50	179.60
2010	1,940.00	226.20	189.26	102.09	230.14	121.00	182.10
2011	1,842.00	231.50	209.94	100.63	239.40	122.20	191.20
2012	1,846.00	238.19	215.46	100.96	247.83	121.20	191.60
2013	1,985.00	243.13	214.71	100.64	263.37	117.60	190.80
2014	1,990.00	249.00	212.77	99.93	274.08	118.80	192.70
2015	2,136.00	256.18	193.84	97.74	274.84	122.70	189.80
2016	2,180.00	262.91	188.94	97.17	276.56	123.10	186.70

Economic Indices, Percentage Changes from Prior Calendar Year								
Calendar Year (9)	Average Weekly Earnings (10)	Food (11)	Private Transportation (12)	Phone (13)	Postage (14)	Machines & Equipment (15)	Paper (16)	Weighted Average (17)
2002								
2003	8.5%	2.1%	3.0%	-1.4%	5.0%	-0.2%	1.0%	6.9%
2004	11.1%	3.0%	3.5%	-2.5%	0.0%	0.8%	2.3%	9.1%
2005	14.4%	3.1%	7.2%	-1.0%	0.0%	1.7%	6.8%	12.0%
2006	-3.1%	3.0%	4.2%	0.9%	5.3%	-0.3%	4.9%	-2.1%
2007	12.4%	3.7%	2.3%	2.6%	2.5%	-0.1%	1.1%	10.2%
2008	6.4%	4.5%	6.1%	2.2%	3.4%	6.5%	8.9%	6.3%
2009	0.4%	3.6%	-9.9%	1.8%	4.8%	1.1%	-2.6%	0.4%
2010	3.6%	1.3%	9.1%	-0.2%	2.6%	-2.0%	1.4%	2.8%
2011	-5.1%	2.3%	10.9%	-1.4%	4.0%	1.0%	5.0%	-3.6%
2012	0.2%	2.9%	2.6%	0.3%	3.5%	-0.8%	0.2%	0.3%
2013	7.5%	2.1%	-0.3%	-0.3%	6.3%	-3.0%	-0.4%	6.0%
2014	0.3%	2.4%	-0.9%	-0.7%	4.1%	1.0%	1.0%	0.4%
2015	7.3%	2.9%	-8.9%	-2.2%	0.3%	3.3%	-1.5%	6.1%
2016	2.1%	2.6%	-2.5%	-0.6%	0.6%	0.3%	-1.6%	1.7%

Weights							
Calendar Year (18)	Average Weekly Earnings (19)	Food (20)	Private Transportation (21)	Phone (22)	Postage (23)	Machines & Equipment (24)	Paper (25)
2002	79.5%	2.2%	2.2%	2.4%	2.4%	9.5%	1.9%
2003	80.2%	2.1%	2.1%	2.1%	2.1%	9.4%	1.9%
2004	79.9%	2.1%	2.1%	1.8%	1.8%	10.4%	1.8%
2005	79.8%	2.1%	2.1%	2.0%	2.0%	10.0%	2.0%
2006	80.9%	2.1%	2.1%	1.8%	1.8%	9.3%	1.8%
2007	79.9%	2.1%	2.1%	1.8%	1.8%	10.4%	1.8%
2008	78.3%	2.1%	2.1%	1.9%	1.9%	11.9%	1.8%
2009	79.5%	1.6%	1.6%	1.8%	1.8%	12.3%	1.4%
2010	80.3%	1.8%	1.8%	2.0%	2.0%	10.7%	1.4%
2011	81.8%	1.8%	1.8%	1.7%	1.7%	9.9%	1.1%
2012	82.0%	1.8%	1.8%	1.6%	1.6%	10.0%	1.1%
2013	81.2%	1.9%	1.9%	1.5%	1.5%	11.0%	0.9%
2014	80.9%	2.1%	2.1%	1.5%	1.5%	10.9%	0.9%
2015	80.7%	1.9%	1.9%	1.4%	1.4%	12.0%	0.8%
2016	80.0%	1.7%	1.7%	1.3%	1.3%	13.3%	0.7%

Notes:

- (2): Average Weekly Earnings, Covered Employment and Wages, Private Fire, Marine, and Casualty Insurers - Massachusetts Unadjusted for Seasonality
 Years CY2010 - CY2016: Bureau of Labor Statistics, Series ID ENU25000405524126 (Direct Property and Casualty Insurers Average Weekly Wage.)
- (3): Food Away From Home, Consumer Price Index, Urban Wage Earners and Clerical Workers - U.S.
 Unadjusted for Seasonality, Base: 1982 - 1984 = 100. Bureau of Labor Statistics, Series ID CWUR0000SEFV.
- (4): Private Transportation, Consumer Price Index, Urban Wage Earners and Clerical Workers - U.S.
 Unadjusted for Seasonality, Base: 1982 - 1984 = 100. Bureau of Labor Statistics, Series ID CWUR0000SAT1.
- (5): Telephone Services, Consumer Price Index, Urban Wage Earners and Clerical Workers - U.S.
 Unadjusted for Seasonality, Base: December 1997= 100. Bureau of Labor Statistics, Series ID CWUR0000SEED.
- (6): Postage, Consumer Price Index, Urban Wage Earners and Clerical Workers - U.S.
 Unadjusted for Seasonality, Base: 1982 - 1984 = 100. Bureau of Labor Statistics, Series ID CWUR0000SEEC01.
- (7): Office and Store Machines and Equipment, Producer Price Index
 Unadjusted for Seasonality, Base: 1982 = 100. Bureau of Labor Statistics, Series ID WPU1193.
- (8): Paper, Producer Price Index
 Unadjusted for Seasonality, Base: 1982 - 1984 = 100. Bureau of Labor Statistics, Series ID WPU0913.
- (17) Weighted average of (10)-(16) using weights for prior year from columns (19)-(25)
- (19)-(25): Section V-H, Exhibit 2, for Calendar Year 2015-2016. Prior Filings for all other years.

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Section V - Trend
 Subsection H - Expense Trends
 7/1/2018

Section V - H
 Exhibit 2
 Page 3

Calendar Year 2015
 Weights for Expense Trends

Expense Component (1)	Percentage of Net Written Premium (2)	% of Total = (2) / Total (2) (3)	Corresponding Index (4)	Weights (5)
Salaries	7.40%	64.5%	Average Weekly Earnings Covered Employment and Wages; Private Fire, Marine, Casualty Massachusetts	80.7%
Payroll Taxes	0.50%	4.4%		
Employee Relations	1.36%	11.9%		
Travel & Travel Items	0.43%	3.7%	Food Away From Home-CPI-US	1.9%
			Private Transportation-CPI-US	1.9%
Postage & Telephone	0.31%	2.7%	Postage-CPI-US	1.4%
			Telephone-CPI-US	1.4%
Equipment	1.38%	12.0%	Office & Stores Machines & Equipment-PPI	12.0%
Printing & Stationery	0.09%	0.8%	Paper-PPI	0.8%
Total	11.47%	100.0%		100.0%

Notes:

(2): 2017 Best's Aggregates and Averages, Property-Casualty, Totals for Commercial Casualty
 Companies with Written Premium Net of Reinsurance Ceded over \$15 million.

(5) = Based on (3)

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Section V - Trend
 Subsection H - Expense Trends
 7/1/2018

Section V - H
 Exhibit 2
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Calendar Year 2016
 Weights for Expense Trends

Expense Component (1)	Percentage of Net Written Premium (2)	% of Total = (2) / Total (2) (3)	Corresponding Index (4)	Weights (5)
Salaries	8.09%	63.7%	Average Weekly Earnings Covered Employment and Wages; Private Fire, Marine, Casualty Massachusetts	80.0%
Payroll Taxes	0.61%	4.8%		
Employee Relations	1.46%	11.5%		
Travel & Travel Items	0.44%	3.5%	Food Away From Home-CPI-US	1.7%
			Private Transportation-CPI-US	1.7%
Postage & Telephone	0.32%	2.5%	Postage-CPI-US	1.3%
			Telephone-CPI-US	1.3%
Equipment	1.69%	13.3%	Office & Stores Machines & Equipment-PPI	13.3%
Printing & Stationery	0.09%	0.7%	Paper-PPI	0.7%
Total	12.70%	100.0%		100.0%

Notes:

(2): 2017 Best's Aggregates and Averages, Property-Casualty, Totals for Commercial Casualty Companies with Written Premium Net of Reinsurance Ceded over \$15 million.

(5) = Based on (3)

Exposure Growth Estimate Based on Trend in Million Worker-Weeks

Policy Year (1)	Estimated Million Worker-Weeks (2)	5 Year Exponential Fit (3)	Difference Squared (4)
2001	77.06		
2002	77.14		
2003	74.30		
2004	71.62		
2005	73.57		
2006	75.65		
2007	78.30		
2008	78.58		
2009	75.29		
2010	79.77		
2011	82.98	82.26	0.51
2012	83.63	84.00	0.13
2013	85.11	85.78	0.44
2014	87.07	87.59	0.27
2015	90.29	89.44	0.72

15 Year Million Worker-Weeks Trend

1.3%

(5)	5 Year MA Trend	2.1%
(6)	n	5
(7)	s	0.83
(8)	t	2.35
(9)	m	5.49
(10)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$	2.05
(11)	Confidence Interval	4.03
(12)	Projected	96.22
(13)	CI / Projected	0.04
(14)	Credibility - 5 Year MA Trend (Z)	100%
(15)	Complement of Credibility	1.3%
(16)	Credibility-Weighted Overall Exposure Growth	2.1%

Notes:

(2): Section V-E, Exhibit 1.

(5): 5 Year Massachusetts Trend from five-year exponential fit to estimated million worker-weeks.

(6): Number of data points used in the exponential fitting of the 5 Year Massachusetts Trend.

(7): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.

(8): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with 3 (= n - 2) degrees of freedom.

(9): Number of years between midpoint of data and projected point.

(11) = (7) x (8) x (10)

(12): Million Worker-Weeks projected to prospective effective period using exponential fit to data.

(13) = (11) / (12)

(14): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%.

Numerically, (14) = the minimum of k / (13) and 100%.

(15): Complement of credibility is based on a 15-year exponential fit.

(16) = [(5) x (14)] + [(15) x [1.0 - (14)]]

EXPENSES

In this filing, the WCRIBMA uses the same methods to calculate expenses as it has used in rate filings beginning in 2011, with the exception of the Defense and Cost Containment Expenses (“DCCE”). These methods, and changes to them, are described below.

Fixed Expenses

The provision for fixed expenses has three components: general expenses, Pool expenses, and other taxes, and was calculated using the same methods used to calculate these expenses in the rate filings since 2011.

The determination of the general expense allowance involves estimating general expenses from the latest three available calendar years of Massachusetts data (Section VI-B, Exhibit 2, Page 2). For each of the three years, a general expense ratio calculated from industrywide data is applied to Massachusetts standard earned premium plus ARAP, excluding expense constant revenue, to obtain an estimate of Massachusetts general expenses for all companies (Section VI-B, Exhibit 2, Page 1). These estimated general expense dollars are trended and adjusted for exposure growth to be consistent with the data periods on which the rate indication in Section I is based. The three years of estimated general expenses are averaged to obtain an estimate of Massachusetts general expense requirements for all companies. As in all of the filings from 2003 forward, general expenses relating to Boards and Bureaus were estimated using the actual

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WCRIBMA expenses taken from WCRIBMA Financial Statements and Expense Analysis Report rather than the Incurred Boards and Bureaus expense item from the Expense Call.

The latest three available years of Massachusetts data, taken from the Massachusetts Workers' Compensation Assigned Risk Pool Annual Report and the WCRIBMA Financial Statements and Expense Analysis Report, are used to determine the Pool expense allowance (Section VI-B, Exhibit 1). The estimated Pool expense dollars are trended and adjusted for exposure growth to be consistent with the data periods on which the rate indication in Section I is based. The three years of estimated Pool expenses are averaged to obtain an estimate of Massachusetts Pool expense requirements for all companies.

The WCRIBMA used the "Other Tax" percentage for the "Commercial Casualty" line as compiled in Best's Aggregates and Averages (2017) to estimate the allowance for miscellaneous taxes in Massachusetts. The resulting allowance for other taxes is then trended and adjusted for exposure growth to be consistent with the experience periods on which the rate indication in Section I is based (Section VI-C).

Variable Expenses

As in the past, the variable expense ratio is comprised of the following components: commissions, other acquisition expenses, premium discounts and premium taxes. As in recent filings, the WCRIBMA has also considered two additional variable expenses which are described below: earned but uncollectible premium net of incidental income and the "frictional costs" of reinsurance.

Commissions

The provision for commission expenses is calculated in this filing using the same method as was used in the 2012, 2014 and 2016 rate filings.¹ The WCRIBMA calculated ratios of direct commission expenses to direct written premium for each of the latest three calendar years using data reported on carriers' Annual Statements.² A three-year average is used to derive the commission expense ratio (Section VI-G, Exhibit 3). The provision for commission expenses could also be evaluated using data that excludes large deductible policies, for which producers are often compensated directly by an insured resulting in no, or very small commissions paid by the insurer.³ Since the WCRIBMA does not currently have such data, a filing was made that included proposed changes to the Massachusetts Workers' Compensation Statistical Plan specifically requiring carriers to report commissions paid on large deductibles beginning with calendar year 2016. Such data would allow the WCRIBMA to remove the impact of large deductible commissions from the commission data collected from Annual Statements

¹ In the 2012 rate filing, the WCRIBMA made a change by using written premium as opposed to earned premiums when estimating the provision for commission expense. Although the 2003 filing used earned premiums, the 2003 and 2012 rate filings are substantively consistent on this point: both derived ratios of commission expense to premiums net of deductible credits. If the WCRIBMA were to use the method it employed in the 2003 rate filing in this rate filing, the provision for commission expense would be 0.5% higher and the rate indication would be 10.5%, 0.6% higher.

² This is consistent with the Commissioner's 1987 Decision (p. 78), in which the Commissioner outlined a simple method for determining expense which he would consider to be reasonable. "First, expenses should be divided into those which can properly be considered to vary directly with premiums and those which cannot. The 2.3 percent premium tax and commissions fall into the first category, general expenses and other taxes (generally related to payroll) fall into the latter group."

³ The Massachusetts Division of Insurance published a regulatory bulletin that addresses this trend on October 4, 2013. Bulletin 2013-09; Fees Charged by Insurance Producers Relative to the Sale of Insurance in the Commonwealth.

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when estimating the provision for commission expenses in the future, however the proposed changes were not approved.⁴

Based on language in the 2012 Decision, the WCRIBMA also revisited its analysis of retrospectively rated policies and determined that the methods used in the filing remain reasonable. Unlike rate deviations in Massachusetts which can only be used to reduce a WCRIBMA approved manual rate and an insured's resulting premium, retrospective rating exposes an insured to the risk of paying additional premiums if loss experience is poor or receiving return premiums if the loss experience is good. The retrospective rating plan is designed to balance the additional premiums paid by some insureds opting for retrospectively rated policies with the return premium received by other insureds, such that the expected average retrospective premium adjustment is zero. In other words, retrospectively rated policies, on average, should generate the same premium as guaranteed cost policies. Assuming a correctly calibrated retrospective rating plan and a workers' compensation market as large as Massachusetts, direct premiums associated with retrospectively rated policies will approximate guaranteed cost premiums and therefore not cause any material distortion in the premium base used by the WCRIBMA to estimate a provision for commission expense. The WCRIBMA surveyed a number of its larger member carriers about the commissions they pay as a consequence of

⁴ The Commissioner's 2012 Decision also asked the State Rating Bureau ("SRB") and the Office of the Attorney General ("OAG") to collaborate with the WCRIBMA on developing systems to provide data regarding payments on large deductible and retrospectively rated policies, and the allocation in such policies of other expenses between insurers and policyholders. The WCRIBMA began to consider the best methods to provide this data following the 2012 decision, and agreed to work on these issues with the OAG and SRB as part of the stipulation governing the 2014 rate filing. The WCRIBMA also presented a proposal for collecting this data to the SRB and OAG for comment and feedback. That proposal included changing the Massachusetts Workers' Compensation Statistical Plan to require the reporting of large deductible commissions as described above. The proposal was not approved as filed. We anticipate that collaboration will continue in an effort to develop a system to collect such data.

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retrospective premium adjustments. All carriers indicated, not surprisingly, that they do not pay commissions on retrospective premium adjustments. Retrospective premium adjustments that require an insured to pay additional premiums are a consequence of poor loss experience. Paying producers commissions for the additional premiums generated by retrospective premium adjustments creates a perverse incentive: the producers' income increases as the loss experience (and workplace safety) deteriorates. An equally unlikely scenario exists if producers were asked to return previously paid commissions because an insured's loss experience was good and the insured's retrospectively rated policy called for a return of premium to the insured. In short, commissions associated with retrospective premium adjustments do not create any distortion in the WCRIBMA estimation of the provision for commission expense because commissions are not paid (or returned) in response to retrospective rating adjustments.

Other Acquisition Expense

The WCRIBMA calculates the other acquisition expense load by taking the ratios of reported other acquisition expenses to reported standard earned premium for each of the latest three calendar years. The WCRIBMA then averages these three ratios to determine the other acquisition expense ratio (Section VI-G, Exhibit 2).

Premium Discounts

The average premium discount is calculated from the Premium Discount Schedules using the methodology used in the Commissioner's Decision on September 1, 1999 Rates and used in each of the WCRIBMA's subsequent rate filings. For interstate-rated risks, the parameter estimate of Massachusetts premium relative to countywide premium is not assumed to be a constant 40% for all policies as was the case prior to the

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2011 rate filing. As in all of the rate filings since then, the Massachusetts portion of the interstate-rated premium is based on actual historical rating data which is considered more accurate and representative of the market.

Carriers in Massachusetts may elect to use either the Type A or the Type B premium discount table. Based on the projected distribution of policy size and the two available premium discount tables, the WCRIBMA estimated an average premium discount for the Type A and Type B tables, separately. These two averages are weighted using the percentages of voluntary market premium written by Type A insurers and Type B insurers (Section VI-E, Exhibit 1) as weights. The resulting average premium discount for the voluntary market is used, in turn, to obtain the premium discount used in the overall rate indication in Section I.

The premium tax rate is 2.28% of net premiums. To put this expense on a “standard premium plus ARAP” basis, the WCRIBMA multiplies the premium tax rate by one minus the “average premium discount for the total market” in Section VI-E, Exhibit 1.

Incidental Income and Earned but Uncollectible Premium

During the hearing on 2003 rates, questions were raised about whether the WCRIBMA should take various forms of “incidental income” (such as finance charges) into account and, if the WCRIBMA were to do so, whether it would also be appropriate to make off-setting adjustments for earned but uncollectible premium (“EBUP”). In response, the WCRIBMA instituted a call for data on both incidental income and EBUP. The WCRIBMA treats incidental income as a negative expense item which is applied as an offset to incidental income by EBUP. The calculation used by the WCRIBMA, which

accounts for both incidental income and EBUP, is based upon a three-year average of the experience reported for calendar years 2014, 2015, and 2016. This year, the selected net effect of including both incidental income and EBUP is zero (Section VI-G, Exhibit 5).

Frictional Costs of Reinsurance

Fundamental to the business of insurance is the concept of sharing underwriting risk among risk bearers. Examples include the sharing of large property risks across a syndicate of primary insurers; self-insureds participating in group self-insurance funds; and reinsurers assuming risks from primary carriers. In workers' compensation, primary insurers utilize reinsurance to reduce their overall underwriting risk, and reinsurers (not unlike primary insurers) must commit capital (surplus) to support the underwriting risk they assume from primary insurers. Reinsurance allows primary insurers to underwrite risks that, but for the existence of a risk-sharing business partner, they would not be able to insure.

Primary carriers must cover their costs of purchasing reinsurance and provide an opportunity for reinsurers to earn a fair rate of return on their invested capital. Prior to the 2005 filing, both the benefits of reinsurance and the costs of obtaining it were overlooked in making rates for workers' compensation in Massachusetts. In the 2005 filing, the WCRIBMA introduced an expense load intended to recognize only the "frictional costs" of reinsurance. Frictional costs, as that term is used in this filing, are the sum of the acquisition expenses (reduced for recognition of ceding commissions), general expenses and taxes associated with providing reinsurance coverage that must be borne by the

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primary carriers. The estimation of the load for frictional costs associated with the purchase of reinsurance is detailed in Section VI-G, Exhibit 4.

Expense Constants

Beginning with the September 1, 2008 rate filing, a new three tiered system of expense constants replaced the two tier system. The current expense constants are \$159 for risk sizes less than \$200, \$250 for risk sizes greater than or equal to \$200 but less than \$1,000, and \$338 for risk sizes greater than or equal to \$1,000. The WCRIBMA is seeking no change in the existing expense constants.

Loss Adjustment Expense

Loss adjustment expense is made up of two components, DCCE and Adjusting and Other Expense (“AO”). In this rate filing, the WCRIBMA utilized the same method that was introduced in the last rate filing for the estimation of the DCCE load, which is the ratio of DCCE to loss. Previously, the WCRIBMA relied on Annual Statement data to derive the DCCE load. In this filing, the WCRIBMA utilizes Aggregate Financial data, specifically the Policy Year Call (Call #2) which excludes data for large deductible policies and therefore is not subject to any distortion created by the various treatments of DCCE that exist in the large deductible market.⁵ Using the Policy Year Call, the WCRIBMA calculated calendar year paid loss and calendar year paid DCCE. Ratios of paid DCCE

⁵ The DOI has historically approved large deductible filings that allow for the allocation of DCCE expense between insurer and insured in a number of different ways. DCCE expense may be paid entirely by the insurer or the insured. Alternatively, the DCCE expense may be included with loss before the application of the deductible resulting in a pro rata sharing of DCCE expense based on the respective amounts for which the insured and the insurer are responsible in accordance with the deductible agreement.

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to paid loss were then calculated for the three most recent complete calendar years. The average of these three ratios was selected as the DCCE load (Section VI-H).⁶

The AO portion of the LAE ratio is adjusted for the effects of losses eliminated by large deductibles. The reported AO for large deductible policies is assumed to be less than it would have been had the policies been written on a full coverage basis, but more than it would have been as a percentage of net losses.⁷ In other words, AO is assumed to be partially variable and partially fixed with respect to large deductible losses. The selected adjustment factor is an average of that which would result from assuming all AO is fixed and from assuming all AO is variable (Section VI-I, Exhibit 1, Page 1).

The derivation of the AO load could also be accomplished using data excluding large deductible experience. However, as explained above such data are not readily available and the collection of such data would be cumbersome, data quality would be difficult to gauge without sources with which to reconcile the data, and the data's use in ratemaking would likely have little impact on the overall rate indication. A lower bound

⁶ The WCRIBMA looked at alternative approaches to this method, including (1) the development of policy year paid DCCE to paid loss ratios, (2) development of policy year paid plus case DCCE to paid plus case loss ratios, and (3) calendar paid plus case DCCE to paid plus case loss. The resulting estimates, 9.9%, 10.0%, and 9.9% respectively, were higher than the method employed in this filing, which yielded as DCCE load of 9.4%. As in the last filing, the WCRIBMA chose the most conservative method.

⁷ "The Role of Large Deductible Policies for PEO's in the Failures of Small Workers' *Compensation Insurers*," a white paper available at www.NAIC.org, provides some insight as to why, for certain insureds, AO expense incurred by the insurer is less when the insured is issued a large deductible policy instead of a guaranteed cost policy. The white paper, on page 6, states, "[t]he intention of insurance regulators and workers' compensation administrators is that the large deductible workers' compensation policies should provide employees with exactly the same coverage for accidents and injuries as policies that do not have deductibles. The reality is that side agreements made outside of the policy contract may make these policies perform more like self-insurance with an excess policy. The difference between large deductible policies and excess insurance is that with large deductibles the insurer is presumed to adjust the claims, report the loss data to statistical agents, and assume the risk of not being paid in a timely manner by the employer. With excess policies the insurer only steps in when the losses occur above the agreed-upon attachment point (losses in excess of preset amount)." www.naic.org/documents/committees_c_wctf_related_150819_lg_deduct_policy_role_in_failures.pdf

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for the AO expense ratio can be estimated by taking the ratio of direct AO expense to losses gross of deductible recoveries. In other words, we only gross up the denominator of the ratio to eliminate the impact of the large deductibles without making an analogous and logical adjustment to the numerator. The result of such an exercise for calendar years 2014 – 2016 yields only a slightly lower bound for the AO expense ratio of 8.6%.

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Section VI - Expenses
Subsection A - Summary
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Section VI - A
Exhibit 1

Summary of Expense Ratios

(1)	Commission and Other Acquisition Expense Ratio	12.6%
(2)	Average Premium Discount as a % of Standard Premium + ARAP	5.2%
(3)	Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4)	Variable Expense Ratio = (1) + (2) + (3)	19.9%
(5)	Fixed Expense Ratio	4.2%
(6)	Total Loss Adjustment Expense Ratio (LAE / Loss)	18.5%

Notes:

(1): Section VI-G, Exhibit 1.

(2): Section VI-E, Exhibit 1.

(3): 2.28% from Section VI-B, Exhibit 3.

(5): Section VI-B, Exhibit 1.

(6): Section VI-H, Exhibit 1.

Calculation of Fixed Expenses

Calendar Year (1)	General Expense Exclusive of Expense Constant Premium (2)	Total Pool Expenses for non-Large Deductible (3)	Total General Expense = (2) + (3) (4)	Projected to PY 2014			Projected to PY 2015		
				Expense Trend Factor (5)	Exposure Growth Factor (6)	Projected General Expense = (4) x (5) x (6) (7)	Expense Trend Factor (8)	Exposure Growth Factor (9)	Projected General Expense = (4) x (8) x (9) (10)
2014	33,538,421	1,724,709	35,263,131	1.031	1.011	36,724,563	1.070	1.032	38,941,285
2015	30,375,750	1,820,871	32,196,621	0.971	0.990	30,942,666	1.008	1.011	32,810,388
2016	34,428,914	1,819,888	36,248,802	0.955	0.969	33,548,221	0.992	0.990	35,573,217
Average			34,569,518			33,738,483			35,774,963

Policy Year (11)	Three Year Average Projected General Expense to PY (12)	Provision for Other Taxes (13)	Provision for Fixed Expenses = (12) + (13) (14)	Expense Trends from PYs to 7/1/2019 (15)	Trended Fixed Expenses = (14) x (15) (16)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period (17)	Fixed Expense Ratio to Standard Earned Premium plus ARAP = (16) / (17) (18)
2014	33,738,483	3,749,394	37,487,878	1.129	42,308,278	990,393,027	4.3%
2015	35,774,963	3,975,710	39,750,674	1.087	43,202,688	1,023,022,921	4.2%
Average							4.2%

Notes:

- (2): Exhibit 2, Page 1.
- (3): Exhibit 2, Page 3.
- (5): Section V-H, Exhibit 1.
- (6): 2.1% annual growth in worker-weeks, from Section V-H, Exhibit 3; 0.5 years from CY 2014 to PY 2014, -0.5 years from CY 2015 to PY 2014, -1.5 years from CY 2016 to PY 2014.
- (8): Section V-H, Exhibit 1.
- (9): 2.1% annual growth in worker-weeks, from Section V-H, Exhibit 3; 1.5 years from CY 2014 to PY 2015, 0.5 years from CY 2015 to PY 2015, -0.5 years from CY 2016 to PY 2015.
- (13): Section VI-C, Exhibit 1.
- (15): Section V-H, Exhibit 1.
- (17): These premium amounts do not match those displayed in Section I. This is due to the exclusion of data from a company group included in the Section I data. The premium amounts displayed have been adjusted by the same development, trend, and premium level factors shown in Section I and off-balance factors shown in Section III. The ARAP premium has been adjusted from company level to DSR level premium using the policy year adjustment factors from Section III-B, Exhibit 2.

VI 000013

Section VI - Expenses
 Subsection B - Fixed Expenses
 7/1/2018

Section VI - B
 Exhibit 2
 Page 1

General Expense Exclusive of Proposed Expense Constant

	Calendar Year		
	2014	2015	2016
(1) Standard Earned Premium Including Expense Constant Premium	799,136,131	846,498,292	905,150,102
(2) ARAP Premium at Company Level	36,346,462	35,041,168	35,273,932
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.046	1.043	1.049
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	837,143,359	883,061,305	942,142,937
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.026	1.042	1.042
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	0.998	0.999
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	857,898,184	918,323,149	980,055,992
(8) Ratio of Adjusted General Expense to Adjusted Standard Earned Premium plus ARAP	5.8%	5.3%	5.4%
(9) General Expenses = (7) x (8)	49,694,314	48,247,589	52,603,096
(10) Expense Constant Premium	35,624,503	36,890,076	37,078,756
(11) General Expense Portion of Expense Constant	51.0%	51.0%	51.0%
(12) Average Expense Constant in Effect	233.18	231.64	232.82
(13) Proposed Average Expense Constant	241.30	241.30	241.30
(14) Expense Trend Factor - Calendar Year XXXX to 7/1/19, the midpoint of the Prospective Effective Period	1.163	1.096	1.078
(15) Trend Factor to Adjust Proposed Average Expense Constant to Calendar Year XXXX = 1.0 / (14)	0.860	0.912	0.928
(16) Detrended Proposed Average Expense Constant = (13) x (15)	207.46	220.16	223.88
(17) Adjusted General Expenses Generated by the Expense Constant = [(10) x (11)] x [(16) / (12)]	16,155,893	17,871,839	18,174,182
(18) General Expenses Exclusive of Expense Constant Premium = (9) - (17)	33,538,421	30,375,750	34,428,914

Notes:

- (1),(2): Aggregate Financial Policy Year Call, excludes large deductible policies.
- (3): Section III-B, Exhibit 2.
- (5): Section III-B, Exhibit 1.
- (6): Section III-C, Exhibit 1.
- (8): Page 2.
- (10): Calculated expense constant premium based on historical Unit Statistical Plan Data.
- (11): Exhibit 3.
- (12): Calculated average expense constant in effect based on historical Unit Statistical Plan Data.
- (13): Section VI-D, Exhibit 1.
- (14): Section V-H, Exhibit 1.

Calculation of General Expense

	Calendar Year		
	2014	2015	2016
(1) Standard Earned Premium Including Expense Constant Premium	906,769,995	966,011,869	1,044,940,146
(2) ARAP Premium at Company Level	40,789,042	40,496,339	41,073,233
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.046	1.043	1.049
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	949,422,796	1,008,266,972	1,088,014,883
(5) Adjustment for Experience, Merit, ARAP and CCPAP Off-Balance	1.026	1.042	1.042
(6) Adjustment for Insolvency Fund Recoupment	0.999	0.998	0.999
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	972,961,302	1,048,528,449	1,131,798,015
(8) Actual WCRIBMA Expenses	9,843,354	9,796,899	11,523,179
(9) General Expenses (excluding Boards & Bureaus Expenses)	46,516,067	45,291,519	49,224,452
(10) Adjusted General Expense = (8) + (9)	56,359,421	55,088,418	60,747,631
(11) Ratio of Adjusted General Expense to Adjusted Standard Earned Premium plus ARAP (including expense constants) = (10) / (7)	5.8%	5.3%	5.4%

Notes:

(1),(2): Aggregate Financial Reconciliation Report Calls, Calendar Years 2014 - 2016, including large deductible policies.

(3): Section III-B, Exhibit 2.

(5): Section III-B, Exhibit 1.

(6): Section III-C, Exhibit 1.

(8): WCRIBMA Financial Statements and Expense Analysis Report. Excludes Workers' Compensation Bureau Pool Expenses.

(9): Aggregate Financial Expense Calls, Calendar Years 2014 - 2016.

VI 000015

Section VI - Expenses
 Subsection B - Fixed Expenses
 7/1/2018

Section VI - B
 Exhibit 2
 Page 3

Calculation of Pool Expense

	Calendar Year		
	2014	2015	2016
(1) Administrative Expenses	499,150	516,159	507,781
(2) Other Expense Allowances	-	-	-
(3) Workers' Compensation Bureau Pool Expenses	2,306,965	2,460,911	2,552,578
(4) Total Pool Expenses = (1) + (2) + (3)	2,806,115	2,977,070	3,060,359
(5) Target Pool Expenses for Excluded Companies	556,358	601,877	686,448
(6) Total Pool Expenses, excluding 2 company(ies) = (4) - (5)	2,249,758	2,375,193	2,373,911
(7) Proportion of Voluntary Assessable Premium Not from Large Deductibles " u "	0.767	0.767	0.767
(8) Total Pool Expenses for Non-Large Deductibles = (6) x (7)	1,724,709	1,820,871	1,819,888

Notes:

- (1),(2): Massachusetts Workers' Compensation Assigned Risk Pool Annual Report and WCRIBMA Financial Statements and Expense Analysis Report, adjusted for non-large deductible policies.
- (3): From the WCRIB Financial Statements and Expense Analysis Report
- (7): Section I-D, Exhibit 2.

VI 000016

Section VI - Expenses
Subsection B - Fixed Expenses
7/1/2018

Section VI - B
Exhibit 3

Expense Constant Components

(1)	Portion of Expense Constant for General Expenses Loaded for Premium Taxes	52.2%
(2)	Current Premium Tax Rate	2.28%
(3)	General Expense Portion of Expense Constant = (1) x [1.0 - (2)]	51.0%
(4)	Other Acquisition Portion of Expense Constant = [1.0 - (1)] x [1.0 - (2)]	46.7%

Notes:

(1): NCCI 1991 Calendar Year Expense database.

(2): Massachusetts Department of Revenue, 2016 Form 63-23P.

2.28% is Premium Tax as % of Net Premium.

VI 000017

Section VI - Expenses
 Subsection C - Other Taxes
 7/1/2018

Section VI - C
 Exhibit 1

Calculation of Other Taxes

(1)	Calendar Year 2016 Standard Earned Premium Including Expense Constant Premium	905,150,102		
(2)	Calendar Year 2016 ARAP Premium at Company Level	35,273,932		
(3)	Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.049		
(4)	Calendar Year 2016 Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	942,142,937		
(5)	Calendar Year 2016 Other Taxes Ratio	0.43%		
(6)	Calendar Year 2016 Other Taxes = (4) x (5)	4,051,215		
			<u>PY2014</u>	<u>PY2015</u>
(7)	Other Tax Trend Factor from CY 2016 to PY XXXX	0.955	0.992	
(8)	Annual Exposure Growth	2.1%	2.1%	
(9)	Trend Length	-1.5	-0.5	
(10)	Provision for Other Taxes = (6) x (7) x { [1.0 + (8)] ^ (9) }	3,749,394	3,975,710	

Notes:

(1),(2): Based on from Aggregate Financial Policy Year Call.

(3): Section III-B, Exhibit 2.

(5): 2017 Best's Aggregates and Averages. Page 651.

(7): Section V-H, Exhibit 1.

(8): Section V-H, Exhibit 3.

(9): -1.5 years from CY 2016 to PY 2014, -0.5 years from CY 2016 to PY 2015.

VI 000018

Section VI - Expenses
 Subsection D - Expense Constant
 7/1/2018

Section VI - D
 Exhibit 1

Calculation of Expense Constant

Standard Premium Ranges		PY 2015 Adjusted Policy Count	Adjusted Policy Distribution	Current Expense Constant	Trend Factor from 7/1/18 to 7/1/19	Selected Trend Factor	Proposed Expense Constant = (5) x (7) (8)
Unadjusted	Adjusted						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Less than \$200	Less Than \$179	71,579	45%	\$159.00	1.025	1.000	\$159.00
\$200 to \$1,000	\$179 to \$893	29,913	19%	\$250.00	1.025	1.000	\$250.00
\$1,000 or more	\$893 or more	58,226	36%	\$338.00	1.025	1.000	\$338.00
Total		159,718	100%	\$241.30			\$241.30

Notes:

Unit Statistical Plan Data PY 2015 (excluding Large Deductible policies).

Risk sizes in terms of Massachusetts Standard Premium.

(2): Instead of projecting the premiums for all policies forward to the prospective effective period, the end points of the Standard Premium

Ranges are adjusted. This is done by dividing the end points by the Premium Adjustment Factor, 1.12, from Section III-E, Exhibit 1.

(4) = (3) / Total (3)

TOTAL (5) = (5) weighted by (4)

(6): Section V-H, Exhibit 1.

Total (8) = (8) weighted by (4)

VI 000019

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2018

Section VI - E
 Exhibit 1

Calculation of Average Premium Discount

		<u>Elected Premium Discount Table</u>	
		<u>Type A</u>	<u>Type B</u>
(1)	Average Premium Discount as a % of Standard Premium	7.5%	4.2%
(2)	Percentage of Voluntary Written Premium by Discount Type	74.3%	25.7%
(3)	Weighted Average Premium Discount as a % of Standard Premium in Voluntary Market = (1) weighted by (2)	6.7%	
(4)	Voluntary Market Share	81.3%	
(5)	Average Premium Discount in Total Market = (3) x (4)	5.4%	
(6)	Average ARAP Surcharge for Prospective Effective Period as a % of Standard Premium	5.1%	
(7)	Average Premium Discount as a % of Standard Premium + ARAP = (5) / [1.0 + (6)]	5.2%	

Notes:

- (1): Type "A" - Exhibit 2, Total (10).
 Type "B" - Exhibit 3, Total (10).
- (2): Exhibit 4.
- (4): Special Bulletin 12/19/17. Market Share is estimated using Standard Premium plus ARAP.
- (6): Section IX-K, Exhibit 3.

VI 000020

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2018

Section VI - E
 Exhibit 2

Average Premium Discount Voluntary Market Risks - Type "A" Discounts

Intrastate Intervals					
Layer of Standard Premium (1)	Standard Premium Ranges - PY 2015				Total = [Sum of (2)] (3)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	100,377,532	68,620,000	2,310,000	10,000	171,317,532
10,000 - 200,000		160,007,464	43,890,000	190,000	204,087,464
200,000 - 1,750,000			45,988,671	1,550,000	47,538,671
1,750,000 - & Over				3,863,266	3,863,266
Total	100,377,532	228,627,464	92,188,671	5,613,266	426,806,933

Interstate Intervals					
Layer of Standard Premium (4)	Standard Premium Ranges - PY 2015				Total Premium in Layer (6)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	157,970	3,625,696	1,608,856	216,872	5,609,394
10,000 - 200,000		22,841,202	30,568,260	4,120,567	57,530,029
200,000 - 1,750,000			53,629,381	33,615,144	87,244,525
1,750,000 - & Over				85,275,444	85,275,444
Total	157,970	26,466,898	85,806,497	123,228,027	235,659,392

Total		Proportion of Premium in Layer (9)	% Premium Discount Type A Company (10)
Layer of Standard Premium (7)	Total = (3) + (6) (8)		
0 - 10,000	176,926,926	26.7%	0.0%
10,000 - 200,000	261,617,493	39.5%	9.1%
200,000 - 1,750,000	134,783,196	20.3%	11.3%
1,750,000 - & Over	89,138,710	13.5%	12.3%
Total	662,466,325	100.0%	7.5%

Notes:

Unit Statistical Plan Data.

Layers correspond to the Premium Discount layers.

For interstate rated policies, the ratio of Massachusetts Standard Premium to Countrywide Standard Premium is assumed to equal the ratio of Massachusetts Expected Losses (used in an interstate experience modification) to Countrywide Expected Losses.

(9) = (8) / Total (8)

Total (10) = (10) weighted by (9)

VI 000021

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2018

Section VI - E
 Exhibit 3

Average Premium Discount Voluntary Market Risks - Type "B" Discounts

Intrastate Intervals					
Layer of Standard Premium (1)	Standard Premium Ranges - PY 2015				Total = [Sum of (2)] (3)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	57,569,275	29,220,000	570,000	10,000	87,369,275
10,000 - 200,000		49,609,468	10,830,000	190,000	60,629,468
200,000 - 1,750,000			15,104,358	1,550,000	16,654,358
1,750,000 - & Over				4,092,313	4,092,313
Total	57,569,275	78,829,468	26,504,358	5,842,313	168,745,414

Interstate Intervals					
Layer of Standard Premium (4)	Standard Premium Ranges - PY 2015				Total Premium in Layer (6)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	58,365	1,275,188	434,414	70,577	1,838,544
10,000 - 200,000		7,608,661	8,253,858	1,340,960	17,203,479
200,000 - 1,750,000			16,278,685	10,939,412	27,218,097
1,750,000 - & Over				55,243,206	55,243,206
Total	58,365	8,883,849	24,966,957	67,594,155	101,503,326

Total		Proportion of Premium in Layer (9)	% Premium Discount Type B Company (10)
Layer of Standard Premium (7)	Total = (3) + (6) (8)		
0 - 10,000	89,207,819	33.0%	0.0%
10,000 - 200,000	77,832,947	28.8%	5.1%
200,000 - 1,750,000	43,872,455	16.2%	6.5%
1,750,000 - & Over	59,335,519	22.0%	7.5%
Total	270,248,740	100.0%	4.2%

Notes:

Unit Statistical Plan Data.

Layers correspond to the Premium Discount layers.

For interstate rated policies, the ratio of Massachusetts Standard Premium to Countrywide Standard Premium is assumed to equal the ratio of Massachusetts Expected Losses (used in an interstate experience modification) to Countrywide Expected Losses.

(9) = (8) / Total (8)

Total (10) = (10) weighted by (9)

VI 000022

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2018

Section VI - E
 Exhibit 4
 Page 1

Calendar Year 2016 Direct Written Premiums by Premium Discount Election - Type "A" or Type "B"

NAIC Company Number (1)	Company Name (2)	Elected Discount Schedule (3)	Direct Written Premium (4)	Residual Market Written Premium (5)	Adjusted Voluntary Written Premium		
					Total Written Premium (6)	Type A Written Premium (7)	Type B Written Premium (8)
33758	ASSOCIATED INDUSTRIES OF MASS. MUTUAL INS. CO.	A	100,608,037	62,005,356	38,602,681	38,602,681	0
22667	ACE AMERICAN INSURANCE COMPANY	A	53,810,583	26,609,604	27,200,979	27,200,979	0
23841	NEW HAMPSHIRE INSURANCE COMPANY	B	49,779,184	0	49,779,184	0	49,779,184
25666	TRAVELERS INDEMNITY COMPANY OF AMERICA	A	42,934,961	36,673,580	6,261,381	6,261,381	0
25682	TRAVELERS INDEMNITY COMPANY OF CONNECTICUT	A	41,792,102	0	41,792,102	41,792,102	0
25658	TRAVELERS INDEMNITY COMPANY	A	40,170,643	-14,133	40,184,776	40,184,776	0
44326	ATLANTIC CHARTER INSURANCE COMPANY	A	36,639,300	13,392,556	23,246,744	23,246,744	0
42390	AMGUARD INSURANCE COMPANY	A	36,197,354	21,055,594	15,141,760	15,141,760	0
25674	TRAVELERS PROPERTY CASUALTY COMPANY OF AMERICA	A	33,932,672	28,932,209	5,000,463	5,000,463	0
16535	ZURICH AMERICAN INSURANCE COMPANY	A	32,814,738	0	32,814,738	32,814,738	0
30104	HARTFORD UNDERWRITERS INSURANCE COMPANY	A	30,502,673	21,130,640	9,372,033	9,372,033	0
11104	ASSOCIATED EMPLOYERS INSURANCE COMPANY	B	30,361,937	0	30,361,937	0	30,361,937
40142	AMERICAN ZURICH INSURANCE COMPANY	A	26,906,823	12,358,704	14,548,119	14,548,119	0
23035	LIBERTY MUTUAL FIRE INSURANCE COMPANY	A	25,732,609	15,911,927	9,820,682	9,820,682	0
29459	TWIN CITY FIRE INSURANCE COMPANY	B	25,612,427	0	25,612,427	0	25,612,427
33600	LM INSURANCE CORPORATION	A	24,730,112	22,806,109	1,924,003	1,924,003	0
31325	ACADIA INSURANCE COMPANY	B	24,176,483	9,797,984	14,378,499	0	14,378,499
25011	WESCO INSURANCE COMPANY	A	24,157,165	0	24,157,165	24,157,165	0
31470	NORGUARD INSURANCE COMPANY	A	20,697,526	0	20,697,526	20,697,526	0
11984	INDEPENDENCE CASUALTY INSURANCE COMPANY	A	20,378,819	0	20,378,819	20,378,819	0
42404	LIBERTY INSURANCE CORPORATION	A	18,734,059	0	18,734,059	18,734,059	0
19445	NATIONAL UNION FIRE INS. CO. OF PITTSBURGH PA	B	16,884,257	0	16,884,257	0	16,884,257
19682	HARTFORD FIRE INSURANCE COMPANY	B	16,863,090	0	16,863,090	0	16,863,090
12886	MASSACHUSETTS EMPLOYERS INSURANCE COMPANY	A	13,786,653	0	13,786,653	13,786,653	0
19429	INSURANCE COMPANY OF THE STATE OF PENNSYLVANIA	A	12,888,774	0	12,888,774	12,888,774	0
28258	CONTINENTAL INDEMNITY COMPANY	B	12,165,088	0	12,165,088	0	12,165,088
13083	NEW HAMPSHIRE EMPLOYERS INSURANCE COMPANY	A	12,164,172	0	12,164,172	12,164,172	0
20281	FEDERAL INSURANCE COMPANY	A	11,860,860	0	11,860,860	11,860,860	0
18023	STAR INSURANCE COMPANY	A	11,796,753	0	11,796,753	11,796,753	0
37478	HARTFORD INSURANCE COMPANY OF THE MIDWEST	B	11,595,848	0	11,595,848	0	11,595,848
41360	ARBELLA PROTECTION INSURANCE COMPANY, INC.	A	11,319,053	0	11,319,053	11,319,053	0
22357	HARTFORD ACCIDENT AND INDEMNITY COMPANY	A	11,272,471	0	11,272,471	11,272,471	0
42376	TECHNOLOGY INSURANCE COMPANY INC.	A	10,676,437	0	10,676,437	10,676,437	0
29424	HARTFORD CASUALTY INSURANCE COMPANY	B	10,646,024	0	10,646,024	0	10,646,024
41343	HDI GLOBAL INSURANCE COMPANY	A	8,709,976	0	8,709,976	8,709,976	0
24147	OLD REPUBLIC INSURANCE COMPANY	A	8,661,992	0	8,661,992	8,661,992	0
12777	CHUBB INDEMNITY INSURANCE COMPANY	A	8,654,611	0	8,654,611	8,654,611	0
21458	EMPLOYERS INSURANCE COMPANY OF WAUSAU	B	7,876,134	0	7,876,134	0	7,876,134
23809	GRANITE STATE INSURANCE COMPANY	B	7,083,118	11,151	7,071,967	0	7,071,967
24198	PEERLESS INSURANCE COMPANY	A	7,073,857	0	7,073,857	7,073,857	0
12262	PENNSYLVANIA MANUFACTURERS' ASSOCIATION INS. CO.	A	7,019,317	0	7,019,317	7,019,317	0
22292	HANOVER INSURANCE COMPANY (THE)	A	6,915,048	0	6,915,048	6,915,048	0
23965	NORFOLK & DEDHAM MUTUAL FIRE INSURANCE COMPANY	A	6,855,642	0	6,855,642	6,855,642	0
14788	NGM INSURANCE COMPANY	A	6,841,890	0	6,841,890	6,841,890	0
11030	MEMIC INDEMNITY COMPANY	A	6,649,467	0	6,649,467	6,649,467	0
25224	GREAT DIVIDE INSURANCE COMPANY	A	6,429,792	0	6,429,792	6,429,792	0
11150	ARCH INSURANCE COMPANY	A	6,417,470	0	6,417,470	6,417,470	0
13803	FARM FAMILY CASUALTY INSURANCE COMPANY	A	6,399,869	0	6,399,869	6,399,869	0
20443	CONTINENTAL CASUALTY COMPANY	B	5,789,864	2,995,831	2,794,033	0	2,794,033
21113	UNITED STATES FIRE INSURANCE COMPANY	A	5,635,471	0	5,635,471	5,635,471	0
24139	OLD REPUBLIC GENERAL INSURANCE CORPORATION	A	5,557,280	0	5,557,280	5,557,280	0
13374	ARROW MUTUAL LIABILITY INSURANCE COMPANY	B	5,179,872	0	5,179,872	0	5,179,872
21784	FIREMEN'S INSURANCE COMPANY OF WASHINGTON, D.C.	B	5,118,511	0	5,118,511	0	5,118,511
39926	SELECTIVE INSURANCE COMPANY OF THE SOUTHEAST	A	5,066,747	0	5,066,747	5,066,747	0

VI 000023

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2018

Section VI - E
 Exhibit 4
 Page 2

Calendar Year 2016 Direct Written Premiums by Premium Discount Election - Type "A" or Type "B"

NAIC Company Number (1)	Company Name (2)	Elected Discount Schedule (3)	Direct Written Premium (4)	Residual Market Written Premium (5)	Adjusted Voluntary Written Premium		
					Total Written Premium (6)	Type A Written Premium (7)	Type B Written Premium (8)
20346	PACIFIC INDEMNITY COMPANY	A	4,839,017	0	4,839,017	4,839,017	0
10664	ENDEAVOUR INSURANCE COMPANY	B	4,599,371	0	4,599,371	0	4,599,371
38318	STARR INDEMNITY & LIABILITY COMPANY	A	4,455,062	0	4,455,062	4,455,062	0
21261	ELECTRIC INSURANCE COMPANY	A	4,407,519	0	4,407,519	4,407,519	0
25623	PHOENIX INSURANCE COMPANY, (THE)	A	4,407,453	0	4,407,453	4,407,453	0
13935	FEDERATED MUTUAL INSURANCE COMPANY	A	4,397,302	0	4,397,302	4,397,302	0
19038	TRAVELERS CASUALTY AND SURETY COMPANY	A	4,363,714	0	4,363,714	4,363,714	0
23817	ILLINOIS NATIONAL INSURANCE COMPANY	B	4,352,679	0	4,352,679	0	4,352,679
20052	NATIONAL LIABILITY & FIRE INSURANCE COMPANY	A	4,195,991	0	4,195,991	4,195,991	0
25976	UTICA MUTUAL INSURANCE COMPANY	A	4,110,740	0	4,110,740	4,110,740	0
37257	PRAETORIAN INSURANCE COMPANY	A	4,099,329	0	4,099,329	4,099,329	0
24082	OHIO SECURITY INSURANCE COMPANY	A	4,048,358	0	4,048,358	4,048,358	0
15105	SAFETY NATIONAL CASUALTY CORPORATION	A	3,689,739	0	3,689,739	3,689,739	0
10017	ARBELLA INDEMNITY INSURANCE COMPANY, INC.	A	3,615,894	0	3,615,894	3,615,894	0
21172	VANLINER INSURANCE COMPANY	A	3,500,490	0	3,500,490	3,500,490	0
24988	SENTRY INSURANCE A MUTUAL COMPANY	A	3,405,273	0	3,405,273	3,405,273	0
31534	CITIZENS INSURANCE COMPANY OF AMERICA	A	3,351,002	0	3,351,002	3,351,002	0
21105	NORTH RIVER INSURANCE COMPANY	A	3,145,575	0	3,145,575	3,145,575	0
20427	AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA	A	3,138,318	0	3,138,318	3,138,318	0
20303	GREAT NORTHERN INSURANCE COMPANY	A	3,090,035	0	3,090,035	3,090,035	0
20478	NATIONAL FIRE INSURANCE COMPANY OF HARTFORD	A	2,956,007	0	2,956,007	2,956,007	0
25844	UNION INSURANCE COMPANY	B	2,949,156	0	2,949,156	0	2,949,156
26662	MILWAUKEE CASUALTY INSURANCE CO.	A	2,946,240	0	2,946,240	2,946,240	0
21415	EMPLOYERS MUTUAL CASUALTY COMPANY	A	2,938,852	0	2,938,852	2,938,852	0
19801	ARGONAUT INSURANCE COMPANY	A	2,865,426	0	2,865,426	2,865,426	0
25615	CHARTER OAK FIRE INSURANCE COMPANY, (THE)	A	2,587,427	0	2,587,427	2,587,427	0
12416	PROTECTIVE INSURANCE COMPANY	A	2,386,843	0	2,386,843	2,386,843	0
37885	XL SPECIALTY INSURANCE COMPANY	A	2,343,568	0	2,343,568	2,343,568	0
12475	REPUBLIC FRANKLIN INSURANCE COMPANY	A	2,314,744	0	2,314,744	2,314,744	0
20494	TRANSPORTATION INSURANCE COMPANY	B	2,276,999	0	2,276,999	0	2,276,999
22306	MASSACHUSETTS BAY INSURANCE COMPANY	A	2,189,372	0	2,189,372	2,189,372	0
33588	FIRST LIBERTY INSURANCE CORPORATION (THE)	A	2,128,526	0	2,128,526	2,128,526	0
35289	CONTINENTAL INSURANCE COMPANY, (THE)	A	2,080,031	0	2,080,031	2,080,031	0
20362	MITSUBI SUMITOMO INSURANCE COMPANY OF AMERICA	A	2,072,169	0	2,072,169	2,072,169	0
20508	VALLEY FORGE INSURANCE COMPANY	A	1,997,067	0	1,997,067	1,997,067	0
13706	DORCHESTER MUTUAL INSURANCE COMPANY	A	1,992,833	0	1,992,833	1,992,833	0
36064	HANOVER AMERICAN INSURANCE COMPANY (THE)	A	1,986,766	0	1,986,766	1,986,766	0
41840	ALLMERICA FINANCIAL BENEFIT INSURANCE COMPANY	A	1,961,645	0	1,961,645	1,961,645	0
19410	COMMERCE AND INDUSTRY INSURANCE COMPANY	B	1,892,660	0	1,892,660	0	1,892,660
27855	ZURICH AMERICAN INSURANCE COMPANY OF ILLINOIS	A	1,781,464	0	1,781,464	1,781,464	0
16608	NEW YORK MARINE AND GENERAL INSURANCE COMPANY	A	1,681,394	0	1,681,394	1,681,394	0
25984	GRAPHIC ARTS MUTUAL INSURANCE COMPANY	A	1,653,883	0	1,653,883	1,653,883	0
23329	MERCHANTS MUTUAL INSURANCE COMPANY	A	1,621,187	0	1,621,187	1,621,187	0
31348	CRUM & FORSTER INDEMNITY COMPANY	B	1,586,901	0	1,586,901	0	1,586,901
26247	AMERICAN GUARANTEE AND LIABILITY INSURANCE COMPANY	A	1,498,822	0	1,498,822	1,498,822	0
11149	MAINE EMPLOYERS' MUTUAL INSURANCE COMPANY	B	1,497,044	0	1,497,044	0	1,497,044
24074	OHIO CASUALTY INSURANCE COMPANY (THE)	A	1,487,235	0	1,487,235	1,487,235	0
10052	CHUBB NATIONAL INSURANCE COMPANY	A	1,374,956	0	1,374,956	1,374,956	0
14702	EASTGUARD INSURANCE COMPANY	A	1,369,680	0	1,369,680	1,369,680	0
20230	CENTRAL MUTUAL INSURANCE COMPANY	B	1,294,342	0	1,294,342	0	1,294,342
19259	SELECTIVE INSURANCE COMPANY OF SOUTH CAROLINA	A	1,187,122	0	1,187,122	1,187,122	0
20397	VIGILANT INSURANCE COMPANY	A	1,181,983	0	1,181,983	1,181,983	0
18767	CHURCH MUTUAL INSURANCE COMPANY	B	1,174,715	0	1,174,715	0	1,174,715
10687	UTICA NATIONAL ASSURANCE COMPANY	A	1,168,247	0	1,168,247	1,168,247	0

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Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
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Section VI - E
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Calendar Year 2016 Direct Written Premiums by Premium Discount Election - Type "A" or Type "B"

NAIC Company Number (1)	Company Name (2)	Elected Discount Schedule (3)	Direct Written Premium (4)	Residual Market Written Premium (5)	Adjusted Voluntary Written Premium		
					Total Written Premium (6)	Type A Written Premium (7)	Type B Written Premium (8)
19879	SECURITY NATIONAL INSURANCE COMPANY	A	1,153,947	0	1,153,947	1,153,947	0
26182	HARLEYSVILLE WORCESTER INSURANCE COMPANY	A	1,146,285	0	1,146,285	1,146,285	0
15059	PUBLIC SERVICE INSURANCE COMPANY	A	1,144,881	0	1,144,881	1,144,881	0
15954	AMTRUST INSURANCE COMPANY OF KANSAS, INC.	A	1,108,677	0	1,108,677	1,108,677	0
38911	BERKLEY NATIONAL INSURANCE COMPANY	A	1,077,998	0	1,077,998	1,077,998	0
21423	UNION INSURANCE COMPANY OF PROVIDENCE	A	1,073,330	0	1,073,330	1,073,330	0
42552	NOVA CASUALTY COMPANY	A	1,025,487	0	1,025,487	1,025,487	0
27154	ATLANTIC SPECIALTY INSURANCE COMPANY	A	975,837	0	975,837	975,837	0
28460	SENTRY CASUALTY COMPANY	A	967,654	0	967,654	967,654	0
24414	GENERAL CASUALTY COMPANY OF WISCONSIN	A	936,035	0	936,035	936,035	0
10804	CONTINENTAL WESTERN INSURANCE COMPANY	B	910,545	0	910,545	0	910,545
11126	SOMPO JAPAN INSURANCE COMPANY OF AMERICA	A	898,742	0	898,742	898,742	0
11185	FOREMOST INSURANCE COMPANY GRAND RAPIDS, MICHIGAN	B	890,660	0	890,660	0	890,660
41513	FOREMOST SIGNATURE INSURANCE COMPANY	B	883,254	0	883,254	0	883,254
11800	FOREMOST PROPERTY AND CASUALTY INSURANCE COMPANY	B	862,083	0	862,083	0	862,083
13978	FLORISTS' MUTUAL INSURANCE COMPANY	A	801,719	0	801,719	801,719	0
16551	SAVERS PROPERTY AND CASUALTY INSURANCE COMPANY	A	783,107	0	783,107	783,107	0
29939	MAIN STREET AMERICA ASSURANCE COMPANY	A	765,176	0	765,176	765,176	0
23442	PATRIOT GENERAL INSURANCE COMPANY	A	761,504	0	761,504	761,504	0
21180	SENTRY SELECT INSURANCE COMPANY	A	736,046	0	736,046	736,046	0
20222	ALL AMERICA INSURANCE COMPANY	A	735,130	0	735,130	735,130	0
15067	QUINCY MUTUAL FIRE INSURANCE COMPANY	A	734,719	0	734,719	734,719	0
12901	MERCHANTS PREFERRED INSURANCE COMPANY	A	724,301	0	724,301	724,301	0
28304	FEDERATED SERVICE INSURANCE COMPANY	A	684,504	0	684,504	684,504	0
43478	UTICA NATIONAL INSURANCE COMPANY OF TEXAS	A	673,430	0	673,430	673,430	0
12831	STATE NATIONAL INSURANCE COMPANY INC.	A	654,420	0	654,420	654,420	0
23396	AMERISURE MUTUAL INSURANCE COMPANY	B	630,207	0	630,207	0	630,207
10120	EVEREST NATIONAL INSURANCE COMPANY	B	616,365	0	616,365	0	616,365
10340	STONINGTON INSURANCE COMPANY	A	545,723	0	545,723	545,723	0
24554	XL INSURANCE AMERICA, INC.	A	536,926	0	536,926	536,926	0
13714	PHARMACISTS MUTUAL INSURANCE COMPANY	A	535,936	0	535,936	535,936	0
23434	MIDDLESEX INSURANCE COMPANY	A	524,485	0	524,485	524,485	0
15032	GUIDEONE MUTUAL INSURANCE COMPANY	A	508,651	0	508,651	508,651	0
22136	GREAT AMERICAN INSURANCE COMPANY OF NEW YORK	A	504,548	0	504,548	504,548	0
28886	TRANSGUARD INSURANCE COMPANY OF AMERICA, INC.	A	495,844	0	495,844	495,844	0
27847	INSURANCE COMPANY OF THE WEST	A	490,023	0	490,023	490,023	0
11991	NATIONAL CASUALTY COMPANY	A	476,803	0	476,803	476,803	0
11045	EXCELSIOR INSURANCE COMPANY	A	470,599	0	470,599	470,599	0
10665	AMERITRUST INSURANCE CORPORATION	A	389,976	0	389,976	389,976	0
20044	BERKSHIRE HATHAWAY HOMESTATE INSURANCE COMPANY	A	376,818	0	376,818	376,818	0
14190	OBI NATIONAL INSURANCE COMPANY	A	376,612	0	376,612	376,612	0
28223	NATIONWIDE AGRIBUSINESS INSURANCE COMPANY	B	375,883	0	375,883	0	375,883
26832	GREAT AMERICAN ALLIANCE INSURANCE COMPANY	A	366,747	0	366,747	366,747	0
10800	PREMIER GROUP INSURANCE COMPANY	B	346,664	0	346,664	0	346,664
11673	REDWOOD FIRE AND CASUALTY INSURANCE COMPANY	A	344,665	0	344,665	344,665	0
10945	TOKIO MARINE AMERICA INSURANCE COMPANY	A	340,325	0	340,325	340,325	0
23043	LIBERTY MUTUAL INSURANCE COMPANY	B	300,470	-6,367	306,837	0	306,837
27120	TRUMBULL INSURANCE COMPANY	A	299,485	0	299,485	299,485	0
35696	HARLEYSVILLE PREFERRED INSURANCE COMPANY	A	293,379	0	293,379	293,379	0
24171	NETHERLANDS INSURANCE COMPANY (THE)	A	287,254	0	287,254	287,254	0
24449	REGENT INSURANCE COMPANY	A	278,546	0	278,546	278,546	0
15911	AMERICAN MINING INSURANCE COMPANY	A	272,715	0	272,715	272,715	0
22322	GREENWICH INSURANCE COMPANY	A	245,402	0	245,402	245,402	0
11371	GREAT WEST CASUALTY COMPANY	A	244,097	0	244,097	244,097	0

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Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2018

Section VI - E
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Calendar Year 2016 Direct Written Premiums by Premium Discount Election - Type "A" or Type "B"

NAIC Company Number (1)	Company Name (2)	Elected Discount Schedule (3)	Direct Written Premium (4)	Residual Market Written Premium (5)	Adjusted Voluntary Written Premium		
					Total Written Premium (6)	Type A Written Premium (7)	Type B Written Premium (8)
25135	STATE AUTOMOBILE MUTUAL INSURANCE COMPANY	A	229,061	0	229,061	229,061	0
13269	ZENITH INSURANCE COMPANY	A	228,239	0	228,239	228,239	0
23582	HARLEYSVILLE INSURANCE COMPANY	A	211,503	0	211,503	211,503	0
10677	CINCINNATI INSURANCE COMPANY	A	207,440	0	207,440	207,440	0
25127	STATE AUTO PROPERTY & CASUALTY INSURANCE COMPANY	A	198,705	0	198,705	198,705	0
14923	PATRONS MUTUAL INSURANCE COMPANY OF CONNECTICUT	A	195,421	0	195,421	195,421	0
21881	NATIONAL SURETY CORPORATION	A	184,866	0	184,866	184,866	0
41238	TRANS PACIFIC INSURANCE COMPANY	A	182,578	0	182,578	182,578	0
10166	ACCIDENT FUND INSURANCE COMPANY OF AMERICA	A	182,175	0	182,175	182,175	0
21865	ASSOCIATED INDEMNITY CORPORATION	B	165,836	0	165,836	0	165,836
24066	AMERICAN FIRE AND CASUALTY COMPANY	A	161,723	0	161,723	161,723	0
18333	PEERLESS INDEMNITY INSURANCE COMPANY	A	158,821	0	158,821	158,821	0
20699	ACE PROPERTY AND CASUALTY INSURANCE COMPANY	A	158,274	0	158,274	158,274	0
44393	WEST AMERICAN INSURANCE COMPANY	A	148,208	0	148,208	148,208	0
19704	AMERICAN STATES INSURANCE COMPANY	A	141,517	0	141,517	141,517	0
12866	T.H.E INSURANCE COMPANY	B	138,645	0	138,645	0	138,645
19720	AMERICAN ALTERNATIVE INSURANCE CORPORATION	A	132,009	0	132,009	132,009	0
22748	PACIFIC EMPLOYERS INSURANCE COMPANY	A	129,073	0	129,073	129,073	0
31895	AMERICAN INTERSTATE INSURANCE COMPANY	A	124,815	0	124,815	124,815	0
10642	CHEROKEE INSURANCE COMPANY	A	117,425	0	117,425	117,425	0
21857	AMERICAN INSURANCE COMPANY, (THE)	A	115,693	0	115,693	115,693	0
20613	SPARTA INSURANCE COMPANY	A	103,622	0	103,622	103,622	0
19488	AMERISURE INSURANCE COMPANY	B	103,285	0	103,285	0	103,285
29157	UNITED WISCONSIN INSURANCE COMPANY	A	101,477	0	101,477	101,477	0
10346	EMPLOYERS PREFERRED INSURANCE COMPANY	A	99,142	0	99,142	99,142	0
31003	TRI-STATE INSURANCE COMPANY OF MINNESOTA	A	97,931	0	97,931	97,931	0
40045	STARNET INSURANCE COMPANY	A	95,503	0	95,503	95,503	0
13056	RLI INSURANCE COMPANY	A	87,586	0	87,586	87,586	0
19402	AIG PROPERTY CASUALTY COMPANY	B	87,251	0	87,251	0	87,251
12304	ACCIDENT FUND GENERAL INSURANCE COMPANY	A	75,749	0	75,749	75,749	0
43575	INDEMNITY INSURANCE COMPANY OF NORTH AMERICA	A	67,673	0	67,673	67,673	0
21873	FIREMAN'S FUND INSURANCE COMPANY	A	67,023	0	67,023	67,023	0
19690	AMERICAN ECONOMY INSURANCE COMPANY	A	62,047	0	62,047	62,047	0
11123	SAFETY FIRST INSURANCE COMPANY	A	60,576	0	60,576	60,576	0
29580	BERKLEY REGIONAL INSURANCE COMPANY	A	59,372	0	59,372	59,372	0
21849	AMERICAN AUTOMOBILE INSURANCE COMPANY	A	48,060	0	48,060	48,060	0
19984	ACIG INSURANCE COMPANY	A	47,283	0	47,283	47,283	0
26042	WAUSAU UNDERWRITERS INSURANCE COMPANY	A	45,836	0	45,836	45,836	0
24767	ST. PAUL FIRE & MARINE INSURANCE COMPANY	A	44,565	0	44,565	44,565	0
11050	AMERISURE PARTNERS INSURANCE COMPANY	B	43,104	0	43,104	0	43,104
13528	BROTHERHOOD MUTUAL INSURANCE COMPANY	B	35,850	0	35,850	0	35,850
18279	BANKERS STANDARD INSURANCE COMPANY	A	34,738	0	34,738	34,738	0
35408	IMPERIUM INSURANCE COMPANY	B	33,847	0	33,847	0	33,847
26069	WAUSAU BUSINESS INSURANCE COMPANY	A	33,836	0	33,836	33,836	0
41394	BENCHMARK INSURANCE COMPANY	A	30,836	0	30,836	30,836	0
38300	SAMSUNG FIRE & MARINE INSURANCE CO. LTD (U.S. BRANCH)	A	30,639	0	30,639	30,639	0
40517	ADVANTAGE WORKERS COMPENSATION INSURANCE COMPANY	A	30,110	0	30,110	30,110	0
21709	TRUCK INSURANCE EXCHANGE	A	24,364	0	24,364	24,364	0
25143	STATE FARM FIRE AND CASUALTY COMPANY	A	24,071	0	24,071	24,071	0
10391	BERKSHIRE HATHAWAY DIRECT INSURANCE COMPANY	A	22,573	0	22,573	22,573	0
23280	CINCINNATI INDEMNITY COMPANY	A	18,293	0	18,293	18,293	0
16691	GREAT AMERICAN INSURANCE COMPANY	A	14,805	0	14,805	14,805	0
14982	PENN MILLERS INSURANCE COMPANY	A	11,145	0	11,145	11,145	0
25402	EMPLOYERS ASSURANCE COMPANY	A	10,450	0	10,450	10,450	0

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Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2018

Section VI - E
 Exhibit 4
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Calendar Year 2016 Direct Written Premiums by Premium Discount Election - Type "A" or Type "B"

NAIC Company Number (1)	Company Name (2)	Elected Discount Schedule (3)	Direct Written Premium (4)	Residual Market Written Premium (5)	Adjusted Voluntary Written Premium		
					Total Written Premium (6)	Type A Written Premium (7)	Type B Written Premium (8)
34630	OAK RIVER INSURANCE COMPANY	A	9,991	0	9,991	9,991	0
26344	GREAT AMERICAN ASSURANCE COMPANY	A	8,781	0	8,781	8,781	0
19399	AIU INSURANCE COMPANY	B	8,519	0	8,519	0	8,519
23612	MIDWEST EMPLOYERS CASUALTY COMPANY	A	6,647	0	6,647	6,647	0
19828	ARGONAUT-MIDWEST INSURANCE COMPANY	A	5,064	0	5,064	5,064	0
25887	UNITED STATES FIDELITY AND GUARANTY COMPANY	A	4,349	0	4,349	4,349	0
22551	MITSUI SUMITOMO INSURANCE USA INC.	A	2,496	0	2,496	2,496	0
27740	NORTH POINTE INSURANCE COMPANY	A	2,135	0	2,135	2,135	0
23469	AMERICAN MODERN HOME INSURANCE COMPANY	A	2,122	0	2,122	2,122	0
12305	ACCIDENT FUND NATIONAL INSURANCE COMPANY	A	2,019	0	2,019	2,019	0
36684	RIVERPORT INSURANCE COMPANY	A	1,299	0	1,299	1,299	0
11000	SENTINEL INSURANCE COMPANY, LTD.	A	1,033	0	1,033	1,033	0
36234	PREFERRED PROFESSIONAL INSURANCE COMPANY	A	883	0	883	883	0
28665	CINCINNATI CASUALTY COMPANY	A	821	0	821	821	0
14990	PENNSYLVANIA NATIONAL MUTUAL CASUALTY INS. CO.	B	775	0	775	0	775
34690	PROPERTY AND CASUALTY INSURANCE CO. OF HARTFORD	A	744	0	744	744	0
20702	ACE FIRE UNDERWRITERS INSURANCE COMPANY	A	593	0	593	593	0
20095	BITCO GENERAL INSURANCE CORPORATION	A	409	0	409	409	0
35386	FIDELITY AND GUARANTY INSURANCE COMPANY	A	191	0	191	191	0
13331	MOTORISTS COMMERCIAL MUTUAL INSURANCE COMPANY	A	184	0	184	184	0
24732	GENERAL INSURANCE COMPANY OF AMERICA	A	169	0	169	169	0

Total	1,224,072,294	273,660,745	950,411,549	706,021,201	244,390,348
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Percentage of Voluntary written premium electing Type A Discount:	74.3%
Percentage of Voluntary written premium electing Type B Discount:	25.7%

Notes:

- (4) = Annual Statement Exhibit of Premium and Losses
- (5) = consistent with the Annual Statement Exhibit of Premium and Losses
- (6) = (4) - (5), subject to a minimum of 0

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Section VI - Expenses
Subsection F - Expense Constant Offset
7/1/2018

Section VI - F
Exhibit 1

Calculation of Expense Constant as Percent of Premium for Prospective Effective Period

(1) Expense Constant Offset for Policy Year 2015	0.958
(2) Expense Constant as Percent of Premium for Policy Year 2015 = 1.0 - (1)	4.2%
(3) Calculated Expense Constant for Policy Year 2015	\$232.07
(4) Factor to Bring Policy Year 2015 Premium to Premium Level of Prospective Effective Period	1.12
(5) Estimated Expense Constant for Prospective Effective Period	\$241.30
(6) Expense Constant as Percent of Premium for Prospective Effective Period = { (2) x [(5) / (3)] } / { [(1) x (4)] + [(2) x ((5) / (3))] }	3.9%

Notes:

(1): Exhibit 2.

(3): Based on Unit Statistical Plan Data

(4): Section III-E, Exhibit 1.

(5): Section D, Exhibit 1.

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Section VI - Expenses
 Subsection F - Expense Constant Offset
 7/1/2018

Section VI - F
 Exhibit 2

Expense Constant Offsets

Used in Section I and Section III

Policy Year (1)	Standard Premium Excluding Expense Constant (2)	ARAP at Company Level (3)	Factor to Adjust ARAP from Company Level to DSR Level Premium (4)	Expense Constant (5)	Expense Constant Offset (6)
2014	995,173,438	47,158,506	1.045	45,726,485	0.958
2015	1,062,283,940	47,074,092	1.045	47,272,963	0.959

Used in the Calculation of Expense Constant as Percent of Premium for Prospective Effective Period

Policy Year (7)	Standard Premium Excluding Expense Constant (8)	ARAP at Company Level (9)	Factor to Adjust ARAP from Company Level to DSR Level Premium (10)	Expense Constant (11)	Expense Constant Offset (12)
2015	834,670,517	35,932,109	1.045	38,139,510	0.958

Notes:

Based on Unit Statistical Plan Data, excluding Large Deductible Policies.

(4) Section III-B, Exhibit 2.

(6) = { (2) + [(3) * (4)] } / [{ (2) + [(3) * (4)] } + (5)]

(10) Section III-B, Exhibit 2.

(12) = { (8) + [(9) * (10)] } / [{ (8) + [(9) * (10)] } + (11)]

The Standard Premium excluding Expense Constant values for Policy Year 2015 used in Section I and Section III differ from those used in the calculation of the Expense Constant because of a differing company mixes.

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Section VI - Expenses
Subsection G - Acquisition Expenses
7/1/2018

Section VI - G
Exhibit 1

Provision for Commission and Other Acquisition Expense Including Frictional Reinsurance Expenses

(1)	Other Acquisition and Field Supervision Expense Ratio, Excluding Expense Constants	3.3%
(2)	Selected Average Commission Ratio, Excluding Expense Constants	8.3%
(3)	Selected Frictional Reinsurance Expenses Ratio (relative to Standard plus ARAP premiums, excluding expense constants)	1.0%
(4)	Selected Effect of Incidental Income and EBUP Expense, Excluding of Expense Constants	0.0%
(5)	Commission and Other Acquisition Expense Ratio = (1) + (2) + (3) + (4)	12.6%

Notes:

(1): Exhibit 2.

(2): Exhibit 3.

(3): Exhibit 4, Page 1.

(4): Exhibit 5.

Calculation of Other Acquisition Expense

	Calendar Year		
	2014	2015	2016
(1) Standard Earned Premium Including Expense Constant Premium	906,769,995	966,011,869	1,044,940,146
(2) ARAP Premium at Company Level	40,789,042	40,496,339	41,073,233
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.046	1.043	1.049
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	949,422,796	1,008,266,972	1,088,014,883
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.026	1.042	1.042
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	0.998	0.999
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	972,961,302	1,048,528,449	1,131,798,015
(8) Other Acquisition, Field Supervision, Collection Expenses for Home Office and Branch Office, excluding Commissions	48,743,974	50,747,202	58,685,708
(9) Other Acquisition Expense Ratio = (8) / (7)	5.0%	4.8%	5.2%
(10) Three Year Average		5.0%	
(11) Expense Constant as Percent of Premium for Prospective Effective Period		3.9%	
(12) Other Acquisition Portion of Expense Constant		46.7%	
(13) Percent of Premium due to Portion of Expense Constant for Other Acquisition Expense = (11) x (12)		1.8%	
(14) Other Acquisition and Field Supervision Expense Ratio, Excluding Expense Constants = [(10) - (13)] / [1.0 - (11)]		3.3%	

Notes:

- (1), (2): Aggregate Financial Reconciliation Report Calls, Calendar Years 2014 - 2016.
Reported Premium, plus ARAP, and including Large Deductible Policies at Standard Premium.
- (3): Section III-B, Exhibit 2.
- (5): Section III-B, Exhibit 1.
- (6): Section III-C, Exhibit 1.
- (8): Aggregate Financial Expense Calls, Calendar Years 2014 - 2016.
- (11): Section VI-F, Exhibit 1.
- (12): Section VI-B, Exhibit 3.

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Section VI - Expenses
Subsection G - Acquisition Expenses
7/1/2018

Section VI - G
Exhibit 3

Calculation of Average Commission Rate

	Calendar Year		
	2014	2015	2016
(1) Direct Written Premium	835,697,096	885,039,083	935,404,943
(2) Total Commissions for Agents and Brokers	65,022,823	68,643,373	77,428,739
(3) Average Commission Rate = (2) / (1)	7.8%	7.8%	8.3%
(4) Three Year Average		7.9%	
(5) Expense Constant as Percent of Premium for Prospective Effective Period		3.9%	
(6) Average Commission Ratio, Excluding Expense Constants = (4) / [1.0 - (5)]		8.3%	
(7) Selected Average Commission Ratio, Excluding Expense Constants		8.3%	

Notes:

- (1): Annual Statement Exhibit of Premium and Losses, Calendar Years 2014 - 2016.
(2): Aggregate Financial Expense Calls, Calendar Years 2014 - 2016.
(5): Section VI-F, Exhibit 1.

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Frictional Reinsurance Expenses

Calendar Year	Reinsurer Underwriting Expenses as Percentage of Net Written Premium				
	Commission and Brokerage	Other Acquisition	General Expenses	Taxes	Total Underwriting Expenses = (2) + (3) + (4) + (5)
(1)	(2)	(3)	(4)	(5)	(6)
2002	20.3%	3.7%	2.7%	0.4%	27.0%
2003	18.7%	4.2%	2.7%	0.6%	26.2%
2004	18.0%	4.0%	2.9%	0.5%	25.4%
2005	26.2%	8.0%	6.4%	0.7%	41.3%
2006	13.3%	4.6%	4.4%	0.5%	22.8%
2007	14.0%	4.9%	4.2%	0.5%	23.6%
2008	18.4%	4.3%	3.9%	0.6%	27.2%
2009	19.8%	2.9%	3.4%	0.2%	26.3%
2010	17.7%	3.2%	3.8%	0.2%	24.9%
2011	19.2%	3.0%	2.8%	0.2%	25.2%
2012	19.1%	3.1%	2.7%	0.3%	25.2%
2013	17.4%	3.6%	3.5%	0.3%	24.8%
2014	18.1%	3.5%	5.3%	0.4%	27.3%
2015	18.5%	3.2%	3.2%	0.3%	25.2%
2016	18.2%	3.0%	3.4%	0.3%	24.9%
(7) Average	18.5%	3.9%	3.7%	0.4%	26.5%
(8) Estimated Ceding Commission & Brokerage Rate for Workers' Compensation Non-Proportional Reinsurance	16.2%				
(9) Adjusted Average = (7) - (8)	2.3%	3.9%	3.7%	0.4%	10.3%

- (10) Estimated % of Direct Premium Ceded for Workers' Compensation Non-Proportional Reinsurance 14.1%
- (11) Implied Frictional Reinsurance Expenses Relative to Direct Premiums (as a %)
= Total (9) x (10) 1.45%
- (12) Selected Frictional Reinsurance Expenses Ratio
(relative to Standard plus ARAP premiums, excluding expense constants) 1.0%

Notes:

- (2)-(5): Insurance Expense Exhibit database - By Line Underwriting Experience from Best's Aggregates & Averages for Reinsurance Editions 2003 - 2017.
- (8): Page 2, (10).
- (10): Page 2, (11).

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Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2018

Section VI - G
 Exhibit 4
 Page 2

Estimate of Ceding Commission & Brokerage Rate for Workers' Compensation Non-Proportional Reinsurance

Calendar Year (1)	Written Premiums (000's)			Ratio of Commission & Brokerage Incurred to Written Premium		Commission & Brokerage Expenses Incurred (000's)		
	Direct (2)	Net (3)	Direct - Net = (2) - (3) (4)	Direct (5)	Net (6)	Direct = (2) x (5) (7)	Net = (3) x (6) (8)	Direct - Net = (7) - (8) (9)
2002	43,950,839	38,137,991	5,812,848	0.077	0.066	3,384,215	2,517,107	867,107
2003	50,031,977	43,333,685	6,698,292	0.072	0.063	3,602,302	2,730,022	872,280
2004	51,988,628	45,667,027	6,321,601	0.074	0.063	3,847,158	2,877,023	970,136
2005	53,139,231	46,633,441	6,505,790	0.068	0.056	3,613,468	2,611,473	1,001,995
2006	50,942,134	45,033,012	5,909,122	0.072	0.069	3,667,834	3,107,278	560,556
2007	50,367,861	44,207,021	6,160,840	0.071	0.061	3,576,118	2,696,628	879,490
2008	42,686,615	37,535,546	5,151,069	0.077	0.060	3,286,869	2,252,133	1,034,737
2009	37,879,014	32,642,883	5,236,131	0.079	0.060	2,992,442	1,958,573	1,033,869
2010	37,180,836	32,184,623	4,996,213	0.079	0.060	2,937,286	1,931,077	1,006,209
2011	41,651,380	35,751,070	5,900,310	0.084	0.068	3,498,716	2,431,073	1,067,643
2012	44,555,061	37,992,643	6,562,418	0.084	0.070	3,742,625	2,659,485	1,083,140
2013	49,384,867	41,250,232	8,134,635	0.084	0.068	4,148,329	2,805,016	1,343,313
2014	52,613,735	44,053,515	8,560,220	0.084	0.066	4,419,554	2,907,532	1,512,022
2015	54,522,916	45,090,969	9,431,947	0.088	0.073	4,798,017	3,291,641	1,506,376
2016	58,255,242	47,961,376	10,293,866	0.085	0.067	4,951,696	3,213,412	1,738,283
Total	719,150,336	617,475,034	101,675,302	0.079	0.065	56,466,628	39,989,473	16,477,156

- (10) Estimated Ceding Commission & Brokerage Rate for Workers' Compensation Non-Proportional Reinsurance = Total (9) / Total (4) 16.2%
- (11) Estimated % of Direct Premium Ceded for Workers' Compensation Non-Proportional Reinsurance = Total (4) / Total (2) 14.1%

Notes:

(2), (3), (5), (6): Insurance Expense Exhibit database - By Line Underwriting Experience from Best's Aggregates & Averages for Workers' Comp Editions 2003 - 2017.

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Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2018

Section VI - G
 Exhibit 5

Effect of Incidental Income and Earned but Uncollected Premium

	Calendar Year		
	2014	2015	2016
(1) Standard Earned Premium Including Expense Constant Premium	906,769,995	966,011,869	1,044,940,146
(2) ARAP Premium at Company Level	40,789,042	40,496,339	41,073,233
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.046	1.043	1.049
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	949,422,796	1,008,266,972	1,088,014,883
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.026	1.042	1.042
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	0.998	0.999
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	972,961,302	1,048,528,449	1,131,798,015
(8) Earned But Uncollected Premium ("EBUP")	9,563,957	9,349,214	5,361,012
(9) Incidental Income	1,563,918	1,213,797	1,336,668
(10) Net Effect of Incidental Income and EBUP Expense = [(8) - (9)] / (7)	0.8%	0.8%	0.4%
(11) Three Year Average		0.7%	
(12) Expense Constant as Percent of Premium for Prospective Effective Period		3.9%	
(13) Effect of Incidental Income and EBUP Expense, Exclusive of Expense Constants = (11) / [1.0 - (12)]		0.7%	
(14) Selected Effect of Incidental Income and EBUP Expense, Excluding of Expense Constants		0.0%	

Notes:

- (1), (2): Aggregate Financial Reconciliation Report Calls, Calendar Years 2014 - 2016.
Reported Premium and ARAP, including Large Deductible Policies at Standard Premium.
- (3): Section III-B, Exhibit 2.
- (5): Section III-B, Exhibit 1.
- (6): Section III-C, Exhibit 1.
- (8),(9): Aggregate Financial Expense Call.
- (12): Section VI-F, Exhibit 1.

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Section VI - Expenses
Subsection H - Loss Adjustment Expense
7/1/2018

Section VI - H
Exhibit 1

Defense and Cost Containment Expense ("DCCE") Ratio and Total Loss Adjustment Expense ("LAE") Ratio

		Calendar Year		
		2014	2015	2016
(1)	Ground Up Paid Losses	506,307,197	500,195,047	507,699,297
(2)	Ground Up Paid Defense and Cost Containment Expense	47,850,342	47,990,664	47,063,402
(3)	Defense and Cost Containment Expense Ratio = (2) / (1)	9.5%	9.6%	9.3%
(4)	Three Year Average Defense and Cost Containment Expense Ratio = Average of (3)		9.4%	
(5)	Selected Three Year Average Defense and Cost Containment Expense Ratio		9.4%	
(6)	Total Loss Adjustment Expense Ratio (LAE / Loss)		18.5%	

Notes:

(1),(2): Aggregate Financial Policy Year Calls.

(6): (5) + [(9) from Section VI-H, Exhibit 2]

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Section VI - Expenses
 Subsection H - Loss Adjustment Expense
 7/1/2018

Section VI - H
 Exhibit 2

Adjusting and Other ("AO") Expense Ratio

	Calendar Year		
	2014	2015	2016
(1) Direct Incurred Losses	570,633,219	605,650,564	623,261,176
(2) Factor to Adjust the Direct Losses to Full Coverage Losses	1.118	1.118	1.133
(3) Estimated Full Coverage Incurred Losses = (1) x (2)	638,167,500	677,175,892	705,930,377
(4) Direct Incurred Adjusting and Other Expense	59,324,740	54,837,877	58,698,118
(5) Factor to Adjust the Direct Adjusting and Other Expense to Full Coverage AO Expense	1.056	1.056	1.062
(6) Estimated Full Coverage Adjusting and Other Expense = (4) x (5)	62,639,144	57,895,420	62,348,853
(7) Adjusted Adjusting and Other Expense Ratio = (6) / (3)	9.82%	8.55%	8.83%
(8) Three Year Average Adjusted Adjusting and Other Expense Ratio = Average of (7)		9.1%	
(9) Selected Three Year Average Adjusted Adjusting and Other Expense Ratio		9.1%	

Notes:

(1),(4): Aggregate Financial Calendar Year Expense Data Calls, 2014 - 2016.

(2),(5): Section VI-I, Exhibit 1, Page 1.

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Section VI - Expenses
 Subsection I - Adjustment for Large Deductible Policies
 7/1/2018

Section VI - I
 Exhibit 1
 Page 1

Adjustment to the Adjusting and Other Expense Provision

	Calendar Year		
	2014	2015	2016
(1) Average Premium Reduction Factor for Large Deductible Policies	0.805	0.811	0.824
(2) Loss Elimination Ratio (LER) for Large Deductible Policies = (1) x 1.104	88.9%	89.5%	91.0%
(3) Market Share (Standard Premium Basis) of Large Deductible Policies	11.9%	11.8%	12.9%
(4) LER for Full Coverage plus Large Deductible Policies = [(2) x (3)] + { 0.0 x [1.0 - (3)] }	10.6%	10.6%	11.7%
(5) Factor to Adjust the Direct Losses to Full Coverage Losses = 1.0 / [1.0 - (4)]	1.118	1.118	1.133
(6) Factor to Adjust the Direct AO Expense to Full Coverage AO Expense = 1.0 / { 1.0 - [0.5 x (4)] }	1.056	1.056	1.062

Notes:

(1),(3): Exhibit 2.

(2): 1.104 from Exhibit 1, Page 2.

(6): Assumes 50% of Adjusting & Other expense varies directly with losses.

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Section VI - Expenses
 Subsection I - Adjustment for Large Deductible Policies
 7/1/2018

Section VI - I
 Exhibit 1
 Page 2

Loss Elimination Ratio for Large Deductible Policies

		<u>As a % of Standard Premium plus ARAP</u>
(1)	Commission and Other Acquisition Expense Ratio	10.9%
(2)	Premium Discount Ratio	5.0%
(3)	Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4)	Profit Provision	0.0%
(5)	Insolvency Fund Assessment	-0.2%
(6)	Residual Market Subsidy (Retrospectively-rated policies)	0.7%
(7)	Variable Expense Ratio = (1) + (2) + (3) + (4) + (5) + (6)	18.5%
(8)	Expected Loss Ratio without LAE	64.2%
(9)	Defense and Cost Containment Expense ("DCC")	6.5%
(10)	Adjusting and Other Expenses ("AO")	6.3%
(11)	Variable Adjusting and Other Expenses = 0.5 x (10)	3.2%
(12)	Portion of Expected Loss + LAE Ratio that varies with deductible (ELARD) = (8) + (9) + (11)	73.8%
(13)	LER / D = [1.0 - (7)] / (12)	1.104

D = Average Premium Reduction Factor for Large Deductible Policies

LER = Loss Elimination Ratio

ELARD = Loss + DCC + (1/2 x AO)

$D = [LER \times ELARD] / [100\% - (\text{Variable Expense})]$

$LER = D \times [1.0 - (\text{Variable Expense})] / LER \times (1.0 + DCC + 1/2 \times AO)$

Notes:

Values approved for rates effective 7/1/16.

(1) - (6) = From prior Rate Decision/Stipulation

(8) = From prior Rate Decision/Stipulation

(9) = 10.1% x (8), ratio of DCC to Losses from the 7/1/16 filing.

(10) = 9.8% x (8), ratio of AO to Losses from the 7/1/16 filing.

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Section VI - Expenses
 Subsection I - Adjustment for Large Deductible Policies
 7/1/2018

Section VI - I
 Exhibit 2

Average Large Deductible Premium Reduction Factor and Large Deductible Market Share

		Policy Year												
		2013	2014	2015	2016*									
(1)	Standard Earned Premium Excluding Large Deductible Policies	781,696,019	834,781,331	871,568,050	488,506,275									
(2)	Earned Premium Net of Deductible Credit for Large Deductible Policies	20,709,430	21,773,872	21,383,799	13,374,267									
(3)	Standard Earned Premium for Large Deductible Policies	109,060,765	109,173,912	119,319,061	77,570,049									
(4)	Standard Earned Premium for All Policies = (1) + (3)	890,756,784	943,955,243	990,887,111	566,076,324									
(5)	Average Premium Reduction Factor for Large Deductible Policies = $1.0 - [(2) / (3)]$	0.810	0.801	0.821	0.828									
(6)	Market Share (Standard Premium Basis) of Large Deductible Policies = (3) / (4)	12.2%	11.6%	12.0%	13.7%									
		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">Calendar Year</th> </tr> <tr> <th style="text-align: center;">2014</th> <th style="text-align: center;">2015</th> <th style="text-align: center;">2016</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0.805</td> <td style="text-align: center;">0.811</td> <td style="text-align: center;">0.824</td> </tr> </tbody> </table>				Calendar Year			2014	2015	2016	0.805	0.811	0.824
Calendar Year														
2014	2015	2016												
0.805	0.811	0.824												
(7)	Average Premium Reduction Factor for Large Deductible Policies = Average of PY-1 and PY													
(8)	Market Share (Standard Premium Basis) of Large Deductible Policies = Average of PY-1 and PY		11.9%	11.8%	12.9%									

Notes:

- (1): Aggregate Financial Policy Year Call, Policy Year Accumulated Earned Premium – Standard at Bureau DSR Level.
- (2): Aggregate Financial Policy Year Large Deductible Call, Policy Year Accumulated Earned Premium – Net.
- (3): Aggregate Financial Policy Year Large Deductible Call, Policy Year Accumulated Earned Premium – Standard at Bureau DSR Level.
- * Policy Year 2016 is an incomplete Policy Year, valued as of 12/31/2016

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Section VI - Expenses
Subsection J - Expected Loss Ratios Underlying the Proposed Rates & Rating Values
7/1/2018

Section VI - J
Exhibit 1

Expected Loss Ratios Underlying the Proposed Rates & Rating Values

	<u>As a % of Standard Premium plus Adjusted ARAP</u>
(1) Commission and Other Acquisition Expense Ratio	12.6%
(2) Average Premium Discount as a % of Standard Premium + ARAP	5.2%
(3) Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4) Variable Expense Ratio = (1) + (2) + (3)	19.9%
(5) Underwriting Profit Provision	0.3%
(6) Permissible Loss, LAE, and Fixed Expense Ratio = 1.0 - [(4) + (5)]	79.8%
(7) Fixed Expense Ratio	4.8%
(8) Expected Loss and Loss Adjustment Expense Ratio = (6) - (7)	75.0%
(9) Total Loss Adjustment Expense Ratio (LAE / Loss)	18.5%
(10) Expected Loss Ratio without Loss Adjustment Expense = (8) / [1.0 + (9)]	63.3%

Notes:

(1): Section VI-G, Exhibit 1.

(2): Section VI-E, Exhibit 1.

(3): 2.28% from Section VI-B, Exhibit 3.

(5): Section VII-A, Exhibit 1.

(7): Section VI-B, Exhibit 1. The Average Fixed Expense Ratio, 4.2%, is divided by [1.0 + indicated rate change], -11.1%, to give the Fixed Expense Ratio underlying the proposed rates.

(9): Section VI-H, Exhibit 1.

UNDERWRITING PROFIT PROVISION**Background**

The Commissioner approved the use of the IRR for purposes of estimating underwriting profit provisions in the decision on 2003 rates, and the WCRIBMA continues to rely on that model in this filing.¹ Additionally, consistent with 2014 and 2016 filings, the WCRIBMA is using a secondary analysis, the insurer capital cost (ICC) model, to augment the IRR that is used to set the profit provision in the filing. The ICC model is not a replacement for the IRR; rather, it provides an alternative view of the cash flows from the insurance transaction, taken from the perspective of the insurance company (as opposed to the investor).

Both the IRR and ICC models are variants of the generic discounted cash flow (DCF) methodology that is the standard investment decision tool relied upon in corporate and managerial finance. Such models have several features that make them particularly appealing for use in rate regulation.

Fundamental principles of economics tell us that the price of insurance should be set to cover the expected value of future costs associated with the risk transfer under consideration.² In addition to losses and expenses, one of the costs of insurance is the cost of capital: there must be a provision in the rates that compensates investors for the

¹ See, 2003 Decision, page 40: “For the following reasons, we conclude that use of an IRR model for the underwriting profits provisions will be superior to the M-C model.”

² This is simply the insurance specific application of the general proposition that price should equal marginal cost. This is not only a principle of economics; basic precepts of actuarial science require the same thing. See, for example, the CAS Statement of Principles on Property Casualty Insurance Ratemaking or the Standard of Practice on Rate of Return in Ratemaking.

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opportunity cost of the capital committed to the insurance activity. The underwriting profit provision is the component of the rates that, taken along with investment income, should provide insurers with a fair rate of return.

This suggests that to set an underwriting profit provision in insurance rates, one should first establish a fair and reasonable rate of return, and then select a profit provision that produces that fair return. Such an analysis is consistent with the traditional practice in other regulated industries, where rates include allowances for the expected costs of providing the regulated product or service, along with a provision for a fair rate of return on the capital required to produce the regulated product or service. This type of procedure comports with the legal standard under which fair regulation is applied, as articulated in the Hope Natural Gas decision of the U.S. Supreme Court.³ It is also consistent with the procedures relied upon in Massachusetts for the regulation of public utilities.

To that end, the WCRIBMA requested that David Appel and his colleagues at Milliman, Inc. assist the WCRIBMA's staff in developing a procedure for setting the profit factor in workers' compensation rates that will yield insurers a fair and reasonable return on the capital invested in support of the insurance transaction. Dr. Appel has performed the following work for the WCRIBMA:

1. He has assisted the WCRIBMA in developing a methodology to estimate the cost of capital, or fair rate of return, insurers should be allowed for bearing the risk of underwriting workers' compensation insurance in Massachusetts.

³ The Hope decision states, in part, that "...the return to the equity owner should be commensurate with the returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital." Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944).

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2. He has assisted the WCRIBMA in developing the two DCF models (IRR and ICC) used in this filing to estimate the underwriting profit factor required to yield the indicated fair rate of return.
3. He has assisted the WCRIBMA in developing the portfolio rate of return analysis.
4. He has used these models to derive an underwriting profit factor that is consistent with the current cost of capital. This is the underwriting profit provision proposed in this rate filing.

In this filing, the calculated underwriting profit provision is 0.27%. The DCF models and the cost of capital calculation are actuarially sound and produce a rate in the statutorily required range of reasonableness. We therefore recommend that the Commissioner approve their use.

Section VII-A – Summary

Table A1 summarizes the main parameters needed for the calculation of the profit provision.

VII-B– Discounted Cash Flow Models

In Section VII-B we present the DCF models we have constructed and implemented with Dr. Appel's assistance. Exhibit 1 presents the IRR model and the relevant cash flows to investors. Exhibit 2 presents the ICC model and the relevant cash flows to insurers.

This section also includes a detailed appendix that shows that the IRR and ICC models are mathematical equivalents and yield the same results.

VII-C – Underwriting Cash Flows

In Section VII-C we estimate the actual underwriting cash flows that accrue to the insurer in each time period. These cash flows include premium, losses and LAE, other expenses, taxes, investment income and surplus. Each one of these cash flows is estimated quarterly over a period of 36 years to calculate the final flow of funds related to the insurance transaction.

Tables C5_1 and C5_2 provide cash flow patterns and amounts for premium collection, payment of losses, LAE and expenses calculated by the WCRIBMA. Prior to the 2014 filing, the WCRIBMA relied on a study from 1977 for the flow patterns of general expenses, other acquisition expenses, premium taxes, and miscellaneous and other taxes. In this filing, consistent with the 2014 and 2016 filings, the WCRIBMA made distinct assumptions (detailed below) for the payment pattern of each of these various types of expenses. The cash flow patterns for a single policy were converted to a policy year basis for use in DCF models.

General Expenses

We assume that the payment pattern for general expenses is equal to the average of the written premium flow and earned premium flow. This corresponds to an assumption

that on average half of the general expense payments are made as premium is written and half are made as premium is earned.

Commission & Brokerage

We assume that the commission and brokerage flow pattern coincides with the collected premium flow.

Other Acquisition Expense

Other acquisition costs are assumed to be paid as follows: one sixth in the period preceding the writing of premium, and five sixths in the period the premium is written.

Premium Taxes

The distribution of premium taxes is assumed to be equal to the written premium pattern with a single period lag.

Miscellaneous and Other Taxes

We assume that the miscellaneous and other taxes flow pattern coincides with written premium flow.

Reinsurance Expenses

We assume that the reinsurance expense flow pattern coincides with the written premium flow.

Premium Discount

We assume that the premium discount flow pattern coincides with the collected premium flow.

VII-D – Capital Needed From Investors

Table D1 derives the amount of capital required to be supplied from investors.

VII-E – Cost of Capital

In Section VII-E we present the cost of capital analysis developed by Dr. Appel, including a detailed appendix describing the methods used. To estimate the cost of capital prior to the 2010 filing, the WCRIBMA relied on a sample of large, publicly traded property/casualty insurers, drawn exclusively from the Value Line Investment Survey, Part 3 (The Ratings and Reports). Since the 2010 filing, the WCRIBMA has expanded the sample to include data on all publicly traded property casualty insurers. These additional data are drawn from the Value Line Investment Survey, Small & Mid Cap Edition, and the Standard & Poor's Compustat database. The Compustat database includes the data from smaller companies not included in Value Line dataset, and is therefore more representative of the Massachusetts industry's carrier mix than a sample relying only on

the largest publicly traded insurers in the country. The addition of information on a broader range of insurers produces more reliable and robust estimates of the cost of capital, because these data more appropriately reflect the risk associated with smaller carriers.⁴

In this filing, consistent with the 2016 filing, the WCRIBMA has requested Dr. Appel to implement a three-stage dividend growth model to reflect the assumption that in the long run the industry's dividend growth rate will revert to a level equal to the growth rate of the economy as a whole. The calculation of the three-stage dividend growth model is shown in Section VII-E, Exhibit 2, Page 1.

VII-F – Leverage Ratio

In this filing, the amount of surplus is estimated using a total reserve-to-surplus ratio, as approved in the Commissioner's decision on 2005 automobile insurance rates and used in workers' compensation rate filings since 2005.

In calculating the reserves-to-surplus ratio, we use data for the "Commercial Casualty Composite" group of companies as identified in Best's Aggregates and Averages. We estimate this ratio by using an average of five years of data for loss and

⁴ The standard deviation of a sample mean derived from a random sample, is calculated as $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{N}}$, where σ is the standard deviation of the population from which the random sample is drawn and N is the sample size. As N increases, the standard deviation of the sample mean decreases. Based on the sample sizes used by the SRB and the WCRIBMA in the 2012 rate proceeding, 22 and 98 respectively, the standard deviation of the WCRIBMA's estimated cost of capital would be less than half that of the SRB's estimate, meaning the WCRIBMA's calculated cost of capital is a statistically better estimate of the true population parameter. Additionally, a sample drawn strictly from Value Line is not a random sample because of the disproportionate representation of large insurers.

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LAE reserves, plus unearned premium reserves. The calculation of the ratio is shown in Exhibit 1.

VII-G - Premium Flow

In the WCRIBMA's 2008 filing, the WCRIBMA updated the data underlying the premium cash flow pattern in an effort to improve the accuracy of the profit model. In order to construct a new flow, a special premium payment call was made to a representative group of carriers. Each company group was asked to obtain a random sample of fifty complete-year guaranteed cost (non large deductible) policies with policy effective dates in 2004 that include premiums related to Massachusetts' workers' compensation exposures. The 50 randomly selected policies were stratified, based on the total premium for all states covered by the policy, as follows:

Policy Premium Range	Number of Policies in Sample
0 – 9,999	10
10,000 – 199,999	24
Over 200,000	16

If the population of policies in any of the premium ranges was not sufficient to allow for the recommended sample size, the size of the samples for the other premium layers was increased so that 50 policies were sampled in total. The premium flow used in the profit model is shown in Exhibit 1.

VII-H - Expense Weights

In the current filing, separate policy year 2014 and policy year 2015 weights are calculated for general expenses, miscellaneous and other taxes, and loss and loss adjustment expenses. The weights used to combine the various expense flow patterns into final expense flows are calculated using the expense provisions from Section VI. The average of the two policy year weights is used in the DCF models.

Acquisition expenses, premium taxes and premium discounts are treated as varying in proportion to standard premium plus ARAP. Loss adjustment expenses are treated as varying in proportion to losses. General expenses and other taxes are treated as fixed expenses.

Since the total premium amount will vary with the profit provision, and since losses, loss adjustment expenses and fixed expense amounts are all treated as not varying with premium levels, the proportion of premium attributable to losses, LAE and fixed expenses depends on the underwriting profit provision. Thus their weights relative to those items that vary in proportion to total premium will change as the profit provision does but their weight relative to each other will not.

VII-I - Loss and LAE Flow

The WCRIBMA has updated the data underlying both the medical and the indemnity loss flows used in determining the profit provision. The WCRIBMA has used the most recent available financial aggregate data to derive estimates of the patterns of loss payments. Consistent with other sections of the filing, the WCRIBMA has calculated loss development

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factors separately for one large carrier. The development factors for AIG and the remainder of the industry are from Section II, Exhibit 1, Pages 1 and 4. These are used in Exhibit 2 for the calculation of the combined loss flow.

Exhibit 1 shows the calculation of loss and LAE payout pattern used in the DCF models. The Defense and Cost Containment Expense (DCC) flow is assumed to have the same pattern as the loss flow. This corresponds to an assumption that on average DCC payments occur at approximately the same time as claim payments.

The pattern of the Adjusting and Other Expense (AO) flow is assumed to be the same as the average of the loss flow and an earned premium flow. This corresponds to an assumption that on average half of the AO payments are made as accidents occur over the course of the policy effective period and that the other half of the AO payments are made as claims are paid.

The combined loss and LAE flow on a single policy basis used in the profit model, which reflects a weighted average of the medical and indemnity flows, is shown in Exhibit 1. This is then converted to a full policy year basis and appears in Table C5_1 (Section VII-C, Exhibit 5, Page 1).

VII-J - Portfolio Rate of Return

Portfolio Composition

The mix of securities in the insurance industry asset portfolio is based on data compiled in A.M Best's Aggregates & Averages. Best's is the single most widely recognized source of insurer financial data, and is the source that is routinely relied upon

for insurer asset information. These data are compiled directly from insurer annual statements, and they contain substantial detail on the mix and maturity of bonds. Hence this is a preferred source for estimating the mix of securities in the insurer asset portfolio.

In this filing, consistent with the 2014 and 2016 filings and conforming to the 2012 Commissioner’s Decision, WCRIBMA includes “other assets” as an additional category in the portfolio. We begin our calculation of the portfolio rate of return by assigning weights to each of nine categories of assets: cash and short-term investments; government securities and other taxable bonds including industrials; tax exempt bonds including bonds issued by states and territories and special revenue bonds; common stocks; real estate (the sum of real estate investments, offices and sales); preferred stocks; and other assets. We assign weights using data from Best’s Aggregates and Averages Property Casualty, 2017 edition for total US Property and Casualty Industry (Exhibit 1, Page 2). The weights are shown in column (2) of Exhibit 1, Page 1.

Investment Yields

Prior to its 2005 filing the WCRIBMA relied on 12-month average yields to estimate expected future investment income. It is more appropriate, however, to rely on more recent data for this purpose, as it is more likely to be predictive of future investment earnings. In the DCF models used this year (and in the filings from 2005 to present), the WCRIBMA has relied on yields averaged over the last 3 months⁵.

⁵ Following the Commissioner’s Decision in the 2012 rate case, the WCRIBMA studied the distribution of bonds held by insurers, to identify whether the bond maturities that impact the yield calculations were reasonably proxied by the Schedule D data used in the filing. Although there were small differences in the

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We use the return on 3-month T-bills to estimate the pre-tax return for cash and short-term investments (3-month average from Exhibit 2, Page 3). The pre-tax returns on bonds shown in the next column are taken from Exhibit 2, Page 1. Using industrywide allocations of bonds by class and maturity from Best's Aggregates and Averages, we calculate (in Exhibit 3) the percentages of bonds in each class. Using yields developed from the data shown on Exhibit 2, Page 3 (calculated on Exhibit 2, Page 2), we calculate an average yield (based on a 3-month average of yields) for each of the bond categories included in the Best's data (Exhibit 2, Page 1). We derive the pre-tax return on common stocks using a three horizon CAPM calculation, assuming that these assets have a beta of 1.0. The pre-tax return on real estate is the sum of the 3-month treasury rate and the real estate differential of 3.94% taken from Ibbotson and Siegel, "Real Estate Returns: A Comparison with Other Investments". The pre-tax return on preferred stocks is taken from the yield data in Exhibit 2, Page 2. We assume that the pre-tax return and the tax rate on other assets coincide with the pre-tax return and tax rate on preferred stocks.⁶

Market Risk Premium

We use market returns from 1926-2016 to calculate the short term, intermediate term and long term market risk premiums used to calculate the yield on stocks. (As discussed in Section VII-E, these are the same risk premiums used to calculate the cost of capital, which

maturities of newly purchased compared to existing bonds, they did not appear to have a material impact on the yield calculation.

⁶ We were not able to find a consistent source of information for the types of securities or expected returns on the assets contained in the "other" class. However based on the data we did review, it appears that other invested assets are comprised of a mix of equity type and fixed income type investments. We assigned them a return equal to the preferred stock return.

is required for internal consistency in the rate filing.) The calculation, shown on Exhibit 4, uses data drawn from the *2017 SBB Yearbook*.

Investment Expenses

The WCRIBMA has relied on the same data source for this value as for the asset portfolio, A.M Best's Aggregates & Averages. This is appropriate. Since investment yields are estimated based on the actual portfolios held by insurers, it is consistent to estimate the reported investment expenses that are associated with those portfolios.

We subtract after-tax investment expenses from after-tax returns in Exhibit 1. In Exhibit 5 we calculate investment expenses using data from Best's Aggregates and Averages. In this filing, consistent with the 2014 and 2016 filings, the WCRIBMA did not include interest expense and depreciation of real estate in the calculation of total invested expenses.⁷ The pre-tax average investment expense carried to Section VII-J, Exhibit 1, Page 1 is 0.24%.

Tax Rate on Common Stocks

We calculate the effective tax rate on common stock in Exhibit 6. The effective tax rate for capital gains on common stocks is shown in Exhibit 6, Page 2. That rate is based on a 36% turnover ratio, taken from an AIB study of Massachusetts auto insurers' portfolio

⁷ The State Rating Bureau contested the inclusion of depreciation, interest expense, and aggregate write-ins for investment expenses in the estimation of an investment expense allowance. With respect to depreciation and interest expense, we anticipate objections to their inclusion on the grounds that it would result in double counting. However, we know of no reason to believe including aggregate write-ins presents a double counting problem. For purposes of limiting the debate on investment expenses, the WCRIBMA has opted in this filing to exclude depreciation and interest expense.

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stock sales. The interest rate used in calculating the present value of the taxes is the weighted average cost of capital from Section VII-E, Exhibit 1. Prior to the 2010 filing the WCRIBMA relied on a 10 year average to calculate the capital gains and dividend weights shown in Exhibit 6, Page 1. In this filing, the WCRIBMA relied on data from 1926 – 2016. This change was made because of the extreme volatility in the financial markets in recent years. Combining a tax rate of 14.18% for common stock dividends and 26.26% on capital gains, we derive an overall average tax rate of 22.13% (Exhibit 6, Page 1).

Exhibit 6, Page 3 displays the calculation of common stock tax rate for different discount rates and turnover rates.

Overall Result

The after-tax portfolio rate of return used in this filing is 2.88%.

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Section VII - Profit
Subsection A - Summary
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Section VII-A
Exhibit 1

TABLE A1: ASSUMPTIONS AND PROFIT PROVISION CALCULATION

Underwriting Assumptions:		
(1)	Written Premium	
(a)	Gross - Before Premium Discount	1,000.00
(b)	Net - After Premium Discount	948.36
(2)	Collected Premium Net - After Premium Discount	948.36
(3)	Loss & LAE Ratio	75.05%
(4)	Commission Ratio	8.26%
(5)	Premium Discount	5.16%
(6)	General Expense Ratio	4.30%
(7)	Other Acquisition Expense Ratio	3.32%
(8)	Premium Tax Rate	2.16%
(9)	Reinsurance Expense Ratio	1.00%
(10)	Miscellaneous and Other Taxes	0.48%
Cost of Capital:		
(11)	Weighted Average Cost of Capital	7.23%
Portfolio Rate of Return:		
(12)	After Tax Portfolio Rate of Return	2.88%
Leverage Ratio:		
(13)	Reserves to Surplus Ratio	1.80
Profit Provision:		
(14)	Profit Provision Calculation	0.27%

Notes:

(1b) = (1a) x [1.0 - (5)]

(2) = (1b), assumed that all premium is collectible.

(3) - (10): Section VII-H, Exhibit 1 (average of the two policy years).

(3), (6), (10) are divided by (1.0 + Rate Change).

(11): Section VII-E, Exhibit 1.

(12): Section VII-J, Exhibit 1, page 1.

(13): Section VII-F, Exhibit 1.

(14) = 1.0 - [(3) + (4) + (5) + (6) + (7) + (8) + (9) + (10)]

DISCOUNTED CASH FLOW (DCF) MODELS:**INTERNAL RATE OF RETURN (IRR) AND INSURER CAPITAL COST (ICC)****General Considerations**

For more than a decade the WCRIBMA has relied on an internal rate of return (IRR) model to estimate the profit provision that should be included in Massachusetts workers' compensation insurance rates. Once the fair rate of return has been established (based on the cost of capital analyses presented in the filing), the underwriting profit provision can be determined so that the total return on equity (including both underwriting and investment income) is equal to the fair return.

The WCRIBMA's IRR model projects the cash flows attributable to the sale of workers' compensation insurance coverage and calculates the implied rate of return on those cash flows. Virtually every textbook on modern corporate and managerial finance cites the IRR along with the net present value method as the most widely supported investment decision-making rules currently known. Many insurers rely on IRR models to estimate the expected rate of return associated with alternative insurance transactions.

Since the 2014 filing, the WCRIBMA has introduced an additional analysis, the Insurer Capital Cost (ICC) model, to augment the IRR model used to set the profit provision in the filing. The ICC model is not a replacement for the IRR model. Rather, while it produces exactly the same results as the IRR model, the ICC model provides an alternative view of the cash flows derived from the insurance transaction, taken from the perspective of the insurance company (as opposed to the investor). The purpose of the

ICC model is to clarify the sources and uses of funds related to the sale of workers' compensation policies; detail the capital contributions by investors that are required to finance the underwriting of insurance; and properly recognize the cost of that capital to the insurer.

The IRR and ICC Models

Both the IRR and ICC models are variants of the more generic discounted cash flow (DCF) methodology that is a standard investment decision tool relied upon in corporate and managerial finance. Such models have several features that make them particularly appealing for use in rate regulation.

1. DCF models are prospective and therefore consistent with both actuarial principles and regulatory standards.

Discounted cash flow models, such as the IRR and ICC, attempt to estimate the rate of return attributable to policies sold in the future. From a financial perspective, this is the essence of the rate approval process: to set a price that yields a fair rate of return on the insurance contracts sold under the proposed rates. Alternative approaches, such as accounting models, attempt to estimate the rate of return that will be earned by the insurance company next year, assuming a proposed set of rates is approved. These models may be useful for some purposes, but they are not appropriate for use in rate-setting, which should focus on the return on the cohort of policies sold under a set of proposed rates.

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2. DCF analyses account for all investment income on both policyholder and investor supplied funds.

Both the IRR and ICC model account for investment income in ratemaking and credit the investment income insurers expect to earn in the time period between the sale of policies and the payment of all losses and expenses against otherwise-indicated premium requirements.

Both DCF models account for all such income based on the investment yields insurers can expect to earn when the investible funds are received. However, the ICC model is designed so it explicitly identifies and tracks the investible funds derived from both investors and policyholders in order to avoid any confusion regarding the nature of the cash flows from the insurance transaction.

3. DCF analyses account for the time value of money.

The cash flows for some lines of insurance can extend for literally decades after the sale of the policy. In such a case the relative value of the income stream that occurs in future years should be discounted to obtain its present value. Only in this fashion can insurers make rational decisions regarding alternative investment opportunities.

Textbooks on modern financial theory typically recommend discounted cash flow techniques for evaluating investments that pay returns over a period of years into the future. This is because such techniques place all investments on a

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common footing: that is, they evaluate the future cash flows in the context of the present. This is the only sound basis for comparing alternatives.

4. DCF analyses account for federal income taxes.

The impact of taxes on insurance rates of return can be substantial, particularly given the special provisions of the internal revenue code applied to insurers. These provisions generally affect the timing of taxable income, and the only way to correctly account for them is to look at the flow of taxes over time, which can be readily accomplished using a DCF model.

The IRR and ICC models focus solely on the policy or block of policies that will be sold when the approved rates are actually in effect. These are exactly the policies for which the rate of return should be calculated, as they are the ones to which the premium rates approved in this filing will apply. To calculate the rate of return, the models follow these policies through their lifetime, estimating in each time period the actual cash flows that accrue to the insurer. These cash flows include the following:

- Premiums
- Losses
- Loss Adjustment Expenses
- Other Expenses
- Taxes
- Investment Income
- Surplus

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In principle, when an insurer sells a policy it sets into motion a series of events, including the collection of premium; the payment of losses, expenses and taxes; the earning of investment income; and the commitment and later release of surplus. Each one of these cash flows is estimated quarterly over a period of 36 years, to calculate the final flow of funds related to the insurance transaction. In essence the models produce an estimate of the "cash in, cash out" attributable to the policies sold at a given rate.

When a DCF model is developed from the perspective of the investor, as in the IRR model, the relevant cash flows are the ones in and out of the investor's equity account. These include the commitment of equity to support insurance reserves, the provision of additional funds to support the pre-payment of expenses and taxes, the flows of after-tax income arising from both underwriting and investment activities, and the ultimate release of equity as losses are paid and reserves are run-off. Once the final cash flows are known, the internal rate of return is then calculated; it is simply the interest rate that discounts the stream of final investor cash flows to yield a net present value of zero. This can be interpreted as the compound annual rate of return, or the yield to maturity, of the investment.

When a DCF model is developed from the perspective of the insurance company, we call it the ICC model. The main difference between the ICC and the IRR models is that in the ICC model the final cash flows are those that accrue to the insurance company, as opposed to the insurance investor. From the vantage point of the insurance company, incoming cash flows arise from funds supplied by investors (initial capital to support reserves and additional capital to prepay expenses and taxes) along with premium

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revenues from the sale of insurance policies and income from the investment of policyholder and investor supplied funds. Cash then flows out of the company due to the payment of insurance-related losses and expenses, as well as the payments to investors for the cost of the capital they have advanced to the company. Those payments are the product of the amount of capital invested at the beginning of each quarter and the previously established cost of capital, or fair rate of return.

When the DCF model is configured as an IRR model (i.e., from the investor perspective), it solves for an underwriting profit factor that produces an internal rate of return equal to the cost of capital. This is appropriate, since an IRR equal to the cost of capital implies that investors earn a fair and reasonable return. However, when the model is configured as an ICC model (i.e., from the insurer perspective), the end result is different, because in the ICC one of the cash outflows is the periodic payment of the cost of capital to investors. Since that cost has already been considered explicitly, the residual cash flows accruing to the insurance company need not incorporate any additional provision for profit. Therefore, instead of solving for the underwriting profit that produces an IRR equal to the cost of capital, the ICC model solves for the underwriting profit factor that produces a net present value of future insurance company cash flows equal to zero. That profit factor is identical to the result obtained when solving for the underwriting profit that produces an IRR to the investor equal to the cost of capital.

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IRR and ICC Model Examples:

Although DCF models may appear complex, the underlying concepts are quite straightforward and are common to a wide range of financial analyses. A very simple example illustrates these concepts, beginning with the IRR model.

Consider an investor placing \$120 at risk in support of an insurance policy. This is the initial contribution of equity, from which a series of cash flows will develop. Let us assume that after all the events have taken place this set of policies will pay the investor the following amounts at the end of each indicated time period:

Year	Capital Flow	Income Flow	Total Cash Flow
0	-120.00		-120.00
1	50.00	5.00	55.00
2	40.00	8.40	48.40
3	30.00	9.93	39.93

As indicated in the table, the cash flows are the result of an initial contribution of capital, followed by the earning of income and return of capital in subsequent periods. After year 3 the transaction is over; that is, it produces no further cash flows to the investor. In this case the internal rate of return on the investment is 10%. This is calculated as follows:

IRR Model					
Year	Capital Flow	Income Flow	Total Cash Flow	Discount Factor @ 10%	Total Cash Flow (NPV)
0	-120.00		-120.00	1.0000	-120.00
1	50.00	5.00	55.00	0.9091	50.00
2	40.00	8.40	48.40	0.8264	40.00
3	30.00	9.93	39.93	0.7513	30.00
Total			23.33		0.00

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Ten percent is the interest rate that discounts the set of cash flows to a net present value of zero. Thus, for the investor who makes a \$120 investment today, with the expectation of future cash flows as indicated in the table above, the compound annual return on the equity investment is 10%. While the cash flows that derive from a real insurance transaction are substantially more complicated, the procedure for discounting them to present value is identical.

The same transaction can also be viewed from the perspective of the insurance company, as in the ICC model. In this case the cash flows from the insurance transaction are the same as in the IRR model, but the cost of capital is explicitly charged as an expense against earnings. Because the cost of capital is already recognized as an expense there is no additional return necessary, and therefore the net present value of the cash flows to the insurance company should be zero. That can be seen in the example below:

ICC Model							
Year	Capital Flow	Amount of Capital	Capital Charge	Income Flow	Net Flow To Insurer	Discount Factor @ 10%	Net Flow to Insurer (NPV)
0	-120.00	120.00				1.0000	0.00
1	50.00	70.00	12.00	5.00	-7.00	0.9091	-6.36
2	40.00	30.00	7.00	8.40	1.40	0.8264	1.16
3	30.00	0.00	3.00	9.93	6.93	0.7513	5.21
Total					1.33		0.00

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In the ICC model, the 10% charge for the cost of the capital used during each period is explicitly counted as an expense, shown in the column entitled Capital Charge. That expense is charged against the income earned from the insurance transaction, resulting in the final cash flow to the insurer, shown as Net Flow to Insurer above. As can be seen, the net present value of the flow to the insurer is zero, under the identical circumstances (i.e., cash flows) that produced an IRR of exactly 10%. This demonstrates the equivalence of the IRR and ICC models – the cash flows that produce an IRR of 10% also produce an NPV of zero to the insurer, after compensating investors for the cost of their capital.

The IRR and ICC Models for Massachusetts Workers' Compensation Insurance

The IRR model is used in this filing to determine the underwriting profit provision that produces a return on equity equal to the current cost of capital. The ICC model views the insurance cash flows from a different perspective, and solves for the underwriting profit that produces a zero NPV for the insurer, after accounting for the cost of capital paid to the investor as an expense. Both of these DCF models use the cost of capital as the “target” rate of return. If the allowed rates produce an expected return at least equal to the cost of capital, insurers will “invest” by providing adequate capacity and offering coverage in the market. However, when the rate of return falls below the cost of capital, insurers have an incentive to restrict underwriting and withdraw capacity from the market. Thus, from the regulatory perspective, setting an underwriting profit that yields a rate of

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return equal to the cost of capital properly balances the interests of insurers and policyholders.

The section below briefly describes the Tables in the filing containing the detailed cash flows underlying the IRR and ICC models. The Tables present the assumptions and parameters underlying the models (Subsection A - Table A1); the development of the final cash flows associated with the alternative IRR/ICC perspectives (Subsection B - Tables B1 and B2); the detailed cash flow patterns and calculations that produce the flows in Tables B1 and B2 (Subsection C - Tables C1 through C5_2); and the flow of capital needed from investors (Subsection D - Table D1).

Table A1 identifies the flows used by the WCRIBMA for premiums, losses and expenses, and summarizes the main parameters needed for the calculation of the profit provision. These inputs apply equally to both the IRR and ICC models.

Table B1 presents the final IRR cash flows; i.e., the cash flows that are relevant when the model is viewed from the perspective of the investor. The cash flow to investors is the sum of the after tax cash flow from underwriting (net of the tax deduction for debt interest), the flow of surplus and the flow of income expected from the investment of reserves and surplus.

Table B2 presents the final ICC cash flows; i.e., the cash flows that are relevant when the model is viewed from the perspective of the insurer. The cash flow to insurers is the sum of the capital charge paid to investors net of the tax deduction for debt interest, the investment return on capital contributed by investors, the investment return on

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policyholder funded investable reserves and the after tax underwriting cash flow (net of policyholder funded investable reserves).

Table C1 calculates the policyholder supplied underwriting cash flows, derived as the difference between collected premium and the sum of losses, LAE and total pretax underwriting expenses paid. In addition, federal income taxes on underwriting (calculated in Tables C2_1 through C2_7) are deducted to obtain the post-tax cash flows from underwriting.

Tables C2_1 through C2_7 present the tax credits and liabilities arising from insurance operations, with special attention to the provisions of the Internal Revenue Code applicable to property casualty insurers. The details supporting the acceleration of income and discounting of each accident year's losses are provided in Tables C2_1 through C2_4. Table C2_5 calculates the total underwriting tax deductions used in Table C2_6 to calculate the federal income tax expense on underwriting. Table C2_7 then calculate the amount of admitted prepaid taxes (DTA's or Deferred Tax Assets. Admitted DTA's are non-cash assets that can be used to fund reserves, resulting in reduced investible balances attributable to reserves.)

Table C3 derives the amount of policyholder supplied funds available for investment, calculated as the sum of loss, LAE and unearned premium reserves less non-cash assets used to support reserves (admitted DTA's and admitted premium receivables). It also derives the additional funds required from investors to support the reserves (i.e., to the extent that the net revenues from underwriting fail to provide sufficient cash to fully fund required reserves, investors must contribute additional capital).

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Table C4 displays the derivation of admitted and non-admitted premium receivables. Statutory accounting rules permit premium balances less than 90 days past due to be carried as balance sheet assets, but balances more than 90 days past due are non-admitted. As with DTA's, admitted assets can be used to support reserves, while non-admitted assets cannot.

Tables C5_1 and C5_2 provide the underlying cash flow patterns from which all the calculations in the IRR and ICC models are derived. These include both cash flows (i.e., premiums collected, losses, LAE and all other expenses paid) as well as accounting flows (premium written and earned, and losses and LAE incurred). (These policy year patterns were developed by the WCRIBMA based on cash flow patterns for a single policy that were converted to a policy year basis.)

Finally, Table D1 derives the amount of capital required to be supplied from investors. Required capital includes the surplus that must stand behind total reserves along with any additional capital amounts required to fund cash shortfalls due to non-admitted DTA's and admitted premium receivables.

DCF Model Results

As shown in Table A1 of this Section, given the assumptions in the filing regarding losses, expenses, investment yields and cash flow patterns, if the underwriting profit provision is set to 0.27%, as proposed by the WCRIBMA, Massachusetts workers' compensation insurance would be expected to produce a rate of return on equity equal to the cost of capital of 7.23%. Since the underwriting profit provision is set specifically

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Subsection B – DCF Models
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Section VII- B
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to yield this fair and reasonable return on equity, if the actuarial projections underlying the rates are reasonable, the rates as filed must be reasonable and satisfy the regulatory requirement that they be neither excessive nor inadequate.

APPENDIX – DCF MODELS

The purpose of this appendix is to demonstrate the equivalence between the two discounted cash flow models, the IRR model and the ICC model, which appear in Section VII – B, Exhibit 1 and Exhibit 2.

IRR MODEL (investor’s perspective)

The relevant cash flows in the IRR model are the following:

- Debt Financing Deduction (DFD)
- Investment Return on Surplus (IR_S)
- Investment Return on Reserves (IR_R)
- After-Tax Underwriting Cash Flow Net of Investable Reserves (UWCF)
- Change in Surplus Contributed by Investor (S)

Given these cash flows, we solve for the profit provision that results in a net present value of cash flows of zero.

$$\text{“IRR” NPV} = \text{PV(DFD)} + \text{PV(IR_S)} + \text{PV(IR_R)} + \text{PV(UWCF)} - \text{PV(S)} = 0$$

ICC MODEL (insurer’s perspective)

The relevant cash flows in the ICC model are the following:

- Debt Financing Deduction (DFD)
- Investment Return on Capital Contributed by Investors (IR_INV)

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- Investment Return on Policyholder Funded Investable Reserves (IR_PH)
- After-Tax Underwriting Cash Flow (Net of Policyholder Funded Investable Reserves) (UWCF)
- Capital Charge Paid to Investors (CC)

Given these cash flows, we solve for the profit provision that results in a net present value of cash flows of zero.

$$\text{“ICC” NPV} = \text{PV(DFD)} + \text{PV(IR_INV)} + \text{PV(IR_PH)} + \text{PV(UWCF)} - \text{PV(CC)}$$

Model Equivalence

To prove that the IRR model and the ICC model are equivalent, we need to demonstrate that:

$$\text{“IRR” NPV} = \text{“ICC” NPV} = 0 \quad \text{for a given profit provision}$$

Simplifying the Problem – Comparison of Relevant Cash Flows from the Two

Models

➤ Debt Financing Deduction:

Same for IRR and ICC:

$$\text{DFD}_{\text{IRR}} = \text{DFD}_{\text{ICC}}$$

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➤ **Total Investable Funds:**

IRR:

- Investable Reserves = Unearned Premium Reserves + Loss & LAE Reserves
– Admitted Premium Receivables – Admitted Prepaid Taxes (DTA)
- Implied Surplus = $\frac{\text{Unearned Premium Reserves} + \text{Loss \& LAE Reserves}}{\text{Reserves to Surplus Ratio}}$

ICC:

- Policyholder Supplied Investable Funds = Investable Reserves - Reserves
Funded by Investors
- Capital Contributed by Investors = Implied Surplus + Reserves Funded by
Investors

Consequently, total investable funds are equal in the two models. Hence, total investment returns are equal as well.

$$IR_{SIRR} + IR_{RIRR} = IR_{INVICC} + IR_{PHICC}$$

➤ **After-Tax Underwriting Cash Flow Net of Investable Reserves:**

IRR:

$UWCF_{IRR} = \text{Collected Premium} - \text{Losses \& LAE Paid} - \text{Total Pretax Underwriting Expenses} - \text{Federal Income Tax Expense on Underwriting} - \text{Investable Reserves}$

ICC:

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$$UWCF_{ICC} = \text{Collected Premium} - \text{Losses \& LAE Paid} - \text{Total Pretax Underwriting Expenses} - \text{Federal Income Tax Expense on Underwriting} - \text{Investor Supplied Reserves}$$

Consequently,

$$UWCF_{IRR} = UWCF_{ICC} - \text{Change in Investor Supplied Reserves}$$

Note: The sign convention is from perspective of the investor. If the investor has to contribute capital to fund reserves, that would be a negative cash flow to the investor. Subtracting a negative value effectively results in an addition.

Given the results from above, the comparison of the “IRR” NPV and the “ICC” NPV can be simplified to a comparison of:

$$PV(S) + PV(\text{Change in Investor Supplied Reserves}) = PV(CC)$$

Moreover, the sum of the surplus contributions and the investor supplied reserves is precisely the capital needed from investors, leaving you with:

$$PV(C) = PV(CC)$$

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where C is Change in Capital Provided by Investors and CC is Capital Charge Paid to Investors.

PV(C) = PV(CC)

The IRR model and ICC model are mathematically equivalent if $PV(C) = PV(CC)$, where the Capital Charge Paid to Investors for a given period is equal to the contributed capital from the prior period time the cost of capital. This is demonstrated below.

Given:

- C_i is the capital cash flow in period i
- r is the weighted average cost of capital

PROOF OF EQUIVALENCE OF NPV OF CAPITAL CHARGES AND CAPITAL CONTRIBUTIONS

$$\begin{aligned} \sum_{i=1}^n \frac{C_i}{(1+r)^{i-1}} &= \sum_{i=1}^{n-1} \frac{(\sum_{j=1}^i C_j) \times r}{(1+r)^i} \\ &= r \times \left[\frac{C_1}{(1+r)} + \frac{C_1 + C_2}{(1+r)^2} + \frac{C_1 + C_2 + C_3}{(1+r)^3} + \dots + \frac{C_1 + C_2 + C_3 + \dots + C_{n-1}}{(1+r)^{n-1}} \right] \\ &= r \times \left[\left(\sum_{i=1}^{n-1} \frac{C_1}{(1+r)^i} \right) + \left(\sum_{i=2}^{n-1} \frac{C_2}{(1+r)^i} \right) + \dots + \left(\sum_{i=n-1}^{n-1} \frac{C_{n-1}}{(1+r)^i} \right) \right] \\ &= r \times \left[C_1 \left(\frac{1}{(1+r)} - \frac{1}{(1+r)^n} \right) + C_2 \left(\frac{1}{(1+r)^2} - \frac{1}{(1+r)^n} \right) + \dots \right. \\ &\quad \left. + C_{n-1} \left(\frac{1}{(1+r)^{n-1}} - \frac{1}{(1+r)^n} \right) \right] \\ &= r \times \left[C_1 \left(\frac{1}{r} - \frac{1}{r(1+r)^{n-1}} \right) + C_2 \left(\frac{1}{r(1+r)} - \frac{1}{r(1+r)^{n-1}} \right) + \dots + C_{n-1} \left(\frac{1}{r(1+r)^{n-2}} - \frac{1}{r(1+r)^{n-1}} \right) \right] \\ &= \left[C_1 \left(1 - \frac{1}{(1+r)^{n-1}} \right) + C_2 \left(\frac{1}{(1+r)} - \frac{1}{(1+r)^{n-1}} \right) + \dots + C_{n-1} \left(\frac{1}{(1+r)^{n-2}} - \frac{1}{(1+r)^{n-1}} \right) \right] \\ &= C_1 + \frac{C_2}{(1+r)} + \dots + \frac{C_{n-1}}{(1+r)^{n-2}} - \frac{C_1}{(1+r)^{n-1}} - \frac{C_2}{(1+r)^{n-1}} - \dots - \frac{C_{n-1}}{(1+r)^{n-1}} \\ &= \sum_{i=1}^{n-1} \frac{C_i}{(1+r)^{i-1}} - \frac{(\sum_{i=1}^{n-1} C_i)}{(1+r)^{n-1}} \quad \text{where } \sum_{i=1}^n C_i = 0 \rightarrow \sum_{i=1}^{n-1} C_i = -C_n \\ &= \sum_{i=1}^{n-1} \frac{C_i}{(1+r)^{i-1}} + \frac{C_n}{(1+r)^{n-1}} \\ &= \sum_{i=1}^n \frac{C_i}{(1+r)^{i-1}} \end{aligned}$$

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Section VII-B
Exhibit 1

TABLE B1: INTERNAL RATE OF RETURN (IRR) MODEL - PRESENT VALUE (PV) NOMINAL CASH FLOWS TO INVESTORS

TIME INTERVAL		POST TAX CASH FROM UW MINUS INVESTABLE RESERVES	BOND INTEREST TAX DEDUCTION FOR INSURERS	NET CASH FLOW FROM UNDERWRITING	CASH POST-TAX INCOME	NET FLOW FROM SURPLUS ACCOUNT	SURPLUS POST-TAX INCOME	CASH FLOWS TO INVESTORS (NOMINAL)	CASH FLOWS TO INVESTORS (PV NOMINAL)
FROM (1)	TO (2)								
07/01/17	09/30/17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/01/17	12/31/17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/18	03/31/18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/01/18	06/30/18	(5.96)	0.00	(5.96)	0.00	0.00	0.00	(5.96)	(5.65)
07/01/18	09/30/18	(2.91)	0.00	(2.91)	0.04	(118.60)	0.00	(121.47)	(113.27)
10/01/18	12/31/18	(13.64)	0.10	(13.54)	0.21	(92.49)	0.85	(104.97)	(96.20)
01/01/19	03/31/19	(16.81)	0.18	(16.64)	0.76	(121.85)	1.51	(136.22)	(122.67)
04/01/19	06/30/19	(6.32)	0.28	(6.04)	1.65	(93.57)	2.37	(95.58)	(84.59)
07/01/19	09/30/19	14.18	0.36	14.54	2.52	48.37	3.04	68.48	59.55
10/01/19	12/31/19	16.45	0.31	16.76	3.11	43.58	2.70	66.15	56.53
01/01/20	03/31/20	11.39	0.27	11.65	3.29	36.72	2.39	54.05	45.39
04/01/20	06/30/20	(12.47)	0.23	(12.24)	3.21	30.67	2.12	23.76	19.61
07/01/20	09/30/20	(11.13)	0.22	(10.91)	3.15	26.55	1.91	20.69	16.78
10/01/20	12/31/20	11.39	0.20	11.59	3.03	24.68	1.72	41.02	32.69
01/01/21	03/31/21	6.61	0.18	6.78	2.74	21.90	1.54	32.96	25.81
04/01/21	06/30/21	3.27	0.16	3.43	2.47	19.44	1.38	26.71	20.56
07/01/21	09/30/21	1.41	0.14	1.55	2.22	17.30	1.25	22.32	16.88
10/01/21	12/31/21	0.63	0.12	0.75	2.00	15.70	1.12	19.57	14.55
01/01/22	03/31/22	0.31	0.11	0.42	1.80	13.39	1.01	16.62	12.14
04/01/22	06/30/22	0.31	0.10	0.41	1.63	11.36	0.91	14.31	10.27
07/01/22	09/30/22	0.31	0.09	0.40	1.49	9.74	0.83	12.46	8.79
10/01/22	12/31/22	0.31	0.08	0.39	1.36	8.72	0.76	11.24	7.79
01/01/23	03/31/23	0.15	0.08	0.23	1.25	7.27	0.70	9.45	6.43
04/01/23	06/30/23	0.15	0.07	0.22	1.16	5.98	0.65	8.02	5.36
07/01/23	09/30/23	0.15	0.07	0.22	1.09	5.01	0.61	6.92	4.55
10/01/23	12/31/23	0.15	0.06	0.21	1.02	4.44	0.57	6.25	4.04
01/01/24	03/31/24	0.14	0.06	0.20	0.97	3.64	0.54	5.35	3.40
04/01/24	06/30/24	0.14	0.06	0.20	0.92	2.94	0.51	4.57	2.85
07/01/24	09/30/24	0.14	0.05	0.19	0.88	2.45	0.49	4.02	2.46
10/01/24	12/31/24	0.14	0.05	0.19	0.85	2.22	0.48	3.74	2.25
01/01/25	03/31/25	0.13	0.05	0.18	0.82	1.89	0.46	3.35	1.98
04/01/25	06/30/25	0.13	0.05	0.18	0.80	1.60	0.45	3.02	1.76
07/01/25	09/30/25	0.13	0.05	0.18	0.78	1.41	0.43	2.80	1.60
10/01/25	12/31/25	0.13	0.05	0.17	0.76	1.35	0.42	2.71	1.52
01/01/26	03/31/26	0.09	0.05	0.14	0.74	1.25	0.42	2.54	1.40
04/01/26	06/30/26	0.09	0.04	0.13	0.73	1.16	0.41	2.43	1.32
07/01/26	09/30/26	0.09	0.04	0.13	0.71	1.08	0.40	2.33	1.24
10/01/26	12/31/26	0.09	0.04	0.13	0.70	1.03	0.39	2.25	1.18
01/01/27	03/31/27	0.10	0.04	0.14	0.69	0.95	0.38	2.16	1.11
04/01/27	06/30/27	0.10	0.04	0.14	0.67	0.87	0.38	2.06	1.04
07/01/27	09/30/27	0.10	0.04	0.14	0.66	0.81	0.37	1.98	0.98
10/01/27	12/31/27	0.10	0.04	0.14	0.65	0.76	0.36	1.91	0.93
01/01/28	03/31/28	0.10	0.04	0.14	0.64	0.68	0.36	1.82	0.87
04/01/28	06/30/28	0.10	0.04	0.14	0.63	0.61	0.35	1.74	0.82
07/01/28	09/30/28	0.10	0.04	0.14	0.63	0.59	0.35	1.70	0.79
10/01/28	12/31/28	0.10	0.04	0.14	0.62	0.60	0.35	1.70	0.78
01/01/29	03/31/29	0.10	0.04	0.14	0.61	0.61	0.34	1.70	0.76
04/01/29	06/30/29	0.10	0.04	0.14	0.60	0.62	0.34	1.70	0.75
07/01/29	09/30/29	0.10	0.04	0.14	0.60	0.65	0.33	1.71	0.74
10/01/29	12/31/29	0.10	0.04	0.13	0.59	0.69	0.33	1.74	0.74
01/01/30	03/31/30	0.09	0.03	0.13	0.58	0.73	0.32	1.75	0.73
04/01/30	06/30/30	0.09	0.03	0.12	0.57	0.76	0.32	1.77	0.73
07/01/30	09/30/30	0.09	0.03	0.12	0.56	0.76	0.31	1.75	0.71
10/01/30	12/31/30	0.09	0.03	0.12	0.55	0.71	0.31	1.69	0.67
01/01/31	03/31/31	0.09	0.03	0.12	0.54	0.65	0.30	1.61	0.63
04/01/31	06/30/31	0.09	0.03	0.12	0.53	0.59	0.30	1.54	0.59
07/01/31	09/30/31	0.09	0.03	0.12	0.52	0.55	0.29	1.48	0.56
10/01/31	12/31/31	0.09	0.03	0.12	0.52	0.52	0.29	1.45	0.53
01/01/32	03/31/32	0.08	0.03	0.11	0.51	0.49	0.29	1.39	0.50
04/01/32	06/30/32	0.08	0.03	0.11	0.50	0.45	0.28	1.34	0.48
07/01/32	09/30/32	0.08	0.03	0.11	0.50	0.44	0.28	1.32	0.46
10/01/32	12/31/32	0.08	0.03	0.10	0.49	0.44	0.28	1.31	0.45
01/01/33	03/31/33	0.01	0.03	0.04	0.49	0.43	0.27	1.23	0.42
04/01/33	06/30/33	0.01	0.03	0.04	0.48	0.43	0.27	1.22	0.41
07/01/33	09/30/33	0.01	0.03	0.04	0.48	0.44	0.27	1.22	0.40
10/01/33	12/31/33	0.01	0.03	0.04	0.47	0.46	0.26	1.24	0.40
01/01/34	03/31/34	0.00	0.03	0.03	0.47	0.48	0.26	1.24	0.39
04/01/34	06/30/34	0.00	0.03	0.03	0.46	0.51	0.26	1.25	0.39
07/01/34	09/30/34	0.00	0.03	0.03	0.45	0.51	0.25	1.25	0.38
10/01/34	12/31/34	0.00	0.03	0.03	0.45	0.50	0.25	1.23	0.37
01/01/35	03/31/35	0.00	0.03	0.03	0.44	0.48	0.25	1.19	0.35
04/01/35	06/30/35	0.00	0.03	0.03	0.44	0.46	0.24	1.16	0.34
07/01/35	09/30/35	0.00	0.03	0.03	0.43	0.45	0.24	1.15	0.33
10/01/35	12/31/35	0.00	0.03	0.03	0.42	0.46	0.24	1.15	0.32
01/01/36	03/31/36	0.00	0.02	0.03	0.42	0.47	0.23	1.14	0.31
04/01/36	06/30/36	0.00	0.02	0.03	0.41	0.47	0.23	1.14	0.31
07/01/36	09/30/36	0.00	0.02	0.03	0.41	0.46	0.23	1.11	0.30
10/01/36	12/31/36	0.00	0.02	0.03	0.40	0.43	0.22	1.08	0.28
01/01/37	03/31/37	0.00	0.02	0.03	0.39	0.39	0.22	1.03	0.26
04/01/37	06/30/37	0.00	0.02	0.02	0.39	0.36	0.22	0.99	0.25
07/01/37	09/30/37	0.00	0.02	0.02	0.39	0.34	0.21	0.97	0.24
10/01/37	12/31/37	0.00	0.02	0.02	0.38	0.34	0.21	0.96	0.23
01/01/38	03/31/38	0.00	0.02	0.02	0.38	0.34	0.21	0.95	0.23
04/01/38	06/30/38	0.00	0.02	0.02	0.37	0.34	0.21	0.94	0.22

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Section VII-B
Exhibit 1

TABLE B1: INTERNAL RATE OF RETURN (IRR) MODEL - PRESENT VALUE (PV) NOMINAL CASH FLOWS TO INVESTORS

TIME INTERVAL		POST TAX CASH FROM UW MINUS INVESTABLE RESERVES	BOND INTEREST TAX DEDUCTION FOR INSURERS	NET CASH FLOW FROM UNDERWRITING	CASH POST-TAX INCOME	NET FLOW FROM SURPLUS ACCOUNT	SURPLUS POST-TAX INCOME	CASH FLOWS TO INVESTORS (NOMINAL)	CASH FLOWS TO INVESTORS (PV NOMINAL)
FROM (1)	TO (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
07/01/38	09/30/38	0.00	0.02	0.02	0.37	0.33	0.20	0.93	0.21
10/01/38	12/31/38	0.00	0.02	0.02	0.36	0.32	0.20	0.91	0.21
01/01/39	03/31/39	0.00	0.02	0.02	0.36	0.30	0.20	0.88	0.20
04/01/39	06/30/39	0.00	0.02	0.02	0.36	0.28	0.20	0.85	0.19
07/01/39	09/30/39	0.00	0.02	0.02	0.35	0.29	0.20	0.86	0.19
10/01/39	12/31/39	0.00	0.02	0.02	0.35	0.34	0.19	0.91	0.19
01/01/40	03/31/40	0.00	0.02	0.02	0.34	0.40	0.19	0.96	0.20
04/01/40	06/30/40	0.00	0.02	0.02	0.34	0.45	0.19	1.00	0.20
07/01/40	09/30/40	0.00	0.02	0.02	0.33	0.48	0.18	1.02	0.20
10/01/40	12/31/40	0.00	0.02	0.02	0.33	0.48	0.18	1.01	0.20
01/01/41	03/31/41	0.00	0.02	0.02	0.32	0.48	0.18	1.00	0.19
04/01/41	06/30/41	0.00	0.02	0.02	0.31	0.48	0.17	0.99	0.19
07/01/41	09/30/41	0.00	0.02	0.02	0.31	0.48	0.17	0.98	0.18
10/01/41	12/31/41	0.00	0.02	0.02	0.30	0.48	0.17	0.97	0.18
01/01/42	03/31/42	0.00	0.02	0.02	0.30	0.48	0.16	0.96	0.17
04/01/42	06/30/42	0.00	0.02	0.02	0.29	0.48	0.16	0.95	0.17
07/01/42	09/30/42	0.00	0.02	0.02	0.28	0.48	0.16	0.94	0.16
10/01/42	12/31/42	0.00	0.02	0.02	0.28	0.48	0.15	0.93	0.16
01/01/43	03/31/43	0.00	0.02	0.02	0.27	0.48	0.15	0.92	0.15
04/01/43	06/30/43	0.00	0.02	0.02	0.26	0.48	0.15	0.91	0.15
07/01/43	09/30/43	0.00	0.02	0.02	0.26	0.48	0.14	0.90	0.15
10/01/43	12/31/43	0.00	0.02	0.02	0.25	0.48	0.14	0.89	0.14
01/01/44	03/31/44	0.00	0.01	0.02	0.25	0.48	0.14	0.88	0.14
04/01/44	06/30/44	0.00	0.01	0.02	0.24	0.48	0.13	0.87	0.13
07/01/44	09/30/44	0.00	0.01	0.02	0.23	0.48	0.13	0.86	0.13
10/01/44	12/31/44	0.00	0.01	0.02	0.23	0.48	0.13	0.85	0.13
01/01/45	03/31/45	0.00	0.01	0.02	0.22	0.48	0.12	0.84	0.12
04/01/45	06/30/45	0.00	0.01	0.02	0.22	0.48	0.12	0.83	0.12
07/01/45	09/30/45	0.00	0.01	0.01	0.21	0.48	0.12	0.82	0.12
10/01/45	12/31/45	0.00	0.01	0.01	0.20	0.48	0.11	0.81	0.11
01/01/46	03/31/46	0.00	0.01	0.01	0.20	0.48	0.11	0.80	0.11
04/01/46	06/30/46	0.00	0.01	0.01	0.19	0.48	0.11	0.79	0.11
07/01/46	09/30/46	0.00	0.01	0.01	0.18	0.48	0.10	0.78	0.10
10/01/46	12/31/46	0.00	0.01	0.01	0.18	0.48	0.10	0.77	0.10
01/01/47	03/31/47	0.00	0.01	0.01	0.17	0.48	0.10	0.76	0.10
04/01/47	06/30/47	0.00	0.01	0.01	0.17	0.48	0.09	0.75	0.09
07/01/47	09/30/47	0.00	0.01	0.01	0.16	0.48	0.09	0.74	0.09
10/01/47	12/31/47	0.00	0.01	0.01	0.15	0.48	0.09	0.73	0.09
01/01/48	03/31/48	0.00	0.01	0.01	0.15	0.48	0.08	0.72	0.09
04/01/48	06/30/48	0.00	0.01	0.01	0.14	0.48	0.08	0.71	0.08
07/01/48	09/30/48	0.00	0.01	0.01	0.14	0.48	0.08	0.70	0.08
10/01/48	12/31/48	0.00	0.01	0.01	0.13	0.48	0.07	0.69	0.08
01/01/49	03/31/49	0.00	0.01	0.01	0.12	0.48	0.07	0.68	0.08
04/01/49	06/30/49	0.00	0.01	0.01	0.12	0.48	0.07	0.67	0.07
07/01/49	09/30/49	0.00	0.01	0.01	0.11	0.48	0.06	0.66	0.07
10/01/49	12/31/49	0.00	0.01	0.01	0.10	0.48	0.06	0.65	0.07
01/01/50	03/31/50	0.00	0.01	0.01	0.10	0.48	0.05	0.64	0.07
04/01/50	06/30/50	0.00	0.01	0.01	0.09	0.48	0.05	0.63	0.06
07/01/50	09/30/50	0.00	0.01	0.01	0.09	0.48	0.05	0.62	0.06
10/01/50	12/31/50	0.00	0.00	0.01	0.08	0.48	0.04	0.61	0.06
01/01/51	03/31/51	0.00	0.00	0.01	0.07	0.48	0.04	0.60	0.06
04/01/51	06/30/51	0.00	0.00	0.01	0.07	0.48	0.04	0.59	0.06
07/01/51	09/30/51	0.00	0.00	0.01	0.06	0.48	0.03	0.58	0.05
10/01/51	12/31/51	0.00	0.00	0.01	0.06	0.48	0.03	0.57	0.05
01/01/52	03/31/52	0.00	0.00	0.01	0.05	0.48	0.03	0.56	0.05
04/01/52	06/30/52	0.00	0.00	0.00	0.04	0.48	0.02	0.55	0.05
07/01/52	09/30/52	0.00	0.00	0.00	0.04	0.48	0.02	0.54	0.05
10/01/52	12/31/52	0.00	0.00	0.00	0.03	0.48	0.02	0.53	0.05
01/01/53	03/31/53	0.00	0.00	0.00	0.02	0.48	0.01	0.52	0.04
04/01/53	06/30/53	0.00	0.00	0.00	0.02	0.48	0.01	0.51	0.04
07/01/53	09/30/53	0.00	0.00	0.00	0.01	0.42	0.01	0.44	0.04
10/01/53	12/31/53	0.00	0.00	0.00	0.01	0.32	0.00	0.33	0.03
01/01/54	03/31/54	(0.00)	0.00	0.00	0.00	0.18	0.00	0.19	0.01
04/01/54	06/30/54	0.00	0.00	0.00	0.00	0.06	0.00	0.06	0.00
TOTAL		1.76	6.11	7.88	86.26	(0.00)	55.04	149.18	(0.00)

Notes:

(3) = Table C1, (14) - [Table C3, (7), incremental]

(4) = Table B2, (5)

(5) = (3) + (4)

(6) = Table C3, (7)_k x { [1.0 + Table A1, (12)] ^ 0.25 - 1.0 }

(7) = -1.0 X Table D1, (7), incremental

(8) = Table D1, (7)_k x { [1.0 + Table A1, (12)] ^ 0.25 - 1.0 }

(9) = (5) + (6) + (7) + (8)

(10) = (9) x (1 + WACC)^{time in years}, based on the time interval with beginning date 07/01/17

WACC is the weighted average cost of capital from Section VII-E, Exhibit 1 which is equal to 7.23%.

The Total PV is equal to zero which implies that the profit provision derived from an investors prospective is equal to the profit provision derived from insurers prospective and is equal to 0.27% from Table A1, (14).

TABLE B2: INSURER CAPITAL COST (ICC) MODEL - PRESENT VALUE (PV) CASH FLOW TO INSURER

TIME INTERVAL		INVESTOR SUPPLIED	NET CAPITAL CHARGES			SOURCES TO PAY NET CAPITAL CHARGE				CASH FLOW TO INSURER (11)	PV CASH FLOW TO INSURER (12)
						INVESTOR SUPPLIED	POLICYHOLDER SUPPLIED				
							AFTER TAX INV INCOME ON INVESTOR SUPPLIED FUNDS (7)	POLICYHOLDER SUPPLIED INVESTABLE FUNDS (8)	AFTER TAX INV INCOME ON POLICYHOLDER SUPPLIED FUNDS (9)		
FROM (1)	TO (2)	CAPITAL NEEDED FROM INVESTORS (3)	INVESTOR REQUIRED RETURN CAPITAL CHARGE (4)	BOND INTEREST TAX DEDUCTION FOR INSURERS (5)	NET CAPITAL COST TO INSURERS (6)						
07/01/17	09/30/17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/01/17	12/31/17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/18	03/31/18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/01/18	06/30/18	5.30	0.00	0.00	0.00	0.00	0.00	0.00	(0.66)	(0.66)	(0.62)
07/01/18	09/30/18	127.47	0.09	0.00	0.09	0.04	20.87	0.00	0.66	0.61	0.57
10/01/18	12/31/18	233.60	2.25	0.10	2.15	0.91	84.65	0.15	0.00	(1.09)	(1.00)
01/01/19	03/31/19	372.27	4.12	0.18	3.94	1.67	191.70	0.60	0.00	(1.67)	(1.50)
04/01/19	06/30/19	472.16	6.56	0.28	6.27	2.66	307.81	1.37	0.00	(2.25)	(1.99)
07/01/19	09/30/19	409.60	8.32	0.36	7.96	3.37	404.83	2.20	0.00	(2.39)	(2.08)
10/01/19	12/31/19	349.58	7.22	0.31	6.90	2.92	445.95	2.89	0.00	(1.09)	(0.94)
01/01/20	03/31/20	301.47	6.16	0.27	5.89	2.49	447.09	3.18	0.00	(0.22)	(0.18)
04/01/20	06/30/20	283.27	5.31	0.23	5.08	2.15	425.18	3.19	0.00	0.26	0.21
07/01/20	09/30/20	267.85	4.99	0.22	4.77	2.02	398.17	3.03	0.00	0.28	0.23
10/01/20	12/31/20	231.78	4.72	0.20	4.51	1.91	368.52	2.84	0.00	0.24	0.19
01/01/21	03/31/21	203.28	4.08	0.18	3.91	1.65	336.61	2.63	0.00	0.38	0.29
04/01/21	06/30/21	180.57	3.58	0.16	3.43	1.45	305.43	2.40	0.00	0.42	0.33
07/01/21	09/30/21	161.86	3.18	0.14	3.04	1.29	276.05	2.18	0.00	0.42	0.32
10/01/21	12/31/21	145.53	2.85	0.12	2.73	1.15	248.68	1.97	0.00	0.40	0.29
01/01/22	03/31/22	131.83	2.56	0.11	2.45	1.04	225.13	1.77	0.00	0.36	0.26
04/01/22	06/30/22	120.17	2.32	0.10	2.22	0.94	205.24	1.61	0.00	0.32	0.23
07/01/22	09/30/22	110.12	2.12	0.09	2.03	0.86	188.26	1.46	0.00	0.30	0.21
10/01/22	12/31/22	101.09	1.94	0.08	1.86	0.79	173.11	1.34	0.00	0.27	0.19
01/01/23	03/31/23	93.68	1.78	0.08	1.70	0.72	160.35	1.23	0.00	0.25	0.17
04/01/23	06/30/23	87.54	1.65	0.07	1.58	0.67	149.89	1.14	0.00	0.23	0.16
07/01/23	09/30/23	82.39	1.54	0.07	1.48	0.62	141.19	1.07	0.00	0.22	0.14
10/01/23	12/31/23	77.79	1.45	0.06	1.39	0.59	133.50	1.01	0.00	0.21	0.13
01/01/24	03/31/24	74.01	1.37	0.06	1.31	0.55	127.09	0.95	0.00	0.20	0.12
04/01/24	06/30/24	70.93	1.30	0.06	1.25	0.53	121.96	0.91	0.00	0.19	0.12
07/01/24	09/30/24	68.34	1.25	0.05	1.20	0.51	117.70	0.87	0.00	0.18	0.11
10/01/24	12/31/24	65.98	1.20	0.05	1.15	0.49	113.86	0.84	0.00	0.18	0.11
01/01/25	03/31/25	63.97	1.16	0.05	1.11	0.47	110.60	0.81	0.00	0.17	0.10
04/01/25	06/30/25	62.24	1.13	0.05	1.08	0.46	107.87	0.79	0.00	0.17	0.10
07/01/25	09/30/25	60.70	1.10	0.05	1.05	0.44	105.47	0.77	0.00	0.16	0.09
10/01/25	12/31/25	59.23	1.07	0.05	1.02	0.43	103.18	0.75	0.00	0.16	0.09
01/01/26	03/31/26	57.89	1.04	0.05	1.00	0.42	101.07	0.74	0.00	0.16	0.09
04/01/26	06/30/26	56.64	1.02	0.04	0.98	0.41	99.12	0.72	0.00	0.16	0.09
07/01/26	09/30/26	55.47	1.00	0.04	0.95	0.40	97.29	0.71	0.00	0.16	0.08
10/01/26	12/31/26	54.35	0.98	0.04	0.93	0.40	95.57	0.69	0.00	0.15	0.08
01/01/27	03/31/27	53.30	0.96	0.04	0.92	0.39	93.96	0.68	0.00	0.15	0.08
04/01/27	06/30/27	52.33	0.94	0.04	0.90	0.38	92.48	0.67	0.00	0.15	0.08
07/01/27	09/30/27	51.43	0.92	0.04	0.88	0.37	91.12	0.66	0.00	0.15	0.08
10/01/27	12/31/27	50.57	0.91	0.04	0.87	0.37	89.85	0.65	0.00	0.15	0.07
01/01/28	03/31/28	49.79	0.89	0.04	0.85	0.36	88.73	0.64	0.00	0.15	0.07
04/01/28	06/30/28	49.08	0.88	0.04	0.84	0.36	87.73	0.63	0.00	0.15	0.07
07/01/28	09/30/28	48.44	0.86	0.04	0.83	0.35	86.74	0.63	0.04	0.19	0.09
10/01/28	12/31/28	47.84	0.85	0.04	0.82	0.35	85.66	0.62	0.10	0.25	0.11
01/01/29	03/31/29	47.23	0.84	0.04	0.81	0.34	84.56	0.61	0.10	0.25	0.11
04/01/29	06/30/29	46.61	0.83	0.04	0.80	0.34	83.45	0.60	0.10	0.24	0.11
07/01/29	09/30/29	45.96	0.82	0.04	0.79	0.33	82.28	0.60	0.10	0.24	0.10
10/01/29	12/31/29	45.27	0.81	0.04	0.77	0.33	81.04	0.59	0.10	0.24	0.10
01/01/30	03/31/30	44.54	0.80	0.03	0.76	0.32	79.74	0.58	0.09	0.23	0.10
04/01/30	06/30/30	43.78	0.78	0.03	0.75	0.32	78.38	0.57	0.09	0.23	0.09
07/01/30	09/30/30	43.02	0.77	0.03	0.74	0.31	77.03	0.56	0.09	0.22	0.09
10/01/30	12/31/30	42.31	0.76	0.03	0.73	0.31	75.76	0.55	0.09	0.22	0.09
01/01/31	03/31/31	41.66	0.75	0.03	0.71	0.30	74.60	0.54	0.09	0.21	0.08
04/01/31	06/30/31	41.07	0.73	0.03	0.70	0.30	73.54	0.53	0.09	0.21	0.08
07/01/31	09/30/31	40.53	0.72	0.03	0.69	0.29	72.56	0.52	0.09	0.21	0.08
10/01/31	12/31/31	40.00	0.71	0.03	0.68	0.29	71.63	0.52	0.09	0.21	0.08
01/01/32	03/31/32	39.52	0.70	0.03	0.67	0.29	70.76	0.51	0.08	0.20	0.07
04/01/32	06/30/32	39.07	0.70	0.03	0.67	0.28	69.96	0.50	0.08	0.20	0.07
07/01/32	09/30/32	38.63	0.69	0.03	0.66	0.28	69.19	0.50	0.08	0.19	0.07
10/01/32	12/31/32	38.19	0.68	0.03	0.65	0.28	68.41	0.49	0.08	0.19	0.07
01/01/33	03/31/33	37.76	0.67	0.03	0.64	0.27	67.70	0.49	0.01	0.13	0.04
04/01/33	06/30/33	37.34	0.67	0.03	0.64	0.27	67.00	0.48	0.01	0.13	0.04
07/01/33	09/30/33	36.90	0.66	0.03	0.63	0.27	66.27	0.48	0.01	0.13	0.04
10/01/33	12/31/33	36.44	0.65	0.03	0.62	0.26	65.51	0.47	0.01	0.13	0.04
01/01/34	03/31/34	35.96	0.64	0.03	0.61	0.26	64.65	0.47	0.00	0.12	0.04
04/01/34	06/30/34	35.45	0.63	0.03	0.61	0.26	63.75	0.46	0.00	0.11	0.04
07/01/34	09/30/34	34.94	0.62	0.03	0.60	0.25	62.84	0.45	0.00	0.11	0.03
10/01/34	12/31/34	34.44	0.62	0.03	0.59	0.25	61.95	0.45	0.00	0.11	0.03
01/01/35	03/31/35	33.96	0.61	0.03	0.58	0.25	61.09	0.44	0.00	0.11	0.03
04/01/35	06/30/35	33.50	0.60	0.03	0.57	0.24	60.26	0.44	0.00	0.11	0.03
07/01/35	09/30/35	33.05	0.59	0.03	0.56	0.24	59.44	0.43	0.00	0.11	0.03
10/01/35	12/31/35	32.59	0.58	0.03	0.56	0.24	58.61	0.42	0.00	0.10	0.03
01/01/36	03/31/36	32.12	0.57	0.02	0.55	0.23	57.78	0.42	0.00	0.10	0.03
04/01/36	06/30/36	31.65	0.57	0.02	0.54	0.23	56.94	0.41	0.00	0.10	0.03
07/01/36	09/30/36	31.20	0.56	0.02	0.53	0.23	56.11	0.41	0.00	0.10	0.03
10/01/36	12/31/36	30.76	0.55	0.02	0.53	0.22	55.34	0.40	0.00	0.10	0.03
01/01/37	03/31/37	30.37	0.54	0.02	0.52	0.22	54.64	0.39	0.00	0.10	0.02
04/01/37	06/30/37	30.02	0.54	0.02	0.51	0.22	53.99	0.39	0.00	0.10	0.02

TABLE B2: INSURER CAPITAL COST (ICC) MODEL - PRESENT VALUE (PV) CASH FLOW TO INSURER

TIME INTERVAL		INVESTOR SUPPLIED	NET CAPITAL CHARGES			SOURCES TO PAY NET CAPITAL CHARGE				CASH FLOW TO INSURER (11)	PV CASH FLOW TO INSURER (12)
						INVESTOR SUPPLIED	POLICYHOLDER SUPPLIED				
							AFTER TAX INV INCOME ON INVESTOR SUPPLIED FUNDS (7)	POLICYHOLDER SUPPLIED INVESTABLE FUNDS (8)	AFTER TAX INV INCOME ON POLICYHOLDER SUPPLIED FUNDS (9)		
FROM (1)	TO (2)	CAPITAL NEEDED FROM INVESTORS (3)	INVESTOR REQUIRED RETURN CAPITAL CHARGE (4)	BOND INTEREST TAX DEDUCTION FOR INSURERS (5)	NET CAPITAL COST TO INSURERS (6)						
07/01/37	09/30/37	29.67	0.53	0.02	0.51	0.21	53.38	0.39	0.00	0.09	0.02
10/01/37	12/31/37	29.33	0.52	0.02	0.50	0.21	52.76	0.38	0.00	0.09	0.02
01/01/38	03/31/38	28.99	0.52	0.02	0.49	0.21	52.14	0.38	0.00	0.09	0.02
04/01/38	06/30/38	28.64	0.51	0.02	0.49	0.21	51.53	0.37	0.00	0.09	0.02
07/01/38	09/30/38	28.31	0.50	0.02	0.48	0.20	50.92	0.37	0.00	0.09	0.02
10/01/38	12/31/38	27.99	0.50	0.02	0.48	0.20	50.35	0.36	0.00	0.09	0.02
01/01/39	03/31/39	27.69	0.49	0.02	0.47	0.20	49.82	0.36	0.00	0.09	0.02
04/01/39	06/30/39	27.42	0.49	0.02	0.47	0.20	49.32	0.36	0.00	0.09	0.02
07/01/39	09/30/39	27.12	0.48	0.02	0.46	0.20	48.79	0.35	0.00	0.09	0.02
10/01/39	12/31/39	26.78	0.48	0.02	0.46	0.19	48.18	0.35	0.00	0.09	0.02
01/01/40	03/31/40	26.38	0.47	0.02	0.45	0.19	47.46	0.34	0.00	0.09	0.02
04/01/40	06/30/40	25.93	0.46	0.02	0.44	0.19	46.65	0.34	0.00	0.08	0.02
07/01/40	09/30/40	25.46	0.46	0.02	0.44	0.18	45.79	0.33	0.00	0.08	0.02
10/01/40	12/31/40	24.97	0.45	0.02	0.43	0.18	44.92	0.33	0.00	0.08	0.02
01/01/41	03/31/41	24.49	0.44	0.02	0.42	0.18	44.05	0.32	0.00	0.08	0.02
04/01/41	06/30/41	24.02	0.43	0.02	0.41	0.17	43.20	0.31	0.00	0.08	0.01
07/01/41	09/30/41	23.54	0.42	0.02	0.40	0.17	42.33	0.31	0.00	0.08	0.01
10/01/41	12/31/41	23.05	0.41	0.02	0.40	0.17	41.46	0.30	0.00	0.08	0.01
01/01/42	03/31/42	22.57	0.41	0.02	0.39	0.16	40.60	0.30	0.00	0.07	0.01
04/01/42	06/30/42	22.10	0.40	0.02	0.38	0.16	39.74	0.29	0.00	0.07	0.01
07/01/42	09/30/42	21.62	0.39	0.02	0.37	0.16	38.88	0.28	0.00	0.07	0.01
10/01/42	12/31/42	21.13	0.38	0.02	0.36	0.15	38.01	0.28	0.00	0.07	0.01
01/01/43	03/31/43	20.65	0.37	0.02	0.36	0.15	37.15	0.27	0.00	0.07	0.01
04/01/43	06/30/43	20.18	0.36	0.02	0.35	0.15	36.29	0.26	0.00	0.07	0.01
07/01/43	09/30/43	19.70	0.36	0.02	0.34	0.14	35.43	0.26	0.00	0.07	0.01
10/01/43	12/31/43	19.21	0.35	0.02	0.33	0.14	34.56	0.25	0.00	0.06	0.01
01/01/44	03/31/44	18.73	0.34	0.01	0.32	0.14	33.69	0.25	0.00	0.06	0.01
04/01/44	06/30/44	18.26	0.33	0.01	0.32	0.13	32.84	0.24	0.00	0.06	0.01
07/01/44	09/30/44	17.78	0.32	0.01	0.31	0.13	31.97	0.23	0.00	0.06	0.01
10/01/44	12/31/44	17.29	0.31	0.01	0.30	0.13	31.10	0.23	0.00	0.06	0.01
01/01/45	03/31/45	16.81	0.30	0.01	0.29	0.12	30.24	0.22	0.00	0.06	0.01
04/01/45	06/30/45	16.34	0.30	0.01	0.28	0.12	29.38	0.22	0.00	0.05	0.01
07/01/45	09/30/45	15.86	0.29	0.01	0.28	0.12	28.52	0.21	0.00	0.05	0.01
10/01/45	12/31/45	15.37	0.28	0.01	0.27	0.11	27.65	0.20	0.00	0.05	0.01
01/01/46	03/31/46	14.89	0.27	0.01	0.26	0.11	26.79	0.20	0.00	0.05	0.01
04/01/46	06/30/46	14.42	0.26	0.01	0.25	0.11	25.93	0.19	0.00	0.05	0.01
07/01/46	09/30/46	13.94	0.25	0.01	0.24	0.10	25.07	0.18	0.00	0.05	0.01
10/01/46	12/31/46	13.46	0.25	0.01	0.23	0.10	24.20	0.18	0.00	0.05	0.01
01/01/47	03/31/47	12.98	0.24	0.01	0.23	0.10	23.33	0.17	0.00	0.04	0.01
04/01/47	06/30/47	12.50	0.23	0.01	0.22	0.09	22.48	0.17	0.00	0.04	0.01
07/01/47	09/30/47	12.02	0.22	0.01	0.21	0.09	21.61	0.16	0.00	0.04	0.01
10/01/47	12/31/47	11.54	0.21	0.01	0.20	0.09	20.74	0.15	0.00	0.04	0.00
01/01/48	03/31/48	11.06	0.20	0.01	0.19	0.08	19.88	0.15	0.00	0.04	0.00
04/01/48	06/30/48	10.58	0.19	0.01	0.19	0.08	19.02	0.14	0.00	0.04	0.00
07/01/48	09/30/48	10.10	0.19	0.01	0.18	0.08	18.16	0.14	0.00	0.04	0.00
10/01/48	12/31/48	9.62	0.18	0.01	0.17	0.07	17.29	0.13	0.00	0.03	0.00
01/01/49	03/31/49	9.14	0.17	0.01	0.16	0.07	16.43	0.12	0.00	0.03	0.00
04/01/49	06/30/49	8.66	0.16	0.01	0.15	0.07	15.57	0.12	0.00	0.03	0.00
07/01/49	09/30/49	8.18	0.15	0.01	0.15	0.06	14.70	0.11	0.00	0.03	0.00
10/01/49	12/31/49	7.70	0.14	0.01	0.14	0.06	13.84	0.10	0.00	0.03	0.00
01/01/50	03/31/50	7.22	0.14	0.01	0.13	0.05	12.97	0.10	0.00	0.03	0.00
04/01/50	06/30/50	6.74	0.13	0.01	0.12	0.05	12.11	0.09	0.00	0.02	0.00
07/01/50	09/30/50	6.26	0.12	0.01	0.11	0.05	11.25	0.09	0.00	0.02	0.00
10/01/50	12/31/50	5.78	0.11	0.00	0.11	0.04	10.38	0.08	0.00	0.02	0.00
01/01/51	03/31/51	5.30	0.10	0.00	0.10	0.04	9.52	0.07	0.00	0.02	0.00
04/01/51	06/30/51	4.82	0.09	0.00	0.09	0.04	8.66	0.07	0.00	0.02	0.00
07/01/51	09/30/51	4.34	0.08	0.00	0.08	0.03	7.80	0.06	0.00	0.02	0.00
10/01/51	12/31/51	3.86	0.08	0.00	0.07	0.03	6.93	0.06	0.00	0.02	0.00
01/01/52	03/31/52	3.38	0.07	0.00	0.07	0.03	6.07	0.05	0.00	0.01	0.00
04/01/52	06/30/52	2.90	0.06	0.00	0.06	0.02	5.21	0.04	0.00	0.01	0.00
07/01/52	09/30/52	2.42	0.05	0.00	0.05	0.02	4.34	0.04	0.00	0.01	0.00
10/01/52	12/31/52	1.94	0.04	0.00	0.04	0.02	3.48	0.03	0.00	0.01	0.00
01/01/53	03/31/53	1.46	0.03	0.00	0.03	0.01	2.62	0.02	0.00	0.01	0.00
04/01/53	06/30/53	0.98	0.03	0.00	0.02	0.01	1.76	0.02	0.00	0.00	0.00
07/01/53	09/30/53	0.56	0.02	0.00	0.02	0.01	1.01	0.01	0.00	0.00	0.00
10/01/53	12/31/53	0.24	0.01	0.00	0.01	0.00	0.44	0.01	0.00	0.00	0.00
01/01/54	03/31/54	0.06	0.00	0.00	0.00	0.00	0.11	0.00	(0.00)	0.00	0.00
04/01/54	06/30/54	0.00	0.00	0.00	0.00	0.00	(0.00)	0.00	0.00	0.00	0.00
TOTAL		8,010.96	141.12	6.11	135.01	57.14	11,800.82	84.17	1.76	8.05	(0.00)

Notes:

- (3) = Table D1, (9)
- (4) = $(3)_{t-1} \times [(1.0 + WACC)^{0.25} - 1.0]$,
 where WACC is the weighted average cost of capital from Section VII-E, Exhibit 1 which is equal to 7.23%
- (5) = $(3)_{t-1} \times [(1.0 + Debt Capital Cost)^{0.25} - 1.0] \times Debt Capital Share \times 0.35$,
 where Debt Capital Cost=4.05% and Debt Capital Share=22%, from Section VII-E, Exhibit 1.
- (6) = (4) - (5)
- (7) = $(3)_{t-1} \times [(1.0 + Table A1, (12))^{0.25} - 1.0]$
- (8) = Table C3, (10)
- (9) = $(8)_{t-1} \times [(1.0 + Table A1, (12))^{0.25} - 1.0]$
- (10) = Table C3, (9)
- (11) = $-1.0 \times [(6) - (7) - (9) - (10)]$
- (12) = $(11) \times (1 + WACC)^{time in years}$, based on the time interval with beginning date 07/01/17,
 where WACC is the weighted average cost of capital from Section VII-E, Exhibit 1 which is equal to 7.23%

TABLE C1: POLICYHOLDER SUPPLIED - UNDERWRITING (UW) CASH FLOWS

TIME INTERVAL		COLLECTED PREMIUM NET	LOSS & LAE PAYOUT	UNDERWRITING EXPENSES							PRE TAX CASH FLOWS FROM UW	FEDERAL INCOME TAX EXPENSE ON UW	POST TAX CASH FLOWS FROM UW
				COMMIS. & BROKER.	GENERAL EXPENSES	OTHER ACQ. EXPENSES	PREMIUM TAXES	MISC. AND OTHER TAXES	REINS. EXPENSES	TOTAL PRETAX UW EXPENSES			
FROM (1)	TO (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
07/01/17	09/30/17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/01/17	12/31/17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/18	03/31/18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/01/18	06/30/18	5.30	0.00	0.46	0.00	1.31	0.00	0.00	0.00	1.77	3.53	4.18	(0.66)
07/01/18	09/30/18	52.85	5.52	4.60	5.79	7.72	0.00	1.13	2.37	21.63	25.71	4.18	21.53
10/01/18	12/31/18	114.62	14.74	9.98	6.33	7.39	5.14	1.00	2.09	31.92	67.96	4.18	63.78
01/01/19	03/31/19	178.67	26.72	15.56	9.61	9.51	4.52	1.39	2.92	43.51	108.45	1.39	107.06
04/01/19	06/30/19	199.82	37.22	17.40	10.28	7.24	6.31	1.25	2.62	45.10	117.50	1.39	116.11
07/01/19	09/30/19	167.22	43.90	14.57	4.68	0.00	5.66	0.00	0.00	24.91	98.41	1.39	97.02
10/01/19	12/31/19	100.44	45.62	8.75	3.56	0.00	0.00	0.00	0.00	12.31	42.51	1.39	41.12
01/01/20	03/31/20	53.72	47.32	4.68	2.04	0.00	0.00	0.00	0.00	6.72	(0.31)	(1.45)	1.14
04/01/20	06/30/20	28.61	48.79	2.49	0.69	0.00	0.00	0.00	0.00	3.19	(23.36)	(1.45)	(21.91)
07/01/20	09/30/20	21.15	47.77	1.84	0.00	0.00	0.00	0.00	0.00	1.84	(28.46)	(1.45)	(27.01)
10/01/20	12/31/20	14.57	44.39	1.27	0.00	0.00	0.00	0.00	0.00	1.27	(31.10)	(1.45)	(29.64)
01/01/21	03/31/21	7.24	39.39	0.63	0.00	0.00	0.00	0.00	0.00	0.63	(32.78)	(0.87)	(31.91)
04/01/21	06/30/21	3.20	34.97	0.28	0.00	0.00	0.00	0.00	0.00	0.28	(32.05)	(0.87)	(31.18)
07/01/21	09/30/21	0.95	31.12	0.08	0.00	0.00	0.00	0.00	0.00	0.08	(30.26)	(0.87)	(29.38)
10/01/21	12/31/21	0.00	28.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(28.24)	(0.87)	(27.37)
01/01/22	03/31/22	0.00	24.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(24.09)	(0.54)	(23.55)
04/01/22	06/30/22	0.00	20.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(20.43)	(0.54)	(19.89)
07/01/22	09/30/22	0.00	17.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(17.53)	(0.54)	(16.99)
10/01/22	12/31/22	0.00	15.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(15.69)	(0.54)	(15.15)
01/01/23	03/31/23	0.00	13.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(13.07)	(0.31)	(12.77)
04/01/23	06/30/23	0.00	10.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(10.76)	(0.31)	(10.46)
07/01/23	09/30/23	0.00	9.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(9.01)	(0.31)	(8.70)
10/01/23	12/31/23	0.00	7.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(7.99)	(0.31)	(7.69)
01/01/24	03/31/24	0.00	6.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(6.56)	(0.15)	(6.41)
04/01/24	06/30/24	0.00	5.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(5.29)	(0.15)	(5.14)
07/01/24	09/30/24	0.00	4.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(4.41)	(0.15)	(4.26)
10/01/24	12/31/24	0.00	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(3.99)	(0.15)	(3.84)
01/01/25	03/31/25	0.00	3.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(3.40)	(0.14)	(3.26)
04/01/25	06/30/25	0.00	2.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.87)	(0.14)	(2.73)
07/01/25	09/30/25	0.00	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.54)	(0.14)	(2.40)
10/01/25	12/31/25	0.00	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.43)	(0.14)	(2.29)
01/01/26	03/31/26	0.00	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.24)	(0.13)	(2.11)
04/01/26	06/30/26	0.00	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.08)	(0.13)	(1.95)
07/01/26	09/30/26	0.00	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.95)	(0.13)	(1.82)
10/01/26	12/31/26	0.00	1.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.85)	(0.13)	(1.72)
01/01/27	03/31/27	0.00	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.70)	(0.09)	(1.61)
04/01/27	06/30/27	0.00	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.57)	(0.09)	(1.48)
07/01/27	09/30/27	0.00	1.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.45)	(0.09)	(1.36)
10/01/27	12/31/27	0.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.36)	(0.09)	(1.27)
01/01/28	03/31/28	0.00	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.22)	(0.10)	(1.12)
04/01/28	06/30/28	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.10)	(0.10)	(1.00)
07/01/28	09/30/28	0.00	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.05)	(0.10)	(0.96)
10/01/28	12/31/28	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.08)	(0.10)	(0.98)
01/01/29	03/31/29	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.10)	(0.10)	(1.00)
04/01/29	06/30/29	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.12)	(0.10)	(1.02)
07/01/29	09/30/29	0.00	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.17)	(0.10)	(1.07)
10/01/29	12/31/29	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.24)	(0.10)	(1.14)
01/01/30	03/31/30	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.31)	(0.10)	(1.21)
04/01/30	06/30/30	0.00	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.37)	(0.10)	(1.27)
07/01/30	09/30/30	0.00	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.36)	(0.10)	(1.26)
10/01/30	12/31/30	0.00	1.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.28)	(0.10)	(1.18)
01/01/31	03/31/31	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.16)	(0.09)	(1.07)
04/01/31	06/30/31	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.06)	(0.09)	(0.97)
07/01/31	09/30/31	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.98)	(0.09)	(0.89)
10/01/31	12/31/31	0.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.94)	(0.09)	(0.85)
01/01/32	03/31/32	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.09)	(0.79)
04/01/32	06/30/32	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.81)	(0.09)	(0.73)
07/01/32	09/30/32	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.79)	(0.09)	(0.70)
10/01/32	12/31/32	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.78)	(0.09)	(0.70)
01/01/33	03/31/33	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.77)	(0.08)	(0.70)
04/01/33	06/30/33	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.76)	(0.08)	(0.69)
07/01/33	09/30/33	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.79)	(0.08)	(0.71)
10/01/33	12/31/33	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.83)	(0.08)	(0.75)
01/01/34	03/31/34	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.01)	(0.86)
04/01/34	06/30/34	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.91)	(0.01)	(0.90)
07/01/34	09/30/34	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.92)	(0.01)	(0.91)
10/01/34	12/31/34	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.90)	(0.01)	(0.89)
01/01/35	03/31/35	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/35	06/30/35	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.82)	(0.00)	(0.82)
07/01/35	09/30/35	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.82)	(0.00)	(0.82)
10/01/35	12/31/35	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.83)	(0.00)	(0.83)
01/01/36	03/31/36	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.84)	(0.00)	(0.83)
04/01/36	06/30/36	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.84)	(0.00)	(0.84)
07/01/36	09/30/36	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.82)	(0.00)	(0.82)
10/01/36	12/31/36	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.78)	(0.00)	(0.77)
01/01/37	03/31/37	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.70)	(0.00)	(0.70)
04/01/37	06/30/37	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.64)	(0.00)	(0.64)
07/01/37	09/30/37	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.62)	(0.00)	(0.61)
10/01/37	12/31/37	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.62)	(0.00)	(0.62)
01/01/38	03/31/38	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.62)	(0.00)	(0.62)
04/01/38	06/30/38	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.62)	(0.00)	(0.61)
07/01/38	09/30/38												

TABLE C1: POLICYHOLDER SUPPLIED - UNDERWRITING (UW) CASH FLOWS

TIME INTERVAL		COLLECTED PREMIUM NET (3)	LOSS & LAE PAYOUT (4)	UNDERWRITING EXPENSES							PRE TAX CASH FLOWS FROM UW (12)	FEDERAL INCOME TAX EXPENSE ON UW (13)	POST TAX CASH FLOWS FROM UW (14)
				COMMISS. & BROKER. (5)	GENERAL EXPENSES (6)	OTHER ACQ. EXPENSES (7)	PREMIUM TAXES (8)	MISC. AND OTHER TAXES (9)	REINS. EXPENSES (10)	TOTAL PRETAX UW EXPENSES (11)			
FROM (1)	TO (2)												
10/01/38	12/31/38	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.57)	(0.00)	(0.57)
01/01/39	03/31/39	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.53)	(0.00)	(0.53)
04/01/39	06/30/39	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.49)	(0.00)	(0.49)
07/01/39	09/30/39	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.53)	(0.00)	(0.53)
10/01/39	12/31/39	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.61)	(0.00)	(0.61)
01/01/40	03/31/40	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.72)	(0.00)	(0.72)
04/01/40	06/30/40	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.81)	(0.00)	(0.81)
07/01/40	09/30/40	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/40	12/31/40	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/41	03/31/41	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/41	06/30/41	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/41	09/30/41	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/41	12/31/41	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/42	03/31/42	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/42	06/30/42	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/42	09/30/42	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/42	12/31/42	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/43	03/31/43	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/43	06/30/43	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/43	09/30/43	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/43	12/31/43	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/44	03/31/44	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/44	06/30/44	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/44	09/30/44	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/44	12/31/44	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/45	03/31/45	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/45	06/30/45	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/45	09/30/45	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/45	12/31/45	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/46	03/31/46	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/46	06/30/46	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/46	09/30/46	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/46	12/31/46	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/47	03/31/47	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/47	06/30/47	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/47	09/30/47	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/47	12/31/47	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/48	03/31/48	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/48	06/30/48	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/48	09/30/48	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/48	12/31/48	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/49	03/31/49	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/49	06/30/49	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/49	09/30/49	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/49	12/31/49	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/50	03/31/50	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/50	06/30/50	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/50	09/30/50	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/50	12/31/50	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/51	03/31/51	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/51	06/30/51	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/51	09/30/51	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/51	12/31/51	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/52	03/31/52	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/52	06/30/52	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/52	09/30/52	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
10/01/52	12/31/52	0.00	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.87)	(0.00)	(0.87)
01/01/53	03/31/53	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
04/01/53	06/30/53	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
07/01/53	09/30/53	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.75)	(0.00)	(0.75)
10/01/53	12/31/53	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.57)	(0.00)	(0.57)
01/01/54	03/31/54	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.33)	(0.00)	(0.33)
04/01/54	06/30/54	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.11)	(0.00)	(0.11)
TOTAL		948.36	750.47	82.60	42.99	33.17	21.62	4.78	10.00	195.17	2.71	0.95	1.76

Notes:
 (3) = Table A1, (2) x Table C5_1, (3)
 (4) = Table A1, (3) x Table A1, (1a) x Table C5_1, (4)
 (5) = Table A1, (4) x Table A1, (1a) x Table C5_1, (5)
 (6) = Table A1, (6) x Table A1, (1a) x Table C5_1, (6)
 (7) = Table A1, (7) x Table A1, (1a) x Table C5_1, (7)
 (8) = Table A1, (8) x Table A1, (1a) x Table C5_1, (8)
 (9) = Table A1, (10) x Table A1, (1a) x Table C5_1, (9)
 (10) = Table A1, (9) x Table A1, (1a) x Table C5_1, (10)
 (11) = (5) + (6) + (7) + (8) + (9) + (10)
 (12) = (3) - (4) - (11)
 (13) = Table C2_6, (6), annual tax expense allocated to the model time periods.
 (14) = (12) - (13)

TABLE C2_1: FEDERAL INCOME TAXES - TAXABLE PREMIUM REVENUE

TIME INTERVAL		WRITTEN PREMIUM NET (3)	UNEARNED PREMIUM RESERVES (4)	CHANGE IN UNEARNED PREMIUM RESERVES (5)	TAX DEDUCTIBLE CHANGE IN UNEARNED PREMIUM RESERVES (6)	NON TAX DEDUCTIBLE CHANGE IN UNEARNED PREMIUM RESERVES (7)	TAXABLE PREMIUM REVENUE (8)
FROM (1)	TO (2)						
01/01/17	12/31/17	0.00	0.00	0.00	0.00	0.00	0.00
01/01/18	12/31/18	423.31	309.95	309.95	247.96	61.99	175.36
01/01/19	12/31/19	525.05	118.85	(191.10)	(152.88)	(38.22)	677.92
01/01/20	12/31/20	0.00	0.00	(118.85)	(95.08)	(23.77)	95.08
01/01/21	12/31/21	0.00	0.00	0.00	0.00	0.00	0.00
01/01/22	12/31/22	0.00	0.00	0.00	0.00	0.00	0.00
01/01/23	12/31/23	0.00	0.00	0.00	0.00	0.00	0.00
01/01/24	12/31/24	0.00	0.00	0.00	0.00	0.00	0.00
01/01/25	12/31/25	0.00	0.00	0.00	0.00	0.00	0.00
01/01/26	12/31/26	0.00	0.00	0.00	0.00	0.00	0.00
01/01/27	12/31/27	0.00	0.00	0.00	0.00	0.00	0.00
01/01/28	12/31/28	0.00	0.00	0.00	0.00	0.00	0.00
01/01/29	12/31/29	0.00	0.00	0.00	0.00	0.00	0.00
01/01/30	12/31/30	0.00	0.00	0.00	0.00	0.00	0.00
01/01/31	12/31/31	0.00	0.00	0.00	0.00	0.00	0.00
01/01/32	12/31/32	0.00	0.00	0.00	0.00	0.00	0.00
01/01/33	12/31/33	0.00	0.00	0.00	0.00	0.00	0.00
01/01/34	12/31/34	0.00	0.00	0.00	0.00	0.00	0.00
01/01/35	12/31/35	0.00	0.00	0.00	0.00	0.00	0.00
01/01/36	12/31/36	0.00	0.00	0.00	0.00	0.00	0.00
01/01/37	12/31/37	0.00	0.00	0.00	0.00	0.00	0.00
01/01/38	12/31/38	0.00	0.00	0.00	0.00	0.00	0.00
01/01/39	12/31/39	0.00	0.00	0.00	0.00	0.00	0.00
01/01/40	12/31/40	0.00	0.00	0.00	0.00	0.00	0.00
01/01/41	12/31/41	0.00	0.00	0.00	0.00	0.00	0.00
01/01/42	12/31/42	0.00	0.00	0.00	0.00	0.00	0.00
01/01/43	12/31/43	0.00	0.00	0.00	0.00	0.00	0.00
01/01/44	12/31/44	0.00	0.00	0.00	0.00	0.00	0.00
01/01/45	12/31/45	0.00	0.00	0.00	0.00	0.00	0.00
01/01/46	12/31/46	0.00	0.00	0.00	0.00	0.00	0.00
01/01/47	12/31/47	0.00	0.00	0.00	0.00	0.00	0.00
01/01/48	12/31/48	0.00	0.00	0.00	0.00	0.00	0.00
01/01/49	12/31/49	0.00	0.00	0.00	0.00	0.00	0.00
01/01/50	12/31/50	0.00	0.00	0.00	0.00	0.00	0.00
01/01/51	12/31/51	0.00	0.00	0.00	0.00	0.00	0.00
01/01/52	12/31/52	0.00	0.00	0.00	0.00	0.00	0.00
01/01/53	12/31/53	0.00	0.00	0.00	0.00	0.00	0.00
01/01/54	12/31/54	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		948.36	428.80	0.00	0.00	0.00	948.36

Notes:
 (3) = Table A1, (1b) x Percentage of Premium written in corresponding year
 (4) = Table A1, (1b) x Percentage of Unearned Premium in corresponding year
 (5) = (4), incremental
 (6) = 0.8 x (5)
 (7) = 0.2 x (5)
 (8) = (3) - (6)

TABLE C2_2: DERIVATION OF DISCOUNTED LOSS & LAE RESERVES

ACCIDENT YEAR 2018									
TIME INTERVAL		IRS DISCOUNT FACTOR (3)	UNDISCOUNTED			DISCOUNTED			LOSS & LAE PAID DURING PERIOD (10)
FROM (1)	TO (2)		LOSS & LAE UNPAID BEG OF PERIOD (4)	LOSS & LAE UNPAID END OF PERIOD (5)	CHANGE IN UNDISCOUNTED LOSS & LAE RESERVES (6)	LOSS & LAE UNPAID BEG OF PERIOD (7)	LOSS & LAE UNPAID END OF PERIOD (8)	CHANGE IN DISCOUNTED LOSS & LAE RESERVES (9)	
01/01/17	12/31/17	0.9280	0.00	75.83	75.83	0.00	70.37	70.37	13.80
01/01/18	12/31/18	0.9175	75.83	53.05	(22.77)	70.37	48.68	(21.69)	22.77
01/01/19	12/31/19	0.9102	53.05	34.64	(18.41)	48.68	31.54	(17.14)	18.41
01/01/20	12/31/20	0.9072	34.64	23.48	(11.16)	31.54	21.30	(10.23)	11.16
01/01/21	12/31/21	0.9062	23.48	17.46	(6.03)	21.30	15.82	(5.48)	6.03
01/01/22	12/31/22	0.9036	17.46	14.44	(3.01)	15.82	13.05	(2.77)	3.01
01/01/23	12/31/23	0.9098	14.44	12.87	(1.57)	13.05	11.71	(1.34)	1.57
01/01/24	12/31/24	0.9181	12.87	11.81	(1.06)	11.71	10.85	(0.86)	1.06
01/01/25	12/31/25	0.9230	11.81	11.01	(0.80)	10.85	10.17	(0.68)	0.80
01/01/26	12/31/26	0.9328	11.01	10.44	(0.57)	10.17	9.74	(0.43)	0.57
01/01/27	12/31/27	0.9431	10.44	9.92	(0.53)	9.74	9.35	(0.39)	0.53
01/01/28	12/31/28	0.9540	9.92	9.28	(0.63)	9.35	8.86	(0.49)	0.63
01/01/29	12/31/29	0.9657	9.28	8.74	(0.55)	8.86	8.44	(0.42)	0.55
01/01/30	12/31/30	0.9784	8.74	8.33	(0.41)	8.44	8.15	(0.29)	0.41
01/01/31	12/31/31	0.9923	8.33	7.96	(0.37)	8.15	7.89	(0.25)	0.37
01/01/32	12/31/32	0.9923	7.96	7.54	(0.42)	7.89	7.48	(0.42)	0.42
01/01/33	12/31/33	0.9923	7.54	7.13	(0.41)	7.48	7.07	(0.40)	0.41
01/01/34	12/31/34	0.9923	7.13	6.73	(0.40)	7.07	6.67	(0.40)	0.40
01/01/35	12/31/35	0.9923	6.73	6.40	(0.33)	6.67	6.35	(0.33)	0.33
01/01/36	12/31/36	0.9923	6.40	6.10	(0.30)	6.35	6.05	(0.29)	0.30
01/01/37	12/31/37	0.9923	6.10	5.85	(0.25)	6.05	5.80	(0.25)	0.25
01/01/38	12/31/38	0.9923	5.85	5.50	(0.35)	5.80	5.45	(0.35)	0.35
01/01/39	12/31/39	0.9923	5.50	5.08	(0.41)	5.45	5.05	(0.41)	0.41
01/01/40	12/31/40	0.9923	5.08	4.67	(0.41)	5.05	4.64	(0.41)	0.41
01/01/41	12/31/41	0.9923	4.67	4.26	(0.41)	4.64	4.23	(0.41)	0.41
01/01/42	12/31/42	0.9923	4.26	3.85	(0.41)	4.23	3.82	(0.41)	0.41
01/01/43	12/31/43	0.9923	3.85	3.43	(0.41)	3.82	3.41	(0.41)	0.41
01/01/44	12/31/44	0.9923	3.43	3.02	(0.41)	3.41	3.00	(0.41)	0.41
01/01/45	12/31/45	0.9923	3.02	2.61	(0.41)	3.00	2.59	(0.41)	0.41
01/01/46	12/31/46	0.9923	2.61	2.20	(0.41)	2.59	2.18	(0.41)	0.41
01/01/47	12/31/47	0.9923	2.20	1.79	(0.41)	2.18	1.77	(0.41)	0.41
01/01/48	12/31/48	0.9923	1.79	1.37	(0.41)	1.77	1.36	(0.41)	0.41
01/01/49	12/31/49	0.9923	1.37	0.96	(0.41)	1.36	0.95	(0.41)	0.41
01/01/50	12/31/50	0.9923	0.96	0.55	(0.41)	0.95	0.54	(0.41)	0.41
01/01/51	12/31/51	0.9923	0.55	0.14	(0.41)	0.54	0.13	(0.41)	0.41
01/01/52	12/31/52	0.9923	0.14	0.00	(0.14)	0.13	0.00	(0.13)	0.14
01/01/53	12/31/53	0.9923	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/54	12/31/54	0.9923	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL			388.42	388.42	0.00	364.45	364.45	0.00	89.63

- Notes:
- (3): Discount factors specified in IRS Internal Revenue Bulletin 2016-51.
 - (4) = (5)_{t-1}
 - (5) = (10), Total - (10), cumulative
 - (6) = (5) - (4)
 - (7) = (8)_{t-1}
 - (8) = (3) x (5)
 - (9) = (8) - (7)
 - (10) = Table A1, (3) x Table A1, (1a) x Loss & LAE Flow (from Section VII-I, Exhibit 1) for each accident year

TABLE C2_3: DERIVATION OF DISCOUNTED LOSS & LAE RESERVES

ACCIDENT YEAR									
2019									
TIME INTERVAL		IRS DISCOUNT FACTOR	UNDISCOUNTED			DISCOUNTED			LOSS & LAE PAID DURING PERIOD
			LOSS & LAE UNPAID BEG OF PERIOD	LOSS & LAE UNPAID END OF PERIOD	CHANGE IN UNDISCOUNTED LOSS & LAE RESERVES	LOSS & LAE UNPAID BEG OF PERIOD	LOSS & LAE UNPAID END OF PERIOD	CHANGE IN DISCOUNTED LOSS & LAE RESERVES	
FROM	TO	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
01/01/17	12/31/17		0.00	0.00	0.00	0.00	0.00	0.00	
01/01/18	12/31/18								
01/01/19	12/31/19	0.9280	0.00	437.84	437.84	0.00	406.31	406.31	128.81
01/01/20	12/31/20	0.9175	437.84	287.15	(150.69)	406.31	263.46	(142.85)	150.69
01/01/21	12/31/21	0.9102	287.15	187.20	(99.95)	263.46	170.40	(93.07)	99.95
01/01/22	12/31/22	0.9072	187.20	130.40	(56.80)	170.40	118.30	(52.10)	56.80
01/01/23	12/31/23	0.9062	130.40	101.03	(29.37)	118.30	91.56	(26.74)	29.37
01/01/24	12/31/24	0.9036	101.03	86.81	(14.23)	91.56	78.44	(13.11)	14.23
01/01/25	12/31/25	0.9098	86.81	78.84	(7.96)	78.44	71.73	(6.71)	7.96
01/01/26	12/31/26	0.9181	78.84	72.75	(6.10)	71.73	66.79	(4.94)	6.10
01/01/27	12/31/27	0.9230	72.75	68.17	(4.58)	66.79	62.92	(3.87)	4.58
01/01/28	12/31/28	0.9328	68.17	65.01	(3.16)	62.92	60.64	(2.28)	3.16
01/01/29	12/31/29	0.9431	65.01	61.59	(3.42)	60.64	58.09	(2.56)	3.42
01/01/30	12/31/30	0.9540	61.59	57.33	(4.26)	58.09	54.69	(3.40)	4.26
01/01/31	12/31/31	0.9657	57.33	54.26	(3.07)	54.69	52.40	(2.29)	3.07
01/01/32	12/31/32	0.9784	54.26	51.87	(2.38)	52.40	50.75	(1.65)	2.38
01/01/33	12/31/33	0.9923	51.87	49.56	(2.31)	50.75	49.18	(1.58)	2.31
01/01/34	12/31/34	0.9923	49.56	46.73	(2.83)	49.18	46.37	(2.80)	2.83
01/01/35	12/31/35	0.9923	46.73	44.28	(2.46)	46.37	43.93	(2.44)	2.46
01/01/36	12/31/36	0.9923	44.28	41.70	(2.57)	43.93	41.38	(2.55)	2.57
01/01/37	12/31/37	0.9923	41.70	39.84	(1.86)	41.38	39.53	(1.85)	1.86
01/01/38	12/31/38	0.9923	39.84	37.97	(1.87)	39.53	37.68	(1.86)	1.87
01/01/39	12/31/39	0.9923	37.97	36.52	(1.45)	37.68	36.24	(1.44)	1.45
01/01/40	12/31/40	0.9923	36.52	33.92	(2.60)	36.24	33.66	(2.58)	2.60
01/01/41	12/31/41	0.9923	33.92	31.31	(2.61)	33.66	31.07	(2.59)	2.61
01/01/42	12/31/42	0.9923	31.31	28.71	(2.61)	31.07	28.48	(2.59)	2.61
01/01/43	12/31/43	0.9923	28.71	26.10	(2.61)	28.48	25.90	(2.59)	2.61
01/01/44	12/31/44	0.9923	26.10	23.49	(2.61)	25.90	23.31	(2.59)	2.61
01/01/45	12/31/45	0.9923	23.49	20.88	(2.61)	23.31	20.72	(2.59)	2.61
01/01/46	12/31/46	0.9923	20.88	18.27	(2.61)	20.72	18.13	(2.59)	2.61
01/01/47	12/31/47	0.9923	18.27	15.67	(2.61)	18.13	15.55	(2.59)	2.61
01/01/48	12/31/48	0.9923	15.67	13.06	(2.61)	15.55	12.96	(2.59)	2.61
01/01/49	12/31/49	0.9923	13.06	10.45	(2.61)	12.96	10.37	(2.59)	2.61
01/01/50	12/31/50	0.9923	10.45	7.84	(2.61)	10.37	7.78	(2.59)	2.61
01/01/51	12/31/51	0.9923	7.84	5.24	(2.61)	7.78	5.20	(2.59)	2.61
01/01/52	12/31/52	0.9923	5.24	2.63	(2.61)	5.20	2.61	(2.59)	2.61
01/01/53	12/31/53	0.9923	2.63	0.02	(2.61)	2.61	0.02	(2.59)	2.61
01/01/54	12/31/54	0.9923	0.02	0.00	(0.02)	0.02	0.00	(0.02)	0.02
TOTAL			2,274.44	2,274.44	0.00	2,136.57	2,136.57	(0.00)	566.65

Notes:

(3): Discount factors specified in IRS Internal Revenue Bulletin 2016-51.

(4) = (5)_{t-1}

(5) = (10), Total - (10), cumulative

(6) = (5) - (4)

(7) = (8)_{t-1}

(8) = (3) x (5)

(9) = (8) - (7)

(10) = Table A1, (3) x Table A1, (1a) x Loss & LAE Flow (from Section VII-I, Exhibit 1) for each accident year

TABLE C2_4: DERIVATION OF DISCOUNTED LOSS & LAE RESERVES

ACCIDENT YEAR 2020									
TIME INTERVAL		IRS DISCOUNT FACTOR (3)	UNDISCOUNTED			DISCOUNTED			LOSS & LAE PAID DURING PERIOD (10)
FROM (1)	TO (2)		LOSS & LAE UNPAID BEG OF PERIOD (4)	LOSS & LAE UNPAID END OF PERIOD (5)	CHANGE IN UNDISCOUNTED LOSS & LAE RESERVES (6)	LOSS & LAE UNPAID BEG OF PERIOD (7)	LOSS & LAE UNPAID END OF PERIOD (8)	CHANGE IN DISCOUNTED LOSS & LAE RESERVES (9)	
1/1/2017	12/31/2017		0.00	0.00	0.00	0.00	0.00	0.00	
1/1/2018	12/31/2018		0.00	0.00	0.00	0.00	0.00	0.00	
1/1/2019	12/31/2019		0.00	0.00	0.00	0.00	0.00	0.00	
1/1/2020	12/31/2020	0.9280	0.00	64.26	64.26	0.00	59.63	59.63	29.94
1/1/2021	12/31/2021	0.9175	64.26	42.02	(22.24)	59.63	38.55	(21.08)	22.24
1/1/2022	12/31/2022	0.9102	42.02	27.86	(14.16)	38.55	25.36	(13.20)	14.16
1/1/2023	12/31/2023	0.9072	27.86	19.99	(7.87)	25.36	18.13	(7.23)	7.87
1/1/2024	12/31/2024	0.9062	19.99	15.97	(4.01)	18.13	14.48	(3.66)	4.01
1/1/2025	12/31/2025	0.9036	15.97	13.97	(2.00)	14.48	12.63	(1.85)	2.00
1/1/2026	12/31/2026	0.9098	13.97	12.76	(1.21)	12.63	11.61	(1.02)	1.21
1/1/2027	12/31/2027	0.9181	12.76	11.83	(0.93)	11.61	10.86	(0.75)	0.93
1/1/2028	12/31/2028	0.9230	11.83	11.15	(0.68)	10.86	10.29	(0.57)	0.68
1/1/2029	12/31/2029	0.9328	11.15	10.61	(0.54)	10.29	9.90	(0.39)	0.54
1/1/2030	12/31/2030	0.9431	10.61	10.00	(0.62)	9.90	9.43	(0.47)	0.62
1/1/2031	12/31/2031	0.9540	10.00	9.35	(0.64)	9.43	8.92	(0.50)	0.64
1/1/2032	12/31/2032	0.9657	9.35	8.88	(0.47)	8.92	8.58	(0.35)	0.47
1/1/2033	12/31/2033	0.9784	8.88	8.49	(0.39)	8.58	8.31	(0.27)	0.39
1/1/2034	12/31/2034	0.9923	8.49	8.08	(0.41)	8.31	8.02	(0.29)	0.41
1/1/2035	12/31/2035	0.9923	8.08	7.63	(0.45)	8.02	7.57	(0.45)	0.45
1/1/2036	12/31/2036	0.9923	7.63	7.21	(0.41)	7.57	7.16	(0.41)	0.41
1/1/2037	12/31/2037	0.9923	7.21	6.83	(0.39)	7.16	6.77	(0.39)	0.39
1/1/2038	12/31/2038	0.9923	6.83	6.52	(0.31)	6.77	6.47	(0.31)	0.31
1/1/2039	12/31/2039	0.9923	6.52	6.23	(0.29)	6.47	6.18	(0.29)	0.29
1/1/2040	12/31/2040	0.9923	6.23	5.92	(0.30)	6.18	5.88	(0.30)	0.30
1/1/2041	12/31/2041	0.9923	5.92	5.49	(0.43)	5.88	5.45	(0.43)	0.43
1/1/2042	12/31/2042	0.9923	5.49	5.06	(0.43)	5.45	5.02	(0.43)	0.43
1/1/2043	12/31/2043	0.9923	5.06	4.62	(0.43)	5.02	4.59	(0.43)	0.43
1/1/2044	12/31/2044	0.9923	4.62	4.19	(0.43)	4.59	4.16	(0.43)	0.43
1/1/2045	12/31/2045	0.9923	4.19	3.76	(0.43)	4.16	3.73	(0.43)	0.43
1/1/2046	12/31/2046	0.9923	3.76	3.32	(0.43)	3.73	3.30	(0.43)	0.43
1/1/2047	12/31/2047	0.9923	3.32	2.89	(0.43)	3.30	2.87	(0.43)	0.43
1/1/2048	12/31/2048	0.9923	2.89	2.46	(0.43)	2.87	2.44	(0.43)	0.43
1/1/2049	12/31/2049	0.9923	2.46	2.02	(0.43)	2.44	2.01	(0.43)	0.43
1/1/2050	12/31/2050	0.9923	2.02	1.59	(0.43)	2.01	1.58	(0.43)	0.43
1/1/2051	12/31/2051	0.9923	1.59	1.16	(0.43)	1.58	1.15	(0.43)	0.43
1/1/2052	12/31/2052	0.9923	1.16	0.72	(0.43)	1.15	0.72	(0.43)	0.43
1/1/2053	12/31/2053	0.9923	0.72	0.29	(0.43)	0.72	0.29	(0.43)	0.43
1/1/2054	12/31/2054	0.9923	0.29	0.00	(0.29)	0.29	0.00	(0.29)	0.29
TOTAL			353.14	353.14	0.00	332.01	332.01	0.00	94.19

Notes:

(3): Discount factors specified in IRS Internal Revenue Bulletin 2016-51.

(4) = (5)_{t-1}

(5) = (10), Total - (10), cumulative

(6) = (5) - (4)

(7) = (8)_{t-1}

(8) = (3) x (5)

(9) = (8) - (7)

(10) = Table A1, (3) x Table A1, (1a) x Loss & LAE Flow (from Section VII-I, Exhibit 1) for each accident year

TABLE C2_5: FEDERAL INCOME TAXES - UNDERWRITING (UW) TAX DEDUCTIONS

TIME INTERVAL		LOSS & LAE PAID DURING PERIOD	CHANGE IN DISCOUNTED LOSS & LAE RESERVES	TAX DEDUCTIBLE LOSS & LAE	TAX DEDUCTIBLE UW EXPENSES	TOTAL UW TAX DEDUCTIONS
FROM (1)	TO (2)	(3)	(4)	(5)	(6)	(7)
01/01/17	12/31/17	0.00	0.00	0.00	0.00	0.00
01/01/18	12/31/18	13.80	70.37	84.17	55.33	139.50
01/01/19	12/31/19	151.59	384.62	536.21	125.84	662.05
01/01/20	12/31/20	199.03	(100.36)	98.67	13.01	111.69
01/01/21	12/31/21	133.35	(124.38)	8.97	0.99	9.96
01/01/22	12/31/22	76.99	(70.78)	6.21	0.00	6.21
01/01/23	12/31/23	40.25	(36.73)	3.52	0.00	3.52
01/01/24	12/31/24	19.81	(18.11)	1.70	0.00	1.70
01/01/25	12/31/25	11.02	(9.42)	1.60	0.00	1.60
01/01/26	12/31/26	8.11	(6.64)	1.47	0.00	1.47
01/01/27	12/31/27	6.08	(5.04)	1.04	0.00	1.04
01/01/28	12/31/28	4.37	(3.24)	1.13	0.00	1.13
01/01/29	12/31/29	4.59	(3.44)	1.15	0.00	1.15
01/01/30	12/31/30	5.43	(4.29)	1.14	0.00	1.14
01/01/31	12/31/31	4.12	(3.09)	1.03	0.00	1.03
01/01/32	12/31/32	3.23	(2.24)	0.98	0.00	0.98
01/01/33	12/31/33	3.13	(2.27)	0.86	0.00	0.86
01/01/34	12/31/34	3.65	(3.50)	0.15	0.00	0.15
01/01/35	12/31/35	3.31	(3.28)	0.03	0.00	0.03
01/01/36	12/31/36	3.32	(3.29)	0.03	0.00	0.03
01/01/37	12/31/37	2.55	(2.53)	0.02	0.00	0.02
01/01/38	12/31/38	2.43	(2.41)	0.02	0.00	0.02
01/01/39	12/31/39	2.09	(2.07)	0.02	0.00	0.02
01/01/40	12/31/40	3.32	(3.29)	0.03	0.00	0.03
01/01/41	12/31/41	3.45	(3.43)	0.03	0.00	0.03
01/01/42	12/31/42	3.45	(3.43)	0.03	0.00	0.03
01/01/43	12/31/43	3.45	(3.43)	0.03	0.00	0.03
01/01/44	12/31/44	3.45	(3.43)	0.03	0.00	0.03
01/01/45	12/31/45	3.45	(3.43)	0.03	0.00	0.03
01/01/46	12/31/46	3.45	(3.43)	0.03	0.00	0.03
01/01/47	12/31/47	3.45	(3.43)	0.03	0.00	0.03
01/01/48	12/31/48	3.45	(3.43)	0.03	0.00	0.03
01/01/49	12/31/49	3.45	(3.43)	0.03	0.00	0.03
01/01/50	12/31/50	3.45	(3.43)	0.03	0.00	0.03
01/01/51	12/31/51	3.45	(3.43)	0.03	0.00	0.03
01/01/52	12/31/52	3.45	(3.43)	0.03	0.00	0.03
01/01/53	12/31/53	3.18	(3.15)	0.02	0.00	0.02
01/01/54	12/31/54	0.31	(0.31)	0.00	0.00	0.00
TOTAL		750.47	0.00	750.47	195.17	945.65

Notes:

(3) = Table C2_2, (10) + Table C2_3, (10) + Table C2_4, (10)

(4) = Table C2_2, (9) + Table C2_3, (9) + Table C2_4, (9)

(5) = (3) + (4)

(6) = Table C1, (11) by tax year

(7) = (5) + (6)

TABLE C2_6: FEDERAL INCOME TAX EXPENSE ON UNDERWRITING

TIME INTERVAL		TAXABLE PREMIUM REVENUE	TOTAL UW TAX DEDUCTIONS	TAX BASIS NET UW GAIN	FEDERAL INCOME TAX EXPENSE ON UW
FROM (1)	TO (2)	(3)	(4)	(5)	(6)
01/01/17	12/31/17	0.00	0.00	0.00	0.00
01/01/18	12/31/18	175.36	139.50	35.86	12.55
01/01/19	12/31/19	677.92	662.05	15.87	5.56
01/01/20	12/31/20	95.08	111.69	(16.60)	(5.81)
01/01/21	12/31/21	0.00	9.96	(9.96)	(3.49)
01/01/22	12/31/22	0.00	6.21	(6.21)	(2.17)
01/01/23	12/31/23	0.00	3.52	(3.52)	(1.23)
01/01/24	12/31/24	0.00	1.70	(1.70)	(0.60)
01/01/25	12/31/25	0.00	1.60	(1.60)	(0.56)
01/01/26	12/31/26	0.00	1.47	(1.47)	(0.51)
01/01/27	12/31/27	0.00	1.04	(1.04)	(0.36)
01/01/28	12/31/28	0.00	1.13	(1.13)	(0.39)
01/01/29	12/31/29	0.00	1.15	(1.15)	(0.40)
01/01/30	12/31/30	0.00	1.14	(1.14)	(0.40)
01/01/31	12/31/31	0.00	1.03	(1.03)	(0.36)
01/01/32	12/31/32	0.00	0.98	(0.98)	(0.34)
01/01/33	12/31/33	0.00	0.86	(0.86)	(0.30)
01/01/34	12/31/34	0.00	0.15	(0.15)	(0.05)
01/01/35	12/31/35	0.00	0.03	(0.03)	(0.01)
01/01/36	12/31/36	0.00	0.03	(0.03)	(0.01)
01/01/37	12/31/37	0.00	0.02	(0.02)	(0.01)
01/01/38	12/31/38	0.00	0.02	(0.02)	(0.01)
01/01/39	12/31/39	0.00	0.02	(0.02)	(0.01)
01/01/40	12/31/40	0.00	0.03	(0.03)	(0.01)
01/01/41	12/31/41	0.00	0.03	(0.03)	(0.01)
01/01/42	12/31/42	0.00	0.03	(0.03)	(0.01)
01/01/43	12/31/43	0.00	0.03	(0.03)	(0.01)
01/01/44	12/31/44	0.00	0.03	(0.03)	(0.01)
01/01/45	12/31/45	0.00	0.03	(0.03)	(0.01)
01/01/46	12/31/46	0.00	0.03	(0.03)	(0.01)
01/01/47	12/31/47	0.00	0.03	(0.03)	(0.01)
01/01/48	12/31/48	0.00	0.03	(0.03)	(0.01)
01/01/49	12/31/49	0.00	0.03	(0.03)	(0.01)
01/01/50	12/31/50	0.00	0.03	(0.03)	(0.01)
01/01/51	12/31/51	0.00	0.03	(0.03)	(0.01)
01/01/52	12/31/52	0.00	0.03	(0.03)	(0.01)
01/01/53	12/31/53	0.00	0.02	(0.02)	(0.01)
01/01/54	12/31/54	0.00	0.00	(0.00)	(0.00)
TOTAL		948.36	945.65	2.71	0.95

Notes:

(3) = Table C2_1, (8)

(4) = Table C2_5, (7)

(5) = (3) - (4)

(6) = 0.35 x (5), where 0.35 is the Federal income tax rate.

TABLE C2_7: ADMITTED PREPAID TAX (DEFERRED TAX ASSET - DTA)

TIME INTERVAL		AY 2018		AY 2019		AY 2020		DISCOUNT UNWOUND DURING PERIOD (9)	DTA ASSOCIATED WITH LOSS & LAE RESERVE (10)	UNEARNED PREMIUM RESERVE (11)	DTA ASSOCIATED WITH UNEARNED PREMIUM RESERVE (12)	ADMITTED PREPAID TAX (DTA) (13)
		CHANGE IN DISCOUNTED LOSS & LAE (3)	LOSS & LAE PAID DURING PERIOD (4)	CHANGE IN DISCOUNTED LOSS & LAE (5)	LOSS & LAE PAID DURING PERIOD (6)	CHANGE IN DISCOUNTED LOSS & LAE (7)	LOSS & LAE PAID DURING PERIOD (8)					
FROM (1)	TO (2)											
01/01/17	12/31/17							0.00	0.00			0.00
01/01/18	12/31/18							0.00	0.38	309.95	21.70	22.08
01/01/19	12/31/19	(21.69)	22.77					1.08	3.19	118.85	8.32	11.51
01/01/20	12/31/20	(17.14)	18.41	(142.85)	150.69			9.11	3.14	0.00	0.00	3.14
01/01/21	12/31/21	(10.23)	11.16	(93.07)	99.95	(21.08)	22.24	8.97	2.17	0.00	0.00	2.17
01/01/22	12/31/22	(5.48)	6.03	(52.10)	56.80	(13.20)	14.16	6.21	1.23	0.00	0.00	1.23
01/01/23	12/31/23	(2.77)	3.01	(26.74)	29.37	(7.23)	7.87	3.52	0.60	0.00	0.00	0.60
01/01/24	12/31/24	(1.34)	1.57	(13.11)	14.23	(3.66)	4.01	1.70	0.56	0.00	0.00	0.56
01/01/25	12/31/25	(0.86)	1.06	(6.71)	7.96	(1.85)	2.00	1.60	0.51	0.00	0.00	0.51
01/01/26	12/31/26	(0.68)	0.80	(4.94)	6.10	(1.02)	1.21	1.47	0.36	0.00	0.00	0.36
01/01/27	12/31/27	(0.43)	0.57	(3.87)	4.58	(0.75)	0.93	1.04	0.39	0.00	0.00	0.39
01/01/28	12/31/28	(0.39)	0.53	(2.28)	3.16	(0.57)	0.68	1.13	0.40	0.00	0.00	0.40
01/01/29	12/31/29	(0.49)	0.63	(2.56)	3.42	(0.39)	0.54	1.15	0.40	0.00	0.00	0.40
01/01/30	12/31/30	(0.42)	0.55	(3.40)	4.26	(0.47)	0.62	1.14	0.36	0.00	0.00	0.36
01/01/31	12/31/31	(0.29)	0.41	(2.29)	3.07	(0.50)	0.64	1.03	0.34	0.00	0.00	0.34
01/01/32	12/31/32	(0.25)	0.37	(1.65)	2.38	(0.35)	0.47	0.98	0.30	0.00	0.00	0.30
01/01/33	12/31/33	(0.42)	0.42	(1.58)	2.31	(0.27)	0.39	0.86	0.05	0.00	0.00	0.05
01/01/34	12/31/34	(0.40)	0.41	(2.80)	2.83	(0.29)	0.41	0.15	0.01	0.00	0.00	0.01
01/01/35	12/31/35	(0.40)	0.40	(2.44)	2.46	(0.45)	0.45	0.03	0.01	0.00	0.00	0.01
01/01/36	12/31/36	(0.33)	0.33	(2.55)	2.57	(0.41)	0.41	0.03	0.01	0.00	0.00	0.01
01/01/37	12/31/37	(0.29)	0.30	(1.85)	1.86	(0.39)	0.39	0.02	0.01	0.00	0.00	0.01
01/01/38	12/31/38	(0.25)	0.25	(1.86)	1.87	(0.31)	0.31	0.02	0.01	0.00	0.00	0.01
01/01/39	12/31/39	(0.35)	0.35	(1.44)	1.45	(0.29)	0.29	0.02	0.01	0.00	0.00	0.01
01/01/40	12/31/40	(0.41)	0.41	(2.58)	2.60	(0.30)	0.30	0.03	0.01	0.00	0.00	0.01
01/01/41	12/31/41	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/42	12/31/42	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/43	12/31/43	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/44	12/31/44	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/45	12/31/45	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/46	12/31/46	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/47	12/31/47	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/48	12/31/48	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/49	12/31/49	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/50	12/31/50	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/51	12/31/51	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/52	12/31/52	(0.41)	0.41	(2.59)	2.61	(0.43)	0.43	0.03	0.01	0.00	0.00	0.01
01/01/53	12/31/53	(0.13)	0.14	(2.59)	2.61	(0.43)	0.43	0.02	0.00	0.00	0.00	0.00
01/01/54	12/31/54	0.00	0.00	(0.02)	0.02	(0.29)	0.29	0.00	0.00	0.00	0.00	0.00

Notes:
 (3) = Table C2_2, (9), the initial value is not relevant in calculating the discount unwound during period.
 (4) = Table C2_2, (10)
 (5) = Table C2_3, (9), the initial value is not relevant in calculating the discount unwound during period.
 (6) = Table C2_3, (10)
 (7) = Table C2_4, (9), the initial value is not relevant in calculating the discount unwound during period.
 (8) = Table C2_4, (10)
 (9) = (3) + (4) + (5) + (6) + (7) + (8)
 (10) = 0.35 x (9)_{t+1}, where 0.35 is the Federal income tax rate.
 (11) = Table C2_1, (4)
 (12) = 0.2 x 0.35 x (11), 0.35 is the Federal income tax rate and 20% of unearned premiums is taxable.
 (13) = (10) + (12)

TABLE C3: POLICYHOLDER SUPPLIED INVESTABLE FUNDS

TIME INTERVAL		UNEARNED PREMIUM RESERVES (3)	LOSS & LAE RESERVES (4)	ADMITTED PREMIUM RECEIVABLES (5)	ADMITTED PREPAID TAX (DTA) (6)	INVESTABLE RESERVES (7)	CUMULATIVE POST TAX CASH FLOW FROM UW (8)	POST TAX CASH FROM UW AVAILABLE TO INVESTORS (9)	POLICYHOLDER SUPPLIED INVESTABLE FUNDS (10)	RESERVES FUNDED BY INVESTORS (11)
FROM (1)	TO (2)									
07/01/17	09/30/17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/01/17	12/31/17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/18	03/31/18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/01/18	06/30/18	0.00	0.00	(5.30)	0.00	5.30	(0.66)	(0.66)	0.00	5.30
07/01/18	09/30/18	194.83	18.55	167.08	16.56	29.74	20.87	0.66	20.87	8.87
10/01/18	12/31/18	311.68	68.09	250.54	22.08	107.15	84.65	0.00	84.65	22.51
01/01/19	03/31/19	441.08	157.92	348.53	19.43	231.03	191.70	0.00	191.70	39.32
04/01/19	06/30/19	484.27	283.07	397.09	16.79	353.45	307.81	0.00	307.81	45.64
07/01/19	09/30/19	277.58	402.73	229.87	14.15	436.29	404.83	0.00	404.83	31.46
10/01/19	12/31/19	120.45	481.45	129.43	11.51	460.96	445.95	0.00	445.95	15.01
01/01/20	03/31/20	30.63	505.21	75.71	9.41	450.71	447.09	0.00	447.09	3.63
04/01/20	06/30/20	0.00	480.66	32.06	7.32	441.28	425.18	0.00	425.18	16.10
07/01/20	09/30/20	0.00	432.89	2.26	5.23	425.40	398.17	0.00	398.17	27.23
10/01/20	12/31/20	0.00	388.50	0.99	3.14	384.37	368.52	0.00	368.52	15.84
01/01/21	03/31/21	0.00	349.11	0.36	2.90	345.85	336.61	0.00	336.61	9.23
04/01/21	06/30/21	0.00	314.14	0.08	2.66	311.40	305.43	0.00	305.43	5.96
07/01/21	09/30/21	0.00	283.01	0.00	2.41	280.60	276.05	0.00	276.05	4.55
10/01/21	12/31/21	0.00	254.77	0.00	2.17	252.60	248.68	0.00	248.68	3.92
01/01/22	03/31/22	0.00	230.68	0.00	1.94	228.74	225.13	0.00	225.13	3.61
04/01/22	06/30/22	0.00	210.25	0.00	1.70	208.55	205.24	0.00	205.24	3.30
07/01/22	09/30/22	0.00	192.72	0.00	1.47	191.26	188.26	0.00	188.26	3.00
10/01/22	12/31/22	0.00	177.03	0.00	1.23	175.80	173.11	0.00	173.11	2.69
01/01/23	03/31/23	0.00	163.96	0.00	1.07	162.89	160.35	0.00	160.35	2.54
04/01/23	06/30/23	0.00	153.19	0.00	0.91	152.28	149.89	0.00	149.89	2.39
07/01/23	09/30/23	0.00	144.18	0.00	0.75	143.43	141.19	0.00	141.19	2.24
10/01/23	12/31/23	0.00	136.19	0.00	0.60	135.60	133.50	0.00	133.50	2.09
01/01/24	03/31/24	0.00	129.64	0.00	0.59	129.05	127.09	0.00	127.09	1.95
04/01/24	06/30/24	0.00	124.35	0.00	0.58	123.77	121.96	0.00	121.96	1.81
07/01/24	09/30/24	0.00	119.94	0.00	0.57	119.37	117.70	0.00	117.70	1.67
10/01/24	12/31/24	0.00	115.95	0.00	0.56	115.39	113.86	0.00	113.86	1.53
01/01/25	03/31/25	0.00	112.55	0.00	0.55	112.00	110.60	0.00	110.60	1.41
04/01/25	06/30/25	0.00	109.68	0.00	0.54	109.15	107.87	0.00	107.87	1.28
07/01/25	09/30/25	0.00	107.14	0.00	0.53	106.62	105.47	0.00	105.47	1.15
10/01/25	12/31/25	0.00	104.72	0.00	0.51	104.20	103.18	0.00	103.18	1.02
01/01/26	03/31/26	0.00	102.47	0.00	0.48	102.00	101.07	0.00	101.07	0.93
04/01/26	06/30/26	0.00	100.39	0.00	0.44	99.95	99.12	0.00	99.12	0.84
07/01/26	09/30/26	0.00	98.44	0.00	0.40	98.04	97.29	0.00	97.29	0.75
10/01/26	12/31/26	0.00	96.59	0.00	0.36	96.23	95.57	0.00	95.57	0.66
01/01/27	03/31/27	0.00	94.89	0.00	0.37	94.52	93.96	0.00	93.96	0.56
04/01/27	06/30/27	0.00	93.32	0.00	0.38	92.94	92.48	0.00	92.48	0.46
07/01/27	09/30/27	0.00	91.87	0.00	0.39	91.48	91.12	0.00	91.12	0.36
10/01/27	12/31/27	0.00	90.51	0.00	0.39	90.12	89.85	0.00	89.85	0.26
01/01/28	03/31/28	0.00	89.29	0.00	0.40	88.89	88.73	0.00	88.73	0.16
04/01/28	06/30/28	0.00	88.19	0.00	0.40	87.80	87.73	0.00	87.73	0.06
07/01/28	09/30/28	0.00	87.14	0.00	0.40	86.74	86.78	0.04	86.74	0.00
10/01/28	12/31/28	0.00	86.06	0.00	0.40	85.66	85.80	0.10	85.66	0.00
01/01/29	03/31/29	0.00	84.96	0.00	0.40	84.56	84.80	0.10	84.56	0.00
04/01/29	06/30/29	0.00	83.85	0.00	0.40	83.45	83.79	0.10	83.45	0.00
07/01/29	09/30/29	0.00	82.68	0.00	0.40	82.28	82.72	0.10	82.28	0.00
10/01/29	12/31/29	0.00	81.44	0.00	0.40	81.04	81.58	0.10	81.04	0.00
01/01/30	03/31/30	0.00	80.13	0.00	0.39	79.74	80.37	0.09	79.74	0.00
04/01/30	06/30/30	0.00	78.76	0.00	0.38	78.38	79.10	0.09	78.38	0.00
07/01/30	09/30/30	0.00	77.40	0.00	0.37	77.03	77.84	0.09	77.03	0.00
10/01/30	12/31/30	0.00	76.12	0.00	0.36	75.76	76.66	0.09	75.76	0.00
01/01/31	03/31/31	0.00	74.95	0.00	0.36	74.60	75.58	0.09	74.60	0.00
04/01/31	06/30/31	0.00	73.89	0.00	0.35	73.54	74.61	0.09	73.54	0.00
07/01/31	09/30/31	0.00	72.91	0.00	0.35	72.56	73.72	0.09	72.56	0.00
10/01/31	12/31/31	0.00	71.97	0.00	0.34	71.63	72.87	0.09	71.63	0.00
01/01/32	03/31/32	0.00	71.10	0.00	0.33	70.76	72.08	0.08	70.76	0.00
04/01/32	06/30/32	0.00	70.29	0.00	0.32	69.96	71.36	0.08	69.96	0.00
07/01/32	09/30/32	0.00	69.50	0.00	0.31	69.19	70.66	0.08	69.19	0.00
10/01/32	12/31/32	0.00	68.72	0.00	0.30	68.41	69.96	0.08	68.41	0.00
01/01/33	03/31/33	0.00	67.94	0.00	0.24	67.70	69.26	0.01	67.70	0.00
04/01/33	06/30/33	0.00	67.18	0.00	0.18	67.00	68.57	0.01	67.00	0.00
07/01/33	09/30/33	0.00	66.39	0.00	0.11	66.27	67.86	0.01	66.27	0.00
10/01/33	12/31/33	0.00	65.56	0.00	0.05	65.51	67.10	0.01	65.51	0.00
01/01/34	03/31/34	0.00	64.69	0.00	0.04	64.65	66.25	0.00	64.65	0.00
04/01/34	06/30/34	0.00	63.78	0.00	0.03	63.75	65.35	0.00	63.75	0.00
07/01/34	09/30/34	0.00	62.86	0.00	0.02	62.84	64.44	0.00	62.84	0.00
10/01/34	12/31/34	0.00	61.96	0.00	0.01	61.95	63.55	0.00	61.95	0.00
01/01/35	03/31/35	0.00	61.10	0.00	0.01	61.09	62.70	0.00	61.09	0.00
04/01/35	06/30/35	0.00	60.27	0.00	0.01	60.26	61.87	0.00	60.26	0.00
07/01/35	09/30/35	0.00	59.45	0.00	0.01	59.44	61.06	0.00	59.44	0.00
10/01/35	12/31/35	0.00	58.62	0.00	0.01	58.61	60.23	0.00	58.61	0.00
01/01/36	03/31/36	0.00	57.79	0.00	0.01	57.78	59.39	0.00	57.78	0.00
04/01/36	06/30/36	0.00	56.94	0.00	0.01	56.94	58.55	0.00	56.94	0.00
07/01/36	09/30/36	0.00	56.12	0.00	0.01	56.11	57.73	0.00	56.11	0.00
10/01/36	12/31/36	0.00	55.35	0.00	0.01	55.34	56.96	0.00	55.34	0.00
01/01/37	03/31/37	0.00	54.64	0.00	0.01	54.64	56.26	0.00	54.64	0.00
04/01/37	06/30/37	0.00	54.00	0.00	0.01	53.99	55.62	0.00	53.99	0.00
07/01/37	09/30/37	0.00	53.38	0.00	0.01	53.38	55.01	0.00	53.38	0.00

TABLE C3: POLICYHOLDER SUPPLIED INVESTABLE FUNDS

TIME INTERVAL		UNEARNED PREMIUM RESERVES (3)	LOSS & LAE RESERVES (4)	ADMITTED PREMIUM RECEIVABLES (5)	ADMITTED PREPAID TAX (DTA) (6)	INVESTABLE RESERVES (7)	CUMULATIVE POST TAX CASH FLOW FROM UW (8)	POST TAX CASH FROM UW AVAILABLE TO INVESTORS (9)	POLICYHOLDER SUPPLIED INVESTABLE FUNDS (10)	RESERVES FUNDED BY INVESTORS (11)
FROM (1)	TO (2)									
10/01/37	12/31/37	0.00	52.77	0.00	0.01	52.76	54.39	0.00	52.76	0.00
01/01/38	03/31/38	0.00	52.15	0.00	0.01	52.14	53.77	0.00	52.14	0.00
04/01/38	06/30/38	0.00	51.53	0.00	0.01	51.53	53.16	0.00	51.53	0.00
07/01/38	09/30/38	0.00	50.93	0.00	0.01	50.92	52.56	0.00	50.92	0.00
10/01/38	12/31/38	0.00	50.36	0.00	0.01	50.35	51.98	0.00	50.35	0.00
01/01/39	03/31/39	0.00	49.82	0.00	0.01	49.82	51.45	0.00	49.82	0.00
04/01/39	06/30/39	0.00	49.33	0.00	0.01	49.32	50.96	0.00	49.32	0.00
07/01/39	09/30/39	0.00	48.80	0.00	0.01	48.79	50.43	0.00	48.79	0.00
10/01/39	12/31/39	0.00	48.19	0.00	0.01	48.18	49.82	0.00	48.18	0.00
01/01/40	03/31/40	0.00	47.47	0.00	0.01	47.46	49.10	0.00	47.46	0.00
04/01/40	06/30/40	0.00	46.66	0.00	0.01	46.65	48.30	0.00	46.65	0.00
07/01/40	09/30/40	0.00	45.80	0.00	0.01	45.79	47.44	0.00	45.79	0.00
10/01/40	12/31/40	0.00	44.93	0.00	0.01	44.92	46.57	0.00	44.92	0.00
01/01/41	03/31/41	0.00	44.06	0.00	0.01	44.05	45.71	0.00	44.05	0.00
04/01/41	06/30/41	0.00	43.21	0.00	0.01	43.20	44.85	0.00	43.20	0.00
07/01/41	09/30/41	0.00	42.34	0.00	0.01	42.33	43.99	0.00	42.33	0.00
10/01/41	12/31/41	0.00	41.47	0.00	0.01	41.46	43.13	0.00	41.46	0.00
01/01/42	03/31/42	0.00	40.61	0.00	0.01	40.60	42.27	0.00	40.60	0.00
04/01/42	06/30/42	0.00	39.75	0.00	0.01	39.74	41.41	0.00	39.74	0.00
07/01/42	09/30/42	0.00	38.89	0.00	0.01	38.88	40.55	0.00	38.88	0.00
10/01/42	12/31/42	0.00	38.02	0.00	0.01	38.01	39.68	0.00	38.01	0.00
01/01/43	03/31/43	0.00	37.16	0.00	0.01	37.15	38.82	0.00	37.15	0.00
04/01/43	06/30/43	0.00	36.30	0.00	0.01	36.29	37.96	0.00	36.29	0.00
07/01/43	09/30/43	0.00	35.44	0.00	0.01	35.43	37.10	0.00	35.43	0.00
10/01/43	12/31/43	0.00	34.57	0.00	0.01	34.56	36.24	0.00	34.56	0.00
01/01/44	03/31/44	0.00	33.70	0.00	0.01	33.69	35.38	0.00	33.69	0.00
04/01/44	06/30/44	0.00	32.84	0.00	0.01	32.84	34.52	0.00	32.84	0.00
07/01/44	09/30/44	0.00	31.98	0.00	0.01	31.97	33.66	0.00	31.97	0.00
10/01/44	12/31/44	0.00	31.11	0.00	0.01	31.10	32.79	0.00	31.10	0.00
01/01/45	03/31/45	0.00	30.25	0.00	0.01	30.24	31.93	0.00	30.24	0.00
04/01/45	06/30/45	0.00	29.39	0.00	0.01	29.38	31.08	0.00	29.38	0.00
07/01/45	09/30/45	0.00	28.53	0.00	0.01	28.52	30.22	0.00	28.52	0.00
10/01/45	12/31/45	0.00	27.66	0.00	0.01	27.65	29.35	0.00	27.65	0.00
01/01/46	03/31/46	0.00	26.80	0.00	0.01	26.79	28.49	0.00	26.79	0.00
04/01/46	06/30/46	0.00	25.94	0.00	0.01	25.93	27.63	0.00	25.93	0.00
07/01/46	09/30/46	0.00	25.07	0.00	0.01	25.07	26.77	0.00	25.07	0.00
10/01/46	12/31/46	0.00	24.21	0.00	0.01	24.20	25.91	0.00	24.20	0.00
01/01/47	03/31/47	0.00	23.34	0.00	0.01	23.33	25.04	0.00	23.33	0.00
04/01/47	06/30/47	0.00	22.48	0.00	0.01	22.48	24.19	0.00	22.48	0.00
07/01/47	09/30/47	0.00	21.62	0.00	0.01	21.61	23.33	0.00	21.61	0.00
10/01/47	12/31/47	0.00	20.75	0.00	0.01	20.74	22.46	0.00	20.74	0.00
01/01/48	03/31/48	0.00	19.89	0.00	0.01	19.88	21.60	0.00	19.88	0.00
04/01/48	06/30/48	0.00	19.03	0.00	0.01	19.02	20.74	0.00	19.02	0.00
07/01/48	09/30/48	0.00	18.17	0.00	0.01	18.16	19.88	0.00	18.16	0.00
10/01/48	12/31/48	0.00	17.30	0.00	0.01	17.29	19.02	0.00	17.29	0.00
01/01/49	03/31/49	0.00	16.44	0.00	0.01	16.43	18.16	0.00	16.43	0.00
04/01/49	06/30/49	0.00	15.58	0.00	0.01	15.57	17.30	0.00	15.57	0.00
07/01/49	09/30/49	0.00	14.71	0.00	0.01	14.70	16.44	0.00	14.70	0.00
10/01/49	12/31/49	0.00	13.85	0.00	0.01	13.84	15.57	0.00	13.84	0.00
01/01/50	03/31/50	0.00	12.98	0.00	0.01	12.97	14.71	0.00	12.97	0.00
04/01/50	06/30/50	0.00	12.12	0.00	0.01	12.11	13.86	0.00	12.11	0.00
07/01/50	09/30/50	0.00	11.26	0.00	0.01	11.25	12.99	0.00	11.25	0.00
10/01/50	12/31/50	0.00	10.39	0.00	0.01	10.38	12.13	0.00	10.38	0.00
01/01/51	03/31/51	0.00	9.53	0.00	0.01	9.52	11.27	0.00	9.52	0.00
04/01/51	06/30/51	0.00	8.67	0.00	0.01	8.66	10.41	0.00	8.66	0.00
07/01/51	09/30/51	0.00	7.81	0.00	0.01	7.80	9.55	0.00	7.80	0.00
10/01/51	12/31/51	0.00	6.94	0.00	0.01	6.93	8.68	0.00	6.93	0.00
01/01/52	03/31/52	0.00	6.08	0.00	0.01	6.07	7.82	0.00	6.07	0.00
04/01/52	06/30/52	0.00	5.22	0.00	0.01	5.21	6.97	0.00	5.21	0.00
07/01/52	09/30/52	0.00	4.35	0.00	0.01	4.34	6.11	0.00	4.34	0.00
10/01/52	12/31/52	0.00	3.49	0.00	0.01	3.48	5.24	0.00	3.48	0.00
01/01/53	03/31/53	0.00	2.62	0.00	0.01	2.62	4.38	0.00	2.62	0.00
04/01/53	06/30/53	0.00	1.76	0.00	0.00	1.76	3.52	0.00	1.76	0.00
07/01/53	09/30/53	0.00	1.01	0.00	0.00	1.01	2.77	0.00	1.01	0.00
10/01/53	12/31/53	0.00	0.44	0.00	0.00	0.44	2.20	0.00	0.44	0.00
01/01/54	03/31/54	0.00	0.11	0.00	0.00	0.11	1.88	(0.00)	0.11	0.00
04/01/54	06/30/54	0.00	0.00	0.00	0.00	(0.00)	1.76	0.00	(0.00)	0.00
TOTAL		1,860.50	12,024.10	1,628.71	161.76	12,094.14	11,959.61	1.76	11,800.82	293.32

Notes:

- (3) = Table A1, (1b) x [Table C5_2, (6) - Table C5_2, (7)]
- (4) = Table A1, (1a) x Table A1, (3) x [Table C5_2, (8) - Table C5_1, (13)]
- (5) = Table C4, (7)
- (6) = Table C2_7, (13), DTA allocated to the model time periods.
- (7) = (3) + (4) - (5) - (6)
- (8) = Table C1, (14), cumulative
- (9) = [(8) - (10)] - (9)_{t-1}, cumulative
- (10) = min [max (0, (8)), (7)]
- (11) = (7) - (10)

TABLE C4: ADMITTED PREMIUM RECEIVABLES

TIME INTERVAL		CUMULATIVE		COLLECTED PREMIUM MINUS PRIOR PERIOD EARNED PREMIUM (5)	NONADMITTED PREMIUM RECEIVABLES (6)	ADMITTED PREMIUM RECEIVABLES (7)
		EARNED PREMIUM NET (3)	COLLECTED PREMIUM NET (4)			
FROM (1)	TO (2)					
07/01/17	09/30/17	0.00	0.00	0.00	0.00	0.00
10/01/17	12/31/17	0.00	0.00	0.00	0.00	0.00
01/01/18	03/31/18	0.00	0.00	0.00	0.00	0.00
04/01/18	06/30/18	0.00	5.30	5.30	0.00	(5.30)
07/01/18	09/30/18	30.41	58.15	58.15	0.00	167.08
10/01/18	12/31/18	111.64	172.77	142.37	0.00	250.54
01/01/19	03/31/19	258.91	351.45	239.81	0.00	348.53
04/01/19	06/30/19	464.09	551.27	292.37	0.00	397.09
07/01/19	09/30/19	670.78	718.49	254.40	0.00	229.87
10/01/19	12/31/19	827.91	818.93	148.15	0.00	129.43
01/01/20	03/31/20	917.73	872.65	44.74	0.00	75.71
04/01/20	06/30/20	948.36	901.26	(16.47)	15.04	32.06
07/01/20	09/30/20	948.36	922.41	(25.95)	23.69	2.26
10/01/20	12/31/20	948.36	936.98	(11.38)	10.39	0.99
01/01/21	03/31/21	948.36	944.21	(4.15)	3.79	0.36
04/01/21	06/30/21	948.36	947.41	(0.95)	0.87	0.08
07/01/21	09/30/21	948.36	948.36	0.00	0.00	0.00
10/01/21	12/31/21	948.36	948.36	0.00	0.00	0.00
01/01/22	03/31/22	948.36	948.36	0.00	0.00	0.00
04/01/22	06/30/22	948.36	948.36	0.00	0.00	0.00
07/01/22	09/30/22	948.36	948.36	0.00	0.00	0.00
10/01/22	12/31/22	948.36	948.36	0.00	0.00	0.00
01/01/23	03/31/23	948.36	948.36	0.00	0.00	0.00
04/01/23	06/30/23	948.36	948.36	0.00	0.00	0.00
07/01/23	09/30/23	948.36	948.36	0.00	0.00	0.00
10/01/23	12/31/23	948.36	948.36	0.00	0.00	0.00
01/01/24	03/31/24	948.36	948.36	0.00	0.00	0.00
04/01/24	06/30/24	948.36	948.36	0.00	0.00	0.00
07/01/24	09/30/24	948.36	948.36	0.00	0.00	0.00
10/01/24	12/31/24	948.36	948.36	0.00	0.00	0.00
01/01/25	03/31/25	948.36	948.36	0.00	0.00	0.00
04/01/25	06/30/25	948.36	948.36	0.00	0.00	0.00
07/01/25	09/30/25	948.36	948.36	0.00	0.00	0.00
10/01/25	12/31/25	948.36	948.36	0.00	0.00	0.00
01/01/26	03/31/26	948.36	948.36	0.00	0.00	0.00
04/01/26	06/30/26	948.36	948.36	0.00	0.00	0.00
07/01/26	09/30/26	948.36	948.36	0.00	0.00	0.00
10/01/26	12/31/26	948.36	948.36	0.00	0.00	0.00
01/01/27	03/31/27	948.36	948.36	0.00	0.00	0.00
04/01/27	06/30/27	948.36	948.36	0.00	0.00	0.00
07/01/27	09/30/27	948.36	948.36	0.00	0.00	0.00
10/01/27	12/31/27	948.36	948.36	0.00	0.00	0.00
01/01/28	03/31/28	948.36	948.36	0.00	0.00	0.00
04/01/28	06/30/28	948.36	948.36	0.00	0.00	0.00
07/01/28	09/30/28	948.36	948.36	0.00	0.00	0.00
10/01/28	12/31/28	948.36	948.36	0.00	0.00	0.00
01/01/29	03/31/29	948.36	948.36	0.00	0.00	0.00
04/01/29	06/30/29	948.36	948.36	0.00	0.00	0.00
07/01/29	09/30/29	948.36	948.36	0.00	0.00	0.00
10/01/29	12/31/29	948.36	948.36	0.00	0.00	0.00
01/01/30	03/31/30	948.36	948.36	0.00	0.00	0.00
04/01/30	06/30/30	948.36	948.36	0.00	0.00	0.00
07/01/30	09/30/30	948.36	948.36	0.00	0.00	0.00
10/01/30	12/31/30	948.36	948.36	0.00	0.00	0.00
01/01/31	03/31/31	948.36	948.36	0.00	0.00	0.00
04/01/31	06/30/31	948.36	948.36	0.00	0.00	0.00
07/01/31	09/30/31	948.36	948.36	0.00	0.00	0.00
10/01/31	12/31/31	948.36	948.36	0.00	0.00	0.00
01/01/32	03/31/32	948.36	948.36	0.00	0.00	0.00
04/01/32	06/30/32	948.36	948.36	0.00	0.00	0.00
07/01/32	09/30/32	948.36	948.36	0.00	0.00	0.00
10/01/32	12/31/32	948.36	948.36	0.00	0.00	0.00
01/01/33	03/31/33	948.36	948.36	0.00	0.00	0.00
04/01/33	06/30/33	948.36	948.36	0.00	0.00	0.00
07/01/33	09/30/33	948.36	948.36	0.00	0.00	0.00
10/01/33	12/31/33	948.36	948.36	0.00	0.00	0.00
01/01/34	03/31/34	948.36	948.36	0.00	0.00	0.00
04/01/34	06/30/34	948.36	948.36	0.00	0.00	0.00
07/01/34	09/30/34	948.36	948.36	0.00	0.00	0.00
10/01/34	12/31/34	948.36	948.36	0.00	0.00	0.00
01/01/35	03/31/35	948.36	948.36	0.00	0.00	0.00
04/01/35	06/30/35	948.36	948.36	0.00	0.00	0.00
07/01/35	09/30/35	948.36	948.36	0.00	0.00	0.00
10/01/35	12/31/35	948.36	948.36	0.00	0.00	0.00
01/01/36	03/31/36	948.36	948.36	0.00	0.00	0.00
04/01/36	06/30/36	948.36	948.36	0.00	0.00	0.00
07/01/36	09/30/36	948.36	948.36	0.00	0.00	0.00
10/01/36	12/31/36	948.36	948.36	0.00	0.00	0.00
01/01/37	03/31/37	948.36	948.36	0.00	0.00	0.00
04/01/37	06/30/37	948.36	948.36	0.00	0.00	0.00
07/01/37	09/30/37	948.36	948.36	0.00	0.00	0.00

TABLE C4: ADMITTED PREMIUM RECEIVABLES

TIME INTERVAL		CUMULATIVE		COLLECTED PREMIUM MINUS PRIOR PERIOD EARNED PREMIUM (5)	NONADMITTED PREMIUM RECEIVABLES (6)	ADMITTED PREMIUM RECEIVABLES (7)
		EARNED PREMIUM NET (3)	COLLECTED PREMIUM NET (4)			
FROM (1)	TO (2)					
10/01/37	12/31/37	948.36	948.36	0.00	0.00	0.00
01/01/38	03/31/38	948.36	948.36	0.00	0.00	0.00
04/01/38	06/30/38	948.36	948.36	0.00	0.00	0.00
07/01/38	09/30/38	948.36	948.36	0.00	0.00	0.00
10/01/38	12/31/38	948.36	948.36	0.00	0.00	0.00
01/01/39	03/31/39	948.36	948.36	0.00	0.00	0.00
04/01/39	06/30/39	948.36	948.36	0.00	0.00	0.00
07/01/39	09/30/39	948.36	948.36	0.00	0.00	0.00
10/01/39	12/31/39	948.36	948.36	0.00	0.00	0.00
01/01/40	03/31/40	948.36	948.36	0.00	0.00	0.00
04/01/40	06/30/40	948.36	948.36	0.00	0.00	0.00
07/01/40	09/30/40	948.36	948.36	0.00	0.00	0.00
10/01/40	12/31/40	948.36	948.36	0.00	0.00	0.00
01/01/41	03/31/41	948.36	948.36	0.00	0.00	0.00
04/01/41	06/30/41	948.36	948.36	0.00	0.00	0.00
07/01/41	09/30/41	948.36	948.36	0.00	0.00	0.00
10/01/41	12/31/41	948.36	948.36	0.00	0.00	0.00
01/01/42	03/31/42	948.36	948.36	0.00	0.00	0.00
04/01/42	06/30/42	948.36	948.36	0.00	0.00	0.00
07/01/42	09/30/42	948.36	948.36	0.00	0.00	0.00
10/01/42	12/31/42	948.36	948.36	0.00	0.00	0.00
01/01/43	03/31/43	948.36	948.36	0.00	0.00	0.00
04/01/43	06/30/43	948.36	948.36	0.00	0.00	0.00
07/01/43	09/30/43	948.36	948.36	0.00	0.00	0.00
10/01/43	12/31/43	948.36	948.36	0.00	0.00	0.00
01/01/44	03/31/44	948.36	948.36	0.00	0.00	0.00
04/01/44	06/30/44	948.36	948.36	0.00	0.00	0.00
07/01/44	09/30/44	948.36	948.36	0.00	0.00	0.00
10/01/44	12/31/44	948.36	948.36	0.00	0.00	0.00
01/01/45	03/31/45	948.36	948.36	0.00	0.00	0.00
04/01/45	06/30/45	948.36	948.36	0.00	0.00	0.00
07/01/45	09/30/45	948.36	948.36	0.00	0.00	0.00
10/01/45	12/31/45	948.36	948.36	0.00	0.00	0.00
01/01/46	03/31/46	948.36	948.36	0.00	0.00	0.00
04/01/46	06/30/46	948.36	948.36	0.00	0.00	0.00
07/01/46	09/30/46	948.36	948.36	0.00	0.00	0.00
10/01/46	12/31/46	948.36	948.36	0.00	0.00	0.00
01/01/47	03/31/47	948.36	948.36	0.00	0.00	0.00
04/01/47	06/30/47	948.36	948.36	0.00	0.00	0.00
07/01/47	09/30/47	948.36	948.36	0.00	0.00	0.00
10/01/47	12/31/47	948.36	948.36	0.00	0.00	0.00
01/01/48	03/31/48	948.36	948.36	0.00	0.00	0.00
04/01/48	06/30/48	948.36	948.36	0.00	0.00	0.00
07/01/48	09/30/48	948.36	948.36	0.00	0.00	0.00
10/01/48	12/31/48	948.36	948.36	0.00	0.00	0.00
01/01/49	03/31/49	948.36	948.36	0.00	0.00	0.00
04/01/49	06/30/49	948.36	948.36	0.00	0.00	0.00
07/01/49	09/30/49	948.36	948.36	0.00	0.00	0.00
10/01/49	12/31/49	948.36	948.36	0.00	0.00	0.00
01/01/50	03/31/50	948.36	948.36	0.00	0.00	0.00
04/01/50	06/30/50	948.36	948.36	0.00	0.00	0.00
07/01/50	09/30/50	948.36	948.36	0.00	0.00	0.00
10/01/50	12/31/50	948.36	948.36	0.00	0.00	0.00
01/01/51	03/31/51	948.36	948.36	0.00	0.00	0.00
04/01/51	06/30/51	948.36	948.36	0.00	0.00	0.00
07/01/51	09/30/51	948.36	948.36	0.00	0.00	0.00
10/01/51	12/31/51	948.36	948.36	0.00	0.00	0.00
01/01/52	03/31/52	948.36	948.36	0.00	0.00	0.00
04/01/52	06/30/52	948.36	948.36	0.00	0.00	0.00
07/01/52	09/30/52	948.36	948.36	0.00	0.00	0.00
10/01/52	12/31/52	948.36	948.36	0.00	0.00	0.00
01/01/53	03/31/53	948.36	948.36	0.00	0.00	0.00
04/01/53	06/30/53	948.36	948.36	0.00	0.00	0.00
07/01/53	09/30/53	948.36	948.36	0.00	0.00	0.00
10/01/53	12/31/53	948.36	948.36	0.00	0.00	0.00
01/01/54	03/31/54	948.36	948.36	0.00	0.00	0.00
04/01/54	06/30/54	948.36	948.36	0.00	0.00	0.00

Notes:
 (3) = Table A1, (1b) x Table C5_2, (7)
 (4) = Table A1, (1b) x Table C5_1, (12)
 (5) = (4) - (3)_{t-1}, t-1 implies that is nonadmitted if not received in 90 days.
 (6) = max{ 0, -(5) x [1.0 - Table A1, (4) x Table A1, (1a) / Table A1, (1b)] }
 (7) = Table A1, (1b) x [Table C5_2, (6) - Table C5_1, (12)] - (6)

TABLE C5_1: POLICYHOLDER SUPPLIED - UNDERWRITING CASH FLOW PATTERNS

TIME INTERVAL		COLLECTED PREMIUM	LOSS & LAE PAYOUT	COMMISS. & BROKER.	GENERAL EXPENSES	OTHER ACQ. EXPENSES	PREMIUM TAXES	MISC. AND OTHER TAXES	REINS. EXPENSES	PREMIUM DISCOUNT	CUMULATIVE	
FROM	TO										COLLECTED PREMIUM	LOSS & LAE PAYOUT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
07/01/17	09/30/17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10/01/17	12/31/17	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
01/01/18	03/31/18	0.00%	0.00%	0.0000%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
04/01/18	06/30/18	0.56%	0.00%	0.5589%	0.00%	3.96%	0.00%	0.00%	0.00%	0.56%	0.56%	0.00%
07/01/18	09/30/18	5.57%	0.73%	5.5730%	13.48%	23.27%	0.00%	23.75%	23.75%	5.57%	6.13%	0.73%
10/01/18	12/31/18	12.09%	1.96%	12.0864%	14.73%	22.27%	23.75%	20.89%	20.89%	12.09%	18.22%	2.70%
01/01/19	03/31/19	18.84%	3.56%	18.8403%	22.35%	28.68%	20.89%	29.17%	29.17%	18.84%	37.06%	6.26%
04/01/19	06/30/19	21.07%	4.96%	21.0704%	23.91%	21.83%	29.17%	26.19%	26.19%	21.07%	58.13%	11.22%
07/01/19	09/30/19	17.63%	5.85%	17.6325%	10.90%	0.00%	26.19%	0.00%	0.00%	17.63%	75.76%	17.07%
10/01/19	12/31/19	10.59%	6.08%	10.5904%	8.28%	0.00%	0.00%	0.00%	0.00%	10.59%	86.35%	23.15%
01/01/20	03/31/20	5.66%	6.31%	5.6648%	4.74%	0.00%	0.00%	0.00%	0.00%	5.66%	92.02%	29.45%
04/01/20	06/30/20	3.02%	6.50%	3.0165%	1.61%	0.00%	0.00%	0.00%	0.00%	3.02%	95.03%	35.95%
07/01/20	09/30/20	2.23%	6.37%	2.2304%	0.00%	0.00%	0.00%	0.00%	0.00%	2.23%	97.26%	42.32%
10/01/20	12/31/20	1.54%	5.92%	1.5359%	0.00%	0.00%	0.00%	0.00%	0.00%	1.54%	98.80%	48.23%
01/01/21	03/31/21	0.76%	5.25%	0.7632%	0.00%	0.00%	0.00%	0.00%	0.00%	0.76%	99.56%	53.48%
04/01/21	06/30/21	0.34%	4.66%	0.3373%	0.00%	0.00%	0.00%	0.00%	0.00%	0.34%	99.90%	58.14%
07/01/21	09/30/21	0.10%	4.15%	0.1000%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	100.00%	62.29%
10/01/21	12/31/21	0.00%	3.76%	0.0000%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	66.05%
01/01/22	03/31/22	0.00%	3.21%	0.0000%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	69.26%
04/01/22	06/30/22	0.00%	2.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	71.98%
07/01/22	09/30/22	0.00%	2.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	74.32%
10/01/22	12/31/22	0.00%	2.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	76.41%
01/01/23	03/31/23	0.00%	1.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	78.15%
04/01/23	06/30/23	0.00%	1.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	79.59%
07/01/23	09/30/23	0.00%	1.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	80.79%
10/01/23	12/31/23	0.00%	1.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	81.85%
01/01/24	03/31/24	0.00%	0.87%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	82.73%
04/01/24	06/30/24	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	83.43%
07/01/24	09/30/24	0.00%	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	84.02%
10/01/24	12/31/24	0.00%	0.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	84.55%
01/01/25	03/31/25	0.00%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	85.00%
04/01/25	06/30/25	0.00%	0.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	85.38%
07/01/25	09/30/25	0.00%	0.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	85.72%
10/01/25	12/31/25	0.00%	0.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	86.05%
01/01/26	03/31/26	0.00%	0.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	86.35%
04/01/26	06/30/26	0.00%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	86.62%
07/01/26	09/30/26	0.00%	0.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	86.88%
10/01/26	12/31/26	0.00%	0.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.13%
01/01/27	03/31/27	0.00%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.36%
04/01/27	06/30/27	0.00%	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.57%
07/01/27	09/30/27	0.00%	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.76%
10/01/27	12/31/27	0.00%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.94%
01/01/28	03/31/28	0.00%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.10%
04/01/28	06/30/28	0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.25%
07/01/28	09/30/28	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.39%
10/01/28	12/31/28	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.53%
01/01/29	03/31/29	0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.68%
04/01/29	06/30/29	0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.83%
07/01/29	09/30/29	0.00%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.98%
10/01/29	12/31/29	0.00%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.15%
01/01/30	03/31/30	0.00%	0.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.32%
04/01/30	06/30/30	0.00%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.50%
07/01/30	09/30/30	0.00%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.69%
10/01/30	12/31/30	0.00%	0.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.86%
01/01/31	03/31/31	0.00%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.01%
04/01/31	06/30/31	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.15%
07/01/31	09/30/31	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.28%
10/01/31	12/31/31	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.41%
01/01/32	03/31/32	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.53%
04/01/32	06/30/32	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.63%
07/01/32	09/30/32	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.74%
10/01/32	12/31/32	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.84%
01/01/33	03/31/33	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.95%
04/01/33	06/30/33	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.05%
07/01/33	09/30/33	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.15%
10/01/33	12/31/33	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.26%
01/01/34	03/31/34	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.38%
04/01/34	06/30/34	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.50%
07/01/34	09/30/34	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.62%
10/01/34	12/31/34	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.74%
01/01/35	03/31/35	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.86%
04/01/35	06/30/35	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.97%
07/01/35	09/30/35	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.08%
10/01/35	12/31/35	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.19%
01/01/36	03/31/36	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.30%
04/01/36	06/30/36	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.41%
07/01/36	09/30/36	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.52%
10/01/36	12/31/36	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.63%
01/01/37	03/31/37	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.72%
04/01/37	06/30/37	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.80%
07/01/37	09/30/37	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.89%
10/01/37	12/31/37	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.97%
01/01/38	03/31/38	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.05%

TABLE C5_1: POLICYHOLDER SUPPLIED - UNDERWRITING CASH FLOW PATTERNS

TIME INTERVAL		COLLECTED PREMIUM	LOSS & LAE PAYOUT	COMMISS. & BROKER.	GENERAL EXPENSES	OTHER ACQ. EXPENSES	PREMIUM TAXES	MISC. AND OTHER TAXES	REINS. EXPENSES	PREMIUM DISCOUNT	CUMULATIVE	
FROM	TO										COLLECTED PREMIUM	LOSS & LAE PAYOUT
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
04/01/38	06/30/38	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.13%
07/01/38	09/30/38	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.21%
10/01/38	12/31/38	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.29%
01/01/39	03/31/39	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.36%
04/01/39	06/30/39	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.43%
07/01/39	09/30/39	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.50%
10/01/39	12/31/39	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.58%
01/01/40	03/31/40	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.67%
04/01/40	06/30/40	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.78%
07/01/40	09/30/40	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.90%
10/01/40	12/31/40	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.01%
01/01/41	03/31/41	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.13%
04/01/41	06/30/41	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.24%
07/01/41	09/30/41	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.36%
10/01/41	12/31/41	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.47%
01/01/42	03/31/42	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.59%
04/01/42	06/30/42	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.70%
07/01/42	09/30/42	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.82%
10/01/42	12/31/42	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.93%
01/01/43	03/31/43	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.05%
04/01/43	06/30/43	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.16%
07/01/43	09/30/43	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.28%
10/01/43	12/31/43	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.39%
01/01/44	03/31/44	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.51%
04/01/44	06/30/44	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.62%
07/01/44	09/30/44	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.74%
10/01/44	12/31/44	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.85%
01/01/45	03/31/45	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.97%
04/01/45	06/30/45	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.08%
07/01/45	09/30/45	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.20%
10/01/45	12/31/45	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.31%
01/01/46	03/31/46	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.43%
04/01/46	06/30/46	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.54%
07/01/46	09/30/46	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.66%
10/01/46	12/31/46	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.77%
01/01/47	03/31/47	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.89%
04/01/47	06/30/47	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.00%
07/01/47	09/30/47	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.12%
10/01/47	12/31/47	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.23%
01/01/48	03/31/48	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.35%
04/01/48	06/30/48	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.46%
07/01/48	09/30/48	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.58%
10/01/48	12/31/48	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.69%
01/01/49	03/31/49	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.81%
04/01/49	06/30/49	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.92%
07/01/49	09/30/49	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.04%
10/01/49	12/31/49	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.16%
01/01/50	03/31/50	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.27%
04/01/50	06/30/50	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.38%
07/01/50	09/30/50	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.50%
10/01/50	12/31/50	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.62%
01/01/51	03/31/51	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.73%
04/01/51	06/30/51	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.84%
07/01/51	09/30/51	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.96%
10/01/51	12/31/51	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.08%
01/01/52	03/31/52	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.19%
04/01/52	06/30/52	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.30%
07/01/52	09/30/52	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.42%
10/01/52	12/31/52	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.54%
01/01/53	03/31/53	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.65%
04/01/53	06/30/53	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.77%
07/01/53	09/30/53	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.87%
10/01/53	12/31/53	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.94%
01/01/54	03/31/54	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.99%
04/01/54	06/30/54	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
TOTAL		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%		

Notes:
 (3): The premium collection pattern for a single policy from Section VII-G, Exhibit 1, converted to a full policy year basis.
 (4): The loss & LAE payout pattern for a single policy from Section VII-I, Exhibit 1, converted to a full policy year basis.
 (5), (11) = (3)
 (6) = 0.5 x Table C5_2, (3) + 0.5 x Table C5_2, (4)
 (7) = 1/6 x Table C5_2, (3)_{t+1} + 5/6 x Table C5_2, (3)_t
 (8) = Table C5_2, (3)_{t-1}
 (9), (10) = Table C5_2, (3)
 (12) = (3), cumulative
 (13) = (4), cumulative

TABLE C5.2: ADDITIONAL PREMIUM AND LOSS PATTERNS

TIME INTERVAL		WRITTEN PREMIUM (3)	EARNED PREMIUM (4)	LOSS & LAE INCURRED (5)	CUMULATIVE		
FROM (1)	TO (2)				WRITTEN PREMIUM (6)	EARNED PREMIUM (7)	LOSS & LAE INCURRED (8)
07/01/17	09/30/17		0.00%	0.00%	0.00%	0.00%	0.00%
10/01/17	12/31/17		0.00%	0.00%	0.00%	0.00%	0.00%
01/01/18	03/31/18		0.00%	0.00%	0.00%	0.00%	0.00%
04/01/18	06/30/18		0.00%	0.00%	0.00%	0.00%	0.00%
07/01/18	09/30/18	23.75%	3.21%	3.21%	23.75%	3.21%	3.21%
10/01/18	12/31/18	20.89%	8.57%	8.57%	44.64%	11.77%	11.77%
01/01/19	03/31/19	29.17%	15.53%	15.53%	73.81%	27.30%	27.30%
04/01/19	06/30/19	26.19%	21.64%	21.64%	100.00%	48.94%	48.94%
07/01/19	09/30/19		21.79%	21.79%	100.00%	70.73%	70.73%
10/01/19	12/31/19		16.57%	16.57%	100.00%	87.30%	87.30%
01/01/20	03/31/20		9.47%	9.47%	100.00%	96.77%	96.77%
04/01/20	06/30/20		3.23%	3.23%	100.00%	100.00%	100.00%
07/01/20	09/30/20		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/20	12/31/20		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/21	03/31/21		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/21	06/30/21		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/21	09/30/21		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/21	12/31/21		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/22	03/31/22		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/22	06/30/22		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/22	09/30/22		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/22	12/31/22		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/23	03/31/23		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/23	06/30/23		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/23	09/30/23		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/23	12/31/23		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/24	03/31/24		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/24	06/30/24		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/24	09/30/24		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/24	12/31/24		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/25	03/31/25		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/25	06/30/25		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/25	09/30/25		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/25	12/31/25		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/26	03/31/26		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/26	06/30/26		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/26	09/30/26		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/26	12/31/26		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/27	03/31/27		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/27	06/30/27		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/27	09/30/27		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/27	12/31/27		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/28	03/31/28		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/28	06/30/28		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/28	09/30/28		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/28	12/31/28		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/29	03/31/29		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/29	06/30/29		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/29	09/30/29		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/29	12/31/29		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/30	03/31/30		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/30	06/30/30		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/30	09/30/30		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/30	12/31/30		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/31	03/31/31		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/31	06/30/31		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/31	09/30/31		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/31	12/31/31		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/32	03/31/32		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/32	06/30/32		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/32	09/30/32		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/32	12/31/32		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/33	03/31/33		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/33	06/30/33		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/33	09/30/33		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/33	12/31/33		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/34	03/31/34		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/34	06/30/34		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/34	09/30/34		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/34	12/31/34		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/35	03/31/35		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/35	06/30/35		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/35	09/30/35		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/35	12/31/35		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/36	03/31/36		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/36	06/30/36		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/36	09/30/36		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/36	12/31/36		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/37	03/31/37		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/37	06/30/37		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/37	09/30/37		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/37	12/31/37		0.00%	0.00%	100.00%	100.00%	100.00%

TABLE C5.2: ADDITIONAL PREMIUM AND LOSS PATTERNS

TIME INTERVAL		WRITTEN PREMIUM (3)	EARNED PREMIUM (4)	LOSS & LAE INCURRED (5)	CUMULATIVE		
FROM (1)	TO (2)				WRITTEN PREMIUM (6)	EARNED PREMIUM (7)	LOSS & LAE INCURRED (8)
01/01/38	03/31/38		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/38	06/30/38		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/38	09/30/38		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/38	12/31/38		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/39	03/31/39		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/39	06/30/39		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/39	09/30/39		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/39	12/31/39		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/40	03/31/40		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/40	06/30/40		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/40	09/30/40		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/40	12/31/40		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/41	03/31/41		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/41	06/30/41		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/41	09/30/41		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/41	12/31/41		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/42	03/31/42		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/42	06/30/42		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/42	09/30/42		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/42	12/31/42		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/43	03/31/43		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/43	06/30/43		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/43	09/30/43		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/43	12/31/43		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/44	03/31/44		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/44	06/30/44		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/44	09/30/44		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/44	12/31/44		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/45	03/31/45		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/45	06/30/45		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/45	09/30/45		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/45	12/31/45		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/46	03/31/46		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/46	06/30/46		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/46	09/30/46		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/46	12/31/46		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/47	03/31/47		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/47	06/30/47		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/47	09/30/47		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/47	12/31/47		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/48	03/31/48		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/48	06/30/48		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/48	09/30/48		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/48	12/31/48		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/49	03/31/49		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/49	06/30/49		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/49	09/30/49		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/49	12/31/49		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/50	03/31/50		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/50	06/30/50		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/50	09/30/50		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/50	12/31/50		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/51	03/31/51		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/51	06/30/51		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/51	09/30/51		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/51	12/31/51		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/52	03/31/52		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/52	06/30/52		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/52	09/30/52		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/52	12/31/52		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/53	03/31/53		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/53	06/30/53		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/53	09/30/53		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/53	12/31/53		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/54	03/31/54		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/54	06/30/54		0.00%	0.00%	100.00%	100.00%	100.00%
TOTAL		100.00%	100.00%	100.00%			

Notes:

- (3): Based on Unit Statistical Plan Data.
- (4): Single policy earned premium is earned uniformly through the one year policy term and then converted to a policy year basis.
- (5): We assume that the loss & LAE incurred pattern coincides with the earned premium pattern.
- (6) = (3), cumulative
- (7) = (4), cumulative
- (8) = (5), cumulative

TABLE D1: CAPITAL NEEDED FROM INVESTORS

TIME INTERVAL		UNEARNED PREMIUM RESERVES (3)	LOSS & LAE RESERVES (4)	TOTAL RESERVES (5)	RESERVES TO SURPLUS RATIO (6)	IMPLIED SURPLUS (7)	RESERVES FUNDED BY INVESTORS (8)	CAPITAL NEEDED FROM INVESTORS (9)
FROM (1)	TO (2)							
07/01/17	09/30/17	0.00	0.00	0.00	1.80	0.00	0.00	0.00
10/01/17	12/31/17	0.00	0.00	0.00	1.80	0.00	0.00	0.00
01/01/18	03/31/18	0.00	0.00	0.00	1.80	0.00	0.00	0.00
04/01/18	06/30/18	0.00	0.00	0.00	1.80	0.00	5.30	5.30
07/01/18	09/30/18	194.83	18.55	213.37	1.80	118.60	8.87	127.47
10/01/18	12/31/18	311.68	68.09	379.77	1.80	211.09	22.51	233.60
01/01/19	03/31/19	441.08	157.92	598.99	1.80	332.95	39.32	372.27
04/01/19	06/30/19	484.27	283.07	767.33	1.80	426.52	45.64	472.16
07/01/19	09/30/19	277.58	402.73	680.31	1.80	378.14	31.46	409.60
10/01/19	12/31/19	120.45	481.45	601.90	1.80	334.56	15.01	349.58
01/01/20	03/31/20	30.63	505.21	535.84	1.80	297.84	3.63	301.47
04/01/20	06/30/20	0.00	480.66	480.66	1.80	267.17	16.10	283.27
07/01/20	09/30/20	0.00	432.89	432.89	1.80	240.62	27.23	267.85
10/01/20	12/31/20	0.00	388.50	388.50	1.80	215.94	15.84	231.78
01/01/21	03/31/21	0.00	349.11	349.11	1.80	194.05	9.23	203.28
04/01/21	06/30/21	0.00	314.14	314.14	1.80	174.61	5.96	180.57
07/01/21	09/30/21	0.00	283.01	283.01	1.80	157.31	4.55	161.86
10/01/21	12/31/21	0.00	254.77	254.77	1.80	141.61	3.92	145.53
01/01/22	03/31/22	0.00	230.68	230.68	1.80	128.22	3.61	131.83
04/01/22	06/30/22	0.00	210.25	210.25	1.80	116.87	3.30	120.17
07/01/22	09/30/22	0.00	192.72	192.72	1.80	107.12	3.00	110.12
10/01/22	12/31/22	0.00	177.03	177.03	1.80	98.40	2.69	101.09
01/01/23	03/31/23	0.00	163.96	163.96	1.80	91.13	2.54	93.68
04/01/23	06/30/23	0.00	153.19	153.19	1.80	85.15	2.39	87.54
07/01/23	09/30/23	0.00	144.18	144.18	1.80	80.14	2.24	82.39
10/01/23	12/31/23	0.00	136.19	136.19	1.80	75.70	2.09	77.79
01/01/24	03/31/24	0.00	129.64	129.64	1.80	72.06	1.95	74.01
04/01/24	06/30/24	0.00	124.35	124.35	1.80	69.12	1.81	70.93
07/01/24	09/30/24	0.00	119.94	119.94	1.80	66.67	1.67	68.34
10/01/24	12/31/24	0.00	115.95	115.95	1.80	64.45	1.53	65.98
01/01/25	03/31/25	0.00	112.55	112.55	1.80	62.56	1.41	63.97
04/01/25	06/30/25	0.00	109.68	109.68	1.80	60.97	1.28	62.24
07/01/25	09/30/25	0.00	107.14	107.14	1.80	59.55	1.15	60.70
10/01/25	12/31/25	0.00	104.72	104.72	1.80	58.21	1.02	59.23
01/01/26	03/31/26	0.00	102.47	102.47	1.80	56.96	0.93	57.89
04/01/26	06/30/26	0.00	100.39	100.39	1.80	55.80	0.84	56.64
07/01/26	09/30/26	0.00	98.44	98.44	1.80	54.72	0.75	55.47
10/01/26	12/31/26	0.00	96.59	96.59	1.80	53.69	0.66	54.35
01/01/27	03/31/27	0.00	94.89	94.89	1.80	52.74	0.56	53.30
04/01/27	06/30/27	0.00	93.32	93.32	1.80	51.87	0.46	52.33
07/01/27	09/30/27	0.00	91.87	91.87	1.80	51.07	0.36	51.43
10/01/27	12/31/27	0.00	90.51	90.51	1.80	50.31	0.26	50.57
01/01/28	03/31/28	0.00	89.29	89.29	1.80	49.63	0.16	49.79
04/01/28	06/30/28	0.00	88.19	88.19	1.80	49.02	0.06	49.08
07/01/28	09/30/28	0.00	87.14	87.14	1.80	48.44	0.00	48.44
10/01/28	12/31/28	0.00	86.06	86.06	1.80	47.84	0.00	47.84
01/01/29	03/31/29	0.00	84.96	84.96	1.80	47.23	0.00	47.23
04/01/29	06/30/29	0.00	83.85	83.85	1.80	46.61	0.00	46.61
07/01/29	09/30/29	0.00	82.68	82.68	1.80	45.96	0.00	45.96
10/01/29	12/31/29	0.00	81.44	81.44	1.80	45.27	0.00	45.27
01/01/30	03/31/30	0.00	80.13	80.13	1.80	44.54	0.00	44.54
04/01/30	06/30/30	0.00	78.76	78.76	1.80	43.78	0.00	43.78
07/01/30	09/30/30	0.00	77.40	77.40	1.80	43.02	0.00	43.02
10/01/30	12/31/30	0.00	76.12	76.12	1.80	42.31	0.00	42.31
01/01/31	03/31/31	0.00	74.95	74.95	1.80	41.66	0.00	41.66
04/01/31	06/30/31	0.00	73.89	73.89	1.80	41.07	0.00	41.07
07/01/31	09/30/31	0.00	72.91	72.91	1.80	40.53	0.00	40.53
10/01/31	12/31/31	0.00	71.97	71.97	1.80	40.00	0.00	40.00
01/01/32	03/31/32	0.00	71.10	71.10	1.80	39.52	0.00	39.52
04/01/32	06/30/32	0.00	70.29	70.29	1.80	39.07	0.00	39.07
07/01/32	09/30/32	0.00	69.50	69.50	1.80	38.63	0.00	38.63
10/01/32	12/31/32	0.00	68.72	68.72	1.80	38.19	0.00	38.19
01/01/33	03/31/33	0.00	67.94	67.94	1.80	37.76	0.00	37.76
04/01/33	06/30/33	0.00	67.18	67.18	1.80	37.34	0.00	37.34
07/01/33	09/30/33	0.00	66.39	66.39	1.80	36.90	0.00	36.90
10/01/33	12/31/33	0.00	65.56	65.56	1.80	36.44	0.00	36.44
01/01/34	03/31/34	0.00	64.69	64.69	1.80	35.96	0.00	35.96
04/01/34	06/30/34	0.00	63.78	63.78	1.80	35.45	0.00	35.45
07/01/34	09/30/34	0.00	62.86	62.86	1.80	34.94	0.00	34.94
10/01/34	12/31/34	0.00	61.96	61.96	1.80	34.44	0.00	34.44
01/01/35	03/31/35	0.00	61.10	61.10	1.80	33.96	0.00	33.96
04/01/35	06/30/35	0.00	60.27	60.27	1.80	33.50	0.00	33.50
07/01/35	09/30/35	0.00	59.45	59.45	1.80	33.05	0.00	33.05
10/01/35	12/31/35	0.00	58.62	58.62	1.80	32.59	0.00	32.59
01/01/36	03/31/36	0.00	57.79	57.79	1.80	32.12	0.00	32.12
04/01/36	06/30/36	0.00	56.94	56.94	1.80	31.65	0.00	31.65
07/01/36	09/30/36	0.00	56.12	56.12	1.80	31.20	0.00	31.20
10/01/36	12/31/36	0.00	55.35	55.35	1.80	30.76	0.00	30.76
01/01/37	03/31/37	0.00	54.64	54.64	1.80	30.37	0.00	30.37
04/01/37	06/30/37	0.00	54.00	54.00	1.80	30.02	0.00	30.02
07/01/37	09/30/37	0.00	53.38	53.38	1.80	29.67	0.00	29.67
10/01/37	12/31/37	0.00	52.77	52.77	1.80	29.33	0.00	29.33

TABLE D1: CAPITAL NEEDED FROM INVESTORS

TIME INTERVAL		UNEARNED PREMIUM RESERVES (3)	LOSS & LAE RESERVES (4)	TOTAL RESERVES (5)	RESERVES TO SURPLUS RATIO (6)	IMPLIED SURPLUS (7)	RESERVES FUNDED BY INVESTORS (8)	CAPITAL NEEDED FROM INVESTORS (9)
FROM (1)	TO (2)							
01/01/38	03/31/38	0.00	52.15	52.15	1.80	28.99	0.00	28.99
04/01/38	06/30/38	0.00	51.53	51.53	1.80	28.64	0.00	28.64
07/01/38	09/30/38	0.00	50.93	50.93	1.80	28.31	0.00	28.31
10/01/38	12/31/38	0.00	50.36	50.36	1.80	27.99	0.00	27.99
01/01/39	03/31/39	0.00	49.82	49.82	1.80	27.69	0.00	27.69
04/01/39	06/30/39	0.00	49.33	49.33	1.80	27.42	0.00	27.42
07/01/39	09/30/39	0.00	48.80	48.80	1.80	27.12	0.00	27.12
10/01/39	12/31/39	0.00	48.19	48.19	1.80	26.78	0.00	26.78
01/01/40	03/31/40	0.00	47.47	47.47	1.80	26.38	0.00	26.38
04/01/40	06/30/40	0.00	46.66	46.66	1.80	25.93	0.00	25.93
07/01/40	09/30/40	0.00	45.80	45.80	1.80	25.46	0.00	25.46
10/01/40	12/31/40	0.00	44.93	44.93	1.80	24.97	0.00	24.97
01/01/41	03/31/41	0.00	44.06	44.06	1.80	24.49	0.00	24.49
04/01/41	06/30/41	0.00	43.21	43.21	1.80	24.02	0.00	24.02
07/01/41	09/30/41	0.00	42.34	42.34	1.80	23.54	0.00	23.54
10/01/41	12/31/41	0.00	41.47	41.47	1.80	23.05	0.00	23.05
01/01/42	03/31/42	0.00	40.61	40.61	1.80	22.57	0.00	22.57
04/01/42	06/30/42	0.00	39.75	39.75	1.80	22.10	0.00	22.10
07/01/42	09/30/42	0.00	38.89	38.89	1.80	21.62	0.00	21.62
10/01/42	12/31/42	0.00	38.02	38.02	1.80	21.13	0.00	21.13
01/01/43	03/31/43	0.00	37.16	37.16	1.80	20.65	0.00	20.65
04/01/43	06/30/43	0.00	36.30	36.30	1.80	20.18	0.00	20.18
07/01/43	09/30/43	0.00	35.44	35.44	1.80	19.70	0.00	19.70
10/01/43	12/31/43	0.00	34.57	34.57	1.80	19.21	0.00	19.21
01/01/44	03/31/44	0.00	33.70	33.70	1.80	18.73	0.00	18.73
04/01/44	06/30/44	0.00	32.84	32.84	1.80	18.26	0.00	18.26
07/01/44	09/30/44	0.00	31.98	31.98	1.80	17.78	0.00	17.78
10/01/44	12/31/44	0.00	31.11	31.11	1.80	17.29	0.00	17.29
01/01/45	03/31/45	0.00	30.25	30.25	1.80	16.81	0.00	16.81
04/01/45	06/30/45	0.00	29.39	29.39	1.80	16.34	0.00	16.34
07/01/45	09/30/45	0.00	28.53	28.53	1.80	15.86	0.00	15.86
10/01/45	12/31/45	0.00	27.66	27.66	1.80	15.37	0.00	15.37
01/01/46	03/31/46	0.00	26.80	26.80	1.80	14.89	0.00	14.89
04/01/46	06/30/46	0.00	25.94	25.94	1.80	14.42	0.00	14.42
07/01/46	09/30/46	0.00	25.07	25.07	1.80	13.94	0.00	13.94
10/01/46	12/31/46	0.00	24.21	24.21	1.80	13.46	0.00	13.46
01/01/47	03/31/47	0.00	23.34	23.34	1.80	12.98	0.00	12.98
04/01/47	06/30/47	0.00	22.48	22.48	1.80	12.50	0.00	12.50
07/01/47	09/30/47	0.00	21.62	21.62	1.80	12.02	0.00	12.02
10/01/47	12/31/47	0.00	20.75	20.75	1.80	11.54	0.00	11.54
01/01/48	03/31/48	0.00	19.89	19.89	1.80	11.06	0.00	11.06
04/01/48	06/30/48	0.00	19.03	19.03	1.80	10.58	0.00	10.58
07/01/48	09/30/48	0.00	18.17	18.17	1.80	10.10	0.00	10.10
10/01/48	12/31/48	0.00	17.30	17.30	1.80	9.62	0.00	9.62
01/01/49	03/31/49	0.00	16.44	16.44	1.80	9.14	0.00	9.14
04/01/49	06/30/49	0.00	15.58	15.58	1.80	8.66	0.00	8.66
07/01/49	09/30/49	0.00	14.71	14.71	1.80	8.18	0.00	8.18
10/01/49	12/31/49	0.00	13.85	13.85	1.80	7.70	0.00	7.70
01/01/50	03/31/50	0.00	12.98	12.98	1.80	7.22	0.00	7.22
04/01/50	06/30/50	0.00	12.12	12.12	1.80	6.74	0.00	6.74
07/01/50	09/30/50	0.00	11.26	11.26	1.80	6.26	0.00	6.26
10/01/50	12/31/50	0.00	10.39	10.39	1.80	5.78	0.00	5.78
01/01/51	03/31/51	0.00	9.53	9.53	1.80	5.30	0.00	5.30
04/01/51	06/30/51	0.00	8.67	8.67	1.80	4.82	0.00	4.82
07/01/51	09/30/51	0.00	7.81	7.81	1.80	4.34	0.00	4.34
10/01/51	12/31/51	0.00	6.94	6.94	1.80	3.86	0.00	3.86
01/01/52	03/31/52	0.00	6.08	6.08	1.80	3.38	0.00	3.38
04/01/52	06/30/52	0.00	5.22	5.22	1.80	2.90	0.00	2.90
07/01/52	09/30/52	0.00	4.35	4.35	1.80	2.42	0.00	2.42
10/01/52	12/31/52	0.00	3.49	3.49	1.80	1.94	0.00	1.94
01/01/53	03/31/53	0.00	2.62	2.62	1.80	1.46	0.00	1.46
04/01/53	06/30/53	0.00	1.76	1.76	1.80	0.98	0.00	0.98
07/01/53	09/30/53	0.00	1.01	1.01	1.80	0.56	0.00	0.56
10/01/53	12/31/53	0.00	0.44	0.44	1.80	0.24	0.00	0.24
01/01/54	03/31/54	0.00	0.11	0.11	1.80	0.06	0.00	0.06
04/01/54	06/30/54	0.00	0.00	0.00	1.80	0.00	0.00	0.00
TOTAL		1,860.50	12,024.10	13,884.60		7,717.64	293.32	8,010.96

Notes:

- (3) = Table A1, (1b) x [Table C5_2, (6) - Table C5_2, (7)]
- (4) = Table A1, (1a) x Table A1, (3) x [Table C5_2, (8) - Table C5_1, (13)]
- (5) = (3) + (4)
- (6) = Table A1, (13)
- (7) = (5) / (6)
- (8) = Table C3, (11)
- (9) = (7) + (8)

COST OF CAPITAL

The first step in setting an underwriting profit factor under a rate of return standard is to determine the fair and reasonable return that should be allowed for bearing the risk of underwriting workers' compensation insurance in Massachusetts. In the context of insurance ratemaking, a "fair and reasonable return" has traditionally been interpreted to mean the cost of the equity capital required to support insurance operations.¹ However, in her Decision on 2003 rates, the Commissioner endorsed the use of a weighted average cost of capital that includes the impact of debt capital at the insurance holding company level.² To narrow the debate again this year, the WCRIBMA has used a weighted average cost of capital in its derivation of the profit provision.

Calculating the weighted average cost of capital is simply a matter of separately calculating the cost of equity capital and the cost of debt capital, and then using appropriate weights to combine the two estimates.

Equity Cost of Capital

Several methods have been used to estimate the cost of equity capital for a regulated firm or industry. However, it is widely agreed that methods that rely on market data are preferred, on both a theoretical and pragmatic basis, to those that are based on accounting data. Indeed, it is market requirements that suggest use of the term "cost of

¹ Insurance operating companies typically carry no debt on their balance sheets; that is, the capital of the operating companies is all equity capital.

² See, for example, page 52: "We agree that estimates of the cost of capital should reflect debt/equity financing at the holding company level."

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capital," as the phrase refers to the cost to the firm of attracting investment funds in capital markets.

As in the past, the WCRIBMA has relied on the two most prominent market based methodologies to estimate the cost of equity capital for the WCRIBMA: the DCF (discounted cash flow) model and the traditional, single factor CAPM (capital asset pricing model). These two methods have been widely recognized as the leading approaches for estimating the cost of equity capital in the US economy, and as a result, each method has explicitly been given equal weight in the estimation process. In this filing the WCRIBMA is introducing a three-stage dividend growth model in place of the one-stage model used in prior filings. In contrast with the previous approach, in which a single growth rate persists in perpetuity, the three stage model reflects the assumption that in the long run, the insurance industry's growth rate will decline to a level consistent with the long term growth of the economy at large.

To apply the CAPM and DCF models in the context of insurance regulation, a sample of firms that investors would view as representative of the risks and required returns for property/casualty insurers was selected. In prior years, the WCRIBMA has relied on a sample of large, publicly traded property/casualty insurers that was drawn exclusively from the Value Line Investment Survey. In filings since 2010, and in this filing the WCRIBMA has expanded the sample of companies to include firms drawn from two additional data sources: those included in the property/casualty insurance industry group in the Value Line Investment Survey, Small & Mid Cap Edition and also all property and casualty companies in Standard & Poor's Compustat database with SIC codes 6300 – 6399

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and revenue in SIC codes 6331 or 6351. (Standard & Poor's Compustat database is used by institutional money managers and analysts around the world. Compustat provides vital company, index, and industry information that supports financial models and proprietary company and industry analysis.) The resulting sample is the largest sample of publicly traded insurers which can reasonably be used to estimate the cost of capital.

Based on these data, the cost of equity capital was calculated for the full sample of 92 property/casualty insurers. This calculation provides an estimate of the fair rate of return for the average risk activity in which property/casualty insurers are engaged. Based on the average of the DCF and CAPM results, Dr. Appel determined that investors currently require a return on equity of at least 8.12% for bearing the risk of underwriting property/casualty insurance, as shown below.

DCF	7.62 %
CAPM	8.62%
Average	8.12%

Given these results, the WCRIBMA has used a cost of equity capital of 8.12% as the best estimate of the required equity return for the average risk activity in which property/casualty insurers are engaged.

Debt Cost of Capital

To conform to the 2003 Commissioner's decision, the WCRIBMA estimates the cost of debt capital for property/casualty insurers, as well as the share of debt in their capital structure. In this filing, consistent with the 2014 and 2016 filings, we estimate the cost of debt capital by using current market yields (as opposed to embedded yields) for long term corporate bonds. We calculate the three month average yield using data for US corporate bonds from the US Department of Treasury. The result, 4.05%, is shown in Section VII-J, Exhibit 2, Page 3, line (17). In calculating the debt/equity proportion, consistent with the 2014 and 2016 filings, the WCRIBMA in this filing uses the book value of capital (as opposed to market value).³ For this group of 92 insurers, the share of non-equity capital in the corporate capital structure is 22%, as shown in Section VII – E, Exhibit 4. Thus, the weighted average cost of capital is 7.23%, as shown below:

$$(22\% \times 4.05\%) + (78\% \times 8.12\%) = 7.23\%$$

Since the cost of capital is the required return for the average risk activity in which insurers are engaged, the question naturally arises as to whether workers' compensation insurance in Massachusetts is of average risk when compared to all lines of insurance. To the extent that this line of business is viewed as riskier than average, the cost of capital would be higher than average as well. There are several reasons why workers'

³ The WCRIBMA believes that market value capital weights are also appropriate for estimating a weighted average cost of capital. However, in this rate filing we adopted the method suggested by the Commissioner in the 9/1/2012 decision on rates and use book value capital weights.

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compensation might be viewed as riskier than the average activity in which property/casualty insurers are engaged. Among them are these:

1. Workers' compensation is subject to unlimited liability; there are neither per claim, per occurrence or aggregate loss limits under the policy terms. This is in contrast to the typical property/casualty insurance contract, in which all these limits may apply.
2. Workers' compensation is a "long-tailed" line of business, meaning that the payment of losses may extend for many years beyond the sale date of the policy. It is a well-known principle of statistics that the longer the time horizon of a forecast, the greater the expected error in the estimate. Thus the forecast of ultimate losses in this line is subject to greater risk than in many other lines of business.
3. Workers' compensation has a substantial exposure to medical inflation, which has been more rapid and less predictable than general inflation.
4. Workers' compensation is subject to the risk of occupational disease, which can lead to substantial and inherently unpredictable losses in the future.
5. Workers' compensation is subject to the phenomenon of "benefit utilization," which refers to the observation that as benefits become more generous, workers

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increase their utilization of the system. While the term has traditionally been applied to indemnity benefits (as benefits increase both claim frequency and duration increase) it is equally applicable to medical benefits. Since medical costs are covered with no deductibles or co-payments, workers' compensation has become an increasingly attractive alternative to health insurance for coverage of any workplace illness or injury.

While these characteristics suggest that workers' compensation is of above-average risk, such additional risk not been reflected in its estimate of the cost of capital used in deriving the underwriting profit provision, making the WCRIBMA's provision conservative.

The results of the analysis for the full sample of property/casualty insurers are contained in exhibits to this section, and a more detailed explanation of the models is contained in the accompanying appendix.

APPENDIX: COST OF CAPITAL

INTRODUCTION

This appendix is intended to provide a more detailed description of the cost of capital methods selected by the WCRIBMA to derive the estimated cost of capital that is required to determine the underwriting profit provision in this filing.

The generally recognized standards for determining a fair rate of return for a regulated enterprise were articulated in two cases before the U.S. Supreme Court - Bluefield Waterworks and Hope Natural Gas. In Bluefield, the Court stated:

A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties

Bluefield Waterworks & Improvement Company v. Public Service Commission of West Virginia, 262 U.S. 679, 692-693 (1923). In Hope, the Court further stated:

From the investor or company point of view, it is important that there be enough revenue not only for operating expenses, but also for the capital

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costs of the business. These include service on the debt and dividends on the stock. By that standard the return to the equity owner should be commensurate with the returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.

Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944).

These decisions set forth the two basic standards of fairness under which regulated industries must operate: first, the rate of return to the equity holder should equal that which can be expected to be earned by investors in businesses of similar risk; and second, the rate of return must be sufficient to assure the continued attraction of capital. In essence these criteria, when reasonably applied, balance the interests of consumers of the regulated product or service, and investors, who provide the capital needed to operate the enterprise.

There are several methods that have been used to estimate the fair rate of return, or cost of capital, for a regulated firm or industry. However, it is widely agreed that methods that rely on market data are preferred, on both a theoretical and pragmatic basis, to those that are based on accounting data. Indeed, it is market requirements that suggest use of the term "cost of capital," as the phrase refers to the cost to the firm of attracting investment funds in capital markets. That cost, of course, is the return that the

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firm must pay and investors expect to earn as a result of placing their capital at risk in the enterprise. For this reason, Dr. Appel used the two most prominent market-based methodologies to derive the cost of capital estimates for this filing. The first of these is known as the Discounted Cash Flow (DCF) model (sometimes called the Gordon growth model or the dividend valuation model), and the second is a specific form of Risk Premium Analysis known as the Capital Asset Pricing Model (CAPM).

Dr. Appel used DCF and CAPM approaches to obtain independent estimates of the cost of capital, so as not to place undue reliance on any single methodology. Moreover, he used these two models because economic and financial theory strongly support the use of market data to determine required rates of return, and these are the most prominent market-based methods currently available. Reliance on market data is critical for three reasons.

1. Such information reflects the consensus of all investors regarding the risk and required returns on different securities. Thus, the potential for the biases and perceptions of the analyst to overstate or understate the fair rate of return is minimized.
2. The alternative to market data is to use historical accounting data to estimate the cost of capital. This procedure is seriously flawed because it is not prospective and does not necessarily reflect the returns that are of ultimate concern to investors – those that can be earned in the market.

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3. The use of market-based models is consistent with the dictates of Hope, in the sense that Hope instructs us to consider investor requirements when determining the fair and reasonable rate of return. (For example, "the return to the equity owner should be commensurate with the returns on investments in other enterprises having corresponding risks.")

In effect, these market based models provide an initial estimate of the "opportunity cost" of placing capital at risk in support of workers' compensation insurance in Massachusetts. Opportunity cost is among the most basic concepts in economics. It refers to the fact that resources have a variety of potential uses, and by using a resource in a particular endeavor an investor forgoes the returns that are available in other, alternative activities. Thus, the opportunity cost of capital (otherwise termed the cost of capital) is the return available from employing that capital in its next best alternative use. This is, of course, the return that investors have forgone by using their capital in support of Massachusetts workers' compensation insurance activities.

It is entirely appropriate to begin an estimate of Massachusetts workers' compensation insurers' cost of capital by evaluating the cost of capital for comparable insurers in the U.S. economy. To the extent that these firms are viewed by investors as being of equivalent risk, they will provide a reasonable starting point for estimating the appropriate cost of capital in this case. However, it is also necessary to consider the specific characteristics of the insurance coverage at issue in this proceeding, before

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determining whether the cost of capital for any sample of insurers is a reasonable estimate to be used in the present rate-setting exercise. Should Massachusetts workers' compensation insurance be viewed as differing in risk from the average line of coverage, then the cost of capital may have to be adjusted.

METHODOLOGY

The Discounted Cash Flow (DCF) model and a specific form of Risk Premium Analysis (RPA) known as the Capital Asset Pricing Model (CAPM) were used to estimate the cost of capital. These are the most widely recognized methods for estimating the cost of capital in regulatory proceedings. The DCF analysis is the leading model used by practitioners to estimate the required rate of return in regulatory rate proceedings, while RPA analysis is the leading approach used by academics, both for estimating the cost of capital and explaining capital market behavior. Each one provides a reasonable basis for estimating the cost of capital, and each should be accorded equal weight in the process.

Turning to the discounted cash flow (DCF) model first, the DCF is based upon the presumption that the cost of an investment, typically the price of a stock, must equal the present value of the cash flows from the investment. The logic of this assumption is as follows: investors are willing to pay the current price for a share of stock only if the present value of the expected cash flows emanating from that investment are equal to that price. If the present value of the cash flows were greater (less) than the current price, investors would bid the price up (down).

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The cash flows arising from the purchase of a share of stock are the dividend payments and capital gains the investor expects to receive in the future.

If the security is expected to be held in perpetuity, then the stock price can be expressed as the sum of the discounted dividends:

$$V_0 = [D_1/(1+k)] + [D_2/(1+k)^2] + [D_3/(1+k)^3] + \dots$$

where V_0 is the price of the stock, D_i is the dividend in period i , and k is the investor's implicit discount rate, or cost of capital.

In this filing, consistent with the 2016 filing, the WCRIBMA requested Dr. Appel to implement a three-stage DCF model, which assumes varying rates of dividend growth at different times in the future. The first stage is a five year period of short-term dividend growth, with the rate of growth calculated in the same manner as the dividend growth rate in prior filings. The calculation of this is shown in Section VII-E, Exhibit 2, Page 4.

The second stage, beginning in year six, is a five year period where the dividend growth rate declines (in a linear fashion) to a level consistent with the expected long term growth in the US economy. Then, starting in year 10 (stage 3), the rate of growth is assumed to be remain equal to the long-term rate of growth of the economy (based on the economy's real long-term growth potential and current inflationary expectations). The calculation of this is shown in Section VII-E, Exhibit 2, Page 2. A mathematical presentation of the three-stage dividend growth rate follows:

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$$V_0 = D_0 \sum_{t=1}^{\infty} \left(\frac{1 + g_t}{1 + k} \right)^t = D_1 \sum_{t=1}^{\infty} \frac{(1 + g_t)^{t-1}}{(1 + k)^t}$$

$$\frac{1}{\frac{D_1}{V_0}} = \sum_{t=1}^5 \frac{(1 + g_{ST})^{t-1}}{(1 + k)^t} + (1 + g_{ST})^4 \sum_{t=6}^9 \frac{\prod_{i=1}^{t-5} (1 + g_{IT_i})}{(1 + k)^t}$$

$$+ (1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4}) \sum_{t=10}^{\infty} \frac{(1 + g_{LT})^{t-9}}{(1 + k)^t}$$

$$\frac{1}{\frac{D_1}{V_0}} = \left[\frac{1}{k - g_{ST}} \left(1 - \left(\frac{1 + g_{ST}}{1 + k} \right)^5 \right) + \frac{(1 + g_{ST})^4 (1 + g_{IT_1})}{(1 + k)^6} + \frac{(1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})}{(1 + k)^7} \right.$$

$$+ \frac{(1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})}{(1 + k)^8}$$

$$+ \frac{(1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4})}{(1 + k)^9}$$

$$\left. + \frac{(1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4})(1 + g_{LT})}{(k - g_{LT})} \frac{1}{(1 + k)^9} \right]$$

Where:

V_0 = Present Value of a stock

D_t = Dividend Paid at the end of period t

g_t = Dividend Growth Rate at time t ,

if $t \leq 5 \rightarrow$ Short Term Stage (ST)

if $5 < t < 10 \rightarrow$ Intermediate Term Stage (IT_t)

if $t \geq 10 \rightarrow$ Long Term Stage (LT)

g_{ST} = Short – Term Dividend Growth Rate

g_{IT_t} = Intermediate – Term Dividend Growth Rate,

Linearly Interpolated between time 5 and 10

g_{LT} = Long – Term Dividend Growth Rate

k = Cost of Capital

$\frac{D_1}{V_0}$ = Dividend Payable in the coming 12 months divided by the current price

Turning to the second model used to calculate the cost of capital, the specific form of Risk Premium Analysis (RPA) known as the Capital Asset Pricing Model (CAPM), it should be noted that risk premium analysis is a technique which attempts to estimate the cost of capital by calculating the incremental return investors require to hold a particular security, as opposed to another, less risky asset. While the DCF estimates the cost of

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capital directly, by looking at expected cash flows and market prices, risk premium analysis estimates required returns by evaluating the relative risk of alternative investments. Obviously, those investments with greater risk require greater returns.

The single factor version of the Capital Asset Pricing Model (CAPM) is one specific form of risk premium analysis, which begins with the assumption that there is a risk-free asset, which is typically taken to be a U.S. Treasury security. It then estimates the relative risk of alternative securities to measure the "risk premium" investors require to hold these risky assets. In the classical application of the CAPM, the relative risk of a particular security is measured by a value known as the "beta for market risk" (otherwise known as simply beta) which is an estimate of the relative volatility of that security's returns (or price) compared with the volatility of the entire market (usually proxied by the New York Stock Exchange index or the S&P 500). The information on the beta is used in the following manner to estimate investors' required rate of return:

$$K = r_f + (\beta \times r_D)$$

where r_f is the risk-free yield, β is the beta for market risk, and r_D is the market risk premium.

As noted above, the beta coefficient is a measure of the relative volatility, or riskiness, of an investment, compared with the market average. If an individual stock has a beta of 1.5, for example, the stock has a tendency to be 50% more volatile than the

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market as a whole. This implies that if the market as a whole goes up (or down) by 10% this stock has a tendency to go up (or down) by 15%.

The market risk premium is the average difference between the returns on the market portfolio and the returns on the riskless asset. For example, over the period 1926 - 2016 a diversified portfolio of common stocks earned an annual return which averaged 8.52 percentage points higher than the return on U.S. Treasury bills. Therefore, an individual security of exactly average risk (i.e., with a beta of 1) would be expected to earn 8.52 percentage points more than a T-bill. In addition to the T-bill, however, it is also reasonable to consider alternative-term securities, and to measure the risk premium relative to them. In fact, this type of procedure is frequently recommended when the time horizon of the investment is relatively long, as is often the case with an investment in insurance.

There are at least three reasons to be concerned about the use of a beta for market risk to measure risk for present purposes. First, it is important to note that beta, as typically estimated, does not properly account for "interest rate risk" (that is, the risk that an investment will fluctuate with changes in interest rates). Since investments in property/casualty insurance stocks are subject to considerable interest rate risk, this means that the CAPM underestimates the cost of capital for the property/casualty insurance industry. Second, it is well known that small stocks tend to earn higher returns than their market betas would predict. Thus, to the extent that property casualty insurers are smaller than typical firms, the cost of capital derived using the single factor CAPM would tend to understate the required return. Finally, it is also well known that firms with

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relatively high book to market value ratios tend to produce higher returns than their betas would predict. Therefore, since property casualty insurers tend to have relatively high book to market ratios, the single factor CAPM would tend to understate required returns.

RESULTS

In estimating the cost of capital Dr. Appel relied on financial data for a sample of publicly traded property/casualty insurers, drawn from the Value Line Investment Survey and Standard & Poor's Compustat database. The Value Line Investment Survey is an independent investment advisory service that provides weekly reports on approximately 1,700 publicly traded stocks. In addition, it provides in depth quarterly reports on each of the firms it covers, which contain a wealth of historical and forecast information on each security. In terms of numbers of subscribers and annual revenues Value Line is the largest such service in the world. In addition, Value Line is the data source most widely relied upon by experts estimating the cost of capital in regulatory proceedings.

The data Dr. Appel used were drawn from Value Line's "Insurance-Property/Casualty" group of companies. This is one among nearly 100 groups that are established by Value Line so that they can report simultaneously on a set of companies, which are affected by common economic, social, and financial forces.

The Standard & Poor's Compustat ("Research Insight") program is one of the most complete and current databases of American and Canadian companies that provides annual and quarterly income statements, balance sheets, cash flows, and supplemental data items (including earnings, dividends and market prices) on most publicly held

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companies. Compustat's financial data items are collected from a wide variety of sources including: news wire services, news releases, shareholder reports, direct company contacts, and quarterly and annual documents filed with the Securities and Exchange Commission. Dr. Appel used all property and casualty companies in Standard & Poor's Compustat database with SIC codes 6300 – 6399 and revenue in SIC codes 6331 or 6351. His estimates are based on the most recent available data, from October 2017.

The DCF model requires an estimate of the current dividend yield and the expected growth rate in dividends. The sum of these is the estimated cost of capital.

To estimate the dividend yield, Dr. Appel utilized estimates for the expected first year dividend yield provided by Value Line and Compustat. If there was no information for a specific company in these two sources he checked Yahoo to see if they provided an estimate. Since the annual DCF model requires an estimate of the dividends payable during the first year of the investment, and Value Line's expected first year dividend yield is defined as the estimated dividends payable in the coming year divided by the current share price of the stock, it is precisely the correct value to use in the DCF model. However, for the companies from Compustat and the Value Line Investment Survey, Small and Mid Cap Edition, the dividend yield is defined as the current annual dividend divided by the current share price, not the coming year's dividend as is required in the model. As a consequence, for those companies, an additional adjustment has been made: to estimate the dividends payable during the first year of the investment the current annual dividends

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are multiplied by $1.0 + 0.5 \times \text{Dividend Growth Rate}$ (derived in Section VII-E Exhibit 2, Page 4)⁴.

To estimate the short-term dividend growth rate, Dr. Appel averaged the results from two different techniques, one called the “growth forecast” method, and the other termed “fundamental analysis”. The first, “growth forecast” method, relies on estimates of growth based on historical earnings and dividend data along with analysts’ forecasts of growth in these variables. The second, “fundamental analysis” relies on estimating a firm’s sustainable growth based on the rate at which it retains and reinvests earnings. For each of these approaches, Dr. Appel relied on long term (i.e., ten-year) and short term (five-year) historical information, along with Value Line analysts’ forecasts and Yahoo forecasts. When calculating the expected growth rate, Dr. Appel averaged the results based on these three data sources.

It is appropriate to assume that when evaluating future growth prospects, investors will consider all available information in forming their estimates. This suggests that historical growth in dividends and earnings per share will be of some significance in forming expectations about future growth. At the same time, analysts are an important source of information for investors, and their estimates of future growth are followed closely by the investment community.

As regards fundamental analysis, the premise is that sustainable growth in the future can arise from two sources: retained earnings and issuance of new stock at prices

⁴ Stock dividends are generally paid quarterly but increased only once a year; thus, depending on the timing, a company’s dividend may be increased in the current quarter, or up to four quarters in the future. The growth rate is multiplied by 0.5 year to account for the fact that on average, across a large sample of companies, dividends will be increased approximately one half year in the future.

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different than book value. In the first case, retained earnings can be reinvested to produce earnings, which will be used to pay higher dividends in the future. In the second case, the proceeds from the sale of stock at prices above book value can also be used for new investment, and the profits ultimately will be used to pay higher dividends in the future. Thus, the fundamental analysis computes the expected growth rate as the sum of the earnings retained as a percentage of common equity and a stock issuance adjustment factor, as follows:

$$g = (b \times r) + (s \times v)$$

where: b = retention ratio (retained earnings/profit)

r = return on equity

s = fraction of shares to be issued

v = (market/book) - 1.

The results of the DCF analysis calculating the short-term dividend growth rate for the sample of property/casualty insurers are contained in summary form in section VII-E, Exhibit 2, Page 4 of the filing, with the details of the calculations contained in Exhibit 2, Page 5.

The long-term dividend growth rate that applies in perpetuity starting in year 10 is calculated in two steps. Using data from Bureau of Economic Analysis, Dr. Appel first estimated the growth rate in real gross domestic product (real GDP) for the period 1929-2016. Second, he multiplied this by the rate of expected inflation, calculated by the spread

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between the yield on 10-year treasury notes and 10-year treasury inflation indexed securities. The resultant long-term rate of dividend growth equals 5.26% as shown in Section VII-E, Exhibit 2, Page2.

Stage 2 is applied to years 6 through 9 and is a linear interpolation between dividend growth rates in stage 1 and stage 3. Using a dividend yield of 2.05% the required rate of return (k) in this three-stage DCF model is equal to 7.62%.

The three-stage dividend growth model produces a lower cost of equity and as a result a lower indicated underwriting profit than the one-stage model used in prior filings. Had we used the one-stage dividend growth model, the DCF cost of capital would have been 2.44% higher, which would have resulted in a 1.9% higher profit provision, and a 2.2% higher rate than is indicated in this filing.

Turning now to the CAPM, the model begins with the assumption that there is a risk-free asset, which is typically taken to be a U.S. Treasury security. It then estimates the relative risk of alternative securities, measured by their “beta,” to measure the "risk premium" investors require to hold the risky assets. This information is used in the following manner to estimate investors' required rate of return:

$$K = r_f + (\beta \times r_D)$$

where r_f is the risk-free yield, β is the beta coefficient, and r_D is the market risk premium. In this case, Dr. Appel relied on an average of three CAPM estimates, where the different

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estimates arise from the choices of short-, intermediate- or long-term Treasuries as the risk-free rate.

As regards the estimate of the beta coefficient for the representative sample of 92 property/casualty insurers, the beta coefficient for this sample of companies ranges from 0.22 to 2.17, and averages 0.89. This is shown on Section VII-E, Exhibit 3, Page 2.

Dr. Appel relied on three estimates of the risk-free yield, based on the yields on one-month US Treasury bills, 5-year US Treasury notes and 20-year US Treasury bonds, the standard choices for the riskless security used in practical applications of the CAPM. In implementing this model he chose to average the yields on these securities for the period from July through September 2017. This procedure obtains a representative estimate of current interest rates, and avoids any anomalous results that might arise due to unusual interest rate volatility. During this period the yields on one-month Treasury bills averaged 0.98%, while the yields on 5- and 20-year Treasuries averaged 1.82% and 2.58% respectively.

Combining the information concerning the recent yields on U.S. Treasury securities, beta coefficients for the property/casualty insurance industry, and the historical differential between risk-free and equity investments, Dr. Appel's best estimate of investors' required return on equity is 8.62%.

To illustrate this calculation, consider the results for the short term CAPM below:

$$K = r_f + (\beta \times r_d) , \text{ or}$$

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$$8.59\% = 0.98\% + (0.89 \times 8.52\%)$$

Each of the other calculations (i.e., the intermediate and long horizon CAPM's) is performed identically. The results from these three models are averaged to produce a 8.62% CAPM cost of capital.

Based on all this information, Dr. Appel's single best estimate of the cost of equity capital for property/casualty insurance is 8.12%, which is the average of the results from the DCF and CAPM analyses. However, because traditional estimates of beta fail to account for interest rate risk, the CAPM estimates of the cost of capital will be understated.

Finally, consistent with the 2003 Commissioner's decision, the WCRIBMA estimated the share of debt and equity in insurer capital structures, and estimate the cost of debt, so as to calculate a weighted average cost of capital for use in ratemaking.⁵ The details of these calculations are contained in Section VII-E, Exhibit 4 and Section VII-J, Exhibit 2, Page 3, line (12). As these exhibits show, debt accounts for approximately 22% of insurer capital, while common equity accounts for 78% of capital.

Given the equity cost, as shown above, of 8.12%, and the debt cost of 4.05%, the weighted average cost of capital is 7.23%, as shown below:

$$(22\% \times 4.05\%) + (78\% \times 8.12\%) = 7.23\%$$

⁵ It is typical in insurance regulation to use the cost of equity capital alone as the target return in ratemaking. Since the cost of debt is lower than the cost of equity, the weighted average cost of capital will be lower than the cost of equity alone, and hence the rate indication is lower as well.

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Section VII - E
Exhibit 1

Cost of Capital: Summary Exhibit for Property-Casualty Insurance Companies

(1) Discounted Cash Flow	7.62%
(2) Capital Asset Pricing Model	8.62%
(3) Equity Capital Cost	8.12%
(4) Debt Capital Cost	4.05%
(5) Capital Structure	
(a) Equity Capital Share	78%
(b) Debt Capital Share	22%
(6) Weighted Average Cost of Capital (WACC)	7.23%

Notes:

(1): Exhibit 2, page 1

(2): Exhibit 3, page 1

(3) = [(1) + (2)] / 2.0

(4): Section VII-J, Exhibit 2, page 3, line (17).

(5): Exhibit 4

(6) = [(3) x (5a)] + [(4) x (5b)]

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Cost of Capital Estimate Using Discounted Cash Flow (DCF) Analysis

$$V_0 = D_0 \sum_{t=1}^{\infty} \left(\frac{1 + g_t}{1 + k} \right)^t = D_1 \sum_{t=1}^{\infty} \frac{(1 + g_t)^{t-1}}{(1 + k)^t}$$

$$\frac{1}{V_0} = \sum_{t=1}^5 \frac{(1 + g_{ST})^{t-1}}{(1 + k)^t} + (1 + g_{ST})^4 \sum_{t=6}^9 \frac{\prod_{i=1}^{t-5} (1 + g_{IT_i})}{(1 + k)^t}$$

$$+ (1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4}) \sum_{t=10}^{\infty} \frac{(1 + g_{LT})^{t-9}}{(1 + k)^t}$$

	Time (t) (1)	Dividend Growth Rate (g) (2)	Discounted Dividends (3)
Stage 1	1	8.02%	
	2	8.02%	
	3	8.02%	
	4	8.02%	
	5	8.02%	4.68
Stage 2	6	7.47%	0.94
	7	6.91%	0.94
	8	6.36%	0.92
	9	5.81%	0.91
Stage 3	≥10	5.26%	40.50
(4) Total Discounted Dividends			48.88

(5) Dividend Yield Rate (D_1/V_0)

2.05%

(6) Cost of Capital (k)

7.62%

Notes:

(2): Stage 1 dividend growth rate is the short-term rate from Page 4.

Stage 2 dividend growth rate is a linear interpolation between dividend growth rate of stage 1 and stage 3.

Stage 3 dividend growth rate is the long-term rate from Page 2.

(3): Stage 1 = $(1.0 - [(1.0 + g_{ST}) / (1.0+k)]^5) / (k - g_{ST})$

Stage 2, Time 6 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT_1})] / (1.0 + k)^6$

Stage 2, Time 7 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT_1}) \times (1.0 + g_{IT_2})] / (1.0 + k)^7$

Stage 2, Time 8 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT_1}) \times (1.0 + g_{IT_2}) \times (1.0 + g_{IT_3})] / (1.0 + k)^8$

Stage 2, Time 9 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT_1}) \times (1.0 + g_{IT_2}) \times (1.0 + g_{IT_3}) \times (1.0 + g_{IT_4})] / (1.0 + k)^9$

Stage 3 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT_1}) \times (1.0 + g_{IT_2}) \times (1.0 + g_{IT_3}) \times (1.0 + g_{IT_4}) \times (1.0 + g_{LT})] / [(k - g_{LT}) \times (1.0 + k)^9]$

(5): Page 5

(6): Cost of Capital is calculated using excel function so that $[1.0 / (5)] - (4) = 0$.

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Section VII - E
 Exhibit 2
 Page 2

Discounted Cash Flow (DCF) Analysis: Long-Term Dividend Growth Rate

Years (1)	Real Gross Domestic Product (2)	Real Gross Domestic Product Percent Change (3)
1929	1,056.6	
1930	966.7	-8.51%
1931	904.8	-6.40%
1932	788.2	-12.89%
1933	778.3	-1.26%
1934	862.2	10.78%
1935	939.0	8.91%
1936	1,060.5	12.94%
1937	1,114.6	5.10%
1938	1,077.7	-3.31%
1939	1,163.6	7.97%
1940	1,266.1	8.81%
1941	1,490.3	17.71%
1942	1,771.8	18.89%
1943	2,073.7	17.04%
1944	2,239.4	7.99%
1945	2,217.8	-0.96%
1946	1,960.9	-11.58%
1947	1,939.4	-1.10%
1948	2,020.0	4.16%
1949	2,008.9	-0.55%
1950	2,184.0	8.72%
1951	2,360.0	8.06%
1952	2,456.1	4.07%
1953	2,571.4	4.69%
1954	2,556.9	-0.56%
1955	2,739.0	7.12%
1956	2,797.4	2.13%
1957	2,856.3	2.11%
1958	2,835.3	-0.74%
1959	3,031.0	6.90%
1960	3,108.7	2.56%
1961	3,188.1	2.55%
1962	3,383.1	6.12%
1963	3,530.4	4.35%
1964	3,734.0	5.77%
1965	3,976.7	6.50%
1966	4,238.9	6.59%
1967	4,355.2	2.74%
1968	4,569.0	4.91%
1969	4,712.5	3.14%
1970	4,722.0	0.20%
1971	4,877.6	3.30%
1972	5,134.3	5.26%
1973	5,424.1	5.64%
1974	5,396.0	-0.52%
1975	5,385.4	-0.20%
1976	5,675.4	5.38%
1977	5,937.0	4.61%
1978	6,267.2	5.56%
1979	6,466.2	3.18%

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Discounted Cash Flow (DCF) Analysis: Long-Term Dividend Growth Rate

Years (1)	Real Gross Domestic Product (2)	Real Gross Domestic Product Percent Change (3)
1980	6,450.4	-0.24%
1981	6,617.7	2.59%
1982	6,491.3	-1.91%
1983	6,792.0	4.63%
1984	7,285.0	7.26%
1985	7,593.8	4.24%
1986	7,860.5	3.51%
1987	8,132.6	3.46%
1988	8,474.5	4.20%
1989	8,786.4	3.68%
1990	8,955.0	1.92%
1991	8,948.4	-0.07%
1992	9,266.6	3.56%
1993	9,521.0	2.75%
1994	9,905.4	4.04%
1995	10,174.8	2.72%
1996	10,561.0	3.80%
1997	11,034.9	4.49%
1998	11,525.9	4.45%
1999	12,065.9	4.69%
2000	12,559.7	4.09%
2001	12,682.2	0.98%
2002	12,908.8	1.79%
2003	13,271.1	2.81%
2004	13,773.5	3.79%
2005	14,234.2	3.34%
2006	14,613.8	2.67%
2007	14,873.7	1.78%
2008	14,830.4	-0.29%
2009	14,418.7	-2.78%
2010	14,783.8	2.53%
2011	15,020.6	1.60%
2012	15,354.6	2.22%
2013	15,612.2	1.68%
2014	16,013.3	2.57%
2015	16,471.5	2.86%
2016	16,716.2	1.49%
(4) Average		3.34%
(5) Rate of Expected Inflation		1.86%
(6) Long-Term Dividend Growth Rate		5.26%

Notes:

(2): Bureau of Economic Analysis, Table 1.1.6.

(3) = $[(2)_t / (2)_{t-1}] - 1.0$

(5): Page 3

(6) = $\{ [1.0 + (4)] \times [1.0 + (5)] \} - 1.0$

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Discounted Cash Flow (DCF) Analysis: Long-Term Dividend Growth Rate Rate of Expected Inflation

Time Period (1)	Market yield on U.S. Treasury Securities at 10-year Constant Maturity (2)	Inflation Indexed Market yield on U.S. Treasury Securities at 10-year Constant Maturity (3)	Rate of Expected Inflation (4) = (2) - (3)
2016-10	1.76	0.1	1.66
2016-11	2.14	0.32	1.82
2016-12	2.49	0.56	1.93
2017-01	2.43	0.42	2.01
2017-02	2.42	0.4	2.02
2017-03	2.48	0.49	1.99
2017-04	2.3	0.39	1.91
2017-05	2.3	0.47	1.83
2017-06	2.19	0.46	1.73
2017-07	2.32	0.55	1.77
2017-08	2.21	0.43	1.78
2017-09	2.2	0.37	1.83
Average			1.86%

Source: Federal Reserve Statistical Release, H.15.

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Discounted Cash Flow (DCF) Analysis: Short-Term Dividend Growth Rate

(1) Growth Forecast { = [(a) + (b)] / 2.0 }	7.60
(a) Dividend Component	7.08
(b) Earnings Component	8.12
(2) Fundamental Analysis [= (a) + (b)]	8.43
(a) Retention to book	8.55
(b) Stock issuance factor	-0.12
(3) Short-Term Dividend Growth Rate { = [(1) + (2)] / 2.0 }	8.02

Notes:

- (1a): Page 5, average of columns (3) through (5)
- (1b): Page 5, average of columns (6) through (8)
- (2a): Page 5, average of columns (9) through (11)
- (2b): Page 5, column (15)

Discounted Cash Flow (DCF) Analysis: Parameter Estimation

Property/Casualty Insurance Companies (1)	Dividend Yield (2)	Average Dividend Growth Rate			Average Earnings Growth Rate			Average Earnings Retention Rates Retained Earnings as a Percent of Common Equity			Stock Issuance Adjustment Factor			
		Annual Rate of Change			Annual Rate of Change						2017	2020 - 2022	2020 - 2022	Stock Issuance
		Past 10 Years (3)	Past 5 Years (4)	Forecast (5)	Past 10 Years (6)	Past 5 Years (7)	Forecast (8)	Past 10 Years (9)	Past 5 Years (10)	Forecast (11)	Shares (12)	Shares (13)	Market/ Book (14)	Adjustment Factor (15)
1347 PROPERTY INS HLDGS INC	0.00	NA	NA	NA	NA	NA	NA	7.31	7.31	NA	NA	NA	NA	NA
ACMAT CORP -CL A	0.00	NA	NA	NA	-10.40	NA	NA	3.57	2.82	NA	NA	NA	NA	NA
ALLEGHANY CORP	0.00	NA	NA	0.00	NA	16.00	4.50	6.12	6.82	6.50	16.00	16.00	0.98	0.00
ALLIANZ SE -ADR	3.84	13.48	7.35	NA	1.03	5.55	5.93	6.14	5.72	NA	NA	NA	NA	NA
ALLSTATE CORP	1.60	NA	6.50	5.00	1.00	15.00	7.50	8.14	9.15	8.00	360.00	360.00	1.35	0.00
AMERICAN FINANCIAL GROUP INC	1.40	10.50	11.50	8.50	11.00	3.50	8.00	9.27	7.40	7.50	87.00	86.00	1.10	-0.03
AMERICAN INTERNATIONAL GROUP	2.17	NA	NA	NA	-31.30	1.28	154.04	8.98	4.98	NA	NA	NA	NA	NA
AMERICAN NATIONAL INSURANCE	2.89	0.59	0.51	NA	-1.43	13.47	NA	3.19	3.31	NA	NA	NA	NA	NA
AMERICAN OVERSEAS GROUP LTD	0.00	NA	NA	NA	-4.48	6.43	NA	26.83	37.47	NA	NA	NA	NA	NA
AMERISAFE INC	1.56	NA	NA	NA	14.10	15.00	10.00	10.16	5.52	NA	NA	NA	NA	NA
AMTRUST FINANCIAL SERVICES	5.40	52.00	35.50	7.50	21.50	22.50	5.00	16.82	15.76	9.00	195.00	195.00	1.17	0.00
ARCH CAPITAL GROUP LTD	0.00	NA	NA	0.00	6.50	6.50	9.00	13.14	10.64	8.50	130.00	130.00	1.13	0.00
ARGO GROUP INTL HOLDINGS LTD	1.83	NA	18.80	NA	5.39	42.53	7.00	6.48	7.19	NA	NA	NA	NA	NA
ASPEN INSURANCE HOLDINGS LTD	2.47	6.51	6.62	NA	11.34	9.98	18.15	7.33	6.18	NA	NA	NA	NA	NA
ASSURANT INC	2.31	17.36	18.36	NA	4.28	8.52	19.40	8.23	7.19	NA	NA	NA	NA	NA
ASSURED GUARANTY LTD	1.57	16.23	21.67	NA	10.82	21.42	3.00	10.49	12.29	NA	NA	NA	NA	NA
ATLANTIC AMERICAN CORP	0.64	NA	-14.10	NA	5.03	30.39	NA	4.22	4.02	NA	NA	NA	NA	NA
ATLAS FINANCIAL HOLDINGS INC	0.00	NA	NA	NA	NA	NA	NA	7.73	7.73	NA	NA	NA	NA	NA
AVIVA PLC -ADR	4.48	NA	-8.44	NA	NA	-4.98	NA	9.13	10.78	NA	NA	NA	NA	NA
AXA -ADR	4.35	1.41	3.99	NA	-0.55	6.77	6.80	4.56	4.38	NA	NA	NA	NA	NA
AXIS CAPITAL HOLDINGS LTD	2.76	8.14	7.60	NA	7.21	14.98	4.96	10.45	9.35	NA	NA	NA	NA	NA
BALDWIN & LYONS -CL B	5.10	-5.84	0.50	NA	-2.32	14.00	8.00	4.81	3.94	NA	NA	NA	NA	NA
BERKLEY (W R) CORP	0.80	13.00	11.00	4.50	2.50	8.00	7.00	10.22	8.34	9.00	121.00	120.00	1.30	-0.06
BERKSHIRE HATHAWAY	0.00	NA	NA	0.00	24.00	25.00	9.00	7.68	8.26	8.00	2450.00	2450.00	1.35	0.00
BLUE CAP REINSURANCE	11.32	NA	NA	NA	NA	NA	7.85	3.86	3.86	NA	NA	NA	NA	NA
CHUBB LTD	2.00	11.50	15.50	4.50	10.50	4.00	8.00	9.86	7.64	8.00	460.00	400.00	1.05	-0.17
CINCINNATI FINANCIAL CORP	2.60	6.50	4.00	3.00	1.00	12.00	6.50	3.09	3.18	4.50	164.00	164.00	1.44	0.00
CITIZENS INC	0.00	NA	NA	NA	NA	NA	NA	4.57	1.49	NA	NA	NA	NA	NA
CNA FINANCIAL CORP	2.40	NA	NA	4.50	2.00	0.50	11.00	5.60	4.26	6.00	270.00	270.00	1.10	0.00
DONEGAL GROUP INC	3.64	6.38	3.50	NA	-5.18	14.50	10.00	2.92	2.32	NA	NA	NA	NA	NA
EMC INSURANCE GROUP INC	3.10	5.41	7.25	NA	1.17	10.07	5.00	6.90	5.94	NA	NA	NA	NA	NA
EMPLOYERS HOLDINGS INC	1.46	NA	3.00	NA	1.38	15.00	10.00	14.76	12.92	NA	NA	NA	NA	NA
ENSTAR GROUP LTD	0.00	NA	NA	NA	11.58	1.45	10.00	12.34	10.03	NA	NA	NA	NA	NA
ERIE INDEMNITY CO -CL A	2.60	NA	NA	4.00	NA	NA	11.00	7.50	7.50	13.00	46.00	45.00	NA	NA
ESSENT GROUP LTD	0.00	NA	NA	NA	NA	NA	17.29	12.28	12.28	NA	NA	NA	NA	NA
EVEREST RE GROUP LTD	2.28	23.51	15.62	NA	14.96	26.16	-1.45	11.74	12.39	NA	NA	NA	NA	NA
FAIRFAX FINANCIAL HOLDINGS	2.00	21.73	1.39	NA	NA	2.14	0.60	12.72	7.71	NA	NA	NA	NA	NA
FEDERATED NATIONAL HLDG CO	2.13	NA	NA	NA	18.84	NA	20.00	14.25	13.03	NA	NA	NA	NA	NA
FIRST ACCEPTANCE CORP	0.00	NA	NA	NA	NA	-49.60	NA	14.05	19.09	NA	NA	NA	NA	NA
FIRST AMERICAN FINANCIAL CP	3.16	NA	40.51	NA	NA	20.37	7.30	5.74	7.11	NA	NA	NA	NA	NA
GENWORTH FINANCIAL INC	0.00	NA	NA	NA	NA	48.19	5.00	3.09	2.92	NA	NA	NA	NA	NA
GLOBAL INDEMNITY LTD	0.00	NA	NA	NA	-4.23	9.50	10.00	7.50	6.00	NA	NA	NA	NA	NA
GREENLIGHT CAPITAL RE LTD	0.00	NA	NA	NA	NA	NA	10.00	10.73	9.44	NA	NA	NA	NA	NA
HALLMARK FINANCIAL SERVICES	0.00	NA	NA	NA	-0.50	16.50	4.10	6.40	4.24	NA	NA	NA	NA	NA
HANOVER INSURANCE GROUP INC	2.00	NA	15.50	7.50	11.00	9.50	10.00	6.45	5.78	7.00	42.50	42.50	1.07	0.00
HARTFORD FINANCIAL SERVICES	1.73	-5.38	23.52	NA	-8.96	68.11	10.56	5.93	4.61	NA	NA	NA	NA	NA
HCI GROUP INC	3.64	NA	41.00	NA	NA	31.00	25.00	21.26	22.24	NA	NA	NA	NA	NA
HERITAGE INSURANCE HOLDINGS	1.89	NA	NA	NA	NA	NA	NA	22.93	22.93	NA	NA	NA	NA	NA
HORACE MANN EDUCATORS CORP	2.91	8.99	23.27	NA	2.73	4.07	12.70	6.23	5.12	NA	NA	NA	NA	NA
INFINITY PROPERTY & CAS CORP	2.60	21.30	24.50	NA	-0.46	-3.00	9.00	5.98	3.66	NA	NA	NA	NA	NA
JAMES RIVER GROUP HLDGS LTD	3.12	NA	NA	NA	NA	NA	NA	8.55	8.55	NA	NA	NA	NA	NA
KEMPER CORP/DE	1.88	-5.59	-0.21	NA	-10.10	-10.50	10.00	3.95	3.72	NA	NA	NA	NA	NA
KINGSTONE COS INC	2.04	NA	24.74	NA	13.63	0.96	NA	13.54	7.90	NA	NA	NA	NA	NA
KINGSWAY FINANCIAL SVCS INC	0.00	NA	NA	NA	NA	-37.00	10.00	2.04	2.04	NA	NA	NA	NA	NA
LOEWS CORP	0.54	1.65	0.00	NA	-3.49	-6.01	5.94	6.94	2.33	NA	NA	NA	NA	NA
MAIDEN HOLDINGS LTD	7.85	NA	14.01	NA	NA	2.55	12.00	4.92	5.60	NA	NA	NA	NA	NA
MARKEL CORP	0.00	NA	NA	0.00	6.00	-0.50	7.00	6.78	4.72	5.50	14.00	14.00	1.38	0.00
MBIA INC	0.00	NA	NA	NA	-22.80	NA	10.00	15.22	16.46	NA	NA	NA	NA	NA
MERCURY GENERAL CORP	4.30	5.00	1.00	2.50	-6.00	-2.00	14.00	3.27	NA	4.50	55.00	55.00	1.62	0.00
MGIC INVESTMENT CORP/WI	0.00	NA	NA	NA	-14.20	NA	7.64	30.05	30.05	NA	NA	NA	NA	NA
NATIONAL GENERAL HOLDINGS CP	0.94	NA	NA	NA	NA	NA	15.00	9.65	9.65	NA	NA	NA	NA	NA

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Discounted Cash Flow (DCF) Analysis: Parameter Estimation

Property/Casualty Insurance Companies (1)	Dividend Yield (2)	Average Dividend Growth Rate			Average Earnings Growth Rate			Average Earnings Retention Rates Retained Earnings as a Percent of Common Equity			Stock Issuance Adjustment Factor			
		Annual Rate of Change			Annual Rate of Change						2017	2020 - 2022	2020 - 2022	Stock Issuance
		Past 10 Years (3)	Past 5 Years (4)	Forecast (5)	Past 10 Years (6)	Past 5 Years (7)	Forecast (8)	Past 10 Years (9)	Past 5 Years (10)	Forecast (11)	Shares (12)	Shares (13)	Market/ Book (14)	Adjustment Factor (15)
NATIONAL SEC GROUP INC	1.65	-15.90	-23.50	NA	5.44	43.14	NA	9.56	12.07	NA	NA	NA	NA	NA
NAVIGATORS GROUP INC	0.42	NA	NA	NA	7.14	13.00	8.00	7.91	7.54	NA	NA	NA	NA	NA
NMI HOLDINGS INC	0.00	NA	NA	NA	NA	NA	15.92	13.79	13.79	NA	NA	NA	NA	NA
OLD REPUBLIC INTL CORP	4.00	4.00	1.50	3.50	-4.50	NA	9.00	3.36	3.75	5.00	264.00	265.00	1.25	0.02
ONEBEACON INSURANCE GROUP	4.78	NA	NA	NA	-12.30	-18.50	-5.40	5.83	3.47	NA	NA	NA	NA	NA
OXBRIDGE RE HOLDINGS LTD	12.80	NA	NA	NA	NA	NA	NA	5.41	5.41	NA	NA	NA	NA	NA
PROASSURANCE CORP	2.39	NA	NA	NA	6.71	-6.50	27.25	10.19	6.85	NA	NA	NA	NA	NA
PROGRESSIVE CORP-OHIO	2.00	37.00	16.50	8.00	NA	4.50	8.00	12.97	9.52	11.50	580.00	570.00	2.35	-0.59
RADIAN GROUP INC	0.06	-18.80	0.00	NA	-7.94	NA	9.14	23.30	22.58	NA	NA	NA	NA	NA
RENAISSANCERE HOLDINGS LTD	0.98	4.14	3.71	NA	14.73	7.64	7.98	15.84	13.06	NA	NA	NA	NA	NA
RLI CORP	1.60	9.00	5.50	4.00	3.00	-1.50	6.50	10.70	8.90	7.00	43.00	35.00	1.45	-2.26
SAFETY INSURANCE GROUP INC	4.06	15.75	8.50	NA	-7.53	-2.00	15.00	5.15	3.28	NA	NA	NA	NA	NA
SCOR SE -ADR	4.48	4.25	5.48	NA	0.70	4.61	NA	5.56	5.32	NA	NA	NA	NA	NA
SELECTIVE INS GROUP INC	1.30	4.50	1.00	5.50	2.50	9.50	6.50	6.07	6.08	8.00	58.00	65.00	1.29	0.84
STATE AUTO FINANCIAL CORP	1.66	3.88	-8.00	NA	-6.70	NA	8.00	5.18	5.13	NA	NA	NA	NA	NA
STATE NATIONAL COS INC	1.14	NA	NA	NA	NA	NA	NA	13.90	13.90	NA	NA	NA	NA	NA
SWISS RE LTD -ADR	5.61	NA	NA	NA	4.36	22.66	NA	5.74	5.53	NA	NA	NA	NA	NA
THIRD POINT REINSURANCE LTD	0.00	NA	NA	NA	NA	NA	15.00	8.30	8.30	NA	NA	NA	NA	NA
TIPTREE INC	2.00	NA	NA	NA	NA	NA	NA	6.63	4.42	NA	NA	NA	NA	NA
TOKIO MARINE HOLDINGS -ADR	3.29	14.82	10.73	NA	10.34	24.88	NA	4.14	4.84	NA	NA	NA	NA	NA
TRAVELERS COS INC	2.30	9.50	10.50	4.00	11.50	14.50	1.00	9.78	10.18	7.50	275.00	275.00	1.30	0.00
TRIPLE-S MANAGEMENT CORP	0.00	NA	NA	NA	1.60	-4.93	10.00	7.89	6.01	NA	NA	NA	NA	NA
UNICO AMERICAN CORP	0.00	NA	NA	NA	NA	NA	NA	4.19	1.05	NA	NA	NA	NA	NA
UNITED FIRE GROUP INC	2.70	6.47	7.50	NA	NA	NA	10.00	6.19	5.22	NA	NA	NA	NA	NA
UNITED INSURANCE HOLDINGS CO	1.56	NA	18.50	NA	NA	27.50	20.00	10.61	11.08	NA	NA	NA	NA	NA
UNIVERSAL INSURANCE HLDGS	2.60	10.85	6.00	NA	28.88	30.00	NA	22.65	21.86	NA	NA	NA	NA	NA
VALIDUS HOLDINGS LTD	3.21	NA	7.68	NA	6.27	1.61	-4.42	10.71	7.21	NA	NA	NA	NA	NA
VOYA FINANCIAL INC	0.10	NA	NA	NA	NA	48.84	17.90	6.27	6.27	NA	NA	NA	NA	NA
WHITE MTNS INS GROUP LTD	0.10	-15.90	NA	NA	-2.49	16.50	-7.70	6.89	8.06	NA	NA	NA	NA	NA
WMIH CORP	0.00	NA	NA	NA	NA	NA	NA	32.87	32.87	NA	NA	NA	NA	NA
XL GROUP LTD	2.10	-10.50	NA	9.00	NA	1.50	13.00	7.62	5.78	7.50	250.00	250.00	0.76	0.00
Average	2.05	7.63	9.33	4.28	2.55	10.55	11.27	9.34	8.73	7.58				-0.12

Notes:

Sources: Value Line Investment Survey (VLIS), Part 3, The Ratings & Reports, September 8, 2017
 Value Line Investment Survey, Part 2, Small and Mid Cap Edition, September 1, 2017
 Compustat Database (Version as of September 29, 2017)
<http://finance.yahoo.com> (data available in September 2017)

(2): The dividend yields needed for the DCF Analysis relate dividends at time 1, D_1 , to stock prices at time 0, P_0 . Dividend yields from Compustat and VLIS, Small and Mid Cap Edition, must be adjusted because they are derived from the ratio of dividends at time 0, D_0 , to stock price at time zero, P_0 . D_1 is estimated from D_0 as follows:

$$D_1 = D_0 \times [1.0 + (0.5 \times \text{Dividend Growth Rate})] \quad \text{where Dividend Growth Rate} = 8.02\% \text{ from Page 4.}$$

(11) - (14): Data available only at Value Line Investment Survey, Part 3.

(12), (13): in millions.

(15) = $[(14) - 1.0] \times \{ [(13) / (12)]^t - 1.0 \} \times 100$, where t is 0.25 for the years between midyear 2017 and midyear 2021.

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Cost of Capital Estimate Using Capital Asset Pricing Model Analysis

$$\text{Cost of Capital: } K = r_f + (\beta \times r_d)$$

Time Horizon (1)	Risk-Free Yield (r_f) (2)	Market Risk Premium (r_d) (3)	Beta Coefficient (β) (4)	Estimated Cost of Capital (K) (5)
Short-Term	0.98	8.52	0.89	8.59
Intermediate-Term	1.82	7.51	0.89	8.52
Long-Term	2.58	6.93	0.89	8.77
Average	1.79	7.66	0.89	8.62

Notes:

(2): Section VII-J, Exhibit 2, page 3

Short-Term = average yield on 1-month U.S. Treasury Constant Maturities (line (2))

Intermediate-Term = average yield on 5-year U.S. Treasury (line (8))

Long-Term = average yield on 20-year U.S. Treasury (line (11))

(3): Section VII-J, Exhibit 4

Short-Term = S&P 500 total returns minus U.S. Treasury Bill total returns

Intermediate-Term = S&P 500 total returns minus Intermediate-Term Government Bonds income returns

Long-Term = S&P 500 total returns minus Long-Term Government Bonds income returns

(4): Average Beta Coefficient (Page 2).

(5) = (2) + [(4) x (3)]

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Capital Asset Pricing Model - Beta Coefficient

<u>Property/Casualty Insurance Companies</u>	<u>Beta Coefficients</u>
1347 PROPERTY INS HLDGS INC	0.55
ACMAT CORP -CL A	0.44
ALLEGHANY CORP	0.90
ALLIANZ SE -ADR	1.08
ALLSTATE CORP	0.85
AMERICAN FINANCIAL GROUP INC	0.90
AMERICAN INTERNATIONAL GROUP	1.13
AMERICAN NATIONAL INSURANCE	1.26
AMERICAN OVERSEAS GROUP LTD	0.22
AMERISAFE INC	0.95
AMTRUST FINANCIAL SERVICES	0.95
ARCH CAPITAL GROUP LTD	0.70
ARGO GROUP INTL HOLDINGS LTD	0.88
ASPEN INSURANCE HOLDINGS LTD	0.82
ASSURANT INC	0.88
ASSURED GUARANTY LTD	1.44
ATLANTIC AMERICAN CORP	0.60
ATLAS FINANCIAL HOLDINGS INC	0.75
AVIVA PLC -ADR	0.93
AXA -ADR	1.06
AXIS CAPITAL HOLDINGS LTD	0.75
BALDWIN & LYONS -CL B	0.55
BERKLEY (W R) CORP	0.80
BERKSHIRE HATHAWAY	0.90
BLUE CAP REINSURANCE	0.42
CHUBB LTD	0.85
CINCINNATI FINANCIAL CORP	0.90
CITIZENS INC	1.08
CNA FINANCIAL CORP	1.00
DONEGAL GROUP INC	0.35
EMC INSURANCE GROUP INC	0.97
EMPLOYERS HOLDINGS INC	1.05
ENSTAR GROUP LTD	0.91
ERIE INDEMNITY CO -CL A	0.80
ESSENT GROUP LTD	0.90
EVEREST RE GROUP LTD	0.77
FAIRFAX FINANCIAL HOLDINGS	0.61
FEDERATED NATIONAL HLDG CO	1.42
FIRST ACCEPTANCE CORP	0.89
FIRST AMERICAN FINANCIAL CP	0.82
GENWORTH FINANCIAL INC	2.17
GLOBAL INDEMNITY LTD	0.75
GREENLIGHT CAPITAL RE LTD	0.85

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Section VII - Profit
Subsection E - Cost of Capital
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Exhibit 3
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Capital Asset Pricing Model - Beta Coefficient

<u>Property/Casualty Insurance Companies</u>	<u>Beta Coefficients</u>
HALLMARK FINANCIAL SERVICES	0.85
HANOVER INSURANCE GROUP INC	0.95
HARTFORD FINANCIAL SERVICES	0.96
HCI GROUP INC	1.30
HERITAGE INSURANCE HOLDINGS	1.25
HORACE MANN EDUCATORS CORP	1.08
INFINITY PROPERTY & CAS CORP	0.75
JAMES RIVER GROUP HLDGS LTD	0.75
KEMPER CORP/DE	1.09
KINGSTONE COS INC	0.86
KINGSWAY FINANCIAL SVCS INC	0.56
LOEWS CORP	0.83
MAIDEN HOLDINGS LTD	1.22
MARKEL CORP	0.80
MBIA INC	1.99
MERCURY GENERAL CORP	0.80
MGIC INVESTMENT CORP/WI	1.81
NATIONAL GENERAL HOLDINGS CP	0.90
NATIONAL SEC GROUP INC	0.43
NAVIGATORS GROUP INC	0.80
NMI HOLDINGS INC	0.81
OLD REPUBLIC INTL CORP	1.05
ONEBEACON INSURANCE GROUP	0.80
OXBRIDGE RE HOLDINGS LTD	0.22
PROASSURANCE CORP	0.70
PROGRESSIVE CORP-OHIO	0.85
RADIAN GROUP INC	1.36
RENAISSANCERE HOLDINGS LTD	0.79
RLI CORP	0.95
SAFETY INSURANCE GROUP INC	0.85
SCOR SE -ADR	0.83
SELECTIVE INS GROUP INC	0.95
STATE AUTO FINANCIAL CORP	0.95
STATE NATIONAL COS INC	0.75
SWISS RE LTD -ADR	0.73
THIRD POINT REINSURANCE LTD	1.18
TIPTREE INC	0.07
TOKIO MARINE HOLDINGS -ADR	0.78
TRAVELERS COS INC	0.85
TRIPLE-S MANAGEMENT CORP	0.62
UNICO AMERICAN CORP	0.35
UNITED FIRE GROUP INC	1.00
UNITED INSURANCE HOLDINGS CO	1.15

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Exhibit 3
Page 2

Capital Asset Pricing Model - Beta Coefficient

<u>Property/Casualty Insurance Companies</u>	<u>Beta Coefficients</u>
UNIVERSAL INSURANCE HLDGS	1.35
VALIDUS HOLDINGS LTD	0.79
VOYA FINANCIAL INC	1.43
WHITE MTNS INS GROUP LTD	0.60
WMIH CORP	0.72
XL GROUP LTD	0.90
Average	0.89

Notes:

Sources: Value Line Investment Survey (VLIS), Part 3, The Ratings & Reports, September 8, 2017
Value Line Investment Survey, Part 2, Small and Mid Cap Edition, September 1, 2017
Compustat Database (Version as of September 29, 2017)

If no information for a specific company in the above sources, use Yahoo Finance.

Betas from Compustat have been adjusted using the following equation:

$$\text{Adjusted Betas} = 0.35 + 0.67 \times \text{Compustat Betas}$$

Capital Structure Ratios of Property-Casualty Insurance Companies

Property/Casualty Insurance Companies (1)	Total Debt \$ in millions (2)	Preferred Stock \$ in millions (3)	Total Debt Capital =(2) + (3) (4)	Common Equity \$ in millions (5)	Equity Capital Share (6)	Debt Capital Share (7)
1347 PROPERTY INS HLDGS INC	2.7	0.0	2.7	46.4	0.94	0.06
ACMAT CORP -CL A	8.2	0.0	8.2	29.8	0.78	0.22
ALLEGHANY CORP	1,476.5	0.0	1,476.5	7,939.9	0.84	0.16
ALLIANZ SE -ADR	22,312.2	0.0	22,312.2	71,058.2	0.76	0.24
ALLSTATE CORP	6,347.0	0.0	6,347.0	20,573.0	0.76	0.24
AMERICAN FINANCIAL GROUP INC	2,218.0	0.0	2,218.0	4,916.0	0.69	0.31
AMERICAN INTERNATIONAL GROUP	30,912.0	0.0	30,912.0	76,300.0	0.71	0.29
AMERICAN NATIONAL INSURANCE	136.1	0.0	136.1	4,652.2	0.97	0.03
AMERICAN OVERSEAS GROUP LTD	29.4	0.0	29.4	62.1	0.68	0.32
AMERISAFE INC	0.2	0.0	0.2	456.2	1.00	0.00
AMTRUST FINANCIAL SERVICES	1,599.5	913.8	2,513.3	2,355.4	0.48	0.52
ARCH CAPITAL GROUP LTD	2,547.5	1,873.9	4,421.3	6,379.9	0.59	0.41
ARGO GROUP INTL HOLDINGS LTD	367.6	0.0	367.6	1,792.7	0.83	0.17
ASPEN INSURANCE HOLDINGS LTD	772.7	0.0	772.7	3,646.9	0.83	0.17
ASSURANT INC	1,067.0	0.0	1,067.0	4,098.1	0.79	0.21
ASSURED GUARANTY LTD	1,306.0	0.0	1,306.0	6,504.0	0.83	0.17
ATLANTIC AMERICAN CORP	33.7	0.1	33.8	105.5	0.76	0.24
ATLAS FINANCIAL HOLDINGS INC	19.2	0.0	19.2	127.3	0.87	0.13
AVIVA PLC -ADR	14,774.8	246.7	15,021.5	20,729.9	0.58	0.42
AXA -ADR	12,790.1	0.0	12,790.1	74,494.0	0.85	0.15
AXIS CAPITAL HOLDINGS LTD	993.0	1,126.1	2,119.0	5,146.3	0.71	0.29
BALDWIN & LYONS -CL B	20.0	0.0	20.0	404.3	0.95	0.05
BERKLEY (W R) CORP	2,539.4	0.0	2,539.4	5,047.2	0.67	0.33
BERKSHIRE HATHAWAY	101,644.0	0.0	101,644.0	283,001.0	0.74	0.26
BLUE CAP REINSURANCE	0.0	0.0	0.0	183.3	1.00	0.00
CHUBB LTD	14,821.0	0.0	14,821.0	48,275.0	0.77	0.23
CINCINNATI FINANCIAL CORP	846.0	0.0	846.0	7,060.0	0.89	0.11
CITIZENS INC	0.0	0.0	0.0	249.1	1.00	0.00
CNA FINANCIAL CORP	2,710.0	0.0	2,710.0	11,969.0	0.82	0.18
DONEGAL GROUP INC	74.0	0.0	74.0	438.6	0.86	0.14
EMC INSURANCE GROUP INC	25.0	0.0	25.0	553.3	0.96	0.04
EMPLOYERS HOLDINGS INC	32.0	0.0	32.0	840.6	0.96	0.04
ENSTAR GROUP LTD	673.6	0.4	674.0	2,801.9	0.81	0.19
ERIE INDEMNITY CO -CL A	24,766.0	0.0	24,766.0	816,910.0	0.97	0.03
ESSENT GROUP LTD	100.0	0.0	100.0	1,343.8	0.93	0.07

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Capital Structure Ratios of Property-Casualty Insurance Companies

Property/Casualty Insurance Companies (1)	Total Debt \$ in millions (2)	Preferred Stock \$ in millions (3)	Total Debt Capital =(2) + (3) (4)	Common Equity \$ in millions (5)	Equity Capital Share (6)	Debt Capital Share (7)
EVEREST RE GROUP LTD	633.2	0.0	633.2	8,075.4	0.93	0.07
FAIRFAX FINANCIAL HOLDINGS	4,767.6	1,335.5	6,103.1	8,484.6	0.58	0.42
FEDERATED NATIONAL HLDG CO	4.9	0.0	4.9	219.1	0.98	0.02
FIRST ACCEPTANCE CORP	70.1	0.0	70.1	72.5	0.51	0.49
FIRST AMERICAN FINANCIAL CP	736.7	0.0	736.7	3,008.2	0.80	0.20
GENWORTH FINANCIAL INC	4,639.0	0.0	4,639.0	12,644.0	0.73	0.27
GLOBAL INDEMNITY LTD	163.1	0.0	163.1	798.0	0.83	0.17
GREENLIGHT CAPITAL RE LTD	0.0	0.0	0.0	874.2	1.00	0.00
HALLMARK FINANCIAL SERVICES	85.7	0.0	85.7	265.7	0.76	0.24
HANOVER INSURANCE GROUP INC	786.4	0.0	786.4	2,857.5	0.78	0.22
HARTFORD FINANCIAL SERVICES	5,293.0	0.0	5,293.0	16,903.0	0.76	0.24
HCI GROUP INC	148.3	0.0	148.3	243.7	0.62	0.38
HERITAGE INSURANCE HOLDINGS	72.9	0.0	72.9	358.0	0.83	0.17
HORACE MANN EDUCATORS CORP	247.2	0.0	247.2	1,294.0	0.84	0.16
INFINITY PROPERTY & CAS CORP	276.3	0.0	276.3	699.2	0.72	0.28
JAMES RIVER GROUP HLDGS LTD	222.2	0.0	222.2	693.2	0.76	0.24
KEMPER CORP/DE	752.3	0.0	752.3	1,975.2	0.72	0.28
KINGSTONE COS INC	0.0	0.0	0.0	56.7	1.00	0.00
KINGSWAY FINANCIAL SVCS INC	238.8	6.4	245.2	56.0	0.19	0.81
LOEWS CORP	10,778.0	0.0	10,778.0	18,163.0	0.63	0.37
MAIDEN HOLDINGS LTD	351.4	315.0	666.4	1,045.8	0.61	0.39
MARKEL CORP	2,574.5	0.0	2,574.5	8,460.9	0.77	0.23
MBIA INC	5,015.0	0.0	5,015.0	3,227.0	0.39	0.61
MERCURY GENERAL CORP	320.0	0.0	320.0	1,752.4	0.85	0.15
MGIC INVESTMENT CORP/WI	1,178.7	0.0	1,178.7	2,548.8	0.68	0.32
NATIONAL GENERAL HOLDINGS CP	843.3	420.0	1,263.3	1,473.6	0.54	0.46
NATIONAL SEC GROUP INC	17.1	0.0	17.1	48.1	0.74	0.26
NAVIGATORS GROUP INC	263.7	0.0	263.7	1,178.2	0.82	0.18
NMI HOLDINGS INC	144.4	0.0	144.4	477.3	0.77	0.23
OLD REPUBLIC INTL CORP	1,528.7	0.0	1,528.7	4,471.6	0.75	0.25
ONEBEACON INSURANCE GROUP	273.2	0.0	273.2	1,021.3	0.79	0.21
OXBRIDGE RE HOLDINGS LTD	0.0	0.0	0.0	37.2	1.00	0.00
PROASSURANCE CORP	448.2	0.0	448.2	1,798.7	0.80	0.20
PROGRESSIVE CORP-OHIO	3,148.2	0.0	3,148.2	7,957.1	0.72	0.28
RADIAN GROUP INC	1,069.5	0.0	1,069.5	2,872.3	0.73	0.27

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Capital Structure Ratios of Property-Casualty Insurance Companies

Property/Casualty Insurance Companies (1)	Total Debt \$ in millions (2)	Preferred Stock \$ in millions (3)	Total Debt Capital =(2) + (3) (4)	Common Equity \$ in millions (5)	Equity Capital Share (6)	Debt Capital Share (7)
RENAISSANCERE HOLDINGS LTD	979.5	400.0	1,379.5	4,466.6	0.76	0.24
RLI CORP	148.7	0.0	148.7	823.6	0.85	0.15
SAFETY INSURANCE GROUP INC	0.0	0.0	0.0	670.7	1.00	0.00
SCOR SE -ADR	2,909.2	0.0	2,909.2	7,028.7	0.71	0.29
SELECTIVE INS GROUP INC	445.0	0.0	445.0	1,531.4	0.77	0.23
STATE AUTO FINANCIAL CORP	122.1	0.0	122.1	891.3	0.88	0.12
STATE NATIONAL COS INC	43.8	0.0	43.8	296.4	0.87	0.13
SWISS RE LTD -ADR	11,351.0	0.0	11,351.0	35,634.0	0.76	0.24
THIRD POINT REINSURANCE LTD	206.2	0.0	206.2	1,414.1	0.87	0.13
TIPTREE INC	1,705.0	0.0	1,705.0	293.4	0.15	0.85
TOKIO MARINE HOLDINGS -ADR	6,753.7	0.0	6,753.7	31,814.4	0.82	0.18
TRAVELERS COS INC	6,437.0	0.0	6,437.0	23,221.0	0.78	0.22
TRIPLE-S MANAGEMENT CORP	35.1	0.0	35.1	863.2	0.96	0.04
UNICO AMERICAN CORP	0.0	0.0	0.0	68.9	1.00	0.00
UNITED FIRE GROUP INC	0.0	0.0	0.0	941.9	1.00	0.00
UNITED INSURANCE HOLDINGS CO	54.2	0.0	54.2	241.3	0.82	0.18
UNIVERSAL INSURANCE HLDGS	15.0	0.0	15.0	371.2	0.96	0.04
VALIDUS HOLDINGS LTD	1,060.8	150.0	1,210.8	3,688.3	0.75	0.25
VOYA FINANCIAL INC	5,516.7	0.0	5,516.7	12,993.9	0.70	0.30
WHITE MTNS INS GROUP LTD	285.9	0.0	285.9	3,603.3	0.93	0.07
WMIH CORP	18.8	502.2	521.0	194.1	0.27	0.73
XL GROUP LTD	2,737.6	0.0	2,737.6	10,938.5	0.80	0.20
Average					0.78	0.22

Notes:

Source: Compustat Database (Version as of September 29, 2017)

(6) = (5) / [(4) + (5)]

(7) = 1.0 - (6)

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Section VII - Profit
Subsection F - Leverage Ratio
7/1/2018

Section VII - F
Exhibit 1

Loss & LAE and Unearned Premium Reserves to Surplus Ratio (\$ in Millions)

Year End (1)	Loss & LAE Reserves (2)	Unearned Premium Reserves (3)	Surplus (4)	Ratio = [(2) + (3)] / (4) (5)
2012	261,268	75,901	180,839	1.86
2013	262,894	81,382	186,373	1.85
2014	228,618	70,774	174,153	1.72
2015	229,564	73,041	168,783	1.79
2016	228,165	72,717	169,831	1.77
Average				1.80

Notes:

Source: Various issues of Best's Aggregates and Averages.
Balance Sheet for Commercial Casualty Composite.

Single Policy
 Determination of Selected Premium Flow From Premium Collection Special Call

Time Interval		Net Premium Ranges									Weighted Average Selected Collection Pattern (12)
		0 - 9,999			10,000 - 199,999			200,000 +			
		Actual Premium Collection Pattern		Weight (5)	Actual Premium Collection Pattern		Weight (8)	Actual Premium Collection Pattern		Weight (11)	
From (1)	To (2)	Actual (3)	Selected (4)		Actual (6)	Selected (7)		Actual (9)	Selected (10)		
07/01/17	09/30/17	0.0%	0.0%	24.7%	0.1%	0.0%	49.1%	0.0%	0.0%	26.2%	0.0%
10/01/17	12/31/17	0.0%	0.0%	24.7%	0.0%	0.0%	49.1%	0.2%	0.0%	26.2%	0.0%
01/01/18	03/31/18	0.1%	0.0%	24.7%	0.1%	0.0%	49.1%	0.0%	0.0%	26.2%	0.0%
04/01/18	06/30/18	11.2%	11.2%	24.7%	2.7%	2.7%	49.1%	1.1%	1.0%	26.2%	4.4%
07/01/18	09/30/18	38.1%	38.1%	24.7%	34.5%	34.5%	49.1%	37.8%	37.8%	26.2%	36.3%
10/01/18	12/31/18	22.6%	22.6%	24.7%	26.0%	26.0%	49.1%	22.4%	22.4%	26.2%	24.2%
01/01/19	03/31/19	15.4%	15.4%	24.7%	20.5%	20.5%	49.1%	20.1%	20.1%	26.2%	19.1%
04/01/19	06/30/19	4.0%	4.0%	24.7%	5.7%	5.7%	49.1%	7.4%	7.5%	26.2%	5.8%
07/01/19	09/30/19	2.2%	2.2%	24.7%	1.8%	1.8%	49.1%	3.1%	3.0%	26.2%	2.2%
10/01/19	12/31/19	2.8%	2.8%	24.7%	4.0%	4.0%	49.1%	5.6%	5.6%	26.2%	4.1%
01/01/20	03/31/20	1.9%	1.9%	24.7%	2.2%	2.2%	49.1%	1.9%	1.9%	26.2%	2.0%
04/01/20	06/30/20	1.1%	1.1%	24.7%	1.2%	1.5%	49.1%	0.2%	0.5%	26.2%	1.1%
07/01/20	09/30/20	0.1%	0.7%	24.7%	0.2%	1.1%	49.1%	0.0%	0.2%	26.2%	0.8%
10/01/20	12/31/20	0.0%	0.0%	24.7%	0.1%	0.0%	49.1%	0.1%	0.0%	26.2%	0.0%
01/01/21	03/31/21	0.0%	0.0%	24.7%	0.0%	0.0%	49.1%	0.1%	0.0%	26.2%	0.0%
04/01/21	06/30/21	0.0%	0.0%	24.7%	0.0%	0.0%	49.1%	0.0%	0.0%	26.2%	0.0%
07/01/21	09/30/21	0.2%	0.0%	24.7%	0.2%	0.0%	49.1%	0.0%	0.0%	26.2%	0.0%
10/01/21	12/31/21	0.2%	0.0%	24.7%	0.4%	0.0%	49.1%	0.0%	0.0%	26.2%	0.0%
01/01/22	03/31/22	0.1%	0.0%	24.7%	0.3%	0.0%	49.1%	0.0%	0.0%	26.2%	0.0%
Total											100.0%

Notes:

(5), (8), (11) are calculated using Unit Statistical Plan data for PY 2015.

(3), (6), (9) are from the premium collection special call.

(12) = [(4) x (5)] + [(7) x (8)] + [(10) x (11)]

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Section VII - Profit
Subsection H - Expense Weights
7/1/2018

Section VII - H
Exhibit 1

Cash Flow Weights

Item of Expense Allowance (% of Standard Premium plus ARAP)	Policy Year		Average
	2014	2015	
(1) Expected Losses	58.06%	54.56%	56.31%
(2) Expected Loss Adjustment Expense (LAE):	10.74%	10.10%	10.42%
(a) Defense and Cost Containment Expense	5.48%	5.15%	5.31%
(b) Adjusting and Other Expense	5.26%	4.95%	5.10%
(3) Expected Losses + Expected LAE [= (1) + (2)]	68.80%	64.65%	66.73%
(4) Fixed Expenses	4.27%	4.22%	4.25%
(a) General Expenses	3.84%	3.80%	3.82%
(b) Miscellaneous and Other Taxes	0.43%	0.42%	0.42%
(5) Variable Expenses [= (5a) + (5b) + (5c)]	19.90%	19.90%	19.90%
(a) Total Acquisition	12.58%	12.58%	12.58%
(i) Commissions	8.26%	8.26%	8.26%
(ii) Other Acquisition	3.32%	3.32%	3.32%
(iii) Reinsurance Expenses	1.00%	1.00%	1.00%
(iv) Incidental Income and Earned but Uncollected Premium	0.00%	0.00%	0.00%
(b) Premium Tax	2.16%	2.16%	2.16%
(c) Premium Discount	5.16%	5.16%	5.16%
(6) Total Expenses [= (4) + (5)]	24.18%	24.13%	24.15%

Notes:

- (1): Policy Year 2014 and Policy Year 2015 Expected Losses are based on the loss ratios projected to the prospective policy period adjusted by the factor to remove the residual market subsidy associated with large deductible policies from Section I-B, Exhibit 1.
- (2): Expected LAE = Expected Losses x 0.185 where 0.185 is the LAE ratio calculated in VI-H, Exhibit 1.
- (2a), (2b): Loss Adjustment Expense split between DCC and AO is $0.51 = 0.094 / 0.185$ and $0.49 = 1 - 0.51$ where 0.094 is three year average ratio of DCC to loss from Section VI-H, Exhibit 1, line (4) and LAE ratio = 0.185 from Section VI-H, Exhibit 1, line (6).
- (4): Section VI-B, Exhibit 1 times the factor to reflect the impact of large deductible policies, from Section I-D, Exhibit 1, Page 1.
- (4a), (4b): Policy Year 2014 Fixed Expenses split between General Expenses and Other Taxes based on \$33,738,483 General Expenses and \$3,749,394 Other Taxes. Policy Year 2015 General Expenses split based on \$35,774,963 General Expenses and \$3,975,710 Other Taxes. See VI-B, Exhibit 1, columns (12) & (13).
- (5a): Section VI-G, Exhibit 1.
- (5b), (5c): Section VI-A, Exhibit 1.

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Section VII - Profit
 Subsection I - Loss & LAE Flow
 7/1/2018

Section VII - I
 Exhibit 1

Single Policy
 Loss & Loss Adjustment Expense (LAE) Flow

Time Interval		Earned Premium (3)	Loss Flow (4)	DCC Flow (5) = (4)	AO Flow (6) = [(3) + (4)] / 2.0	Loss & LAE Payout (7)
From (1)	To (2)					
07/01/17	09/30/17	0.0000	0.0000	0.0000	0.0000	0.0000
10/01/17	12/31/17	0.0000	0.0000	0.0000	0.0000	0.0000
01/01/18	03/31/18	0.0000	0.0000	0.0000	0.0000	0.0000
04/01/18	06/30/18	0.0000	0.0000	0.0000	0.0000	0.0000
07/01/18	09/30/18	0.2500	0.0496	0.0496	0.1498	0.0573
10/01/18	12/31/18	0.2500	0.0496	0.0496	0.1498	0.0573
01/01/19	03/31/19	0.2500	0.0496	0.0496	0.1498	0.0573
04/01/19	06/30/19	0.2500	0.0496	0.0496	0.1498	0.0573
07/01/19	09/30/19	0.0000	0.0692	0.0692	0.0346	0.0666
10/01/19	12/31/19	0.0000	0.0692	0.0692	0.0346	0.0666
01/01/20	03/31/20	0.0000	0.0692	0.0692	0.0346	0.0666
04/01/20	06/30/20	0.0000	0.0692	0.0692	0.0346	0.0666
07/01/20	09/30/20	0.0000	0.0457	0.0457	0.0228	0.0439
10/01/20	12/31/20	0.0000	0.0457	0.0457	0.0228	0.0439
01/01/21	03/31/21	0.0000	0.0457	0.0457	0.0228	0.0439
04/01/21	06/30/21	0.0000	0.0457	0.0457	0.0228	0.0439
07/01/21	09/30/21	0.0000	0.0259	0.0259	0.0129	0.0249
10/01/21	12/31/21	0.0000	0.0259	0.0259	0.0129	0.0249
01/01/22	03/31/22	0.0000	0.0259	0.0259	0.0129	0.0249
04/01/22	06/30/22	0.0000	0.0259	0.0259	0.0129	0.0249
07/01/22	09/30/22	0.0000	0.0134	0.0134	0.0067	0.0129
10/01/22	12/31/22	0.0000	0.0134	0.0134	0.0067	0.0129
01/01/23	03/31/23	0.0000	0.0134	0.0134	0.0067	0.0129
04/01/23	06/30/23	0.0000	0.0134	0.0134	0.0067	0.0129
07/01/23	09/30/23	0.0000	0.0065	0.0065	0.0032	0.0062
10/01/23	12/31/23	0.0000	0.0065	0.0065	0.0032	0.0062
01/01/24	03/31/24	0.0000	0.0065	0.0065	0.0032	0.0062
04/01/24	06/30/24	0.0000	0.0065	0.0065	0.0032	0.0062
07/01/24	09/30/24	0.0000	0.0036	0.0036	0.0018	0.0035
10/01/24	12/31/24	0.0000	0.0036	0.0036	0.0018	0.0035
01/01/25	03/31/25	0.0000	0.0036	0.0036	0.0018	0.0035
04/01/25	06/30/25	0.0000	0.0036	0.0036	0.0018	0.0035
07/01/25	09/30/25	0.0000	0.0028	0.0028	0.0014	0.0027
10/01/25	12/31/25	0.0000	0.0028	0.0028	0.0014	0.0027
01/01/26	03/31/26	0.0000	0.0028	0.0028	0.0014	0.0027
04/01/26	06/30/26	0.0000	0.0028	0.0028	0.0014	0.0027
07/01/26	09/30/26	0.0000	0.0021	0.0021	0.0010	0.0020
10/01/26	12/31/26	0.0000	0.0021	0.0021	0.0010	0.0020
01/01/27	03/31/27	0.0000	0.0021	0.0021	0.0010	0.0020
04/01/27	06/30/27	0.0000	0.0021	0.0021	0.0010	0.0020
07/01/27	09/30/27	0.0000	0.0014	0.0014	0.0007	0.0014
10/01/27	12/31/27	0.0000	0.0014	0.0014	0.0007	0.0014
01/01/28	03/31/28	0.0000	0.0014	0.0014	0.0007	0.0014
04/01/28	06/30/28	0.0000	0.0014	0.0014	0.0007	0.0014
07/01/28	09/30/28	0.0000	0.0016	0.0016	0.0008	0.0015
10/01/28	12/31/28	0.0000	0.0016	0.0016	0.0008	0.0015
01/01/29	03/31/29	0.0000	0.0016	0.0016	0.0008	0.0015
04/01/29	06/30/29	0.0000	0.0016	0.0016	0.0008	0.0015
07/01/29	09/30/29	0.0000	0.0020	0.0020	0.0010	0.0019
10/01/29	12/31/29	0.0000	0.0020	0.0020	0.0010	0.0019
01/01/30	03/31/30	0.0000	0.0020	0.0020	0.0010	0.0019
04/01/30	06/30/30	0.0000	0.0020	0.0020	0.0010	0.0019
07/01/30	09/30/30	0.0000	0.0014	0.0014	0.0007	0.0013
10/01/30	12/31/30	0.0000	0.0014	0.0014	0.0007	0.0013
01/01/31	03/31/31	0.0000	0.0014	0.0014	0.0007	0.0013
04/01/31	06/30/31	0.0000	0.0014	0.0014	0.0007	0.0013
07/01/31	09/30/31	0.0000	0.0011	0.0011	0.0005	0.0010
10/01/31	12/31/31	0.0000	0.0011	0.0011	0.0005	0.0010
01/01/32	03/31/32	0.0000	0.0011	0.0011	0.0005	0.0010
04/01/32	06/30/32	0.0000	0.0011	0.0011	0.0005	0.0010
07/01/32	09/30/32	0.0000	0.0011	0.0011	0.0005	0.0010
10/01/32	12/31/32	0.0000	0.0011	0.0011	0.0005	0.0010
01/01/33	03/31/33	0.0000	0.0011	0.0011	0.0005	0.0010
04/01/33	06/30/33	0.0000	0.0011	0.0011	0.0005	0.0010
07/01/33	09/30/33	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/33	12/31/33	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/34	03/31/34	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/34	06/30/34	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/34	09/30/34	0.0000	0.0011	0.0011	0.0006	0.0011
10/01/34	12/31/34	0.0000	0.0011	0.0011	0.0006	0.0011
01/01/35	03/31/35	0.0000	0.0011	0.0011	0.0006	0.0011
04/01/35	06/30/35	0.0000	0.0011	0.0011	0.0006	0.0011
07/01/35	09/30/35	0.0000	0.0012	0.0012	0.0006	0.0011
10/01/35	12/31/35	0.0000	0.0012	0.0012	0.0006	0.0011
01/01/36	03/31/36	0.0000	0.0012	0.0012	0.0006	0.0011
04/01/36	06/30/36	0.0000	0.0012	0.0012	0.0006	0.0011
07/01/36	09/30/36	0.0000	0.0009	0.0009	0.0004	0.0008
10/01/36	12/31/36	0.0000	0.0009	0.0009	0.0004	0.0008
01/01/37	03/31/37	0.0000	0.0009	0.0009	0.0004	0.0008
04/01/37	06/30/37	0.0000	0.0009	0.0009	0.0004	0.0008
07/01/37	09/30/37	0.0000	0.0009	0.0009	0.0004	0.0008

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Section VII - Profit
 Subsection I - Loss & LAE Flow
 7/1/2018

Section VII - I
 Exhibit 1

Single Policy
 Loss & Loss Adjustment Expense (LAE) Flow

Time Interval		Earned Premium (3)	Loss Flow (4)	DCC Flow (5) = (4)	AO Flow (6) = [(3) + (4)] / 2.0	Loss & LAE Payout (7)
From (1)	To (2)					
10/01/37	12/31/37	0.0000	0.0009	0.0009	0.0004	0.0008
01/01/38	03/31/38	0.0000	0.0009	0.0009	0.0004	0.0008
04/01/38	06/30/38	0.0000	0.0009	0.0009	0.0004	0.0008
07/01/38	09/30/38	0.0000	0.0007	0.0007	0.0003	0.0006
10/01/38	12/31/38	0.0000	0.0007	0.0007	0.0003	0.0006
01/01/39	03/31/39	0.0000	0.0007	0.0007	0.0003	0.0006
04/01/39	06/30/39	0.0000	0.0007	0.0007	0.0003	0.0006
07/01/39	09/30/39	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/39	12/31/39	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/40	03/31/40	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/40	06/30/40	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/40	09/30/40	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/40	12/31/40	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/41	03/31/41	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/41	06/30/41	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/41	09/30/41	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/41	12/31/41	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/42	03/31/42	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/42	06/30/42	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/42	09/30/42	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/42	12/31/42	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/43	03/31/43	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/43	06/30/43	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/43	09/30/43	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/43	12/31/43	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/44	03/31/44	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/44	06/30/44	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/44	09/30/44	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/44	12/31/44	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/45	03/31/45	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/45	06/30/45	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/45	09/30/45	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/45	12/31/45	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/46	03/31/46	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/46	06/30/46	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/46	09/30/46	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/46	12/31/46	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/47	03/31/47	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/47	06/30/47	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/47	09/30/47	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/47	12/31/47	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/48	03/31/48	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/48	06/30/48	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/48	09/30/48	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/48	12/31/48	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/49	03/31/49	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/49	06/30/49	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/49	09/30/49	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/49	12/31/49	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/50	03/31/50	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/50	06/30/50	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/50	09/30/50	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/50	12/31/50	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/51	03/31/51	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/51	06/30/51	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/51	09/30/51	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/51	12/31/51	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/52	03/31/52	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/52	06/30/52	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/52	09/30/52	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/52	12/31/52	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/53	03/31/53	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/53	06/30/53	0.0000	0.0012	0.0012	0.0006	0.0012
(8) Relative Weights			1.0000	0.0944	0.0907	

Notes:

- (3): Single policy earned premium is earned uniformly through the one year policy term.
- (4): Exhibit 2, (16). Annual values divided by 4.0.
- (7): Loss & LAE Payout = (1.000 x (4) + 0.0944 x (5) + 0.0907 x (6)) / (1.000 + 0.0944 + 0.0907)
- (8): DCC relative weight = 1.000 x 0.185 x 0.51; AO relative weight = 1.000 x 0.185 x 0.49
 where 0.185 is the LAE factor calculated in Section VI-H, Exhibit 1 and 0.51, 0.49
 are the DCC and AO relative weights from Section VI-H, Exhibit 1.

Loss Payment Pattern

Age In Months (1)	Remainder of Industry							AIG							Total
	Indemnity Unadjusted LDF to Ult (2)	Indemnity % Paid =1.0 / (2) (3)	Indemnity Incremental % Paid (3) - 1st Diff (4)	Medical LDF to Ult (5)	Medical %Paid =1.0 / (5) (6)	Medical Incremental % Paid (6) - 1st Diff (7)	Indemnity & Medical Incremental % Paid (8)	Indemnity Unadjusted LDF to Ult (9)	Indemnity % Paid =1.0 / (9) (10)	Indemnity Incremental % Paid (10) - 1st Diff (11)	Medical LDF to Ult (12)	Medical %Paid =1.0 / (12) (13)	Medical Incremental % Paid (13) - 1st Diff (14)	Indemnity & Medical Incremental % Paid (15)	Indemnity & Medical Incremental % Paid (16)
12	7.505	13.32%	13.32%	2.928	34.15%	34.15%	20.39%	9.102	10.99%	10.99%	3.470	28.82%	28.82%	16.20%	19.86%
24	2.575	38.83%	25.51%	1.502	66.58%	32.43%	27.86%	2.882	34.69%	23.71%	1.612	62.03%	33.21%	26.48%	27.68%
36	1.629	61.40%	22.56%	1.316	75.99%	9.42%	18.10%	1.743	57.36%	22.67%	1.364	73.34%	11.31%	19.35%	18.26%
48	1.339	74.67%	13.28%	1.251	79.93%	3.94%	10.11%	1.385	72.21%	14.85%	1.272	78.61%	5.27%	12.05%	10.36%
60	1.227	81.49%	6.82%	1.222	81.81%	1.88%	5.14%	1.239	80.70%	8.49%	1.231	81.22%	2.61%	6.77%	5.35%
72	1.183	84.52%	3.02%	1.198	83.50%	1.69%	2.57%	1.193	83.82%	3.11%	1.206	82.94%	1.72%	2.70%	2.59%
84	1.158	86.33%	1.81%	1.186	84.29%	0.79%	1.47%	1.168	85.59%	1.77%	1.201	83.25%	0.32%	1.35%	1.45%
96	1.141	87.66%	1.34%	1.174	85.17%	0.88%	1.18%	1.161	86.14%	0.55%	1.188	84.21%	0.95%	0.67%	1.12%
108	1.130	88.52%	0.85%	1.162	86.05%	0.88%	0.86%	1.154	86.63%	0.48%	1.172	85.34%	1.13%	0.67%	0.84%
120	1.124	88.97%	0.46%	1.152	86.81%	0.76%	0.56%	1.148	87.12%	0.50%	1.156	86.47%	1.14%	0.68%	0.58%
132	1.116	89.59%	0.62%	1.144	87.44%	0.63%	0.62%	1.140	87.71%	0.59%	1.145	87.36%	0.89%	0.68%	0.63%
144	1.106	90.44%	0.85%	1.134	88.17%	0.74%	0.81%	1.134	88.19%	0.48%	1.133	88.26%	0.90%	0.60%	0.78%
156	1.100	90.89%	0.45%	1.125	88.88%	0.70%	0.54%	1.126	88.84%	0.64%	1.121	89.17%	0.91%	0.72%	0.56%
168	1.098	91.11%	0.21%	1.115	89.66%	0.78%	0.41%	1.119	89.35%	0.51%	1.109	90.16%	0.99%	0.65%	0.44%
180	1.096	91.26%	0.15%	1.107	90.36%	0.70%	0.34%	1.106	90.42%	1.07%	1.097	91.13%	0.97%	1.04%	0.42%
192	1.091	91.69%	0.44%	1.097	91.14%	0.78%	0.55%	1.105	90.53%	0.11%	1.089	91.81%	0.68%	0.28%	0.52%
204	1.089	91.86%	0.17%	1.087	92.03%	0.90%	0.42%	1.096	91.20%	0.67%	1.081	92.55%	0.74%	0.69%	0.45%
216	1.084	92.23%	0.37%	1.080	92.56%	0.52%	0.42%	1.088	91.95%	0.75%	1.069	93.51%	0.97%	0.81%	0.47%
228	1.083	92.38%	0.14%	1.073	93.22%	0.66%	0.32%	1.081	92.54%	0.59%	1.066	93.80%	0.28%	0.50%	0.34%
240	1.081	92.53%	0.15%	1.063	94.05%	0.83%	0.38%	1.081	92.54%	0.00%	1.063	94.09%	0.29%	0.09%	0.34%
252	1.079	92.64%	0.12%	1.057	94.62%	0.57%	0.27%	1.079	92.64%	0.10%	1.057	94.62%	0.53%	0.23%	0.27%
264			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
276			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
288			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
300			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
312			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
324			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
336			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
348			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
360			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
372			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
384			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
396			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
408			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
420			0.53%			0.38%	0.48%			0.53%			0.38%	0.48%	0.48%
Total			100.00%			100.00%	100.00%			100.00%			100.00%	100.00%	100.00%

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Notes:

- (2), (5): Section II - E, Exhibit 1, Page 1.
- (8) = (4) x 66.08% + (7) x 33.92%, where 66.08% and 33.92% are indemnity and medical estimated ultimate losses respectively, from Section II - A, Exhibit 1, Page 2.
- (9), (12): Section II - E, Exhibit 1, Page 4.
- (15) = (11) x 70.78% + (14) x 29.22%, where 70.78% and 29.22% are indemnity and medical estimated ultimate losses respectively, from Section II - A, Exhibit 1, Page 3.
- (16) = (8) x 87.38% + (15) x 12.62%, where 87.38% and 12.62% are estimated ultimate losses for Remainder of Industry and AIG respectively, from Section II - A, Exhibit 1, Pages 2 and 3.

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Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2018

Section VII - J
 Exhibit 1
 Page 1

Calculation of Portfolio Rate of Return

Asset Class (1)	Proportion (2)	Pre-tax Return (3)	Tax Rate (4)	After-tax Return (5)
Cash and Short-term Investments	5.97%	0.98%	35.00%	0.64%
Governments	9.63%	1.61%	35.00%	1.05%
States & Territories	8.77%	1.58%	5.25%	1.50%
Special Revenue	17.32%	1.88%	5.25%	1.78%
Industrials	27.04%	2.44%	35.00%	1.59%
Common Stocks	21.66%	9.45%	22.13%	7.36%
Real Estate	0.77%	5.00%	35.00%	3.25%
Preferred Stocks	0.68%	5.42%	14.18%	4.65%
Other Assets	8.17%	5.42%	14.18%	4.65%
(6) Total	100.00%	3.90%	22.16%	3.04%
(7) Investment Expenses		0.24%	35.00%	0.15%
(8) Portfolio Rate of Return		3.67%	21.33%	2.88%

Notes:

(2): Page 2, Total US Property/Casualty Industry.

(3): Pretax bond returns are from Exhibit 2, page 1.

Cash and short term investments: using short horizon CAPM with beta=0.00. Exhibit 2, Page 3, line (2).

Pretax return for Common Stock: $r_f + b \times \text{MRP}$ with $b=1.00$ and three horizons. MRP from Exhibit 4 and r_f from Exhibit 2,

Page 3, line (2) for short-term, line (8) for intermediate-term and line (11) for long-term horizon.

9.45% = average (8.52% + 0.98%, 7.51% + 1.82%, 6.93% + 2.58%)

Pretax return for Real Estate: 3 month treasury rate, 1.06% Exhibit 2, page 3, line (3) plus the real estate differential, 3.94% from Ibbotson and Siegel, "Real Estate Returns: A Comparison with Other Investments".

Pretax return for Preferred Stock: calculated using data from yahoo finance.

Pretax return for Other Assets: equal to the pretax return for Preferred Stock.

(4): Governments and Other taxable bonds taxed at Federal Tax Rate of 0.35.

Tax rate for Tax Exempt Bonds = 0.15×0.35

Tax rate for Preferred stock = $(0.30 \times 0.35) + (0.70 \times 0.15 \times 0.35)$

Tax rate for Common Stocks from Exhibit 6, page 1.

Tax rate for Other Assets = Tax rate for Preferred stock = $(0.30 \times 0.35) + (0.70 \times 0.15 \times 0.35)$

(5) = (3) x [1.0 - (4)]

(7): Exhibit 5.

(8) = (6) - (7)

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 Exhibit 1
 Page 2

Asset Distribution for Property-Casualty Industry

Assets (1)	Net Admitted Assets (\$000) (2)	Share = (2) / (4) (3)
Cash and Short Term Investments	95,632,669	5.97%
Bonds:	1,005,988,651	62.76%
Governments		9.63%
States & Territories		8.77%
Special Revenue		17.32%
Industrials		27.04%
Common Stocks	347,223,223	21.66%
Real Estate	12,291,019	0.77%
Preferred Stocks	10,822,877	0.68%
Other Invested Assets	130,917,023	8.17%
(4) Total	1,602,875,462	100.00%

Notes:

Source: Best's Aggregates and Averages, 2017 edition, page 140.

(2): Real estate is sum of: properties occupied by the company, properties held for the production of income and properties held for sale.

None of the values include investments in affiliates.

The Bond Share in total is 62.76%. This is allocated to the subcategories (Governments, States & Territories, Special Revenue and Industrials) by multiplying 62.76% by the adjusted bond weights from Exhibit 3.

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 Page 1

Calculation of Pretax Returns on Bonds

% of Bonds (adjusted for removal of Other Bonds category) by Class, by Maturity for P/C Industry				
Term to Maturity in years	Governments	States and Territories	Special Revenue	Industrials
0.5	4.23%	0.82%	1.61%	3.08%
3	6.79%	3.71%	8.56%	19.72%
7	2.88%	6.58%	10.88%	16.31%
15	0.55%	2.47%	4.59%	1.80%
25	0.89%	0.39%	1.96%	2.17%
Total	15.34%	13.97%	27.60%	43.09%

As of	Term to Maturity in years	Yield Data			
		Governments	States and Territories	Special Revenue	Industrials
Jul-17	0.5	1.13%	0.78%	0.75%	1.31%
	3	1.54%	1.18%	1.28%	2.04%
	7	2.13%	1.77%	2.06%	2.90%
	15	2.49%	2.18%	2.79%	3.58%
	25	2.77%	2.58%	3.54%	3.93%
Aug-17	0.5	1.13%	0.69%	0.67%	1.38%
	3	1.48%	1.07%	1.15%	1.97%
	7	2.03%	1.66%	1.91%	2.82%
	15	2.38%	2.10%	2.67%	3.49%
	25	2.68%	2.51%	3.49%	3.87%
Sep-17	0.5	1.17%	0.68%	0.66%	1.41%
	3	1.51%	1.07%	1.14%	2.01%
	7	2.03%	1.67%	1.88%	2.83%
	15	2.37%	2.12%	2.65%	3.50%
	25	2.66%	2.54%	3.49%	3.87%
Jul-17 Aug-17 Sep-17 Average	All	Weighted Yields			
	All	1.64%	1.65%	1.97%	2.47%
	All	1.59%	1.55%	1.84%	2.41%
	All	1.61%	1.55%	1.82%	2.43%
Average	1.61%	1.58%	1.88%	2.44%	

Notes:

% of Bonds by Class and by Maturity for P/C Industry are from Exhibit 3.

Yield Data are from Page 2.

Example of Weighted Yield calculation for Jul-17, States and Territories:

$$1.65 = (0.78 \times 0.82 + 1.18 \times 3.71 + 1.77 \times 6.58 + 2.18 \times 2.47 + 2.58 \times 0.39) / 13.97$$

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Calculation of Yield Data

Term to Maturity in Years	Jul-17	Aug-17	Sep-17	Formulas used to derive the yields (reference to data on page 3)
Governments				
0.5	1.13%	1.13%	1.17%	=(4)
3	1.54%	1.48%	1.51%	=(7)
7	2.13%	2.03%	2.03%	=(9)
10	2.32%	2.21%	2.20%	=(10)
20	2.65%	2.55%	2.53%	=(11)
30	2.88%	2.80%	2.78%	=(12)
States and Territories				
0.5	0.78%	0.69%	0.68%	=(4) + 9.5/9.0 x [(20) - (5)] - 0.5/9.0 x [(21) - (10)]
3	1.18%	1.07%	1.07%	=(7) + 7.0/9.0 x [(20) - (5)] + 2.0/9.0 x [(21) - (10)]
7	1.77%	1.66%	1.67%	=(9) + 1.0/3.0 x [(20) - (5)] + 2.0/3.0 x [(21) - (10)]
10	1.95%	1.87%	1.89%	=(21)
20	2.40%	2.33%	2.35%	=(11) + 0.5 x [(21) - (10)] + 0.5 x [(22) - (12)]
30	2.75%	2.69%	2.73%	=(22)
Special Revenue				
0.5	0.75%	0.67%	0.66%	=(4) + 29.5/29.0 x [(20) - (5)] - 0.5/29.0 x [(19) - (12)]
3	1.28%	1.15%	1.14%	=(7) + 27.0/29.0 x [(20) - (5)] + 2.0/29.0 x [(19) - (12)]
7	2.06%	1.91%	1.88%	=(9) + 23.0/29.0 x [(20) - (5)] + 6.0/29.0 x [(19) - (12)]
10	2.39%	2.24%	2.21%	=(10) + 20.0/29.0 x [(20) - (5)] + 9.0/29.0 x [(19) - (12)]
20	3.19%	3.10%	3.09%	=(11) + 10.0/29.0 x [(20) - (5)] + 19.0/29.0 x [(19) - (12)]
30	3.89%	3.87%	3.89%	=(19)
Industrial				
0.5	1.31%	1.38%	1.41%	=(4) + 18.0/21.0 x [(1) - (3)] + 3.0/21.0 x [(14) - (6)]
3	2.04%	1.97%	2.01%	=(7) + 2.0/3.0 x [(14) - (6)] + 1.0/3.0 x [(15) - (8)]
7	2.90%	2.82%	2.83%	=(9) + 3.0/5.0 x [(15) - (8)] + 2.0/5.0 x [(16) - (10)]
10	3.38%	3.28%	3.29%	=(16)
20	3.78%	3.71%	3.71%	=(11) + 1.0/2.0 x [(16) - (10)] + 1.0/2.0 x [(17) - (12)]
30	4.08%	4.04%	4.04%	=(17)

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Yield Data

	Jul-17	Aug-17	Sep-17	Average
FEDERAL RESERVE STATISTICAL RELEASE				
Commercial Paper				
(1) 3-month	1.22%	1.25%	1.25%	1.24%
U.S. Govt Securities - Secondary Market				
Treasury Constant Maturities				
(2) 1-month	0.97%	0.98%	0.99%	0.98%
(3) 3-month	1.09%	1.03%	1.05%	1.06%
(4) 6-month	1.13%	1.13%	1.17%	1.14%
(5) 1-year	1.22%	1.23%	1.28%	1.24%
(6) 2-year	1.37%	1.34%	1.38%	1.36%
(7) 3-year	1.54%	1.48%	1.51%	1.51%
(8) 5-year	1.87%	1.78%	1.80%	1.82%
(9) 7-year	2.13%	2.03%	2.03%	2.06%
(10) 10-year	2.32%	2.21%	2.20%	2.24%
(11) 20-year	2.65%	2.55%	2.53%	2.58%
(12) 30-year	2.88%	2.80%	2.78%	2.82%
YAHOO				
(13) Preferred Stock	5.41%	5.44%	5.41%	5.42%
US DEPARTMENT OF THE TREASURY				
HQM Corporate Bond Yield Curve Par Yields				
(14) 2-year	1.83%	1.78%	1.83%	1.81%
(15) 5-year	2.45%	2.38%	2.40%	2.41%
(16) 10-year	3.38%	3.28%	3.29%	3.32%
(17) 30-year	4.08%	4.04%	4.04%	4.05%
VALUE LINE INVESTMENT SURVEY (Part II)				
Bond Buyer Indexes				
(18) 20-Bond Index (GOs)	3.58%	3.53%	3.54%	3.55%
(19) Calculated 30-Bond Index (= (18) x [(12) / (11)])	3.89%	3.87%	3.89%	3.88%
General Obligation Bonds (GOs)				
(20) 1-year Aaa	0.87%	0.80%	0.80%	0.82%
(21) 10-year Aaa	1.95%	1.87%	1.89%	1.90%
(22) 25/30-year Aaa	2.75%	2.69%	2.73%	2.72%

Note:

Sources: Federal Reserve Statistical Release, H.15, Yahoo Finance, US Department of the Treasury and various issues of Value Line Investment Survey, Part II.

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 Exhibit 3

Bond Distribution by Class and by Maturity for Property-Casualty Industry

2016 Industry Totals (\$000)

Term to Maturity in Years	Governments	States and Territories	Special Revenue	Industrials	Other Bonds	Total Bonds
0.5	41,785,600	8,138,065	15,887,966	30,445,515	24,216	96,281,361
3	67,094,882	36,630,114	84,549,454	194,729,848	9,339,538	392,343,836
7.5	28,410,583	64,975,203	107,427,059	161,087,401	1,762,526	363,662,772
15	5,431,259	24,379,809	45,310,742	17,825,883	370,170	93,317,863
25	8,818,979	3,858,240	19,402,850	21,479,866	2,740,325	56,300,260
Total	151,541,303	137,981,431	272,578,071	425,568,513	14,236,775	1,001,906,092

% of Bonds by Class, by Maturity for P/C Industry

Term to Maturity in Years	Governments	States and Territories	Special Revenue	Industrials	Other Bonds	Total Bonds
0.5	4.17%	0.81%	1.59%	3.04%	0.00%	9.61%
3	6.70%	3.66%	8.44%	19.44%	0.93%	39.16%
7.5	2.84%	6.49%	10.72%	16.08%	0.18%	36.30%
15	0.54%	2.43%	4.52%	1.78%	0.04%	9.31%
25	0.88%	0.39%	1.94%	2.14%	0.27%	5.62%
Total	15.13%	13.77%	27.21%	42.48%	1.42%	100.00%

% of Bonds (adjusted for removal of Other Bonds category) by Class, by Maturity for P/C Industry

Term to Maturity in Years	Governments	States and Territories	Special Revenue	Industrials	Total Bonds
0.5	4.23%	0.82%	1.61%	3.08%	9.75%
3	6.79%	3.71%	8.56%	19.72%	38.78%
7.5	2.88%	6.58%	10.88%	16.31%	36.64%
15	0.55%	2.47%	4.59%	1.80%	9.41%
25	0.89%	0.39%	1.96%	2.17%	5.42%
Total	15.34%	13.97%	27.60%	43.09%	100.00%

Notes:

Source: Best's Aggregates and Averages - Property-Casualty, 2017 edition, pages 199-200.
 Bonds less than a year adjusted to remove cash and short term investments.

Market Risk Premium

Year (1)	Large Company Stocks Total Returns (2)	Long-Term Government Bonds Income Returns (3)	Intermediate-Term Government Bonds Income Returns (4)	Short-Term Total Returns (5)	Long-Term Market Risk Premium = (2) - (3) (6)	Intermediate-Term Market Risk Premium = (2) - (4) (7)	Short-Term Market Risk Premium = (2) - (5) (8)
1926	11.62	3.73	3.78	3.27	7.89	7.84	8.35
1927	37.49	3.41	3.49	3.12	34.08	34.00	34.37
1928	43.61	3.22	3.64	3.56	40.39	39.97	40.05
1929	-8.42	3.47	4.07	4.75	-11.89	-12.49	-13.17
1930	-24.90	3.32	3.30	2.41	-28.22	-28.20	-27.31
1931	-43.34	3.33	3.16	1.07	-46.67	-46.50	-44.41
1932	-8.19	3.69	3.63	0.96	-11.88	-11.82	-9.15
1933	53.99	3.12	2.83	0.30	50.87	51.16	53.69
1934	-1.44	3.18	2.93	0.16	-4.62	-4.37	-1.60
1935	47.67	2.81	2.02	0.17	44.86	45.65	47.50
1936	33.92	2.77	1.44	0.18	31.15	32.48	33.74
1937	-35.03	2.66	1.48	0.31	-37.69	-36.51	-35.34
1938	31.12	2.64	1.82	-0.02	28.48	29.30	31.14
1939	-0.41	2.40	1.31	0.02	-2.81	-1.72	-0.43
1940	-9.78	2.23	0.90	0.00	-12.01	-10.68	-9.78
1941	-11.59	1.94	0.67	0.06	-13.53	-12.26	-11.65
1942	20.34	2.46	0.76	0.27	17.88	19.58	20.07
1943	25.90	2.44	1.56	0.35	23.46	24.34	25.55
1944	19.75	2.46	1.44	0.33	17.29	18.31	19.42
1945	36.44	2.34	1.19	0.33	34.10	35.25	36.11
1946	-8.07	2.04	1.08	0.35	-10.11	-9.15	-8.42
1947	5.71	2.13	1.21	0.50	3.58	4.50	5.21
1948	5.50	2.40	1.56	0.81	3.10	3.94	4.69
1949	18.79	2.25	1.36	1.10	16.54	17.43	17.69
1950	31.71	2.12	1.39	1.20	29.59	30.32	30.51
1951	24.02	2.38	1.98	1.49	21.64	22.04	22.53
1952	18.37	2.66	2.19	1.66	15.71	16.18	16.71
1953	-0.99	2.84	2.55	1.82	-3.83	-3.54	-2.81
1954	52.62	2.79	1.60	0.86	49.83	51.02	51.76
1955	31.56	2.75	2.45	1.57	28.81	29.11	29.99
1956	6.56	2.99	3.05	2.46	3.57	3.51	4.10
1957	-10.78	3.44	3.59	3.14	-14.22	-14.37	-13.92
1958	43.36	3.27	2.93	1.54	40.09	40.43	41.82
1959	11.96	4.01	4.18	2.95	7.95	7.78	9.01
1960	0.47	4.26	4.15	2.66	-3.79	-3.68	-2.19
1961	26.89	3.83	3.54	2.13	23.06	23.35	24.76
1962	-8.73	4.00	3.73	2.73	-12.73	-12.46	-11.46
1963	22.80	3.89	3.71	3.12	18.91	19.09	19.68
1964	16.48	4.15	4.00	3.54	12.33	12.48	12.94
1965	12.45	4.20	4.15	3.93	8.25	8.30	8.52
1966	-10.06	4.49	4.93	4.76	-14.55	-14.99	-14.82
1967	23.98	4.59	4.88	4.21	19.39	19.10	19.77
1968	11.06	5.50	5.49	5.21	5.56	5.57	5.85
1969	-8.50	5.95	6.65	6.58	-14.45	-15.15	-15.08
1970	3.86	6.74	7.49	6.52	-2.88	-3.63	-2.66
1971	14.30	6.32	5.75	4.39	7.98	8.55	9.91
1972	18.99	5.87	5.75	3.84	13.12	13.24	15.15
1973	-14.69	6.51	6.58	6.93	-21.20	-21.27	-21.62
1974	-26.47	7.27	7.24	8.00	-33.74	-33.71	-34.47
1975	37.23	7.99	7.35	5.80	29.24	29.88	31.43
1976	23.93	7.89	7.10	5.08	16.04	16.83	18.85

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Market Risk Premium

Year (1)	Large Company Stocks Total Returns (2)	Long-Term Government Bonds Income Returns (3)	Intermediate-Term Government Bonds Income Returns (4)	Short-Term Total Returns (5)	Long-Term Market Risk Premium = (2) - (3) (6)	Intermediate-Term Market Risk Premium = (2) - (4) (7)	Short-Term Market Risk Premium = (2) - (5) (8)
1977	-7.16	7.14	6.49	5.12	-14.30	-13.65	-12.28
1978	6.57	7.90	7.83	7.18	-1.33	-1.26	-0.61
1979	18.61	8.86	9.04	10.38	9.75	9.57	8.23
1980	32.50	9.97	10.55	11.24	22.53	21.95	21.26
1981	-4.92	11.55	12.97	14.71	-16.47	-17.89	-19.63
1982	21.55	13.50	12.81	10.54	8.05	8.74	11.01
1983	22.56	10.38	10.35	8.80	12.18	12.21	13.76
1984	6.27	11.74	11.68	9.85	-5.47	-5.41	-3.58
1985	31.73	11.25	10.29	7.72	20.48	21.44	24.01
1986	18.67	8.98	7.72	6.16	9.69	10.95	12.51
1987	5.25	7.92	7.47	5.47	-2.67	-2.22	-0.22
1988	16.61	8.97	8.24	6.35	7.64	8.37	10.26
1989	31.69	8.81	8.46	8.37	22.88	23.23	23.32
1990	-3.10	8.19	8.15	7.81	-11.29	-11.25	-10.91
1991	30.47	8.22	7.43	5.60	22.25	23.04	24.87
1992	7.62	7.26	6.27	3.51	0.36	1.35	4.11
1993	10.08	7.17	5.53	2.90	2.91	4.55	7.18
1994	1.32	6.59	6.07	3.90	-5.27	-4.75	-2.58
1995	37.58	7.60	6.69	5.60	29.98	30.89	31.98
1996	22.96	6.18	5.82	5.21	16.78	17.14	17.75
1997	33.36	6.64	6.14	5.26	26.72	27.22	28.10
1998	28.58	5.83	5.29	4.86	22.75	23.29	23.72
1999	21.04	5.57	5.30	4.68	15.47	15.74	16.36
2000	-9.10	6.50	6.19	5.89	-15.60	-15.29	-14.99
2001	-11.89	5.53	4.27	3.83	-17.42	-16.16	-15.72
2002	-22.10	5.59	3.98	1.65	-27.69	-26.08	-23.75
2003	28.68	4.80	2.85	1.02	23.88	25.83	27.66
2004	10.88	5.02	3.28	1.20	5.86	7.60	9.68
2005	4.91	4.69	3.92	2.98	0.22	0.99	1.93
2006	15.79	4.68	4.54	4.80	11.11	11.25	10.99
2007	5.49	4.86	4.44	4.66	0.63	1.05	0.83
2008	-37.00	4.45	2.96	1.60	-41.45	-39.96	-38.60
2009	26.46	3.47	2.01	0.10	22.99	24.45	26.36
2010	15.06	4.25	1.92	0.12	10.81	13.14	14.94
2011	2.11	3.82	1.64	0.04	-1.71	0.47	2.07
2012	16.00	2.46	0.73	0.06	13.54	15.27	15.94
2013	32.39	2.88	1.02	0.02	29.51	31.37	32.37
2014	13.69	3.41	1.63	0.02	10.28	12.06	13.67
2015	1.38	2.47	1.51	0.02	-1.09	-0.13	1.36
2016	11.96	2.30	1.36	0.20	9.66	10.60	11.76
Average	11.95	5.02	4.44	3.43	6.93	7.51	8.52

Notes:

Source: 2017 SBBI Yearbook.

(2):Appendix A-1: Large-Capitalization Stocks, Total Returns.

(3): Appendix A-7: Long Term Government Bonds: Income Returns.

(4):Appendix A-11: Intermediate Term Government Bonds: Income Returns.

(5):Appendix A-14: U.S. Treasury Bills, Total Returns.

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 Exhibit 5

Investment Expense to Invested Assets Ratio

Calendar Year (1)	Total Investment Expense Incurred (\$000) (2)	Aggregate Write-ins (\$000) (3)	Total Deductions = (2) + (3) (4)	Total Cash and Invested Assets (\$000) (5)	Ratio = (4) / (5) (6)
2007	2,829,153	655,075	3,484,228	1,330,400,451	0.26%
2008	2,799,958	281,611	3,081,569	1,246,387,298	0.25%
2009	2,811,669	216,379	3,028,048	1,302,970,319	0.23%
2010	3,065,150	197,863	3,263,013	1,359,025,844	0.24%
2011	3,138,189	186,536	3,324,725	1,374,110,208	0.24%
2012	3,201,888	172,506	3,374,394	1,427,203,029	0.24%
2013	3,243,277	179,579	3,422,856	1,519,998,639	0.23%
2014	3,229,177	296,458	3,525,635	1,567,766,111	0.22%
2015	3,403,729	292,688	3,696,417	1,567,456,043	0.24%
2016	3,381,665	282,368	3,664,033	1,626,418,896	0.23%
Average	3,110,386	276,106	3,386,492	1,432,173,684	0.24%

Notes:

Source: Various issues of Best's Aggregates and Averages.

(1) - (4): Exhibit of Net Investment Income, page 150 (calendar year 2016).

(5): Exhibit of Assets, page 140 (calendar year 2016).

Calculation of Common Stock Total Return Tax Rate

Year (1)	Income Returns (2)	Capital Appreciation Returns (3)
1926	5.41	5.72
1927	5.71	30.91
1928	4.81	37.88
1929	3.98	-11.91
1930	4.57	-28.48
1931	5.35	-47.07
1932	6.16	-15.15
1933	6.39	46.59
1934	4.46	-5.94
1935	4.95	41.37
1936	5.36	27.92
1937	4.66	-38.59
1938	4.83	25.21
1939	4.69	-5.45
1940	5.36	-15.29
1941	6.71	-17.86
1942	6.79	12.43
1943	6.24	19.45
1944	5.48	13.80
1945	4.97	30.72
1946	4.09	-11.87
1947	5.49	0.00
1948	6.08	-0.65
1949	7.50	10.26
1950	8.77	21.78
1951	6.91	16.46
1952	5.93	11.78
1953	5.46	-6.62
1954	6.21	45.02
1955	4.56	26.40
1956	3.83	2.62
1957	3.84	-14.31
1958	4.38	38.06
1959	3.31	8.48
1960	3.26	-2.97
1961	3.48	23.13
1962	2.98	-11.81
1963	3.61	18.89
1964	3.33	12.97
1965	3.21	9.06
1966	3.11	-13.09
1967	3.64	20.09
1968	3.18	7.66
1969	2.98	-11.36
1970	3.33	0.10
1971	3.49	10.63
1972	2.95	15.79
1973	2.86	-17.37
1974	3.69	-29.72
1975	5.37	31.55
1976	4.49	19.15
1977	4.35	-11.50
1978	5.33	1.06
1979	5.89	12.31
1980	5.74	25.77
1981	4.88	-9.73
1982	5.61	14.76
1983	5.04	17.27
1984	4.57	1.40

Calculation of Common Stock Total Return Tax Rate

Year (1)	Income Returns (2)	Capital Appreciation Returns (3)
1985	4.72	26.33
1986	3.92	14.62
1987	3.64	2.03
1988	3.99	12.40
1989	4.03	27.25
1990	3.43	-6.56
1991	3.76	26.31
1992	2.98	4.46
1993	2.91	7.06
1994	2.83	-1.54
1995	3.04	34.11
1996	2.43	20.26
1997	2.10	31.01
1998	1.67	26.67
1999	1.36	19.53
2000	1.11	-10.14
2001	1.18	-13.04
2002	1.39	-23.37
2003	1.99	26.38
2004	1.76	8.99
2005	1.84	3.00
2006	2.01	13.62
2007	1.96	3.53
2008	1.92	-38.49
2009	2.48	23.45
2010	2.02	12.78
2011	2.13	0.00
2012	2.50	13.41
2013	2.48	29.60
2014	2.16	11.39
2015	2.10	-0.73
2016	2.26	9.54
Average	4.00	7.71

	Dividend	Capital Gains
(4) Weights	34.14%	65.86%
(5) Tax Rate	14.18%	26.26%
(6) Common Stock Tax Rate		22.13%

Notes:

Source: 2017 SBBI Yearbook.

(2):Appendix A-2: Large-Capitalization Stocks, Income Returns.

(3):Appendix A-3: Large-Capitalization Stocks, Capital Appreciation Returns.

(5) = Dividend Tax Rate = $0.3 \times 0.35 + 0.7 \times 0.35 \times 0.15$

Capital Gains Tax Rate is from page 2.

Calculation of Capital Gains Tax Rate

(1) Turnover Rate	36.00%
(2) Weighted Average Cost of Capital	7.23%
(3) Marginal Tax Rate	35.00%
(4) Annual Expected Capital Gains Rate	7.71%

Year (5)	Investment Basis (6) _{t-1} x [1.0 - (1)] (6)	Investment Value		Investment Sold (8) x (1) (9)	Realized Capital Gains [(8) - (6)] x (1) (10)	Taxes Paid (10) x (3) (11)	Present Value of the Taxes (12)
		Beg of Year (8) _{t-1} - (9) _{t-1} (7)	End of Year (7) x [1.0 + (4)] (8)				
0	1,000,000.00	1,000,000.00	1,077,095.60	387,754.42	27,754.42	9,714.05	9,380.63
1	640,000.00	689,341.19	742,486.36	267,295.09	36,895.09	12,913.28	11,628.72
2	409,600.00	475,191.27	511,826.43	184,257.51	36,801.51	12,880.53	10,816.65
3	262,144.00	327,568.92	352,823.04	127,016.29	32,644.45	11,425.56	8,947.46
4	167,772.16	225,806.74	243,215.45	87,557.56	27,159.59	9,505.85	6,941.88
5	107,374.18	155,657.89	167,658.43	60,357.03	21,702.33	7,595.82	5,172.78
6	68,719.48	107,301.39	115,573.86	41,606.59	16,867.58	5,903.65	3,749.16
7	43,980.47	73,967.27	79,669.82	28,681.14	12,848.17	4,496.86	2,663.09
8	28,147.50	50,988.69	54,919.69	19,771.09	9,637.99	3,373.30	1,862.92
9	18,014.40	35,148.60	37,858.40	13,629.03	7,143.84	2,500.34	1,287.67
10	11,529.22	24,229.38	26,097.36	9,395.05	5,244.53	1,835.59	881.54
11	7,378.70	16,702.31	17,989.98	6,476.39	3,820.06	1,337.02	598.78
12	4,722.37	11,513.59	12,401.24	4,464.45	2,764.39	967.54	404.08
13	3,022.31	7,936.79	8,548.68	3,077.53	1,989.49	696.32	271.19
14	1,934.28	5,471.16	5,892.96	2,121.47	1,425.12	498.79	181.15
15	1,237.94	3,771.49	4,062.26	1,462.41	1,016.76	355.86	120.52
16	792.28	2,599.85	2,800.28	1,008.10	722.88	253.01	79.91
17	507.06	1,792.18	1,930.35	694.93	512.38	179.33	52.82
18	324.52	1,235.42	1,330.67	479.04	362.21	126.78	34.82
19	207.69	851.63	917.29	330.22	255.45	89.41	22.90
20	132.92	587.06	632.32	632.32	499.40	174.79	41.75
Total					248,067.66	86,823.68	65,140.41

(13) Implied Tax Rate on Capital Gains 26.26%

Notes:

- (1): Turnover Rate is based on AIB Stock Turnover Study of 1988 transactions. (2001 AIB Profit Filing, R2000-10, 100H-3, Exhibits 15 and 16)
- (2): Interest Rate is the weighted average cost of capital, Section VII - E, Exhibit 1.
- (4): Page 1.
- (10) Year 20 : All remaining capital gains are assumed realized in year 20.
- (12) = (11) x { [1.0 + (2)]ⁿ - [(5) + 0.5] }
- (13) = (12) Total / (10) Total

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Calculation of Common Stock Tax Rate for Different Discount Rates and Turnover Rates

		Discount Rate											
		4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
Turnover Rate	0.10	18.03%	16.45%	15.11%	13.97%	13.00%	12.16%	11.44%	10.81%	10.27%	9.80%	9.38%	9.02%
	0.15	19.65%	18.26%	17.04%	15.99%	15.06%	14.25%	13.53%	12.89%	12.33%	11.82%	11.37%	10.97%
	0.20	21.16%	19.95%	18.88%	17.92%	17.07%	16.30%	15.61%	14.98%	14.42%	13.90%	13.44%	13.01%
	0.25	22.43%	21.39%	20.45%	19.60%	18.83%	18.12%	17.48%	16.88%	16.34%	15.83%	15.37%	14.94%
	0.30	23.43%	22.55%	21.73%	20.98%	20.29%	19.65%	19.06%	18.51%	17.99%	17.51%	17.07%	16.65%
	0.35	24.21%	23.45%	22.74%	22.09%	21.47%	20.90%	20.36%	19.85%	19.38%	18.93%	18.51%	18.11%
	0.40	24.81%	24.16%	23.54%	22.97%	22.42%	21.91%	21.43%	20.97%	20.53%	20.12%	19.73%	19.36%
	0.45	25.28%	24.72%	24.19%	23.68%	23.20%	22.75%	22.31%	21.90%	21.50%	21.13%	20.77%	20.42%
	0.50	25.67%	25.18%	24.72%	24.27%	23.85%	23.44%	23.05%	22.68%	22.33%	21.98%	21.66%	21.34%
	0.55	25.99%	25.56%	25.16%	24.76%	24.39%	24.03%	23.68%	23.35%	23.03%	22.72%	22.43%	22.14%
	0.60	26.25%	25.88%	25.53%	25.18%	24.85%	24.53%	24.23%	23.93%	23.64%	23.37%	23.10%	22.84%
	0.65	26.48%	26.16%	25.85%	25.55%	25.25%	24.97%	24.70%	24.43%	24.18%	23.93%	23.69%	23.45%
	0.70	26.67%	26.39%	26.12%	25.86%	25.60%	25.35%	25.11%	24.88%	24.65%	24.43%	24.21%	24.00%

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MASSACHUSETTS WORKERS' COMPENSATION

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F-CLASS RATE RECOMMENDATION

Background and Summary

The United States Longshore and Harbor Workers (USL&HW) Act is a federal law that offers benefits to longshoremen, harbor workers, and other employees engaged in loading, unloading, repairing and building a vessel while working on the vessel or any adjoining navigable waters. F-Classes were created for risks that have considerable USL&HW exposure. Since the benefit provisions for F-Classes are different than those prescribed by Massachusetts workers' compensation law, rates for these classifications are calculated separately from Massachusetts state class codes.

To allow movement toward the levels indicated by the data, while acknowledging that F-Class historical data is not fully credible due to its more limited volume, this section of the filing recommends that average rates for F-Class classifications be decreased by 11.5% for the policy period beginning July 1, 2018.

Indicated Rate Change

The ratemaking methodology used for F-Classes is similar to that used in the statewide rate indication: we compare an indicated loss, LAE, loss based assessment, and fixed expense ratio to a permissible loss, LAE, loss based assessment, and fixed expense ratio. Consistent with prior F-Class filings, the indication is derived using the latest five years of Unit Statistical Plan data. Premium and losses are adjusted for the effects of trend, development, changes in benefits, and changes in rates. The resulting

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indicated adjusted loss ratio is loaded for loss adjustment expenses, loss based assessments associated with the USL&HW Act Special Fund (“Special Fund Assessment”), and fixed expenses. The expense provisions, with the exception of the Special Fund Assessment, are taken from Section I. The Special Fund Assessment is currently calculated by the NCCI as 11.9% of incurred indemnity losses covered under the USL&HW Act.

Complement of Credibility

Due to the limited amount of F-Class experience, the rate change derived from the historical experience is not fully credible. As recommended by the Attorney General’s Office in the 2012 rate hearing the WCRIBMA has, since 2014, used a credibility-weighted formula to derive the F-Class rate revision. The credibility assigned to the historical data is calculated as:

$$Z = \text{square root (number of claims in experience base / full credibility standard)}$$

Using a full credibility standard of 4,000.¹

The complement of credibility calculation shown in Section VIII-A Exhibit 2 adjusts the current rates forward for net loss trend, accounts for changes in benefits and Special Funds Assessments since the last revision, and incorporates the expense and profit provisions used in the general rate revision.

¹ Credibility formula and full credibility standard from 2012 AG filing page 22.

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Calculation of Adjusted Standard Earned Premium

To derive an indicated loss ratio, the premiums for policy years 2011 - 2015 must be projected to the level expected to prevail during the prospective effective period. This is done by first extending the reported exposures using the currently effective rates. Since the reported exposures may be subject to further development as a consequence of delayed premium audits, premium development factors are applied. Next, factors are applied to reflect the expected impacts of experience rating, merit rating and ARAP. Note that no wage trend adjustment is made to premiums because the trend applied in the calculation of adjusted losses is net of the impact of estimated wage trend.

In Section VIII-B, each policy year's premium is adjusted to the prevailing level and then all five years are summed to a five year total. This total will be used with the five year total of adjusted losses calculated in Section VIII-C to calculate the indicated loss ratio in Section VIII-A.

Calculation of Adjusted Total Losses

Within Section VIII-C, the losses from policy years 2011 - 2015 are converted to the level expected to prevail during the prospective effective period. Given the differences in benefits and the applicability of the Special Fund Assessment, claims associated with the USL&HW Act and claims associated with the Massachusetts workers' compensation law are adjusted separately. Indemnity and medical loss data are also adjusted separately because of differences in loss development and trend. Losses are adjusted for changes in benefit levels, loss development to ultimate, and trend (in excess of

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expected wage trend). Factors are also applied for the loading of loss adjustment expenses and the Special Fund Assessment resulting in estimates of the sum of loss, LAE and loss based assessments. Note that the conversion factors used to adjust F-Class losses related to the state workers compensation law are the same ones used in the development of class rates in Section IX.

Calculation of Law Amendment Factors

Injured workers in the F-Classes can receive benefits paid under either state law or federal law. Therefore, law amendment factors for both are needed in the derivation of the conversion factors used in Section VIII-C. Law amendment factors related to the USL&HW Act are taken from Section IV–F. These factors are derived from the estimated effects of federal law amendments reported in NCCI's Annual Statistical Bulletin. The law amendment factors related to state workers compensation benefits (and reflected in the conversion factors taken from Section IX) are derived in Section IV-A.

Calculation of Loss Development Factors

The reported losses used in the indication include losses paid and payable under the state workers compensation law and under the USL&HW Act. Since the differing benefit levels can affect development patterns, the losses related to the state workers compensation law are developed separately from losses related to the USL&HW Act. For USL&HW Act claims, NCCI loss development factors were utilized in Section VIII-E. For

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state workers compensation claims, the development factors are consistent with those used in Section IX.

Calculation of Trend Factors

Trend factors adjust for changes in wage levels, claim frequency, and average claim size between the historical period and the prospective effective period. The trend factors used in developing the F-Class indication are consistent with the premium and loss trends selected in Section IX-B, Exhibit 3.

Calculation of Class Rates

There are 14 F-Classes in Massachusetts for which we update class pure premium relativities in a manner similar to that used in Section IX.

The Massachusetts indicated pure premiums are derived from the latest five years of Unit Statistical Plan loss and payroll data. This is the same loss data that underlies the F-Class indication in Subsection A. The losses are adjusted for the appropriate law level changes, development to ultimate, the proposed 18.5% loss adjustment expense factor, and the Special Federal Fund Assessment. These adjustment factors are shown in Section VIII-E.

The countrywide relativities are calculated using the same countrywide data set used in Section IX. Pitch Factors are used to adjust the countrywide data to the same law level, LAE and Special Federal Fund Assessment level as the Massachusetts indicated pure premiums. The calculation of Pitch Factors is described in Section IX-A.

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The relativities underlying present rates are calculated from the pure premiums underlying the last revision, adjusted to reflect the impact of benefit changes and trend to the prospective effective period. These adjustment factors are shown on Exhibit 2 of Subsection F.

This section uses the same classical credibility method and parameters used in Section IX. The Massachusetts full credibility standards come from Section IX-D and are expected losses of \$27,200,000 and \$6,000,000 for indemnity and medical losses respectively. The countrywide full credibility standards also come from Section IX-D and correspond to countrywide claim counts of 1,150 and 1,000 for indemnity and medical losses respectively.

After the formula pure premium relativity is calculated, the proposed manual rates are calculated. Proposed manual rates are subject to swing limits of $\pm 20\%$ surrounding the targeted industry group change (see Section VIII-H). This is the method used for Massachusetts state classes, as outlined in Section IX-H.

Proposed F-Class Rates and Rating Values

Minimum Premium, Expected Loss Rates and D-Ratios are calculated using the methodology and factors from Section IX and X.

Pricing Example

Section VIII-I contains a sample rate calculation for Class 6824, Boat Building or Repairing & Drivers: US Act. Exhibit 1 of Section VIII-I details the calculation of the

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Massachusetts indicated pure premium relativity. Exhibit 2 of Section VIII-I details the calculation of the countrywide relativity. Exhibit 3 of Section VIII-I shows the calculation of the credibilities and the formula relativities. Exhibit 4 of Section VIII-I shows the derivation of the proposed average rate, manual rate and rating values.

USL&HW Coverage Percentage

The USL&HW Coverage Percentage is a factor applied to classification rates which do not anticipate operations subject to the USL&HW Act. If operations under such classifications involve some employees subject to the USL&HW Act, the manual rate and minimum premium are increased by the USL&HW Coverage Percentage for Manual Rates and the Expected Loss Rate is increased by the USL&HW Coverage Percentage for Expected Loss Rates.

The calculation of the proposed USL&HW Coverage Percentages are shown in Section VIII-J. The “Differential in Benefits” from the 7/1/2016 USL&HW Coverage Percentage is the starting point. Using the state and federal benefit level changes which have occurred since then and the projected benefit level changes from Section IV-A and IV-F, the revised differential in benefits is calculated on line (4) of Section VIII-J. The impact of the differential in benefits is then combined with the impact of the Special Fund Assessment to derive the USL&HW Coverage Percentage for Manual Rates on line (10) of Section VIII-J. The USL&HW Coverage Percentage for Expected Loss Rates does not include the impact of the Special Funds Assessment.

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Section VIII – Rate Recommendation
Subsection A – F-Class Rate Recommendation
7/1/2018

Section VIII-A
Page 8

Federal Tax Multiplier

The Federal Tax Multiplier is to be used in retrospective rating for those classes subject to the USL&HW Act. A Federal Tax Multiplier is needed to reflect the impact of the Special Fund Assessment applicable to indemnity losses paid under the USL&HW Act. This filing recommends a Federal Tax Multiplier of 1.076. The calculation is shown in Section VIII-K.

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Section VIII - F-Class Recommendation
Subsection A - Indicated Rate Change
7/1/2018

Section VIII-A
Exhibit 1

F-Class Rate Review Overall Indicated Rate Change

(1)	5-Year Adjusted Standard Plus ARAP Earned Premium	9,135,471
(2)	5-Year Adjusted Losses, LAE, and LBA	4,074,988
(3)	5-Year Adjusted Loss, LAE, and LBA Ratio = (2) / (1)	44.6%
(4)	Fixed Expense Ratio	4.2%
(5)	Indicated Policy Year 7/1/2018 Loss, LAE, Fixed Expense Ratio = (3) + (4)	48.9%
(6)	Variable Expense Ratio	19.9%
(7)	Profit and Contingencies	0.3%
(8)	Permissible Loss, LAE, LBA, and Fixed Expense Ratio = 1.000 - [(6) + (7)]	79.8%
(9)	Indicated Average Rate Change = [(5) / (8)] - 1.000	-38.8%
(10)	Rate Changed based on Trended On-Level Expected Loss Ratio	-4.1%
(11)	5-Year Total Claim Count	181
(12)	Credibility of the Indicated Average Rate Change = [(11) / 4,000] ^{0.5}	21.3%
(13)	Credibility Weighted Average Rate Change = [(9) x (12)] + { (10) x [100% - (12)] }	-11.5%

Notes:

- (1): Section VIII-B, Exhibit 1.
- (2): Section VIII-C, Exhibit 1, Page 2 and 4.
- (4), (6): Section VI-A, Exhibit 1.
- (7): Section VII-A, Exhibit 1.
- (10): Exhibit 2.
- (11): Unit Statistical Plan Data.

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Section VIII - F-Class Recommendation
 Subsection A - Indicated Rate Change
 7/1/2018

Section VIII-A
 Exhibit 2

F-Class Rate Review Complement of Credibility based on Trended On-Level Expected Loss Ratio

(1)	State Class Expected Loss and LAE Ratio from Prior Revision		77.0%
(2)	Loss Adjustment Expense Ratio from Prior Revision		0.200
(3)	Special Fund Assessment Rate as a % of Federal Indemnity Losses from Prior Revision		11.0%
		<u>Indemnity</u>	<u>Medical</u>
(4)	Federal Indemnity/Medical Losses as % of Total Federal Losses	55.5%	44.5%
(5)	F-Class Expected Loss Ratio from Prior Revision		61.1%
	= (1) / {(4) for Indemnity x [1.000 + (2) + (3)] + (4) for Medical x [1.000 + (2)] }		
(6)	Benefit Level Change Factor	1.002	1.000
(7)	Net Indemnity/Medical Trend	-2.6%	-2.9%
(8)	Years since Prior Revision	2.0	2.0
(9)	Trended On-Level Loss Ratio	32.2%	25.6%
	= (4) x (5) x (6) x [1.000 + (7)] ^ (8)		
(10)	Special Fund Assessment Rate as a % of Federal Indemnity Losses		11.9%
(11)	Loss Adjustment Expense Factor		1.185
(12)	Trended Loss, LAE and LBA Ratio		72.3%
	= [(9) for indemnity x (10)] + [(9) Total x (11)]		
(13)	Fixed Expense Ratio		4.2%
(14)	Trended Loss, LAE and Fixed Expense Ratio		76.5%
	= (12) + (13)		
(15)	Variable Expense Ratio		19.9%
(16)	Underwriting Profit Provision		0.3%
(17)	Permissible Loss, LAE, LBA, and Fixed Expense Ratio		79.8%
	= 1.000 - [(15) + (16)]		
(18)	Rate Changed based on Trended On-Level Expected Loss Ratio from Prior Revision		-4.1%
	= [(14) / (17)] - 1.000		

Notes:

- (1): Section VI-J, Exhibit 1 of 07/01/2016 Stipulation.
 (2), (3), (4): Section VIII-J, Exhibit 1 of 07/01/2016 Stipulation.
 (6): Section VIII-F, Exhibit 2.
 (7): Section V-A, Exhibit 1.
 (10): Section VIII-E, Exhibit 1, Page 2.
 (11), (15),(16): Section VI-J, Exhibit 1.
 (13): Section VI-A, Exhibit 1.

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Section VIII - F-Class Recommendation
Subsection B - Adjusted Premium
7/1/2018

Section VIII-B
Exhibit 1

5 Year Adjusted Standard Plus ARAP Earned Premium

Policy Year (1)	Manual Premium (2)	Premium Development Factor (3)	Experience & Merit Rating Adjustment (4)	ARAP Adjustment (5)	Total Adj Standard Plus ARAP Premium (6)
2011	1,919,152	1.000	0.997	1.052	2,012,891
2012	1,797,136	1.000	0.997	1.052	1,884,258
2013	1,639,616	0.999	0.997	1.052	1,718,386
2014	1,476,342	0.999	0.997	1.052	1,546,792
2015	1,883,128	0.999	0.997	1.052	1,973,143
Total	8,715,374				9,135,471

Notes:

(2): Section VIII-F, Exhibit 1, Page 3.

(3): Section V-E, Exhibit 1.

(4): The offset for Merit Rating and Average Experience Modification from the 07/01/2016 Stipulation.

(5): The offset for ARAP from the 07/01/2016 Stipulation.

(6) = (2) x (3) x (4) x (5)

VIII 000012

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2018

Section VIII-C
 Exhibit 1
 Page 1

Calculation of Adjusted Indemnity and Medical Losses Federal Losses

(A). Unit Statistical Plan Limited Reported Losses

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	97,454	554,817	143,946	86,463	124,666
Temporary Total	51,953	72,658	154,123	68,539	95,138
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	4,581	162,758	226,668	27,030	81,825
Temporary Total	63,337	105,939	69,981	98,282	122,740
Medical Only	8,880	36,839	18,081	29,545	12,475

(B). Unit Statistical Plan Converted Unlimited Losses

Converted unlimited Losses are Limited Losses after the application of Primary, Excess and Secondary Conversion Factors.

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	128,325	855,767	221,193	141,918	410,715
Temporary Total	70,975	103,959	242,524	125,563	248,517
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	12,449	288,083	321,385	44,409	171,650
Temporary Total	82,668	134,253	109,420	148,309	217,508
Medical Only	8,566	37,774	19,484	36,041	16,947

Note:

(B): Section VIII-G.

VIII 000013

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2018

Section VIII-C
 Exhibit 1
 Page 2

Calculation of Adjusted Indemnity and Medical Losses Federal Losses

(C). Investment Income Offset Factor

The impact from this factor needs to be removed from the Federal Conversion Factors.

Indemnity	Investment Income Offset Factor
Fatal	0.825
Permanent Total	0.778
Permanent Partial	1.028
Temporary Total	1.036

Medical	
Fatal	1.000
Permanent Total	0.779
Permanent Partial	1.029
Temporary Total	1.037
Medical Only	1.000

(D). Adjusted Losses

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	124,836	832,502	215,180	138,060	399,549
Temporary Total	68,496	100,328	234,053	121,177	239,837
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	12,102	280,059	312,433	43,172	166,869
Temporary Total	79,726	129,475	105,526	143,031	209,766
Medical Only	8,566	37,774	19,484	36,041	16,947
Adjusted Losses, LAE, LBA	4,074,988				

Notes:

(C): Section IX-B, Exhibit 4.

(D) = (B) / (C)

VIII 000014

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2018

Section VIII-C
 Exhibit 1
 Page 3

Calculation of Adjusted Indemnity and Medical Losses State Losses

(A). Unit Statistical Plan Limited Reported Losses

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical Only	0	0	0	0	0

(B). Unit Statistical Plan Converted Unlimited Losses

Unlimited Losses are Limited Losses after the application of Primary, Excess and Secondary Conversion Factors.

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical Only	0	0	0	0	0

Notes:

(B): Section VIII-G.

VIII 000015

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2018

Section VIII-C
 Exhibit 1
 Page 4

Calculation of Adjusted Indemnity and Medical Losses State Losses

(C). Investment Income Offset Factor

The impact from this factor needs to be removed from the State Conversion Factors.

Indemnity	Investment Income Offset Factor
Fatal	0.825
Permanent Total	0.778
Permanent Partial	1.028
Temporary Total	1.036
Medical	
Fatal	1.000
Permanent Total	0.779
Permanent Partial	1.029
Temporary Total	1.037
Medical Only	1.000

(D). Adjusted Losses

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical Only	0	0	0	0	0
Adjusted Losses, LAE	0				

Notes:

(C): Section IX-B, Exhibit 4.

(D) = (B) / (C)

VIII 000016

Section VIII - F-Class Recommendation
Subsection D - Proposed Rates
7/1/2018

Section VIII-D
Exhibit 1

Proposed Rates and Rating Values to be Effective 7/1/2018

Class Code (1)	Manual Rate (2)	Minimum Premium (3)	Loss Constant (4)	Expected Loss Rate (5)	D-Ratio (6)
6801	6.19	467	0	2.49	0.17
6824	9.92	500	0	3.88	0.17
6826	7.65	500	0	3.08	0.16
6843	12.76	500	0	3.72	0.15
6872	16.77	500	0	4.89	0.17
6874	15.35	500	0	4.48	0.15
7309	14.55	500	0	4.24	0.16
7313	15.85	500	0	4.62	0.13
7317	15.94	500	0	4.65	0.15
7327	28.29	500	0	8.25	0.16
7350	18.87	500	0	7.38	0.15
8709	5.03	335	0	1.47	0.16
8726	5.38	347	0	2.17	0.17
9077	5.20	341	0	2.33	0.20

Notes:

(2),(3): Calculated as per Section VIII-I, Exhibit 4.

(4): F-Classes have no loss constant.

(5),(6): Calculated as per Section X.

VIII 000017

Section VIII - F-Class Recommendation
 Subsection E - Conversion/Excess Loss Factors
 7/1/2018

Section VIII-E
 Exhibit 1
 Page 1

Calculation of Indemnity and Medical Conversion Factors Federal Losses

(A). Benefit Level Adjustment Factors

The following factors are used to bring MA Unit Statistical Plan losses to the benefit level of the proposed effective policy year period.

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal	1.033	1.027	1.023	1.019	1.015
Permanent Total	1.027	1.022	1.019	1.015	1.011
Permanent Partial	1.010	1.008	1.007	1.005	1.004
Temporary Total	1.027	1.022	1.019	1.015	1.011
Medical					
All Injury Types	1.000	1.000	1.000	1.000	1.000

(B). Loss Development Factors

The following factors are used to bring MA Unit Statistical Plan losses from first through fifth report to an ultimate basis.

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Likely	1.107	1.152	1.260	1.455	2.500
Not Likely	1.021	1.038	1.097	1.214	1.747
Medical					
Likely	1.205	1.213	1.277	1.365	1.680
Not Likely	1.017	1.021	1.044	1.049	1.113

(C). Trend Factors

The following factors trend the MA Unit Statistical Plan losses from the reported period to the proposed effective period for new rates.

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
All Injury Types	0.820	0.852	0.879	0.836	0.911
Medical					
Lost Time Medical	0.789	0.780	0.845	0.797	0.914
Medical Only	0.641	0.674	0.701	0.773	0.817

(D). Primary Conversion Factors (PCF)

Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal - LD	0.938	1.008	1.133	1.241	2.311
Fatal - NLD	0.866	0.908	0.986	1.035	1.615
Permanent Total	0.932	1.003	1.128	1.235	2.302
Permanent Partial - LD	0.917	0.989	1.115	1.223	2.285
Permanent Partial - NLD	0.846	0.891	0.971	1.021	1.597
Temporary Total - LD	0.932	1.003	1.128	1.235	2.302
Temporary Total - NLD	0.860	0.903	0.982	1.031	1.609
Medical					
Lost Time Medical -LD	0.951	0.946	1.080	1.088	1.536
Lost Time Medical -NLD	0.803	0.797	0.883	0.836	1.018
Medical - NLD	0.652	0.688	0.732	0.810	0.909

Notes:

- (A): Section IV-F, Exhibit 1.
- (B): NCCI.
- (C): Section IX-B, Exhibit 1, Page 1.
- (D) = (A) x (B) x (C)

VIII 000018

Calculation of Indemnity and Medical Conversion Factors Federal Losses

(A). Loss Adjustment Expense Factor

The following factor is applied to include the proposed loss adjustment expense.

	Indemnity	Medical
Loss Adjustment Expense Factor	1.185	1.185

(B). Loss Based Assessments (Special Fund Assessment)

	Indemnity	Medical
Loss Based Assessments	0.119	0.000

(C). Investment Income Offset Factor

The following factor is applied to adjust for investment income.

Indemnity	Investment Income Offset Factor
Fatal	0.825
Permanent Total	0.778
Permanent Partial	1.028
Temporary Total	1.036
Medical	
Fatal	1.000
Permanent Total	0.779
Permanent Partial	1.029
Temporary Total	1.037
Medical Only	1.000

(D). Secondary Conversion Factors (SCF)

Indemnity	
Fatal	1.076
Permanent Total	1.015
Permanent Partial	1.340
Temporary Total	1.351
Medical	
Fatal	1.185
Permanent Total	0.923
Permanent Partial	1.219
Temporary Total	1.229
Medical Only	1.185

Notes:

(A): 1.000 + Loss Adjustment Expense (as a percent of losses) from Section VI-A, Exhibit 1.

(B): NCCI Tax and Assessment Directory.

(C): Section IX-B, Exhibit 4.

(D) = [(A) + (B)] x (C)

VIII 000019

Section VIII - F-Class Recommendation
 Subsection E - Conversion/Excess Loss Factors
 7/1/2018

Section VIII-E
 Exhibit 1
 Page 3

Calculation of Indemnity and Medical Conversion Factors State Losses

The MA Indicated Pure Premium Relativities are calculated from exposure and loss data for the latest available 5 policy years of Unit Statistical Plan data.
 Below are adjustment factors used to put the losses at the level proposed in this filing.

(A). Primary State Conversion Factors

Remainder of Industry	Policy Year				
	2011	2012	2013	2014	2015
Indemnity					
Fatal - LD	0.878	0.921	1.010	1.071	1.674
Fatal - NLD	0.881	0.928	1.004	1.060	1.494
Permanent Total	0.878	0.919	1.008	1.070	1.681
Permanent Partial - LD	0.902	0.940	1.029	1.089	1.703
Permanent Partial - NLD	0.906	0.947	1.023	1.078	1.521
Temporary Total - LD	0.864	0.907	0.995	1.059	1.667
Temporary Total - NLD	0.867	0.914	0.990	1.047	1.488
Medical					
Lost Time Medical - LD	0.778	0.765	0.835	0.796	0.931
Lost Time Medical - NLD	0.789	0.779	0.847	0.798	0.927
Medical - NLD	0.641	0.673	0.702	0.774	0.828
AIG					
Indemnity					
Fatal - LD	0.885	0.939	1.037	1.195	2.073
Fatal - NLD	0.870	0.928	1.001	1.103	1.802
Permanent Total	0.886	0.937	1.035	1.194	2.082
Permanent Partial - LD	0.910	0.958	1.056	1.215	2.110
Permanent Partial - NLD	0.894	0.947	1.019	1.121	1.834
Temporary Total - LD	0.871	0.925	1.022	1.181	2.065
Temporary Total - NLD	0.856	0.914	0.986	1.089	1.795
Medical					
Lost Time Medical - LD	0.708	0.678	0.752	0.742	0.983
Lost Time Medical - NLD	0.773	0.757	0.825	0.790	0.974
Medical - NLD	0.628	0.654	0.684	0.766	0.870

(B). Secondary State Conversion Factors

Indemnity	
Fatal	0.978
Permanent Total	0.922
Permanent Partial	1.218
Temporary Total	1.228
Medical	
Fatal	1.185
Permanent Total	0.923
Permanent Partial	1.219
Temporary Total	1.229
Medical Only	1.185

Notes:

- (A): Section IX-B, Exhibit 1, Page 2.
 (B): Section IX-B, Exhibit 1, Page 3.

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Federal Industry Group
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not Likely (4)	Likely (5)	Not Likely (6)		Likely (8)	Not Likely (9)	Likely (10)	Not Likely (11)	
2011	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	0	97,454	0	4,581	102,035	0	82,454	0	3,677	86,131
	5	0	51,953	0	63,337	115,290	0	44,665	0	50,835	95,500
	6	0	0	0	8,880	8,880	0	0	0	5,793	5,793
2012	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	273,952	280,865	49,290	113,468	717,575	270,960	250,307	46,648	90,389	658,304
	5	0	72,658	0	105,939	178,597	0	65,635	0	84,391	150,026
	6	0	0	0	36,839	36,839	0	0	0	25,349	25,349
2013	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	0	143,946	0	226,668	370,614	0	139,728	0	200,065	339,793
	5	0	154,123	0	69,981	224,104	0	151,349	0	61,768	213,117
	6	0	0	0	18,081	18,081	0	0	0	13,227	13,227
2014	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	0	86,463	0	27,030	113,493	0	88,250	0	22,609	110,859
	5	23,610	44,929	16,251	82,031	166,821	29,161	46,301	17,688	68,613	161,763
	6	0	0	0	29,545	29,545	0	0	0	23,943	23,943
2015	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	81,162	43,504	12,220	69,605	206,491	185,462	69,468	18,771	70,835	344,536
	5	1,534	93,604	8,500	114,240	217,878	3,532	150,607	13,057	116,259	283,455
	6	0	0	0	12,475	12,475	0	0	0	11,344	11,344
All Years, All Injury		380,258	1,069,499	86,261	982,700	2,518,718	489,115	1,088,764	96,164	849,097	2,523,140

Notes:

(3),(4),(5),(6): Unit Statistical Plan data, excluding Large Deductibles.

(8), (9), (10), (11): Limited Incurred Losses x Primary Conversion Factors from Section VIII-E, Exhibit 1, Page 1.

(12) = (8) + (9) + (10) + (11)

VIII 000020

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Federal Industry Group
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)	
		Likely (3)	Not Likely (4)	Likely (5)	Not Likely (6)		Likely (8)	Not Likely (9)	Likely (10)	Not Likely (11)		
2011	1	0	0	0	0	0	0	0	0	0	0	182,991
	2	0	0	0	0	0	0	0	0	0	0	
	9	0	13,276	0	6,535	19,811	0	128,325	0	12,449	140,774	
	5	0	7,861	0	16,442	24,303	0	70,975	0	82,668	153,643	
	6	0	0	0	1,436	1,436	0	0	0	8,566	8,566	
2012	1	0	0	0	0	0	0	0	0	0	0	179,133
	2	0	0	0	0	0	0	0	0	0	0	
	9	52,256	64,879	35,248	64,044	216,427	433,266	422,501	99,831	188,253	1,143,851	
	5	0	11,302	0	24,867	36,169	0	103,959	0	134,253	238,212	
	6	0	0	0	6,527	6,527	0	0	0	37,774	37,774	
2013	1	0	0	0	0	0	0	0	0	0	0	172,600
	2	0	0	0	0	0	0	0	0	0	0	
	9	0	25,282	0	63,582	88,864	0	221,193	0	321,385	542,578	
	5	0	28,134	0	27,281	55,415	0	242,524	0	109,420	351,944	
	6	0	0	0	3,215	3,215	0	0	0	19,484	19,484	
2014	1	0	0	0	0	0	0	0	0	0	0	166,923
	2	0	0	0	0	0	0	0	0	0	0	
	9	0	17,621	0	13,822	31,443	0	141,918	0	44,409	186,327	
	5	4,695	12,767	6,081	28,316	51,859	45,748	79,815	29,206	119,104	273,873	
	6	0	0	0	6,470	6,470	0	0	0	36,041	36,041	
2015	1	0	0	0	0	0	0	0	0	0	0	196,085
	2	0	0	0	0	0	0	0	0	0	0	
	9	29,861	21,601	17,115	34,091	102,668	288,638	122,077	43,745	127,904	582,364	
	5	569	29,210	3,247	44,449	77,475	5,541	242,976	20,034	197,474	466,025	
	6	0	0	0	2,957	2,957	0	0	0	16,947	16,947	
(14) All Years and Injury Types		87,381	231,933	61,691	344,034	725,039	773,193	1,776,263	192,816	1,456,131	4,198,403	897,732
(15) Pure Premium							0.861	1.979	0.215	1.622	4.677	

Notes:
 (3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
 (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
 (7) = (3) + (4) + (5) + (6)
 (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section VIII-E, Exhibit 1, Page 2.
 (12) = (8) + (9) + (10) + (11)
 (13): From Page 3.
 (15): Pure Premium calculated as the All Years, All Injury Types Adjusted Converted Losses divided by the All Years, All Injury Types Exposure.

VIII 000021

Calculation of Manual Premium by Extension of Exposures
 Federal Industry Group
 All Classes

Class Code	Exposure By Policy Year						Current Rate	Manual Premium					
	2011	2012	2013	2014	2015	Total		2011	2012	2013	2014	2015	Total
	(2)	(3)	(4)	(5)	(6)	(7)		= (2) x (8) (9)	= (3) x (8) (10)	= (4) x (8) (11)	= (5) x (8) (12)	= (6) x (8) (13)	= (7) x (8) (14)
6801	2,923	0	0	0	0	2,923	8.98	26,249	0	0	0	0	26,249
6824	42,935	50,915	49,827	51,022	52,497	247,196	10.26	440,513	522,388	511,225	523,486	538,619	2,536,231
6826	3,867	237	612	100	0	4,816	9.84	38,051	2,332	6,022	984	0	47,389
6843	0	0	6,561	100	18,335	24,996	14.29	0	0	93,757	1,429	262,007	357,193
6872	9,147	9,553	7,712	7,107	7,445	40,964	21.87	200,045	208,924	168,661	155,430	162,822	895,883
6874	7,171	2,803	383	94	10	10,461	19.47	139,619	54,574	7,457	1,830	195	203,676
7309	15,897	13,196	13,835	7,342	12,589	62,859	21.11	335,586	278,568	292,057	154,990	265,754	1,326,953
7313	0	0	0	0	0	0	15.29	0	0	0	0	0	0
7317	1,974	319	1,559	5,260	4,441	13,553	14.61	28,840	4,661	22,777	76,849	64,883	198,009
7327	150	182	113	126	88	659	33.44	5,016	6,086	3,779	4,213	2,943	22,037
7350	11,382	11,270	0	0	0	22,652	17.29	196,795	194,858	0	0	0	391,653
8709	2,909	5,659	3,682	1,820	1,581	15,651	5.16	15,010	29,200	18,999	9,391	8,158	80,759
8726	84,636	84,999	88,316	93,952	99,099	451,002	5.83	493,428	495,544	514,882	547,740	577,747	2,629,342
9077	0	0	0	0	0	0	4.77	0	0	0	0	0	0
Total	182,991	179,133	172,600	166,923	196,085	897,732		1,919,152	1,797,136	1,639,616	1,476,342	1,883,128	8,715,374

Notes:
 (2) - (7): Unit Statistical Plan data.
 (8): Section VIII-D, Exhibit 1 of the 7/1/2016 Stipulation.

VIII 000022

Calculation of Pure Premium Underlying Present Rate Factor

Industry Group (1)	Injury Type (2)	Uncapped Rate Level Factor (3)	Industry Group Pure Premium From Previous Revision (4)	Percent of Pure Premium = $(4) / [\text{Total of (4)}]$ (5)	Expected Loss and LAE Ratio (6)	Loss Based Assessment Change Factor (7)	Federal Losses as a % of Total Losses (8)	Benefit Level Change Factor (9)	Trend (10)	Pure Premium Underlying Present Rate Factor = $(3) \times (5) \times (6) \times (7) \times (9) \times (10)$ (11)
Federal	Indemnity	10.717	3.046	0.580	0.770	1.004	1.000	1.002	0.948	4.563
	Medical	10.717	2.205	0.420	0.770	1.004	1.000	1.000	0.942	3.279
	Total		5.251							

Notes:

- (3): Section VIII-H, Exhibit 1 of the 7/1/2016 Stipulation.
- (4): Section VIII-G of the 7/1/2016 Stipulation.
- (6): Section VI-J, Exhibit 1 of the 7/1/2016 Stipulation.
- (7): Change in load from Section VIII-K, Exhibit 1 and the 7/1/2016 Stipulation.
- (8): Based on ratio of Federal losses to sum of Federal and State losses from Section VIII-C, Exhibit 1, Pages 1 & 3.
- (9): Weighted average of Section IV-A, Exhibit 1 and Section IV-F, Exhibit 1, using weights from Column (8).
- (10): Section V-A, Exhibit 1.

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Section VIII - F-Class Recommendation
 Subsection F - Proposed Pure Premium Relativities
 7/1/2018

Section VIII-F
 Exhibit 3

Calculation of Pure Premiums Underlying Present Rate Federal Industry Group

Class Code	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity	Medical	Indemnity	Medical	Total = (4) + (5)
(1)	(2)	(3)	(4)	(5)	(6)
6801	0.746	0.890	3.404	2.918	6.322
6824	0.961	1.192	4.385	3.908	8.293
6826	1.103	0.892	5.032	2.926	7.958
6843	2.791	1.652	12.737	5.417	18.154
6872	1.648	1.662	7.519	5.450	12.969
6874	1.704	1.264	7.777	4.145	11.922
7309	1.485	1.208	6.778	3.960	10.738
7313	2.970	0.789	13.553	2.587	16.139
7317	3.360	1.914	15.331	6.274	21.606
7327	4.140	3.462	18.890	11.353	30.243
7350	2.765	1.973	12.619	6.468	19.087
8709	0.547	0.511	2.497	1.676	4.173
8726	0.553	0.666	2.525	2.184	4.708
9077	0.892	1.973	4.068	6.469	10.538

Notes:

(2), (3): Section VIII-H, Exhibit 2 of the 07/01/2016 Stipulation.

(4), (5) = (2),(3) x Pure Premium Underlying Present Rate Factors from Exhibit 2.

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Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2018

Section VIII - G
 Exhibit 1

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Federal Class Codes		
6801 BOAT BUILDING - WOOD - NOC & DRIVERS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,923	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	2,923	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.070	.
(15) Countrywide Pure Premium:	0.016	0.413	0.429
(16) Countrywide Indicated Relativity:	0.007	0.355	.
(17) Countrywide Credibility:	0.080	0.080	.
(18) Countrywide Lost-Time Claims:	2.000	.	.
(19) Pure Premium Underlying Present Rate:	3.404	2.918	6.322
(20) Relativity to Underlying Present Rate:	0.777	0.906	.
(21) Credibility to Underlying Relativity:	0.880	0.850	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	0.684	0.799	.
(24) Balanced Formula Relativity:	0.657	0.766	0.700

Class(es):		Effective: 7/1/2018							Federal Class Codes		
6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	42,935	0	5	0	3,141	0	4,092	7,233	0.073	0.095	0.168
2012	50,915	1	3	233,780	0	79,471	5,306	318,557	4.592	1.665	6.257
2013	49,827	0	7	0	303,570	0	270,356	573,926	6.093	5.426	11.518
2014	51,022	0	6	0	3,684	0	6,563	10,248	0.072	0.129	0.201
2015	52,497	0	6	0	84,649	0	66,595	151,244	1.612	1.269	2.881
MA Total:	247,195	1	27	233,780	395,044	79,471	352,912	1,061,208	2.544	1.749	4.293

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.896	0.952	.
(14) Massachusetts Credibility:	0.280	0.480	.
(15) Countrywide Pure Premium:	3.457	2.145	5.602
(16) Countrywide Indicated Relativity:	1.624	1.844	.
(17) Countrywide Credibility:	0.360	0.260	.
(18) Countrywide Lost-Time Claims:	95.000	.	.
(19) Pure Premium Underlying Present Rate:	4.385	3.908	8.293
(20) Relativity to Underlying Present Rate:	1.000	1.214	.
(21) Credibility to Underlying Relativity:	0.360	0.260	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	1.196	1.252	.
(24) Balanced Formula Relativity:	1.148	1.201	1.169

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Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2018

Section VIII - G
 Exhibit 2

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Federal Class Codes		
6826 MARINA & DRIVERS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	3,867	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	237	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	612	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	100	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	4,816	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.060	0.090	.
(15) Countrywide Pure Premium:	1.853	0.910	2.763
(16) Countrywide Indicated Relativity:	0.871	0.782	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	17.000	.	.
(19) Pure Premium Underlying Present Rate:	5.032	2.926	7.958
(20) Relativity to Underlying Present Rate:	1.148	0.909	.
(21) Credibility to Underlying Relativity:	0.750	0.710	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	1.026	0.802	.
(24) Balanced Formula Relativity:	0.986	0.769	0.901

Class(es):		Effective: 7/1/2018							Federal Class Codes		
6843 SHIP BUILDING-IRON OR STEEL-NOC & DRIVERS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	6,561	0	3	0	5,354	0	4,389	9,743	0.816	0.669	1.485
2014	100	0	9	0	43,270	0	24,109	67,379	432.70	241.09	673.79
2015	18,335	0	3	0	8,473	0	2,901	11,373	0.462	0.158	0.620
MA Total:	24,996	0	15	0	57,097	0	31,398	88,495	2.284	1.256	3.540

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.804	0.684	.
(14) Massachusetts Credibility:	0.170	0.220	.
(15) Countrywide Pure Premium:	2.214	1.341	3.555
(16) Countrywide Indicated Relativity:	1.040	1.152	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	169.00	.	.
(19) Pure Premium Underlying Present Rate:	12.737	5.417	18.154
(20) Relativity to Underlying Present Rate:	2.905	1.683	.
(21) Credibility to Underlying Relativity:	0.410	0.390	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	1.765	1.256	.
(24) Balanced Formula Relativity:	1.695	1.205	1.502

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Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2018

Section VIII - G
 Exhibit 3

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Federal Class Codes			
6872 SHIP REPAIR CONVERSION- ALL OP & DR: US ACT												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	9,147	0	1	0	6,143	0	10,265	16,408	0.672	1,122	1,794	
2012	9,553	0	3	0	246,501	0	134,739	381,240	25.804	14,105	39,909	
2013	7,712	0	1	0	0	0	173	173	0.000	0.022	0.022	
2014	7,107	0	4	0	13,236	0	19,411	32,647	1.862	2,731	4,594	
2015	7,445	0	1	0	0	0	295	295	0.000	0.040	0.040	
MA Total:	40,964	0	10	0	265,880	0	164,882	430,762	6.491	4.025	10.516	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.285	2.191	.
(14) Massachusetts Credibility:	0.170	0.270	.
(15) Countrywide Pure Premium:	4.722	2.857	7.578
(16) Countrywide Indicated Relativity:	2.219	2.456	.
(17) Countrywide Credibility:	0.420	0.370	.
(18) Countrywide Lost-Time Claims:	267.00	.	.
(19) Pure Premium Underlying Present Rate:	7.519	5.450	12.969
(20) Relativity to Underlying Present Rate:	1.715	1.693	.
(21) Credibility to Underlying Relativity:	0.410	0.360	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	2.024	2.110	.
(24) Balanced Formula Relativity:	1.944	2.023	1.975

Class(es):		Effective: 7/1/2018							Federal Class Codes			
6874 PAINTING: SHIP HULLS - US ACT												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	7,171	0	1	0	0	0	95	95	0.000	0.013	0.013	
2012	2,803	0	0	0	0	0	0	0	0.000	0.000	0.000	
2013	383	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	94	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	10	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	10,460	0	1	0	0	0	95	95	0.000	0.009	0.009	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.005	.
(14) Massachusetts Credibility:	0.100	0.140	.
(15) Countrywide Pure Premium:	11.098	3.088	14.186
(16) Countrywide Indicated Relativity:	5.215	2.654	.
(17) Countrywide Credibility:	0.180	0.190	.
(18) Countrywide Lost-Time Claims:	16.000	.	.
(19) Pure Premium Underlying Present Rate:	7.777	4.145	11.922
(20) Relativity to Underlying Present Rate:	1.774	1.288	.
(21) Credibility to Underlying Relativity:	0.720	0.670	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	2.216	1.368	.
(24) Balanced Formula Relativity:	2.128	1.312	1.808

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Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2018

Section VIII - G
 Exhibit 4

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Federal Class Codes		
7309 STEVEDORING: NOC - US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	15,897	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	13,196	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	13,835	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	7,342	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	12,589	0	2	0	24,777	0	26,121	50,898	1,968	2,075	4,043
MA Total:	62,859	0	2	0	24,777	0	26,121	50,898	0.394	0.416	0.810

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.139	0.226	.
(14) Massachusetts Credibility:	0.190	0.280	.
(15) Countrywide Pure Premium:	2.998	1.512	4.510
(16) Countrywide Indicated Relativity:	1.409	1.300	.
(17) Countrywide Credibility:	0.360	0.360	.
(18) Countrywide Lost-Time Claims:	90.000	.	.
(19) Pure Premium Underlying Present Rate:	6.778	3.960	10.738
(20) Relativity to Underlying Present Rate:	1.546	1.230	.
(21) Credibility to Underlying Relativity:	0.450	0.360	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	1.229	0.974	.
(24) Balanced Formula Relativity:	1.181	0.934	1.084

Class(es):		Effective: 7/1/2018							Federal Class Codes		
7313 COAL DOCK OPERATION & STEVEDORING: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	0	0	0	0	0	0	0	0	.	.	.

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.000	0.000	.
(15) Countrywide Pure Premium:	2.646	0.755	3.401
(16) Countrywide Indicated Relativity:	1.243	0.649	.
(17) Countrywide Credibility:	0.210	0.220	.
(18) Countrywide Lost-Time Claims:	24.000	.	.
(19) Pure Premium Underlying Present Rate:	13.553	2.587	16.139
(20) Relativity to Underlying Present Rate:	3.091	0.804	.
(21) Credibility to Underlying Relativity:	0.790	0.780	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	2.703	0.770	.
(24) Balanced Formula Relativity:	2.596	0.738	1.867

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 Subsection G - Class Relativities
 7/1/2018

Section VIII - G
 Exhibit 5

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Federal Class Codes			
7317 STEVEDORING: BY HAND OR HAND TRUCKS: US ACT												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	1,974	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	319	0	1	0	0	0	2,541	2,541	0.000	7,964	7,964	
2013	1,559	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	5,260	0	1	0	30,690	0	28,387	59,077	5,834	5,396	11,231	
2015	4,441	0	2	0	104,472	0	71,493	175,965	23,524	16,098	39,622	
MA Total:	13,554	0	4	0	135,162	0	102,420	237,583	9,972	7,557	17,529	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.512	4.114	.
(14) Massachusetts Credibility:	0.140	0.180	.
(15) Countrywide Pure Premium:	4.768	1.699	6.467
(16) Countrywide Indicated Relativity:	2.241	1.460	.
(17) Countrywide Credibility:	0.400	0.410	.
(18) Countrywide Lost-Time Claims:	115.00	.	.
(19) Pure Premium Underlying Present Rate:	15.331	6.274	21.606
(20) Relativity to Underlying Present Rate:	3.497	1.949	.
(21) Credibility to Underlying Relativity:	0.460	0.410	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	2.996	2.138	.
(24) Balanced Formula Relativity:	2.878	2.050	2.553

Class(es):		Effective: 7/1/2018							Federal Class Codes			
7327 STEVEDORING: CONTAINERIZED FREIGHT & DRIVERS: US ACT												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	150	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	182	0	0	0	0	0	0	0	0.000	0.000	0.000	
2013	113	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	126	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	88	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	658	0	0	0	0	0	0	0	0.000	0.000	0.000	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	4.833	3.093	7.926
(16) Countrywide Indicated Relativity:	2.271	2.658	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	17.000	.	.
(19) Pure Premium Underlying Present Rate:	18.890	11.353	30.243
(20) Relativity to Underlying Present Rate:	4.309	3.527	.
(21) Credibility to Underlying Relativity:	0.760	0.730	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	3.706	3.106	.
(24) Balanced Formula Relativity:	3.560	2.979	3.332

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 Subsection G - Class Relativities
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Section VIII - G
 Exhibit 6

Calculation of Class Relativities

Class(es): 7350 FREIGHT HANDLING NOC: US ACT		Effective: 7/1/2018							Federal Class Codes		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	11,382	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	11,270	1	4	199,486	37,136	20,360	24,163	281,145	20,996	3,951	24,946
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	22,652	1	4	199,486	37,136	20,360	24,163	281,145	10.446	1.966	12.412

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.678	1.070	.
(14) Massachusetts Credibility:	0.160	0.230	.
(15) Countrywide Pure Premium:	9.855	3.312	13.166
(16) Countrywide Indicated Relativity:	4.631	2.847	.
(17) Countrywide Credibility:	0.320	0.340	.
(18) Countrywide Lost-Time Claims:	65.000	.	.
(19) Pure Premium Underlying Present Rate:	12.619	6.468	19.087
(20) Relativity to Underlying Present Rate:	2.878	2.009	.
(21) Credibility to Underlying Relativity:	0.520	0.430	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	3.567	2.078	.
(24) Balanced Formula Relativity:	3.426	1.993	2.863

Class(es): 8709 STEVEDORING:TALLIERS & CHECKING CLERKS: US ACT		Effective: 7/1/2018							Federal Class Codes		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,909	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	5,659	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	3,682	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	1,820	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,581	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	15,651	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.070	0.110	.
(15) Countrywide Pure Premium:	2.304	1.335	3.638
(16) Countrywide Indicated Relativity:	1.082	1.147	.
(17) Countrywide Credibility:	0.200	0.210	.
(18) Countrywide Lost-Time Claims:	21.000	.	.
(19) Pure Premium Underlying Present Rate:	2.497	1.676	4.173
(20) Relativity to Underlying Present Rate:	0.570	0.521	.
(21) Credibility to Underlying Relativity:	0.730	0.680	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	0.632	0.595	.
(24) Balanced Formula Relativity:	0.607	0.571	0.593

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Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2018

Section VIII - G
 Exhibit 7

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Federal Class Codes			
8726 STEAMSHIP LINE OR AGENCY-PORT EMP: SPRVSRs, CAPTNS, ENGRS, STWR												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	84,636	0	18	0	190,015	0	89,230	279,246	2,245	1,054	3,299	
2012	84,999	0	27	0	242,823	0	193,531	436,354	2,857	2,277	5,134	
2013	88,316	0	26	0	154,792	0	175,372	330,165	1,753	1,986	3,738	
2014	93,952	1	25	45,748	130,853	29,206	121,084	326,890	1,880	1,600	3,479	
2015	99,099	2	17	294,179	142,682	63,779	174,921	675,561	4,408	2,409	6,817	
MA Total:	451,002	3	113	339,926	861,166	92,985	754,139	2,048,215	2,663	1,878	4,541	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.938	1.023	.
(14) Massachusetts Credibility:	0.280	0.490	.
(15) Countrywide Pure Premium:	0.370	0.243	0.613
(16) Countrywide Indicated Relativity:	0.174	0.209	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	18,000	.	.
(19) Pure Premium Underlying Present Rate:	2.525	2.184	4.708
(20) Relativity to Underlying Present Rate:	0.576	0.678	.
(21) Credibility to Underlying Relativity:	0.530	0.310	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	0.601	0.753	.
(24) Balanced Formula Relativity:	0.577	0.722	0.634

Class(es):		Effective: 7/1/2018							Federal Class Codes			
9077 UNITED STATES ARMED SERVICE RISK-ALL EMPLOYEES & DRIVERS												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	0	0	0	0	0	0	0	0	.	.	.	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.000	0.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.928	2.010	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	4.068	6.469	10.538
(20) Relativity to Underlying Present Rate:	0.928	2.010	.
(21) Credibility to Underlying Relativity:	1.000	1.000	.
(22) Industry Group Converted Pure Premium:	2.840	1.837	4.677
(23) Formula Relativity:	0.928	2.010	.
(24) Balanced Formula Relativity:	0.891	1.927	1.298

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Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2018

Section VIII-H
Exhibit 1

Calculation of Federal Industry Group Rate Change and Limits

(1) Industry Group Differential	1.000
(2) Experience and Benefit Level Change - Overall	-11.5%
(3) Target Rate Change = (1) x [1.000 + (2)] - 1.000	-11.5%
(4) Maximum Rate Change = (3) + 20.0%	8.5%
(5) Minimum Rate Change = (3) - 20.0%	-31.5%
(6) Present Average Rate	10.205
(7) Uncapped Rate Level Factor = [1.000 + (3)] x (6)	9.031
(8) Capped Rate Level Factor	8.874

In addition, the WCRIBMA is limiting the increase in average rates for any class to \$15 and no average rate shall exceed \$90 per \$100 of payroll.

Notes:

- (1): Federal Industry Group is the only group being evaluated.
- (2): Selected Rate Change, from Section VIII-A, Exhibit 1.
- (6): Rates by class consistent with the 07/01/16 stipulation, weighted by five years of exposure.
- (8): Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved.

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Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2018

Section VIII-H
Exhibit 2

Calculation of Average Uncapped Rates

Class Code	Balanced Formula Relativity			Uncapped Rate Level Factor	Proposed Average Uncapped Rate = (4) x (5)
	Indemnity	Medical	Total		
(1)	(2)	(3)	(4)	(5)	(6)
6801	0.657	0.766	0.700	9.031	6.32
6824	1.148	1.201	1.169	9.031	10.56
6826	0.986	0.769	0.901	9.031	8.13
6843	1.695	1.205	1.502	9.031	13.57
6872	1.944	2.023	1.975	9.031	17.84
6874	2.128	1.312	1.808	9.031	16.33
7309	1.181	0.934	1.084	9.031	9.79
7313	2.596	0.738	1.867	9.031	16.86
7317	2.878	2.050	2.553	9.031	23.06
7327	3.560	2.979	3.332	9.031	30.09
7350	3.426	1.993	2.863	9.031	25.86
8709	0.607	0.571	0.593	9.031	5.35
8726	0.577	0.722	0.634	9.031	5.73
9077	0.891	1.927	1.298	9.031	11.72

Notes:

(2),(3),(4): Section VIII-G.

(5): Exhibit 1.

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Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2018

Section VIII-H
Exhibit 3

Comparison of Average Rates

Class Code (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
6801	9.44	6.32	6.46
6824	10.79	10.56	10.37
6826	10.35	8.13	7.99
6843	15.02	13.57	13.33
6872	22.99	17.84	17.52
6874	20.47	16.33	16.04
7309	22.19	9.79	15.20
7313	16.07	16.86	16.56
7317	15.35	23.06	16.66
7327	35.15	30.09	29.56
7350	18.17	25.86	19.72
8709	5.43	5.35	5.26
8726	6.13	5.73	5.63
9077	5.01	11.72	5.44

Notes:

(2): from Section VIII-H, Exhibit 3 of the 07/01/16 Stipulation.

(3): Exhibit 2.

(4) = Total Balanced Formula Relativity (Section VIII-G) x Capped Rate Level Factor Subject to maximum and minimum caps (Exhibit 1).

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Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
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Section VIII-H
Exhibit 4

Summary of Proposed Premium Change

Industry Group (1)	Present Premium (2)	Proposed Premium (3)	Proposed Change (4)	Target Change (5)	Capped Rate Level Factor (6)
Federal	9,161,414	8,107,858	-11.5%	-11.5%	8.87

Notes:

- (2): Exposure x Present Average Rates, from Exhibit 3.
- (3): Exposure x Proposed Average Rates, from Exhibit 3.
- (4) = [(3) - (2)] / (2)
- (5), (6): Exhibit 1.

VIII 000036

Pricing Example for Class 6824
 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of MA Indicated Relativity:

		(A). Federal Benefits - Limited Losses (Unit Statistical Plan data, Excluding Large Deductibles)							Medical Only
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total			
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2011	0	0	0	0	0	0	2,267	
	2012	0	0	0	147,818	0	0	0	
	2013	0	0	0	0	90,071	0	103,465	
	2014	0	0	0	0	0	0	2,218	
	2015	0	0	0	0	0	0	32,640	
Medical	2011	0	0	0	0	0	0	729	3,019
	2012	0	0	0	43,996	0	0	0	5,102
	2013	0	0	0	0	167,573	0	13,922	1,807
	2014	0	0	0	0	0	0	2,059	2,965
	2015	0	0	0	0	0	0	36,458	2,263

		(B). Federal Benefits Primary Conversion Factors (Section VIII-E, Exhibit 1, Page 1)							Medical Only
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total			
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2011	0.938	0.866	0.932	0.917	0.846	0.932	0.860	
	2012	1.008	0.908	1.003	0.989	0.891	1.003	0.903	
	2013	1.133	0.986	1.128	1.115	0.971	1.128	0.982	
	2014	1.241	1.035	1.235	1.223	1.021	1.235	1.031	
	2015	2.311	1.615	2.302	2.285	1.597	2.302	1.609	
Medical	2011	0.951	0.803	0.951	0.951	0.803	0.951	0.803	0.652
	2012	0.946	0.797	0.946	0.946	0.797	0.946	0.797	0.688
	2013	1.080	0.883	1.080	1.080	0.883	1.080	0.883	0.732
	2014	1.088	0.836	1.088	1.088	0.836	1.088	0.836	0.810
	2015	1.536	1.018	1.536	1.536	1.018	1.536	1.018	0.909

		(C). Federal Converted Limited Losses [(A) x (B)]							Medical Only
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total			
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2011	0	0	0	0	0	0	1,949	
	2012	0	0	0	146,203	0	0	0	
	2013	0	0	0	0	87,432	0	101,603	
	2014	0	0	0	0	0	0	2,286	
	2015	0	0	0	0	0	0	52,517	
Medical	2011	0	0	0	0	0	0	585	1,969
	2012	0	0	0	41,638	0	0	0	3,511
	2013	0	0	0	0	147,906	0	12,288	1,322
	2014	0	0	0	0	0	0	1,722	2,403
	2015	0	0	0	0	0	0	37,102	2,058

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Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
 7/1/2018

Section VIII-I
 Exhibit 1
 Page 2

Pricing Example for Class 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of MA Indicated Relativity (cont.):

(D). Federal Unadjusted Excess Losses [(Excess Factor - 1.0) x (C)]									
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2011	0	0	0	0	0	0	537	
	2012	0	0	0	40,281	0	0	0	
	2013	0	0	0	0	24,088	0	27,993	
	2014	0	0	0	0	0	0	630	
	2015	0	0	0	0	0	0	14,469	
Medical	2011	0	0	0	0	0	0	161	543
	2012	0	0	0	11,472	0	0	0	967
	2013	0	0	0	0	40,750	0	3,385	364
	2014	0	0	0	0	0	0	474	662
	2015	0	0	0	0	0	0	10,222	567

(E). Federal Adjusted Excess Losses									
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2011	0	0	0	0	0	0	376	
	2012	0	0	0	28,196	0	0	0	
	2013	0	0	0	0	16,862	0	19,595	
	2014	0	0	0	0	0	0	441	
	2015	0	0	0	0	0	0	10,128	
Medical	2011	0	0	0	0	0	0	322	543
	2012	0	0	0	23,556	0	0	0	967
	2013	0	0	0	0	47,976	0	11,783	364
	2014	0	0	0	0	0	0	663	662
	2015	0	0	0	0	0	0	14,563	567

(F). Federal Secondary Conversion Factors					
	Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical Only
Indemnity	1.076	1.015	1.340	1.351	
Medical	1.185	0.923	1.219	1.229	1.185

(G). Federal Converted Unlimited Losses									
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2011	0	0	0	0	0	0	3,141	
	2012	0	0	0	233,780	0	0	0	
	2013	0	0	0	0	139,804	0	163,766	
	2014	0	0	0	0	0	0	3,684	
	2015	0	0	0	0	0	0	84,649	
Medical	2011	0	0	0	0	0	0	1,115	2,977
	2012	0	0	0	79,471	0	0	0	5,306
	2013	0	0	0	0	238,779	0	29,578	1,998
	2014	0	0	0	0	0	0	2,931	3,632
	2015	0	0	0	0	0	0	63,485	3,111

(H). Total Federal Converted Unlimited Losses				
Policy Year	Indemnity		Medical	
	LD	NLD	LD	NLD
2011	0	3,141	0	4,092
2012	233,780	0	79,471	5,306
2013	0	303,570	0	270,356
2014	0	3,684	0	6,563
2015	0	84,649	0	66,595
Total	233,780	395,044	79,471	352,912

Notes:

(E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7

Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses

(F): Section VIII-E, Exhibit 1, Page 2.

(G) = [(C) + (E)] x (F)

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Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
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Section VIII-I
 Exhibit 1
 Page 4

Pricing Example for Class 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of MA Indicated Relativity (cont.):

		(D). State Unadjusted Excess Losses [(Excess Factor -1.0) x (C)]							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	0	0	0	
	2012	0	0	0	0	0	0	0	
	2013	0	0	0	0	0	0	0	
	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
Medical	2011	0	0	0	0	0	0	0	0
	2012	0	0	0	0	0	0	0	0
	2013	0	0	0	0	0	0	0	0
	2014	0	0	0	0	0	0	0	0
	2015	0	0	0	0	0	0	0	0

		(E). State Adjusted Excess Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	0	0	0	
	2012	0	0	0	0	0	0	0	
	2013	0	0	0	0	0	0	0	
	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
Medical	2011	0	0	0	0	0	0	0	0
	2012	0	0	0	0	0	0	0	0
	2013	0	0	0	0	0	0	0	0
	2014	0	0	0	0	0	0	0	0
	2015	0	0	0	0	0	0	0	0

		(F). State Secondary Conversion Factors				
		Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical Only
Indemnity		0.978	0.922	1.218	1.228	
Medical		1.185	0.923	1.219	1.229	1.185

		(G). State Converted Unlimited Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	0	0	0	
	2012	0	0	0	0	0	0	0	
	2013	0	0	0	0	0	0	0	
	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
Medical	2011	0	0	0	0	0	0	0	0
	2012	0	0	0	0	0	0	0	0
	2013	0	0	0	0	0	0	0	0
	2014	0	0	0	0	0	0	0	0
	2015	0	0	0	0	0	0	0	0

		(H). Total State Converted Unlimited Losses			
Policy Year		Indemnity		Medical	
		LD	NLD	LD	NLD
	2011	0	0	0	0
	2012	0	0	0	0
	2013	0	0	0	0
	2014	0	0	0	0
	2015	0	0	0	0
	Total	0	0	0	0

Notes:

(E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7

Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses

(F): Section IX-B, Exhibit 1, Page 3.

(G) = [(C) + (E)] x (F)

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Subsection I - Pricing Example
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Section VIII-I
Exhibit 1
Page 5

Pricing Example for Class 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of MA Indicated Relativity (cont.):

Exposure, Converted Unlimited Losses (Both Federal & State)			
Policy Year (1)	Exposure (2)	Indemnity (3)	Medical (4)
2011	42,935	3,141	4,092
2012	50,915	233,780	84,777
2013	49,827	303,570	270,356
2014	51,022	3,684	6,563
2015	52,497	84,649	66,595
Total	247,196	628,824	432,383
(5)	Indicated Pure Premium	2.544	1.749
(6)	Federal Class Codes Industry Group Pure Premium	2.840	1.837
(7)	MA Indicated Relativity	0.896	0.952

Notes:

- (2): Unit Statistical Plan data, excluding Large Deductibles
- (3), (4): Converted Unlimited Losses from Pages 2 & 4.
- (5): Totals of (3) and (4), divided by Total of (2), respectively.
- (6): Section VIII-F, Exhibit 1, Page 2.
- (7) = (5) / (6)

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Pricing Example for Class 6824
 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of Countrywide Relativity

State (1)	State Code (2)	Losses				Lost-Time Claims		Payroll (9)
		Indemnity		Medical		Likely (7)	Not Likely (8)	
		Likely (3)	Not Likely (4)	Likely (5)	Not Likely (6)			
Alabama	1	0	15,167	0	46,248	0	1	3,876,532
Arizona	2	0	0	0	0	0	0	359,968
Arkansas	3	0	0	0	0	0	0	211,606
Colorado	5	0	0	0	0	0	0	0
Connecticut	6	267,913	14,007	252,679	66,340	1	1	902,602
D.C.	8	0	0	0	0	0	0	0
Florida	9	452,215	951,664	452,075	811,756	5	8	15,742,434
Georgia	10	0	0	0	1,478	0	0	1,776,176
Idaho	11	0	0	0	0	0	0	190,334
Illinois	12	0	0	0	0	0	0	1,073,127
Indiana	13	0	0	0	0	0	0	67,422
Iowa	14	0	0	0	559	0	0	1,013,787
Kansas	15	0	0	0	0	0	0	0
Kentucky	16	0	19,290	0	33,491	0	2	1,369,685
Louisiana	17	497,795	70,222	873,244	149,028	2	8	8,867,737
Maine	18	0	25,445	0	64,402	0	6	16,607,325
Maryland	19	45,740	0	0	9,201	1	0	2,617,075
Michigan	21	0	0	0	0	0	0	0
Minnesota	22	0	0	0	0	0	0	0
Mississippi	23	157,533	47,937	144,663	211,411	1	6	22,135,220
Missouri	24	0	0	0	0	0	0	1,158,634
Montana	25	0	0	0	0	0	0	0
Nebraska	26	0	0	0	0	0	0	0
Nevada	27	0	0	0	0	0	0	0
New Hampshire	28	0	0	0	1,931	0	0	970,065
New Mexico	30	0	0	0	0	0	0	0
North Carolina	32	0	68,564	0	133,315	0	2	4,073,292
Oklahoma	35	61,830	66,727	59,951	58,804	2	3	707,262
Oregon	36	0	177,155	0	167,697	0	4	8,958,573
Rhode Island	38	0	91,103	0	100,453	0	4	3,822,232
South Carolina	39	10,080	75,144	43,343	75,486	1	1	4,330,012
South Dakota	40	0	0	0	0	0	0	0
Tennessee	41	0	28,221	0	13,853	0	2	111,694
Utah	43	0	0	0	0	0	0	0
Vermont	44	0	0	0	0	0	0	72,800
Virginia	45	0	72,795	0	85,413	0	2	7,516,759
West Virginia	47	0	0	0	0	0	0	0
Wisconsin	48	0	0	0	0	0	0	0
Hawaii	52	675,650	0	344,703	16,127	3	0	4,392,316
Alaska	54	261,569	542,145	212,638	2,507,189	4	25	18,955,314
Total		2,430,325	2,265,586	2,383,296	4,554,182	20	75	131,879,983

Notes:
 (3) - (9): Data are total for latest three policy years. See Section IX-D, Exhibit 3.
 (7), (8): Used in calculating countrywide credibilities.

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Pricing Example for Class 6824
 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of Countrywide Relativity

State (1)	State Code (2)	Federal Class Codes Pitch Factors		Pure Premiums, on MA Level		Total (7)
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)	
Alabama	1	2.210	0.876	0.865	1.045	
Arizona	2	0.000	0.000	0.000	0.000	
Arkansas	3	0.403	0.195	0.000	0.000	
Colorado	5	0.000	0.000	0.000	0.000	
Connecticut	6	0.140	0.109	4.365	3.868	
D.C.	8	0.000	0.000	0.000	0.000	
Florida	9	0.849	0.515	7.570	4.136	
Georgia	10	1.260	1.200	0.000	0.100	
Idaho	11	0.000	0.000	0.000	0.000	
Illinois	12	0.882	0.425	0.000	0.000	
Indiana	13	3.204	0.798	0.000	0.000	
Iowa	14	0.534	0.230	0.000	0.013	
Kansas	15	0.000	0.000	0.000	0.000	
Kentucky	16	2.169	0.866	3.055	2.116	
Louisiana	17	1.009	0.458	6.462	5.276	
Maine	18	0.036	0.018	0.006	0.007	
Maryland	19	1.677	1.189	2.930	0.418	
Michigan	21	0.000	0.000	0.000	0.000	
Minnesota	22	0.000	0.000	0.000	0.000	
Mississippi	23	2.732	0.901	2.536	1.449	
Missouri	24	0.190	0.119	0.000	0.000	
Montana	25	0.000	0.000	0.000	0.000	
Nebraska	26	0.000	0.000	0.000	0.000	
Nevada	27	0.000	0.000	0.000	0.000	
New Hampshire	28	0.000	6.615	0.000	1.317	
New Mexico	30	0.000	0.000	0.000	0.000	
North Carolina	32	1.403	0.637	2.361	2.084	
Oklahoma	35	0.173	0.122	3.149	2.043	
Oregon	36	1.486	0.881	2.939	1.649	
Rhode Island	38	0.760	0.674	1.810	1.771	
South Carolina	39	0.818	0.385	1.610	1.057	
South Dakota	40	0.000	0.000	0.000	0.000	
Tennessee	41	0.176	0.235	4.452	2.911	
Utah	43	0.000	0.000	0.000	0.000	
Vermont	44	0.000	0.000	0.000	0.000	
Virginia	45	2.995	1.447	2.901	1.645	
West Virginia	47	2.860	1.074	0.000	0.000	
Wisconsin	48	0.000	0.000	0.000	0.000	
Hawaii	52	0.244	0.285	3.757	2.343	
Alaska	54	1.408	0.245	5.969	3.522	
(8)	Average of (5), (6) weighted by Payroll from Page 1, respectively			3.457	2.145	5.602
(9)	CW Federal Class Codes Pure Premium			2.128	1.163	3.292
(10)	CW Relativity = (8) / (9)			1.624	1.844	1.702
(11)	CW Relativity, balanced to unity			1.624	1.844	

Notes:

(3), (4) = (MA Total Federal Class Code Limited Losses) / [(Federal Class Code Pure Premium by State) x (MA Total Federal Class Code Exposure)].

(5) = 100 x [State Indemnity Losses / State Payroll] x (3), where State Indemnity Losses and State Payroll from page 1.

(6) = 100 x [State Medical Losses / State Payroll] x (4), where State Medical Losses and State Payroll from page 1.

(9) = (8) weighted by MA five year Federal Class Codes Exposure

(11): Relativities balanced to unity (weighted by MA exposure) over Federal Class Codes Industry Group.

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Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
 7/1/2018

Section VIII-I
 Exhibit 3

Pricing Example for Class 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of Credibility and Balanced Formula Relativity:

- (1) MA Indicated Relativity
- (2) Countrywide Indicated Relativity
- (3) Relativity to Underlying Present Rate

Injury Type	
Indemnity	Medical
0.896	0.952
1.624	1.844
1.000	1.214

Calculation of MA Credibility:

The MA Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are expected losses for that injury type.

- (4) Adopted Relativity
- (5) Industry Group Pure Premium Underlying Present Rate Factor
- (6) Pure Premium Underlying Present Rate
= (4) x (5)
- (7) Expected Losses
= (6) x [(Total Exposure from Exhibit 1, Page 5)]
- (8) Full Credibility Standards
- (9) MA Credibility
= Minimum of {100%, [(7) / (8)]^{0.4}}

Injury Type	
Indemnity	Medical
0.961	1.192
4.563	3.279
4.385	3.908
1,083,951	966,119
27,200,000	6,000,000
28%	48%

Calculation of Countrywide Credibility

The Countrywide Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are the countrywide claim counts for that injury type. The countrywide credibility is limited to no more than half of the complement of the credibility assigned to the Massachusetts data.

- (10) Countrywide Lost-Time Claims
- (11) Countrywide Claim Count Standard
- (12) Countrywide Credibility
= Minimum of { [(10) / (11)]^{0.4}, 0.5 x [100% - (9)] }
- (13) Credibility to Underlying
= 100% - (9) - (12)
- (14) Formula Relativity
= [(1) x (9)] + [(2) x (12)] + [(3) x (13)]
- (15) Off Balance Factor

Injury Type	
Indemnity	Medical
95	95
1,150	1,000
36%	26%
36%	26%
1.196	1.252
1.041	1.043

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
1.148	1.201	1.169

Notes:

- (1): Exhibit 1, Page 5.
- (2): Exhibit 2, Page 2.
- (3): Relativity of (6) to Industry Group average, using 5 year Schedule Z exposure as weights.
- (4): Section VIII-F, Exhibit 3.
- (5): Section VIII-F, Exhibit 2.
- (8), (11): Section IX-D, Exhibit 1, Page 1.
- (10): Exhibit 2, Page 1.
- (15): Factor to balance Formula relativities across industry group to unity using 5 year Schedule Z exposure by injury type.
- (16) = (14) / (15) , Total Balanced Formula Relativity is the weighted average of Partial Relativities using the MA Industry Group Pure Premium as weights.

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Section VIII - F-Class Recommendation
Subsection I - Pricing Example
7/1/2018

Section VIII-I
Exhibit 4

Pricing Example for Class 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of Proposed Average Rate and Proposed Manual Rate:

(1) Present Average Rate	10.79
(2) Total Balanced Formula Relativity	1.169
(3) Capped Rate Level Factor	8.874
(4) Maximum Average Rate	11.71
(5) Minimum Average Rate	7.39
(6) Proposed Average Capped Rate = (2) x (3), Subject to Caps (4), (5)	10.37
(7) Offset for Merit Rating	0.997
(8) Offset for ARAP	1.051
(9) Offset for Construction Classification Premium Adjustment Program	1.000
(10) Provision for Insolvency Fund Assessment Recoupment	0.0026
(11) Proposed Manual Rate = { (6) / [(7) x (8) x (9)] } x { 1.000 / [1.000 - (10)] }	9.92
(12) Minimum Premium	500
(13) Loss Constant	0
(14) Expected Loss Rate	3.88
(15) D-Ratio	0.17

Notes:

(1): Section VIII-H, Exhibit 3.

(2): Exhibit 3.

(3): Section VIII-H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved. Class 6824 is in the Federal Class Codes Industry Group.

(4): Multiple caps apply including the maximum increase for any class within the industry group, a maximum absolute dollar change of \$15, and a maximum absolute average rate of \$90.

(5): Based on the minimum decrease for any class within the industry group.

(7), (8), (9), (10): Section IX - K, Exhibit 1. Class 6824 is not eligible for the Construction Credit program.

(12) = { [(11) x 35.0] + (13) + Expense Constant } subject to a maximum of \$500
Where Expense Constant = 159 if (11) x 35 + (13) < 200,
= 250 if (11) x 35 + (13) >= 200 and < 1000
or = 338 if (11) x 35 + (13) >= 1000.

(13): No loss constant for Federal classes.

(14) = (6) x Ratio of Experience Rating ELR to Average Rate, from Section X-C, Exhibit 1.
Class 6824 is in Hazard Group F.

(15): See text of Section X for an explanation of the calculation of D-Ratios.

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Section VIII - F-Class Recommendation
Subsection J - U.S.L.H. & H.W. Coverage Percentage
7/1/2018

Section VIII-J
Exhibit 1

Calculation of USLH & HW Compensation Coverage Percentage

(1)	Benefits Differential Underlying Current USLH & HW Coverage Percentage	1.186
(2)	State Benefit Level Adjustments Since Last Approval	1.012
(3)	Federal Benefit Level Adjustments Since Last Approval	1.000
(4)	Revised Benefits Differential = (1) x [(3) / (2)]	1.171
(5)	Federal Indemnity Losses as % of Total Federal Losses	57.6%
(6)	Expected Loss Ratio for State Classes	63.3%
(7)	Fixed Expense Ratio	4.2%
(8)	Special Fund Assessment Rate as % of Federal Indemnity Losses	0.119
(9)	Loss Adjustment Expense Factor (Applies to Losses)	1.185
(10)	USLH & HW Coverage Percentage for Manual Rates	1.226
(11)	USLH & HW Coverage Percentage for Expected Loss Rates	1.162

Notes:

(1): Section VIII-J, Exhibit 1 of 7/1/2016 Stipulation.

(2): Total Benefit Level Changes from Prior Effective Period to Prospective Period from Section IV-A, Exhibit 1

(3): Total Benefit Level Changes from Prior Effective Period to Prospective Period from Section IV-F, Exhibit 1

(5): Based on ratio of indemnity losses to total losses from Section VIII-C, Exhibit 1, Page 1.

(6): Section VI-J, Exhibit 1.

(7): Average of Fixed Expense Ratios for 2 PYs from Section VI-B, Exhibit 1.

(8): NCCI's Tax & Assessment Directory.

(9): Section VIII-E, Exhibit 1, Page 2.

(10) = { [(6) x (4) x (9)] + [(6) x (4) x (5) x (8)] + (7) } / { [(6) x (9)] + (7) }

(11) = { [(6) x (4) x (9)] + (7) } / { [(6) x (9)] + (7) }

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Section VIII - F-Class Recommendation
Subsection K - Federal Tax Multiplier
7/1/2018

Section VIII-K
Exhibit 1

Calculation of Federal Tax Multiplier

(1)	State Tax Multiplier	1.028
(2)	Loading for Taxes and Residual Market Subsidy = $1.0 - [1.0 / (1)]$	2.7%
(3)	Expected Loss Ratio (no LAE)	63.2%
(4)	Federal Special Funds Assessment	11.9%
(5)	Federal Indemnity Losses as % of Total Losses	57.6%
(6)	Loading for Federal Funds Assessment = $(3) \times (4) \times (5)$	4.3%
(7)	Federal Tax Multiplier = $1.0 / [1.0 - (2) - (6)]$	1.076

Notes:

(1),(3): Section XII-A, Exhibit 4.

(4): NCCI Tax and Assessment Directory.

(5): Based on ratio of federal indemnity losses to state and federal total losses from Section VIII-C, Exhibit 1, Pages 1 and 3.

CLASSIFICATION PRICING

Background

The primary goal of ratemaking is to determine an appropriate price for each insured based on the losses that the insured is expected to generate in the prospective policy period. Because many risks are too small to generate an accurate rate based on their own individual experience, risks are combined into classifications.

The workers' compensation system assigns similar risks to the same classification codes and calculates a rate separately for each code. In aggregating risks, it is desirable to balance stability and responsiveness and derive groups that are distinctly different from each other in terms of experience. In order to attain stability, we want a group large enough that its losses do not fluctuate too much; and for responsiveness, we want a group small enough so that its rate adjusts to the changing costs of similar risks.

In the Massachusetts workers' compensation system, insureds are separated into five Industry Groups: Manufacturing, Construction, Office and Clerical, Goods and Services, and Miscellaneous. The assignment of class codes to each industry group is based on products produced, processes involved, and services provided.

Summary

In this section we first calculate the rate change for each Industry Group as it varies from the statewide overall indicated rate change. The calculation of the indicated Industry Group rate change is similar to the process used in developing the overall rate level indication. We update the indicated class relativities within each Industry Group to reflect

IX 000002

the ratio of the pure premium for the individual class to the pure premium for the given Industry Group. Class relativities are updated regularly in order to maintain a fair and accurate classification system.

Estimated pure premium relativities for each class are a credibility-weighted average of three pure premium relativities: (1) recent Massachusetts (MA) experience, (2) recent "countrywide" (CW) experience, and (3) the relativities underlying the present rate. Average rates are calculated from the updated relativities to derive the proposed rate change by Industry Group. Proposed average rates are capped by an iterative process to attain the required industry group changes. Finally, proposed manual rates are determined by applying offsets to the proposed average capped rates. Since ARAP, Merit and Experience Rating, and the Construction Credit program are each designed to be revenue neutral, an offset for each of these programs is applied to the rate.

Massachusetts Data

The data used for the purpose of classification pricing are the Unit Statistical Plan data from Schedule Z, which shows detailed policy year payroll, premium and loss data for each classification in Massachusetts. The data used exclude the experience of large deductible policies. In this review, we have utilized the latest available five policy years of data, policy years 2011 through 2015.

Adjustment of Massachusetts Data

We begin the process by calculating "limited losses." Limited losses are determined by applying per claim limits and per occurrence limits. These limited losses are multiplied by primary conversion factors (PCF) (Section IX – B, Exhibit 1, Page 1) in order to adjust each policy year's experience to reflect current conditions. Primary conversion factors include benefit level adjustments, loss development factors, and trend factors. Consistent with other sections of the filing, the WCRIBMA has calculated loss development factors separately for AIG. Section IX-B, Exhibit 1, Page 1 shows the development factors for the remainder of the industry and for AIG used in the calculation of the primary conversion factors. Converted limited losses are the product of the limited losses and the primary conversion factors.

Next, we apply excess loss factors. Since the 2010 filing, the WCRIBMA has followed the NCCI's class ratemaking methodology in calculating excess loss factors. A provision for excess losses has been determined using estimated excess ratios by hazard group from Section XII - F, Exhibit 3, Page 1. The excess ratios in Section XII – F, Exhibit 3, Page 1 are "per occurrence" excess ratios which need to be converted to "per claim" excess ratios. This is done by multiplying the excess ratios from Section XII – F, Exhibit 3, Page 1 by a factor of 0.985.

A factor (calculated as $[1.0 / (1.0 - \text{Excess Ratio})] - 1.0$) is applied separately for indemnity and medical losses to converted limited losses by class to derive unadjusted excess losses. Consistent with the methodology in past rate filings and with NCCI's

IX 000004

methodology, 30% of the unadjusted indemnity excess losses are reassigned to medical excess losses. The resulting quantities are termed the adjusted excess losses.

Finally we calculate converted unlimited losses by multiplying the sum of the converted limited losses and the adjusted excess losses by the secondary conversion factors (SCF) (Section IX – B, Exhibit 1, Page 2). Secondary conversion factors include factors to load loss adjustment expenses and the investment income offset. Indemnity and medical converted unlimited losses are then summed by policy year. These sums are displayed by Industry Group in Section IX - C. Massachusetts indicated pure premiums are calculated by dividing these losses by exposure (generally payrolls).

Inclusion of Countrywide Data

Massachusetts relativities are credibility-weighted with countrywide relativities and with the pure premiums relativities underlying present rates. The countrywide data used in this filing are supplied by NCCI and other independent bureaus. Countrywide relativities are based upon the latest available three composite policy years, although the specific years vary by state (see Section IX - D, Exhibit 3). Before the data can be used for ratemaking purposes, they must be adjusted to reflect the Massachusetts' distribution of exposure and loss levels.

Pitch factors are used to adjust the countrywide data to a corresponding Massachusetts level. These pitch factors are calculated as follows:

1. Multiply each state's classification pure premiums by the corresponding Massachusetts exposure to estimate the loss

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level that would occur if the employers in that state were located in Massachusetts.

2. Sum the indemnity and medical losses by state and industry group to determine the aggregate adjusted losses for each state.
3. Calculate aggregate adjusted losses for Massachusetts in a similar fashion.
4. Divide the aggregate adjusted losses for Massachusetts by the aggregate adjusted losses for each state to determine the pitch factors.

Pitch factors represent the amount by which another state's data must be adjusted to be on the same exposure distribution and loss level as the Massachusetts Schedule Z data (Section IX - D, Exhibit 2). Each state's pure premiums are multiplied by its corresponding pitch factor to derive adjusted pure premiums. The sum of the products of the adjusted pure premiums and exposures by state by class is then divided by the total exposure by class to derive countrywide class pure premiums.

For each Industry Group, the countrywide indicated pure premiums are converted to relativities, so that they balance to unity when weighted by Massachusetts exposures.

Underlying Relativities

The relativities underlying present rates are calculated by balancing to unity the pure premiums underlying present rates (which have been adjusted to reflect the impact of benefit changes and trend to the proposed effective period), based on the five most recent years of exposure.

Formula Relativities

Once we have the separate (MA Indicated, CW and Underlying) relativities, we use credibility-weighted averages to calculate formula relativities. The indicated Massachusetts relativity is multiplied by its credibility, the indicated countrywide relativity is multiplied by its (limited) credibility and the relativity underlying the present rate is multiplied by the remaining credibility. The total formula relativity is the weighted average of the indemnity and medical relativities, using the Industry Group indemnity and medical pure premiums as weights. The calculated formula relativities are then balanced to unity based on the five most recent policy years of exposure.

Credibility

Credibility reflects the relative reliability and volume of class data used to determine class relativities. In general, a class with higher expected losses has more weight given to its recent MA indicated relativities, while a class with lower expected losses has more weight given to the countrywide and underlying relativities. Credibilities

IX 000007

are calculated separately for the MA and the CW experience, and the remainder of credibility is assigned to the relativity underlying the present rate.

Massachusetts Credibility

This filing follows the classical credibility method, which has been used since the 2001 rate filing, based on the formula:

$$Z = (E / F)^{0.4}$$

Where Z = Credibility assigned to MA or CW experience
 E = Expected Losses for MA, Claim Counts for CW
 F = Full Credibility Criterion

The Massachusetts full credibility criterion is calculated as the product of the claim count standard and the average claim cost. We use NCCI's credibility standards. The average claim costs have been updated in Section IX - D, Exhibit 1, Page 2 of this filing.

Credibility is a function of the volume of indemnity and medical expected losses. By class, expected losses are calculated separately for indemnity and medical losses by multiplying the pure premiums underlying the present rate by exposure. Pure premiums underlying present rates are the product of the adopted relativities from the previous rate revision and pure premium underlying present rate factors. The factors are comprised of

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the rate level factor implicit in the current rate and an adjustment for benefit level changes and trend since the previous revision (Section IX - E, Exhibit 1).

Practical Credibility Considerations

This method may produce anomalous credibilities for classes with small amounts of data. Therefore, the following constraints are applied:

1. Credibilities cannot be negative.
2. Countrywide credibilities are limited so that the sum of the Massachusetts and countrywide credibilities is not more than 100%.
3. Countrywide credibilities cannot be greater than 50% and are limited to $\frac{1}{2}$ of (1.0 - Massachusetts credibility).

Countrywide Credibility

The credibility of adjusted countrywide pure premiums is determined based on claim counts for lost time claims (Section IX - D, Exhibit 1, Page 1). Exposure cannot be used as a measure of credibility since wage levels vary significantly between states.

Proposed Average Capped Rates

Proposed average rates by class are calculated to achieve the proposed rate change by Industry Group. The uncapped rate for each class is the product of the formula pure premium relativity and the uncapped rate level factor for the Industry Group. This uncapped

IX 000009

rate level factor is the product of the present average rate and the average rate level change by industry group.

Proposed average uncapped rates are then subject to several capping mechanisms (Section IX – H, Exhibit 1) that consequently require an iterative process of adjusting capped average rates to balance to the required industry group change, apply the capping mechanism again, and repeating until the capped average rates produce an industry group change equal to the required industry group change. The WCRIBMA uses the five most recent years of exposures by class to determine if the required Industry Group change is achieved.

Swing Limits

The primary capping mechanism used in the process described above is the application of swing limits by class. Swing limits are used to establish an allowable range of rate changes by industry group. In the 2014 rate filing, the WCRIBMA's proposed swing limits were calculated as follows:

$$\text{Maximum Allowable Rate Change} = (50\% \times \text{EC}) + (100\% \times \text{BC}) + 20\%$$

$$\text{Minimum Allowable Rate Change} = (50\% \times \text{EC}) + (100\% \times \text{BC}) - 20\%$$

where EC = Experience Change (as a percentage)

BC = Benefit Change (as a percentage)

IX 000010

The midpoint of the allowable range of rate changes in this case is 50% of the experience change plus 100% of the benefit change, rather than the required industry group change. This method was potentially biased because only 50% weight is given to the experience change when calculating the upper and lower bounds of the allowable range of rate changes. As the absolute value of the experience change grows, the bias increases until the method is no longer reasonable to use. For instance, assume the WCRIBMA filed a 40% rate decrease driven entirely by an experience change. The allowable range of rate changes would be from -40% to 0%, but for the required industry group change to be realized, all classes within the industry group would have to decrease by 40%. This example, though extreme, is illustrative of the impact biased swing limits can have on the rate capping mechanism.

Swings limits do not impact the total premium for an industry group, but they do impact the dispersion of rates within an industry group. So long as the resulting allowable range of rate changes is valid (that is, it includes the required industry group change) the iterative process will yield a reasonable solution. In this filing the WCRIBMA is proposing to change the method used to calculate swing limits from that used in the 2014 filing, specifically reflecting 100% of the experience change instead of only 50% of the experience change. This simplifies the calculation of the allowable range of rate changes for a given industry group to the following:

$$\begin{aligned}\text{Maximum Allowable Rate Change} &= (100\% \times \text{EC}) + (100\% \times \text{BC}) + 20\% \\ &= \text{IGC} + 20\%\end{aligned}$$

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$$\begin{aligned}\text{Minimum Allowable Rate Change} &= (100\% \times \text{EC}) + (100\% \times \text{BC}) - 20\% \\ &= \text{IGC} - 20\%\end{aligned}$$

where EC = Experience Change (as a percentage)

BC = Benefit Change (as a percentage)

IGC = Required Industry Group Rate Change

This proposed method is comparable to what the NCCI has been doing since 1977. When NCCI began using this method, the allowable range of rate changes was based on the required industry group change plus or minus 25%. Currently, a number of NCCI states have modified the calculation to employ +/- 20% or +/- 15% swing limits in calculating the allowable range of rate changes for an industry group. The swing limits used to calculate the 2016 MA rates had midpoints that were in between the 2014 and proposed method; they reflected 75% of the experience change and 100% of the benefit change.

Manual Rates

Section IX - A displays the proposed manual rates and rating values for this filing. Proposed manual rates are determined by applying offsets to the proposed average capped rates. We calculate offsets for the impact of merit and experience rating, ARAP, construction credits, and the recoupment of the Insolvency Fund assessments, as shown in Section IX - K.

All Risk Adjustment Program

The All Risk Adjustment Program (ARAP) surcharges those experience-rated risks, both voluntary and assigned, with a record of losses greater than expected under the Experience Rating Plan. The purpose of this program is to provide a pricing mechanism to reflect the unusually adverse experience of certain experience-rated risks and to provide an additional financial incentive for such risks to improve workplace safety. Because the program allows for surcharges only, it generates additional premium revenue. In order to achieve revenue-neutrality, we apply a corresponding offset to reduce the manual rates to make up for the anticipated surcharge premium.

The ARAP adjustment is calculated and identified as a separate factor on the Experience Rating Calculation sheet. The ARAP factor can range from 1.00 to a maximum of 1.25. The offset factor for ARAP, calculated in Section IX – K, Exhibit 3, is 1.051.

Merit Rating Program

The objective of the Merit Rating Program is to provide a pricing mechanism for risks too small to qualify for experience rating to share in the loss experience that they generate.

A risk is eligible for the Merit Rating Program if it is not eligible for experience rating and has an average annual premium over the last three policy years of at least \$500.

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Eligible risks receive the following adjustments to their premium, based on the number of lost-time claims over the most recent three policy years.

Number of Lost-Time Claims	Merit Rating Adjustment
0	5% credit
1	None
2 or more	5% debit

To make the program revenue neutral, rates should be offset by the average historical merit rating credit weighted by the percentage of premium eligible for merit rating. Section IX - K, Exhibit 2 shows the calculation of the combined offset of 0.997 for Experience and Merit Rating.

Construction Credit Program

The Massachusetts Construction Classification Premium Adjustment Program is a credit-only program and we have calculated an offset to the eligible classes to assure revenue neutrality. Section IX - K, Exhibit 4 shows the derivation our selection of the 3.3% offset to be applied to the eligible classes.

Loading for Recoupment of Insolvency Fund Assessments

Under Massachusetts law, the Fund may assess carriers to cover the Fund's costs of providing relief in the event of insurer insolvencies. If a carrier writes premium for a line of business covered by the Fund, such premium will be subject to assessment. The law

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provides that these assessments can be recouped from policyholders. Beginning in 1988, workers' compensation insurance has been covered by the Fund. The loading included in this filing is intended to recoup prior year assessments as provided in G.L. c. 175D, § 13.

The Fund does not maintain segregated accounts by line of business and consequently workers' compensation insurers may be assessed by the Fund for expenses related to the insolvency of non-workers' compensation carriers. The Fund assessment base is the total written premium for all lines covered by the Fund, and an individual carrier's assessment is a function of its written premium for all lines covered by the Fund. Therefore, we must first estimate the proportion of the total Fund assessment that is attributable to workers' compensation. This is done by dividing the Massachusetts workers' compensation Statutory Page 14 written premium by the total premium assessment base of the Fund. The assessment applicable to workers' compensation is the product of this ratio and the total Fund assessment. The resulting estimated workers' compensation assessment is then adjusted to reflect the impact of the time value of money, premium taxes, and commissions. This net assessment is divided by the expected written premium in the prospective period to arrive at the factor to load the assessment.

The Fund has not assessed carriers since the last rate revision. The Board of Directors of the Fund at its October 19, 2016 meeting reviewed the financial position of the Fund and voted to note have an assessment or refund of assessment in 2016. The Board of Directors of the Fund at its October 13, 2017 meeting reviewed the financial position of the Fund and voted to note have an assessment or refund of assessment in 2017, The loading in the 7/1/2016 rates was -0.0022 and was intended to apply to policies effective

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during the 7/1/2016 to 6/30/2017 policy period. The loading shown in this filing offsets the unanticipated impact to the policy period from 7/1/2017 to 6/30/2018. The proposed factor is a loading of 0.0026 (Section X-K, Exhibit 5, Page 1).

Pricing Example

Section IX - L is a sample rate calculation, for Class 2660 – Boot or Shoe Manufacturing. Exhibit 1, page 2 shows the calculation of the MA indicated pure premium and relativity. Exhibit 2, page 2 shows the calculation of the CW indicated pure premium and relativity. On Exhibit 3, we calculate the credibilities and formula relativity. The derivation of the proposed manual rate is shown on Exhibit 4.

Special Classes

The following classes are special situations where the rates and rating values are calculated using a methodology other than that detailed above.

6811, 6854, 6882, 6884: State Act Classes comparable to F-Class Codes

- Established 1/1/1990.
- The manual rates for 6811, 6854, 6882, and 6884 are set at 81.57¹% of the manual rates of F-Class Codes 6801 [Boat Building Wood NOC-US Act], 6843 [Ship Building Iron or Steel-NOC-US Act], 6872 [Ship Repair or Conversion-US Act] and 6874 [Painting Ship Hulls-US Act], respectively.

¹ 81.57% = 1.0 / Proposed USLH&HW Coverage Percentage for Manual Rates. Coverage Percentage from Section VIII – J, Exhibit 1.

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- The ELRs for 6811, 6854, 6882, and 6884 are set at 86.06%² of the ELRs of F-Class Codes 6801 [Boat Building Wood NOC-US Act], 6843 [Ship Building Iron or Steel-NOC-US Act], 6872 [Ship Repair or Conversion-US Act] and 6874 [Painting Ship Hulls-US Act], respectively.
- See Circular Letter No. 1519, released 1/3/1990.

8824 – Assisted Living Residences: Personal Care Employees

- Established 4/1/2012.
- The rate and rating values for 8824 are assigned the rate and rating values of Class 9052- Hotel: All Other Employees & Salespersons, Drivers.
- See Circular Letter No. 2188, released 11/14/2011.

8826 – Assisted Living Residences: All Other Employees, Salespersons & Drivers

- Established 4/1/2012.
- The rate and rating values for 8826 are assigned the rate and rating values of Class 9052- Hotel: All Other Employees & Salespersons, Drivers.
- See Circular Letter No. 2188, released 11/14/2011.

Code 9044 - Casino Gambling – Hotel - All Employees & Clerical, Salespersons,

Drivers

- Approved Effective 2/1/2016.

² 86.06% = 1.0 / Proposed USLH&HW Coverage Percentage for ELRs. Coverage Percentage from Section VIII – J, Exhibit 1.

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- The rate and rating values for 9044 are assigned 90% of the rate and rating values of Class 9052 – Hotel: All Other Employees & Salespersons, Drivers.
- See Circular Letter No. 2270, released 12/2/2015.

Code 9062 - Casino Gambling - All Employees & Clerical, Salespersons, Drivers

- Approved Effective 2/1/2016.
- The rate and rating values for 9062 are assigned the rate and rating values of Class 9061 – Club NOC & Clerical.
- See Circular Letter No. 2270, released 12/2/2015.

Section XI-D – Steel Erection Classes

Class 5040 (Iron or Steel: Erection: Erection-Frame Structures), 5059 (Iron or Steel: Erection: Frame Struct Not Over 2 Strs in Hgt) and 5538 (Sheet Metal Work-Shop & Outside-NOC & Drivers) scopes update.

The Scope of two steel erection classifications and a sheet metal classification are being updated so they clearly describe all operations that are common to all insureds involved in these types of projects. Consequently, the rates for Codes 5040 and 5059 are being adjusted downward to reflect the clarification of the scope of these classifications with regard to steel erection operations. Going forward, these changes will ensure a level playing field when determining workers compensation costs related to a steel erection project bid proposal and limit the ability of any competing bidders from gaining an advantage by misallocating payroll to the lower rated secondary classification.

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To reflect the updated scopes, 5538 class experience for policies that had 5040 and 5538 or 5059 and 5538 was reassigned to 5040 or 5059 respectively for the purpose of classification pricing. For the policy years used in Section IX, 2011 – 2015, 190 policies were identified that had code 5040 and 5538. Their 5538 exposure and loss information was reassigned to 5040 and used in the calculations of 5040's MA indicated relativities. Similarly, 118 policies were identified that had code 5059 and 5538. Their 5538 exposure and loss information was reassigned to 5059 and used in the calculations of 5059's MA indicated relativities.

Section IX-M, Exhibit 1 shows the underlying values used in the calculation of 5040 and 5059's rates. The adopted relativities and average rates from the 7/1/2016 stipulation are weighted based on 5538 exposure reassigned to 5040 and 5059. Calculating the underlying values in this manner produces the same 'Present Premium' (Column (2) on Section IX-J, Exhibit 2) for the 3 classes in total as compared to the 'Present Premium' for the 3 classes if no reassignment of 5538 experience had been made.

Section IX-M, Exhibit 2 displays the pricing example for Class 5040 - Iron or Steel: Erection: Erection-Frame Structures. The MA exposure and loss used in the pricing includes 5040 reported experience, in addition to the reassigned 5538 experience mentioned above.

Section IX-M, Exhibit 3 displays the pricing example for Class 5059 - Iron or Steel: Erection: Frame Struct Not Over 2 Strs in Hgt. The MA exposure and loss used in the pricing includes 5059 reported experience, in addition to the reassigned 5538 experience mentioned above.

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Section IX-M, Exhibit 4 displays the pricing example for Class 5538 - Sheet Metal Work-Shop & Outside-NOC & Drivers) scopes update. The MA exposure and loss used in the pricing includes 5538 reported experience, excluding the experience that was reassigned to 5040 and 5059.

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MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL **RATES**

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RATES

LEGEND

- | | |
|--|---|
| (a) Rate for each individual risk must be obtained by Home Office from the MA Bureau.

D Supplement Disease Loading. Refer to Section IV of the Manual Supplement - - Treatment of Disease Coverage. | F Rate provides for coverage under the United States Longshore and Harbor Workers' Compensation Act.

M Risks are subject to Admiralty Law or Federal Employers Liability Act (FELA). |
|--|---|

CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST
0005	2.10	253.	20.	1924	2.07	231.	--	2501	1.84	223.	--	3082D	4.75	325.	--
0008	2.21	256.	20.	1925	4.95	332.	--	2503	1.24	202.	--	3085D	4.63	321.	--
0016	3.67	307.	20.	2003	3.56	284.	--	2570	5.58	354.	--	3110	8.65	500.	--
0034	3.60	305.	20.	2014	3.22	272.	--	2576	1.74	220.	--	3111	1.88	225.	--
0035	1.97	248.	20.	2021	2.27	238.	--	2585	2.85	259.	--	3113	1.43	209.	--
0036	3.60	305.	20.	2039	3.18	270.	--	2586	1.66	217.	--	3114	2.53	248.	--
0042	3.66	307.	20.	2041	2.67	252.	--	2587	3.38	297.	20.	3118	1.76	221.	--
0046	1.75	240.	20.	2070	3.83	293.	--	2623	4.75	325.	--	3119	0.73	185.	--
0050	4.38	453.	50.	2081	3.12	268.	--	2651	1.42	209.	--	3120	1.39	208.	--
0059D	0.25	.	.	2089	2.85	259.	--	2660	1.81	222.	--	3122	2.00	229.	--
0065D	0.11	.	.	2095	3.31	275.	--	2683	1.73	220.	--	3127	1.01	194.	--
0066D	0.09	.	.	2101	2.85	259.	--	2688	2.16	235.	--	3131	1.44	209.	--
0067D	0.09	.	.	2105	(a)	(a)	(a)	2702	13.04	500.	20.	3132	2.95	262.	--
0079	3.22	292.	20.	2111	2.00	229.	--	2710	6.62	482.	--	3145	1.51	212.	--
0083	3.26	293.	20.	2114	2.85	259.	--	2731	3.04	265.	--	3146	1.99	229.	--
0106	10.23	500.	20.	2115	4.34	311.	--	2747	5.53	353.	--	3169	2.52	247.	--
0113	3.60	305.	20.	2121	1.18	200.	--	2790	1.59	215.	--	3179	1.12	198.	--
0170	3.60	305.	20.	2130	1.68	218.	--	2802	3.81	292.	--	3180	2.64	251.	--
0771b	0.82	.	.	2131	2.48	246.	--	2835	1.75	220.	--	3188	1.92	226.	--
0908	77.00	141.	--	2143	1.82	223.	--	2836	1.84	223.	--	3200	1.93	227.	--
0909	161.00	225.	--	2150	4.27	308.	--	2841	3.30	275.	--	3220	2.86	259.	--
0912	322.00	386.	--	2156	4.48	316.	--	2883	3.00	264.	--	3223	(a)	(a)	(a)
0913	153.00	217.	--	2157	3.62	286.	--	2923	1.62	216.	--	3255	2.10	233.	--
0917	2.83	278.	20.	2172	1.84	223.	--	2942	1.82	223.	--	3257	2.49	246.	--
0918	0.52	197.	20.	2211	6.17	466.	--	3018	2.57	249.	--	3270	1.93	227.	--
1430	6.34	472.	--	2220	2.36	242.	--	3022	3.46	280.	--	3300	3.84	293.	--
1438	3.07	266.	--	2260	5.64	356.	--	3027	5.05	336.	--	3305	(a)	(a)	(a)
1463	9.11	500.	--	2288	2.91	261.	--	3028	2.70	254.	--	3315	2.95	262.	--
1624D	3.66	307.	20.	2305	2.83	258.	--	3030	5.68	358.	--	3336	3.36	277.	--
1655	3.26	293.	20.	2362	1.54	213.	--	3040	4.69	323.	--	3365	5.75	500.	50.
1701	2.62	251.	--	2380	2.32	240.	--	3041	3.46	280.	--	3372	2.14	234.	--
1710D	3.66	307.	20.	2402	2.19	236.	--	3042	5.56	354.	--	3373	3.64	286.	--
1747	3.03	265.	--	2413	3.25	273.	--	3066	2.25	238.	--	3381	2.19	236.	--
1748	2.83	258.	--	2416	2.54	248.	--	3076	2.15	234.	--	3383	1.59	215.	--
1853	1.40	208.	--	2417	2.67	252.	--	3081D	4.75	325.	--	3385	0.66	182.	--

Non-Ratable Code and Rate to be used with the following classifications:

b 4771

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CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST
3400	2.52	247.	--	4150	0.61	180.	--	4771c	5.46	470.	--	5507	5.62	497.	50.
3507	2.51	247.	--	4239	2.21	236.	--	4777	3.06	266.	--	5508D	4.53	459.	50.
3515	2.79	257.	--	4243	3.06	266.	--	4825	0.51	177.	--	5509	3.93	347.	50.
3558	0.83	188.	--	4244	2.25	238.	--	4828	1.03	195.	--	5538	3.83	343.	50.
3571	0.79	187.	--	4250	1.78	221.	--	4829	1.03	195.	--	5545	35.87	500.	50.
3574	1.57	214.	--	4251	2.15	234.	--	4902	1.82	223.	--	5547	11.50	500.	50.
3612	1.65	217.	--	4273	2.49	246.	--	4923	0.72	184.	--	5606	1.48	261.	50.
3620	4.50	317.	--	4279	2.00	229.	--	5020	4.24	357.	50.	5610	5.69	499.	50.
3629	1.57	214.	--	4283	1.95	227.	--	5022	9.66	500.	50.	5645	7.14	500.	50.
3632	1.57	214.	--	4299	1.77	221.	--	5037	16.94	500.	50.	5701	22.11	500.	50.
3634	1.39	208.	--	4304	4.51	317.	--	5040	24.12	500.	50.	5703	14.15	500.	50.
3635	2.62	251.	--	4307	1.52	212.	--	5057	21.78	500.	50.	5705	12.78	500.	50.
3638	1.57	214.	--	4308	1.37	207.	--	5059	16.76	500.	50.	6003	9.19	500.	50.
3642	1.09	197.	--	4351	0.87	189.	--	5102	6.15	500.	50.	6005	4.53	459.	50.
3643	1.46	210.	--	4352	1.29	204.	--	5146	6.76	500.	50.	6204	5.87	500.	50.
3647	1.87	224.	--	4360	0.72	184.	--	5160	2.76	306.	50.	6217	4.05	351.	50.
3648	1.24	202.	--	4361	0.67	202.	20.	5183	2.94	312.	50.	6229	3.79	342.	50.
3681	0.67	182.	--	4362	0.52	197.	20.	5188	4.34	452.	50.	6233	2.79	307.	50.
3685	0.60	180.	--	4410	2.51	247.	--	5190	2.18	285.	50.	6251D	5.25	484.	50.
3724	5.10	479.	50.	4432	0.85	189.	--	5191	0.76	206.	20.	6252D	8.35	500.	50.
3726	8.16	500.	50.	4439	3.51	282.	--	5192	2.72	274.	20.	6306	8.15	500.	50.
3807	2.52	247.	--	4452	2.85	259.	--	5213	12.05	500.	50.	6319	3.57	334.	50.
3808	2.66	252.	--	4459	2.49	246.	--	5215	4.35	452.	50.	6325	3.43	329.	50.
3821	4.22	327.	20.	4470	1.95	227.	--	5221	7.03	500.	50.	6400	4.74	466.	50.
3826	3.48	281.	--	4484	1.89	225.	--	5222	8.63	500.	50.	6504	2.85	259.	--
3830	1.57	214.	--	4493	2.01	229.	--	5223	4.20	356.	50.	6702M	(a)	.	--
3841	1.27	203.	--	4511	0.29	189.	20.	5348	4.17	355.	50.	6703M	(a)	.	--
4000	4.57	339.	20.	4512	0.09	182.	20.	5402	6.08	500.	50.	6704M	(a)	.	--
4021	3.60	285.	--	4557	1.65	217.	--	5403	7.68	500.	50.	6801F	6.19	467.	--
4024	2.85	259.	--	4558	1.29	204.	--	5437	4.51	458.	50.	6811	5.05	356.	20.
4034	6.04	461.	--	4583	3.06	266.	--	5443	3.25	323.	50.	6824F	9.92	500.	--
4036	2.27	238.	--	4611	0.87	189.	--	5445	6.11	500.	50.	6826F	7.65	500.	--
4038	2.74	255.	--	4635	4.33	311.	--	5462	6.21	500.	50.	6834	2.17	255.	20.
4053	2.02	230.	--	4653	1.72	219.	--	5472	8.80	500.	50.	6836	3.39	298.	20.
4062	1.64	216.	--	4665	7.30	500.	--	5473	10.86	500.	50.	6843F	12.76	500.	--
4112	0.46	175.	--	4692	0.57	179.	--	5474	4.27	358.	50.	6854	10.41	500.	20.
4113	2.02	230.	--	4693	0.86	189.	--	5478	4.20	356.	50.	6872F	16.77	500.	--
4114	2.14	234.	--	4720	1.81	222.	--	5479	6.96	500.	50.	6874F	15.35	500.	--
4130	2.89	260.	--	4740	1.12	198.	--	5480	4.05	351.	50.	6882	13.68	500.	20.
4133	1.54	213.	--	4741	2.19	236.	--	5506	5.23	483.	50.	6884	12.52	500.	20.

For Non-Ratable portion of Rate, refer to:
 c 0771

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**MASSACHUSETTS WORKERS COMPENSATION
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RATES

CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST
7016M	1.88	.	--	7502	2.05	251.	20.	8232	6.00	480.	20.	8829	2.01	249.	20.
7024M	2.35	.	--	7515	2.37	262.	20.	8233	6.23	488.	20.	8831	0.92	211.	20.
7038M	3.55	.	--	7520	2.82	278.	20.	8235	3.96	318.	20.	8832	0.27	188.	20.
7046M	5.06	.	--	7538	6.12	500.	50.	8263	3.85	314.	20.	8833	1.13	219.	20.
7047M	2.95	.	--	7539	1.15	219.	20.	8264	4.75	345.	20.	8835	1.94	247.	20.
7050M	5.57	.	--	7580	3.16	290.	20.	8265	6.23	488.	20.	8837	(a)	(a)	(a)
7090M	4.44	.	--	7590	3.55	303.	20.	8279	4.33	331.	20.	8868	0.68	203.	20.
7098M	5.95	.	--	7600	3.01	284.	20.	8291	3.41	298.	20.	8901	0.07	181.	20.
7099M	7.46	.	--	7601	5.70	500.	50.	8292	3.15	289.	20.	9014	2.35	261.	20.
7133	(a)	(a)	(a)	7610	0.25	188.	20.	8293	8.00	500.	20.	9015	2.98	283.	20.
7151M	8.26	.	--	7704	2.51	267.	20.	8350	5.63	467.	20.	9016	2.04	250.	20.
7152M	12.95	.	--	7720	1.37	227.	20.	8380	2.56	269.	20.	9019	2.61	270.	20.
7153M	10.33	.	--	7855	4.26	358.	50.	8381	1.72	239.	20.	9033	2.86	279.	20.
7219	8.56	500.	20.	8001	1.74	240.	20.	8385	2.64	271.	20.	9040	2.88	280.	20.
7230	8.70	500.	20.	8002	1.39	228.	20.	8392	1.38	227.	20.	9044	1.38	227.	20.
7231	8.83	500.	20.	8006	1.21	221.	20.	8393	1.62	236.	20.	9052	1.53	233.	20.
7309F	14.55	500.	--	8008	0.73	205.	20.	8500	6.23	488.	20.	9058	1.42	229.	20.
7313F	15.85	500.	--	8010	1.54	233.	20.	8601	0.22	187.	20.	9060	0.95	212.	20.
7317F	15.94	500.	--	8013	0.33	191.	20.	8709F	5.03	335.	--	9061	0.93	212.	20.
7327F	28.29	500.	--	8017	0.91	211.	20.	8710	3.10	288.	20.	9062	0.93	212.	20.
7333M	7.53	.	--	8018	3.06	286.	20.	8719	3.10	288.	20.	9063	0.64	201.	20.
7335M	8.85	.	--	8021	3.02	285.	20.	8720	0.86	209.	20.	9077F	5.20	341.	--
7337M	11.10	.	--	8031	1.77	241.	20.	8721	0.23	187.	20.	9079	1.07	216.	20.
7350F	18.87	500.	--	8032	1.29	224.	20.	8726F	5.38	347.	--	9089	0.87	209.	20.
7360	4.43	334.	20.	8033	1.64	236.	20.	8734M	0.44	.	--	9093	1.10	218.	20.
7370	3.19	291.	20.	8034	3.29	294.	20.	8737M	0.35	.	--	9101	2.94	282.	20.
7380	6.06	482.	20.	8039	1.14	219.	20.	8738M	0.55	.	--	9102	2.54	268.	20.
7382	3.43	299.	20.	8044	2.85	279.	20.	8742	0.12	183.	20.	9154	1.68	238.	20.
7394M	9.68	.	--	8046	1.75	240.	20.	8745	4.67	342.	20.	9156	1.45	230.	20.
7395M	12.37	.	--	8048	2.61	270.	20.	8747	0.82	208.	20.	9178	12.39	500.	20.
7398M	15.51	.	--	8058	2.25	258.	20.	8748	0.63	201.	20.	9179	29.58	500.	20.
7403	4.69	343.	20.	8103	2.73	275.	20.	8800	1.05	216.	20.	9180	4.48	336.	20.
7405d	0.84	218.	20.	8105	5.78	472.	20.	8803	0.04	180.	20.	9182	2.88	280.	20.
7420	6.47	496.	20.	8106	5.62	467.	20.	8805M	0.18	.	--	9186	4.48	336.	20.
7421	1.23	222.	20.	8107	2.49	266.	20.	8810	0.07	181.	20.	9220	2.79	277.	20.
7422	1.23	222.	20.	8111	2.57	269.	20.	8814M	0.14	.	--	9402	3.99	319.	20.
7425	2.38	262.	20.	8203	5.67	468.	20.	8815M	0.23	.	--	9403	8.87	500.	20.
7431e	0.92	222.	20.	8204	4.67	342.	20.	8820	0.08	182.	20.	9410	2.69	273.	20.
7445f	0.28	.	.	8215	3.45	300.	20.	8824	1.53	233.	20.	9501	2.05	231.	--
7453g	0.31	.	.	8227	4.82	469.	50.	8826	1.53	233.	20.	9505	2.05	231.	--

For Non-Ratable portion of Rate, refer to:

d 7445

e 7453

Non-Ratable Code and Rate to be used with:

f 7405

g 7431

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Section IX - Classification Pricing
 Subsection A - Summary
 7/1/2018

Section IX - A
 Exhibit 1
 Page 4

**MASSACHUSETTS WORKERS COMPENSATION
 AND EMPLOYERS LIABILITY INSURANCE MANUAL**

RATES

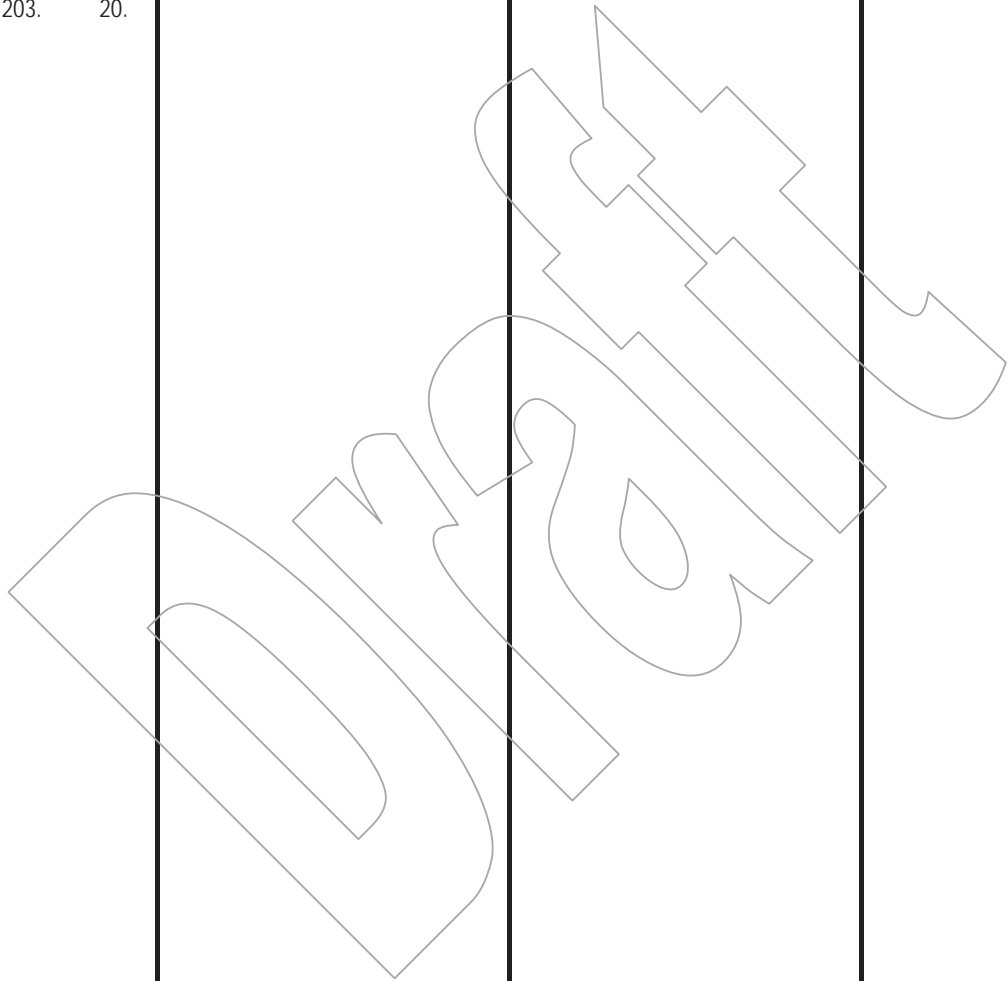
Draft

Proposed Effective July 1, 2018

Page RA-4

RATES

CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST
9519	3.43	299.	20.												
9521	2.84	258.	--												
9522	1.75	220.	--												
9533	13.46	500.	50.												
9534	5.31	486.	50.												
9549	4.95	473.	50.												
9552	7.15	500.	50.												
9586	0.30	190.	20.												
9620	0.68	203.	20.												



Calculation of Pure Premium Underlying Proposed Rate Factor

Industry Group (1)	Injury Type (2)	Uncapped Rate Level Factor (3)	Industry Group Pure Premium (4)	Percent of Pure Premium =(4) / [Total of (4)] (5)	Expected Loss and LAE Ratio (6)	Pure Premium Underlying Proposed Rate Factor = (3) x (5) x (6) (7)
Manufacturing	Indemnity	1.873	0.978	0.656	0.750	0.921
	Medical	1.873	0.514	0.344	0.750	0.484
	Total		1.491			
Construction	Indemnity	4.782	2.623	0.689	0.750	2.473
	Medical	4.782	1.182	0.311	0.750	1.114
	Total		3.805			
Office and Clerical	Indemnity	0.145	0.071	0.621	0.750	0.068
	Medical	0.145	0.044	0.379	0.750	0.041
	Total		0.115			
Goods and Services	Indemnity	1.650	0.836	0.637	0.750	0.789
	Medical	1.650	0.476	0.363	0.750	0.449
	Total		1.312			
Miscellaneous	Indemnity	4.516	2.398	0.668	0.750	2.262
	Medical	4.516	1.193	0.332	0.750	1.125
	Total		3.592			

Notes:

- (3): Section IX - H, Exhibit 1.
- (4): Section IX - C, Exhibits 1-5, page 2.
- (6): Section VI - J, Exhibit 1.

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IX 000025

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2018

Section IX - B
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 Page 1

Calculation of Indemnity and Medical Conversion Factors

(A). Benefit Level Adjustment Factors

The following factors are used to bring MA Unit Statistical Plan losses to the benefit level of the proposed effective policy year period.

	Policy Year				
	2011	2012	2013	2014	2015
Indemnity					
Fatal	1.044	1.039	1.037	1.032	1.020
Permanent Total	1.045	1.038	1.035	1.031	1.025
Permanent Partial	1.073	1.061	1.056	1.049	1.038
Temporary Total	1.027	1.024	1.022	1.020	1.016
Medical					
All Injury Types	1.000	1.000	1.000	1.000	1.000

(B). Loss Development Factors

The following factors are used to bring MA Unit Statistical Plan losses from first through fifth report to an ultimate basis.

	Remainder of Industry				
	Policy Year				
Indemnity	2011	2012	2013	2014	2015
Likely	1.025	1.040	1.108	1.241	1.801
Not Likely	1.029	1.048	1.102	1.228	1.608
Medical					
Likely	0.986	0.981	0.987	0.998	1.018
Not Likely	1.000	0.998	1.002	1.001	1.014

	AIG				
	Policy Year				
Indemnity	2011	2012	2013	2014	2015
Likely	1.034	1.060	1.138	1.385	2.231
Not Likely	1.016	1.048	1.098	1.278	1.939
Medical					
Likely	0.898	0.869	0.889	0.930	1.075
Not Likely	0.979	0.970	0.976	0.991	1.065

(C). Trend Factors

The following factors trend the reported pure premiums from the reported period to the proposed effective period for new rates.

	Policy Year				
	2011	2012	2013	2014	2015
Indemnity					
All Injury Types	0.820	0.852	0.879	0.836	0.911
Medical					
Lost Time Medical	0.789	0.780	0.845	0.797	0.914
Medical Only	0.641	0.674	0.701	0.773	0.817

Notes:

(A): Section IV - A, Exhibit 1.

(B): Development to 10th report (Exhibit 2, Page 1) x Development from 10th to ultimate. The 10th to ultimate development factor was calculated using data from Financial Aggregate Policy Year Call (Call 2) and Large Loss & Catastrophe Call (Call 7).

(C): Exhibit 3. Frequency x Severity Trends / Wage Trends

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Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2018

Section IX - B
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 Page 2

Calculation of Indemnity and Medical Conversion Factors

(D). Primary Conversion Factors (PCF)

Remainder of Industry					
Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal - LD	0.878	0.921	1.010	1.071	1.674
Fatal - NLD	0.881	0.928	1.004	1.060	1.494
Permanent Total	0.878	0.919	1.008	1.070	1.681
Permanent Partial - LD	0.902	0.940	1.029	1.089	1.703
Permanent Partial - NLD	0.906	0.947	1.023	1.078	1.521
Temporary Total - LD	0.864	0.907	0.995	1.059	1.667
Temporary Total - NLD	0.867	0.914	0.990	1.047	1.488

Medical					
Lost Time Medical -LD	0.778	0.765	0.835	0.796	0.931
Lost Time Medical -NLD	0.789	0.779	0.847	0.798	0.927
Medical - NLD	0.641	0.673	0.702	0.774	0.828

AIG					
Indemnity	Policy Year				
	2011	2012	2013	2014	2015
Fatal - LD	0.885	0.939	1.037	1.195	2.073
Fatal - NLD	0.870	0.928	1.001	1.103	1.802
Permanent Total	0.886	0.937	1.035	1.194	2.082
Permanent Partial - LD	0.910	0.958	1.056	1.215	2.110
Permanent Partial - NLD	0.894	0.947	1.019	1.121	1.834
Temporary Total - LD	0.871	0.925	1.022	1.181	2.065
Temporary Total - NLD	0.856	0.914	0.986	1.089	1.795

Medical					
Lost Time Medical -LD	0.708	0.678	0.752	0.742	0.983
Lost Time Medical -NLD	0.773	0.757	0.825	0.790	0.974
Medical - NLD	0.628	0.654	0.684	0.766	0.870

Notes:

(D) = (A) x (B) x (C)

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Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
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Page 3

Calculation of Indemnity and Medical Conversion Factors

(A). Loss Adjustment Expense Factor

The following factor is applied to include the proposed loss adjustment expense.

	Indemnity	Medical
Loss Adjustment Expense	1.185	1.185

(B). Investment Income Offset Factor

The following factor is applied to adjust for investment income.

	Investment Income Offset Factor
Indemnity	
Fatal	0.825
Permanent Total	0.778
Permanent Partial	1.028
Temporary Total	1.036
Medical	
Fatal	1.000
Permanent Total	0.779
Permanent Partial	1.029
Temporary Total	1.037
Medical Only	1.000

(C). Secondary Conversion Factors

The factors above are combined multiplicatively, resulting in the following conversion factors.

Indemnity	
Fatal	0.978
Permanent Total	0.922
Permanent Partial	1.218
Temporary Total	1.228
Medical	
Fatal	1.185
Permanent Total	0.923
Permanent Partial	1.219
Temporary Total	1.229
Medical Only	1.185

Notes:

(A): 1.000 + Loss Adjustment Expense (as a percent of losses) from Section VI-A, Exhibit 1.

(B): Exhibit 4.

(C) = (A) x (B)

IX 000028

Summary of Development Factors Remainder of Industry

		Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		(1) Indemnity Losses								
2Yr Weighted Average		1.451	1.120	1.066	1.015	0.997	0.997	1.001	1.005	1.001
Cumulative		1.759	1.212	1.082	1.016	1.001	1.004	1.007	1.006	1.001
		(2) Medical Losses								
2Yr Weighted Average		1.019	1.011	1.007	0.995	0.997	1.002	0.991	1.002	0.994
Cumulative		1.018	0.998	0.987	0.981	0.986	0.989	0.987	0.996	0.994
		(3) Claim Counts								
2Yr Weighted Average		1.020	1.004	1.008	1.004	1.001	0.999	1.001	1.004	1.001
Cumulative		1.042	1.022	1.017	1.009	1.006	1.005	1.006	1.004	1.001
		Not-Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		(4) Indemnity Losses								
2Yr Weighted Average		1.309	1.115	1.051	1.018	1.015	1.002	1.004	1.000	1.002
Cumulative		1.600	1.222	1.096	1.042	1.024	1.008	1.006	1.002	1.002
		(5) Medical Losses								
2Yr Weighted Average		1.012	0.999	1.004	0.998	0.999	1.001	1.000	0.999	1.001
Cumulative		1.014	1.001	1.002	0.998	1.000	1.001	1.000	1.000	1.001
		(6) Claim Counts								
2Yr Weighted Average		1.018	1.005	1.002	1.002	1.001	1.001	1.001	1.001	1.000
Cumulative		1.030	1.012	1.007	1.005	1.003	1.002	1.002	1.001	1.000

Notes:
 (1), (2), (3): Page 3.
 (4), (5), (6): Page 5.

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Summary of Development Factors AIG

		Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		(1) Indemnity Losses								
5Yr Weighted Average		1.611	1.217	1.073	1.026	1.010	0.999	1.004	1.001	1.001
Cumulative		2.192	1.360	1.117	1.042	1.016	1.005	1.006	1.002	1.001
		(2) Medical Losses								
5Yr Weighted Average		1.156	1.046	1.023	0.968	0.987	0.987	0.988	0.993	0.995
Cumulative		1.139	0.986	0.942	0.921	0.951	0.963	0.976	0.988	0.995
		(3) Claim Counts								
5Yr Weighted Average		1.014	1.009	1.003	1.000	1.004	1.000	0.999	1.001	1.000
Cumulative		1.031	1.017	1.008	1.005	1.004	1.000	1.000	1.001	1.000
		Not-Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		(4) Indemnity Losses								
5Yr Weighted Average		1.518	1.164	1.048	1.032	1.006	0.999	1.001	1.000	1.003
Cumulative		1.928	1.270	1.091	1.042	1.009	1.003	1.003	1.003	1.003
		(5) Medical Losses								
5Yr Weighted Average		1.074	1.016	1.006	0.991	0.995	0.999	0.997	1.002	0.998
Cumulative		1.078	1.004	0.988	0.982	0.991	0.996	0.997	1.001	0.998
		(6) Claim Counts								
5Yr Weighted Average		1.019	1.006	1.003	1.002	1.001	1.000	1.000	1.000	1.000
Cumulative		1.032	1.013	1.006	1.004	1.001	1.001	1.000	1.000	1.000

Notes:

(1), (2), (3): Page 4.

(4), (5), (6): Page 6.

IX 000030

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2018

Section IX - B
 Exhibit 2
 Page 3

Calculation of Likely to Develop Development Factors Remainder of Industry

Policy Year	Likely to Develop								
	Indemnity Losses			Medical Losses			Claim Counts		
	Evaluated at month	Link	Ratio	Evaluated at month	Link	Ratio	Evaluated at month	Link	Ratio
	18	30			18		30		
2014	73,469,643	107,939,871	1.469	49,517,121	50,454,478	1.019	1,466	1,495	1.020
2013	62,448,470	89,295,880	1.430	38,491,402	39,252,866	1.020	1,353	1,379	1.019
Weighted Average			1.451			1.019			1.020
	30	42		30	42		30	42	
2013	95,331,386	106,121,626	1.113	41,131,716	41,776,196	1.016	1,431	1,445	1.010
2012	96,907,604	109,231,774	1.127	46,513,571	46,861,404	1.007	1,463	1,462	0.999
Weighted Average			1.120			1.011			1.004
	42	54		42	54		42	54	
2012	116,129,154	123,018,555	1.059	49,118,282	49,620,390	1.010	1,493	1,506	1.009
2011	101,615,378	109,012,186	1.073	45,795,568	45,918,536	1.003	1,358	1,367	1.007
Weighted Average			1.066			1.007			1.008
	54	66		54	66		54	66	
2011	114,501,138	115,583,883	1.009	48,131,755	47,429,298	0.985	1,390	1,399	1.006
2010	98,213,615	100,246,243	1.021	43,586,338	43,822,885	1.005	1,393	1,394	1.001
Weighted Average			1.015			0.995			1.004
	66	78		66	78		66	78	
2010	102,221,125	100,993,185	0.988	44,360,556	44,704,660	1.008	1,402	1,406	1.003
2009	107,319,294	107,895,401	1.005	44,404,916	43,790,798	0.986	1,309	1,308	0.999
Weighted Average			0.997			0.997			1.001
	78	90		78	90		78	90	
2009	109,109,471	108,820,057	0.997	44,122,211	44,214,770	1.002	1,317	1,320	1.002
2008	99,263,318	98,901,088	0.996	40,919,169	41,021,267	1.002	1,333	1,327	0.995
Weighted Average			0.997			1.002			0.999
	90	102		90	102		90	102	
2008	99,552,950	99,562,243	1.000	41,409,104	40,715,908	0.983	1,332	1,333	1.001
2007	98,337,648	98,567,125	1.002	44,470,424	44,365,260	0.998	1,380	1,383	1.002
Weighted Average			1.001			0.991			1.001
	102	114		102	114		102	114	
2007	98,567,125	99,148,331	1.006	44,346,027	43,886,659	0.990	1,383	1,386	1.002
2006	97,888,173	98,311,743	1.004	43,094,776	43,732,062	1.015	1,455	1,462	1.005
Weighted Average			1.005			1.002			1.004
	114	126		114	126		114	126	
2006	97,581,559	97,612,648	1.000	43,516,392	42,815,925	0.984	1,460	1,462	1.001
2005	91,867,003	91,997,290	1.001	44,132,733	44,289,651	1.004	1,546	1,546	1.000
Weighted Average			1.001			0.994			1.001

Note:
 Unit Statistical Plan data, excluding Large Deductibles.

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Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2018

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 Exhibit 2
 Page 4

Calculation of Likely to Develop Development Factors AIG

Policy Year	Likely to Develop								
	Indemnity Losses			Medical Losses			Claim Counts		
	Evaluated at month	Link	Ratio	Evaluated at month	Link	Ratio	Evaluated at month	Link	Ratio
	18	30		18	30		18	30	
2014	9,140,810	13,651,161	1.493	5,145,487	5,526,222	1.074	181	185	1.022
2013	8,251,617	14,148,207	1.715	5,057,184	6,109,008	1.208	205	200	0.976
2012	7,622,437	12,363,463	1.622	4,626,187	5,719,448	1.236	190	191	1.005
2011	14,403,102	22,256,979	1.545	8,928,327	10,181,424	1.140	334	342	1.024
2010	13,983,387	23,627,475	1.690	7,712,669	8,844,853	1.147	373	383	1.027
Weighted Average			1.611			1.156			1.014
	30	42		30	42		30	42	
2013	15,425,902	18,017,002	1.168	6,376,573	6,505,868	1.020	207	209	1.010
2012	13,548,625	16,199,571	1.196	5,977,599	6,143,754	1.028	203	203	1.000
2011	22,574,026	27,283,677	1.209	10,295,119	11,159,816	1.084	348	351	1.009
2010	24,199,919	30,403,309	1.256	9,071,885	9,703,758	1.070	394	398	1.010
2009	18,412,449	22,731,436	1.235	8,617,003	8,680,709	1.007	259	262	1.012
Weighted Average			1.217			1.046			1.009
	42	54		42	54		42	54	
2012	16,756,205	18,081,385	1.079	6,517,843	6,774,768	1.039	208	206	0.990
2011	28,094,353	30,417,111	1.083	11,324,724	11,716,374	1.035	357	359	1.006
2010	30,127,444	31,880,459	1.058	9,624,379	9,876,839	1.026	404	406	1.005
2009	23,460,275	25,140,084	1.072	8,973,194	8,993,320	1.002	266	269	1.011
2008	33,207,152	35,703,156	1.075	12,212,836	12,406,832	1.016	376	376	1.000
Weighted Average			1.073			1.023			1.003
	54	66		54	66		54	66	
2011	30,467,076	30,820,017	1.012	11,907,928	11,448,169	0.961	360	360	1.000
2010	31,619,226	32,709,618	1.034	9,849,190	9,126,816	0.927	405	405	1.000
2009	26,413,158	26,596,379	1.007	9,572,118	9,245,389	0.966	274	274	1.000
2008	36,286,793	37,792,842	1.042	12,812,415	12,568,297	0.981	382	382	1.000
2007	51,114,813	52,502,557	1.027	16,663,753	16,500,307	0.990	615	616	1.002
Weighted Average			1.026			0.968			1.000
	66	78		66	78		66	78	
2010	32,206,870	32,332,376	1.004	9,073,772	8,691,730	0.958	403	405	1.005
2009	26,424,371	26,514,952	1.003	9,189,356	8,767,800	0.954	273	274	1.004
2008	38,835,458	39,211,312	1.010	12,721,780	12,729,457	1.001	388	391	1.008
2007	53,478,055	54,244,628	1.014	16,866,135	16,826,170	0.998	623	625	1.003
2006	64,518,947	65,415,608	1.014	24,702,397	24,628,325	0.997	779	781	1.003
Weighted Average			1.010			0.987			1.004
	78	90		78	90		78	90	
2009	26,694,672	26,580,795	0.996	8,816,373	9,011,502	1.022	275	273	0.993
2008	39,564,899	39,778,773	1.005	12,848,752	12,544,061	0.976	393	395	1.005
2007	54,374,152	54,726,127	1.006	16,863,803	16,570,572	0.983	626	625	0.998
2006	66,465,489	66,015,512	0.993	25,156,804	24,958,782	0.992	786	787	1.001
2005	72,259,547	72,080,692	0.998	27,689,446	27,118,857	0.979	890	891	1.001
Weighted Average			0.999			0.987			1.000
	90	102		90	102		90	102	
2008	39,778,773	39,734,733	0.999	12,544,061	12,148,962	0.969	395	393	0.995
2007	54,726,127	54,478,186	0.995	16,540,791	16,217,672	0.980	625	625	1.000
2006	66,030,919	66,083,903	1.001	24,981,886	25,251,274	1.011	788	788	1.000
2005	72,690,342	73,490,152	1.011	27,475,840	27,252,464	0.992	893	891	0.998
2004	68,251,462	68,798,336	1.008	26,786,058	26,161,421	0.977	941	941	1.000
Weighted Average			1.004			0.988			0.999
	102	114		102	114		102	114	
2007	54,815,848	54,788,576	1.000	16,257,812	16,506,749	1.015	626	626	1.000
2006	66,083,903	66,200,294	1.002	25,251,274	25,177,419	0.997	788	788	1.000
2005	74,489,727	74,441,353	0.999	27,709,248	26,955,596	0.973	894	897	1.003
2004	70,479,555	70,477,945	1.000	26,960,002	26,607,245	0.987	946	946	1.000
2003	59,750,489	59,988,892	1.004	21,759,834	21,860,197	1.005	935	935	1.000
Weighted Average			1.001			0.993			1.001
	114	126		114	126		114	126	
2006	66,200,294	66,458,582	1.004	25,161,273	24,964,173	0.992	788	787	0.999
2005	74,441,353	74,309,630	0.998	26,955,596	27,046,060	1.003	897	898	1.001
2004	70,477,945	70,512,451	1.000	26,607,245	26,304,493	0.989	946	946	1.000
2003	60,570,364	60,711,073	1.002	22,043,712	22,177,008	1.006	937	939	1.002
2002	40,780,517	40,843,002	1.002	15,895,102	15,533,478	0.977	718	718	1.000
Weighted Average			1.001			0.995			1.000

Note:
 Unit Statistical Plan data, excluding Large Deductibles.

IX 000032

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2018

Section IX - B
 Exhibit 2
 Page 5

Calculation of Not-Likely to Develop Development Factors Remainder of Industry

Policy Year		Not-Likely to Develop								
		Indemnity Losses			Medical Losses			Claim Counts		
		Evaluated at month	Link	Ratio	Evaluated at month	Link	Ratio	Evaluated at month	Link	Ratio
		18	30			18		30		
	2014	139,247,735	185,650,553	1.333	125,017,504	126,402,145	1.011	11,787	11,994	1.018
	2013	130,690,665	167,817,918	1.284	120,040,870	121,692,280	1.014	11,466	11,686	1.019
	Weighted Average			1.309			1.012			1.018
		30	42		30	42		30	42	
	2013	161,782,412	180,654,417	1.117	119,813,430	119,426,913	0.997	11,634	11,685	1.004
	2012	156,562,468	174,235,409	1.113	116,208,741	116,424,403	1.002	11,425	11,479	1.005
	Weighted Average			1.115			0.999			1.005
		42	54		42	54		42	54	
	2012	167,338,030	176,293,637	1.054	114,167,524	114,366,780	1.002	11,448	11,471	1.002
	2011	163,716,850	171,779,073	1.049	109,641,096	110,326,944	1.006	10,914	10,938	1.002
	Weighted Average			1.051			1.004			1.002
		54	66		54	66		54	66	
	2011	166,290,120	169,599,300	1.020	108,113,726	107,919,844	0.998	10,915	10,939	1.002
	2010	148,261,613	150,737,061	1.017	100,536,188	100,401,913	0.999	10,478	10,497	1.002
	Weighted Average			1.018			0.998			1.002
		66	78		66	78		66	78	
	2010	148,716,129	150,012,784	1.009	99,805,709	99,205,419	0.994	10,488	10,495	1.001
	2009	139,770,839	142,787,340	1.022	97,142,856	97,545,981	1.004	9,665	9,676	1.001
	Weighted Average			1.015			0.999			1.001
		78	90		78	90		78	90	
	2009	141,573,270	141,957,813	1.003	97,214,568	96,965,281	0.997	9,667	9,671	1.000
	2008	134,078,431	134,299,084	1.002	88,448,559	88,869,807	1.005	9,921	9,927	1.001
	Weighted Average			1.002			1.001			1.001
		90	102		90	102		90	102	
	2008	133,647,223	133,981,417	1.003	88,481,969	88,223,627	0.997	9,922	9,929	1.001
	2007	126,915,002	127,574,766	1.005	89,935,545	90,111,246	1.002	10,345	10,350	1.000
	Weighted Average			1.004			1.000			1.001
		102	114		102	114		102	114	
	2007	127,574,766	127,600,587	1.000	90,130,479	89,755,435	0.996	10,350	10,353	1.000
	2006	120,445,947	120,447,482	1.000	81,974,706	82,228,461	1.003	10,183	10,193	1.001
	Weighted Average			1.000			0.999			1.001
		114	126		114	126		114	126	
	2006	121,177,666	121,855,664	1.006	82,444,131	82,453,845	1.000	10,195	10,199	1.000
	2005	118,839,027	118,710,085	0.999	80,355,634	80,485,931	1.002	10,989	10,993	1.000
	Weighted Average			1.002			1.001			1.000

Note:
 Unit Statistical Plan data, excluding Large Deductibles.

IX 000034

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2018

Section IX - B
 Exhibit 3

Trend Factors

Policy Year	Statewide Average Weekly Wage	Indemnity Severity	Lost Time Medical Severity	Medical Only Severity	Lost Time Claim Frequency	Medical Only Claim Frequency
(1) Historical Values						
2011	1,174.21	26,771	12,747	819	187.56	396.13
2012	1,190.50	27,033	13,518	853	181.39	367.06
2013	1,225.60	27,419	13,058	880	178.40	352.35
2014	1,265.09	30,118	14,473	865	176.17	335.26
2015	1,303.66	29,689	13,544	902	169.16	313.41

(2) Trend to PY 2015						
2011	1.110	1.109	1.063	1.102	0.902	0.791
2012	1.095	1.098	1.002	1.058	0.933	0.854
2013	1.064	1.083	1.037	1.026	0.948	0.890
2014	1.030	0.986	0.936	1.042	0.960	0.935
2015	1.000	1.000	1.000	1.000	1.000	1.000

(3) Projected Trend from PY 2015 to Prospective Effective Period						
Selected Annual Trend	2.7%	2.1%	2.2%	1.9%	-2.0%	-4.8%
Trend Factor	1.099	1.074	1.079	1.068	0.932	0.841

(4) Trend Factors from PY 2015 to Prospective Effective Period						
Policy Year	Statewide Average Weekly Wage	Indemnity Severity	Lost Time Medical Severity	Medical Only Severity	Lost Time Claim Frequency	Medical Only Claim Frequency
2011	1.221	1.192	1.146	1.177	0.840	0.665
2012	1.204	1.180	1.081	1.130	0.869	0.718
2013	1.169	1.163	1.119	1.095	0.883	0.748
2014	1.133	1.059	1.010	1.113	0.895	0.786
2015	1.099	1.074	1.079	1.068	0.932	0.841

Notes:

- (1): Weekly Wage from Section V-G, Exhibit 2.
 Indemnity Severity from Section V-C, Exhibit 1, Page 1.
 Lost Time Medical Severity from Section V-D, Exhibit 1, Page 1.
 Medical Only Severity from Section V-D, Exhibit 2, Page 1.
 Lost Time Claim Frequency from Section V-B, Exhibit 1, Page 1.
 Medical Only Claim Frequency from Section V-B, Exhibit 2, Page 1.
- (2) = (1) / (1) for Policy Year 2015
- (3): Selected Annual Trend from Section I-D, Exhibit 1, Page 1.
 Trend Factor = (1.0 + Selected Annual Trend) ^ Trend Period, where Trend Period extends from the midpoint of PY 2015 to midpoint of policy effective period 7/1/2018 - 6/30/2019, which is 3.5 years.
- (4) = (2) x (3)

IX 000035

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2018

Section IX - B
 Exhibit 4

Calculation of Investment Income Offset Factor

Indemnity

Injury Type (1)	Loss Flow Discounted at 1.26% Post-Chapter 398 (2)	Injury Type Weights At Ultimate (3)	Investment Income Offset Factor (4)
Fatal	0.781	1.50%	0.825
Permanent Total	0.736	6.65%	0.778
Permanent Partial	0.972	40.15%	1.028
Temporary Total	0.980	16.98%	1.036
Total Indemnity			0.946

Medical

Injury Type (5)	Loss Flow Discounted at 1.26% Post-Chapter 398 (6)	Injury Type Weights At Ultimate (7)	Investment Income Offset Factor (8)
Fatal	0.781	0.24%	1.000
Permanent Total	0.736	3.80%	0.779
Permanent Partial	0.972	14.95%	1.029
Temporary Total	0.980	11.18%	1.037
Medical Only		4.55%	1.000
Total Medical			0.945

Notes:

(2), (6): Loss Flows are from the 8/1/99 rate filing, Section VIII - E, Exhibits 12 and 16. The discount rate is calculated by multiplying the pre-tax rate of return on governments (Section VII-J, Exhibit 1, Page 1) times the complement of the federal tax rate on investment income (Section VII-J, Exhibit 1, Page 1) [1.61% x (1.000 - 22.16%)] = 1.26%

(3): Section IV - E, Exhibit 2, Page 1.

(4)= (2) / 0.946, which is the weighted average of (2) and (3).

(7): Section IV - E, Exhibit 2, Page 2.

(8)= (6) / 0.945, which is the weighted average of (6) and (7). This weighted average excludes Fatal and Medical Only injury types as it is assumed that they generate no investment income.

IX 000036

Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
7/1/2018

Section IX - B
Exhibit 5

Calculation of Excess Loss Factors

Hazard Group (1)	Excess Ratio (2)	Excess Factor (3) = [1.0 / (1.0 - (2))]
A	0.094	1.104
B	0.106	1.119
C	0.131	1.151
D	0.172	1.208
E	0.187	1.230
F	0.216	1.276
G	0.327	1.486

Note:

(2) = Excess Ratio for Accident Limit of \$500,000 x 0.985, where Excess Ratio from Section XII-F, Exhibit 3, Page 1 and 0.985 is the factor to convert the per occurrence claims to per claim basis.

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Manufacturing Industry Group, Industry Code 1
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2011	Fatal	165,500	310,144	0	0	475,644	146,086	273,323	0	0	419,409
	Permanent Total	5,516,383	0	1,969,184	0	7,485,567	4,855,026	0	1,489,217	0	6,344,243
	Permanent Partial	10,498,248	18,618,701	3,483,888	7,480,642	40,081,479	9,494,414	16,818,132	2,640,507	5,879,815	34,832,868
	Temporary Total	5,851,229	11,138,293	3,297,050	8,581,542	28,868,114	5,054,595	9,653,010	2,560,924	6,765,268	24,033,797
	Medical Only	0	0	0	4,034,752	4,034,752	0	0	0	2,580,968	2,580,968
2012	Fatal	0	1,927,249	0	72,751	2,000,000	0	1,787,542	0	56,651	1,844,193
	Permanent Total	4,668,007	0	1,665,391	0	6,333,398	4,299,042	0	1,249,653	0	5,548,695
	Permanent Partial	8,637,926	17,032,082	3,344,168	5,861,823	34,875,999	8,153,360	16,129,473	2,503,969	4,543,009	31,329,811
	Temporary Total	5,276,231	10,904,869	2,277,099	7,937,857	26,396,056	4,784,099	9,962,446	1,742,529	6,177,923	22,666,997
	Medical Only	0	0	0	3,618,483	3,618,483	0	0	0	2,427,940	2,427,940
2013	Fatal	8,000	1,000,000	0	0	1,008,000	8,082	1,004,287	0	0	1,012,369
	Permanent Total	2,233,484	0	572,379	0	2,805,863	2,251,300	0	477,747	0	2,729,047
	Permanent Partial	7,163,374	15,218,882	2,646,788	6,094,155	31,123,199	7,410,670	15,554,456	2,159,359	5,142,627	30,267,112
	Temporary Total	4,098,796	11,524,480	1,624,432	8,685,676	25,933,384	4,084,561	11,403,407	1,351,861	7,355,796	24,195,625
	Medical Only	0	0	0	3,922,927	3,922,927	0	0	0	2,749,118	2,749,118
2014	Fatal	0	350,790	0	0	350,790	0	371,790	0	0	371,790
	Permanent Total	2,063,601	0	510,558	0	2,574,159	2,248,965	0	404,096	0	2,653,061
	Permanent Partial	8,537,190	12,554,481	4,742,086	6,120,396	31,954,153	9,483,329	13,613,046	3,715,142	4,879,014	31,690,531
	Temporary Total	4,525,705	12,675,324	1,811,439	9,184,119	28,196,587	4,791,268	13,288,447	1,442,119	7,330,897	26,852,731
	Medical Only	0	0	0	3,127,368	3,127,368	0	0	0	2,416,333	2,416,333
2015	Fatal	0	458,254	0	41,746	500,000	0	684,768	0	38,693	723,461
	Permanent Total	52,000	0	20,700	0	72,700	87,416	0	19,262	0	106,678
	Permanent Partial	4,086,248	8,307,048	2,414,785	5,277,935	20,086,016	7,113,528	13,135,662	2,265,781	4,940,864	27,455,835
	Temporary Total	3,823,352	13,383,862	2,505,134	11,438,691	31,151,039	6,512,358	20,158,104	2,360,612	10,633,984	39,665,058
	Medical Only	0	0	0	3,060,110	3,060,110	0	0	0	2,546,964	2,546,964
(13) All Years, All Injury Types		77,205,274	135,404,459	32,885,081	94,540,973	340,035,787	80,778,099	143,837,893	26,382,778	76,465,864	327,464,634

Notes:
 (3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.
 (7)= (3) + (4) + (5) + (6)
 (8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (12)= (8) + (9) + (10) +(11)

IX 000037

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Manufacturing Industry Group, Industry Code 1
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses				Converted Unlimited Losses						Exposure (13)
		Indemnity		Medical		Indemnity		Medical		Total		
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Total (7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	Total (12)	
2011	Fatal	16,586	28,842	7,108	12,361	64,897	159,069	295,472	8,423	14,648	477,612	60,683,304
	Permanent Total	542,033	0	495,592	0	1,037,625	4,977,331	0	1,831,711	0	6,809,042	
	Permanent Partial	1,150,036	1,998,955	976,799	1,855,723	5,981,513	12,966,170	22,921,388	4,409,330	9,429,266	49,726,154	
	Temporary Total	536,966	1,100,235	608,399	1,555,051	3,800,651	6,865,802	13,203,766	3,894,248	10,223,441	34,187,257	
	Medical Only	0	0	0	408,944	408,944	0	0	0	3,543,046	3,543,046	
2012	Fatal	0	214,948	0	105,140	320,088	0	1,958,134	0	191,722	2,149,856	59,921,644
	Permanent Total	461,245	0	388,043	0	849,288	4,390,081	0	1,511,372	0	5,901,453	
	Permanent Partial	915,235	1,830,031	775,997	1,534,796	5,056,059	11,046,598	21,876,751	3,998,128	7,408,565	44,330,042	
	Temporary Total	558,113	1,056,344	533,552	1,405,888	3,553,897	6,559,630	13,529,824	2,796,693	9,318,471	32,204,618	
	Medical Only	0	0	0	386,872	386,872	0	0	0	3,335,552	3,335,552	
2013	Fatal	671	122,526	287	52,511	175,995	8,559	1,101,854	341	62,226	1,172,980	60,231,495
	Permanent Total	232,947	0	169,050	0	401,997	2,291,047	0	596,907	0	2,887,954	
	Permanent Partial	793,685	1,774,056	655,764	1,644,515	4,868,020	9,993,854	21,108,130	3,431,506	8,273,215	42,806,705	
	Temporary Total	462,656	1,245,388	414,188	1,704,944	3,827,176	5,583,467	15,531,286	2,170,001	11,133,220	34,417,974	
	Medical Only	0	0	0	428,750	428,750	0	0	0	3,765,774	3,765,774	
2014	Fatal	0	39,233	0	16,814	56,047	0	401,918	0	19,925	421,843	61,786,450
	Permanent Total	226,322	0	152,963	0	379,285	2,282,784	0	514,090	0	2,796,874	
	Permanent Partial	1,121,654	1,492,378	1,143,457	1,414,526	5,172,015	12,918,095	18,400,152	5,922,409	7,671,536	44,912,192	
	Temporary Total	515,484	1,454,388	455,555	1,792,081	4,217,508	6,516,090	18,102,530	2,331,733	11,209,694	38,160,047	
	Medical Only	0	0	0	381,289	381,289	0	0	0	3,315,182	3,315,182	
2015	Fatal	0	99,573	0	50,712	150,285	0	766,967	0	105,944	872,911	64,030,650
	Permanent Total	9,224	0	6,857	0	16,081	89,125	0	24,105	0	113,230	
	Permanent Partial	832,956	1,605,123	743,995	1,572,267	4,754,341	9,679,736	17,955,979	3,668,779	7,939,208	39,243,702	
	Temporary Total	720,853	2,175,031	663,289	2,565,020	6,124,193	8,881,563	27,422,556	3,715,563	16,218,037	56,237,719	
	Medical Only	0	0	0	393,164	393,164	0	0	0	3,484,051	3,484,051	
(14) All Years, All Injury Types		9,096,666	16,237,051	8,190,895	19,281,368	52,805,980	105,209,001	194,576,707	40,825,339	116,662,723	457,273,770	306,653,544
(15) Pure Premium							0.343	0.635	0.133	0.380	1.491	

Notes:

- (3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
- (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
- (7) = (3) + (4) + (5) + (6)
- (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.
- (12) = (8) + (9) + (10) + (11)
- (13): Unit Statistical Plan data, excluding Large Deductibles.
- (15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000038

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Construction Industry Group, Industry Code 2
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2011	Fatal	101,519	1,403,457	0	81,662	1,586,638	89,124	1,231,172	0	64,411	1,384,707
	Permanent Total	10,317,416	0	3,536,107	0	13,853,523	9,063,228	0	2,731,948	0	11,795,176
	Permanent Partial	23,363,855	38,747,890	7,523,294	11,898,242	81,533,281	21,115,691	34,986,538	5,785,264	9,347,052	71,234,545
	Temporary Total	6,111,189	20,401,961	2,542,340	11,421,933	40,477,423	5,277,488	17,679,140	1,977,935	9,004,224	33,938,787
	Medical Only	0	0	0	3,263,307	3,263,307	0	0	0	2,086,879	2,086,879
2012	Fatal	659,764	2,548,122	128,268	172,690	3,508,844	607,350	2,363,408	98,156	134,472	3,203,386
	Permanent Total	15,456,069	0	5,309,525	0	20,765,594	14,228,822	0	4,038,812	0	18,267,634
	Permanent Partial	23,829,390	38,023,629	7,859,730	13,312,733	83,025,482	22,474,164	36,008,803	5,947,231	10,327,678	74,757,876
	Temporary Total	8,286,724	18,533,940	3,187,011	12,123,055	42,130,730	7,513,793	16,932,244	2,438,830	9,434,855	36,319,722
	Medical Only	0	0	0	3,515,502	3,515,502	0	0	0	2,359,429	2,359,429
2013	Fatal	151,968	2,726,650	16,006	217,626	3,112,250	153,522	2,735,997	13,360	183,528	3,086,407
	Permanent Total	12,498,218	0	4,155,210	0	16,653,428	12,623,708	0	3,459,501	0	16,083,209
	Permanent Partial	18,083,093	39,443,641	6,235,042	13,066,729	76,828,505	18,650,772	40,306,352	5,187,715	11,014,455	75,159,294
	Temporary Total	7,634,001	20,950,425	2,478,915	14,180,932	45,244,273	7,598,927	20,730,740	2,069,074	12,009,289	42,408,030
	Medical Only	0	0	0	3,302,263	3,302,263	0	0	0	2,311,864	2,311,864
2014	Fatal	741,047	500,116	23,810	44,884	1,309,857	793,909	530,056	18,956	35,834	1,378,755
	Permanent Total	7,020,847	0	4,194,714	0	11,215,561	7,515,148	0	3,339,487	0	10,854,635
	Permanent Partial	24,452,730	41,575,440	8,752,237	15,324,052	90,104,459	27,005,100	45,189,810	6,934,443	12,207,323	91,336,676
	Temporary Total	12,301,538	21,830,081	5,476,982	13,075,252	52,683,853	13,024,907	22,876,471	4,360,323	10,437,027	50,698,728
	Medical Only	0	0	0	3,777,150	3,777,150	0	0	0	2,918,461	2,918,461
2015	Fatal	0	4,661,717	0	407,816	5,069,533	0	7,118,742	0	378,160	7,496,902
	Permanent Total	962,537	0	1,403,014	0	2,365,551	1,618,095	0	1,305,572	0	2,923,667
	Permanent Partial	13,694,888	21,274,235	5,921,424	11,157,434	52,047,981	23,660,473	32,958,956	5,537,103	10,383,170	72,539,702
	Temporary Total	12,306,040	23,867,066	8,529,040	17,399,288	62,101,434	21,148,355	35,960,533	7,972,703	16,170,733	81,252,324
	Medical Only	0	0	0	3,592,006	3,592,006	0	0	0	2,987,337	2,987,337
(13) All Years, All Injury Types		197,972,833	296,488,370	77,272,669	151,334,556	723,068,428	214,162,576	317,608,962	63,216,413	123,796,181	718,784,132

Notes:
 (3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.
 (7)= (3) + (4) + (5) + (6)
 (8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (12)= (8) + (9) + (10) + (11)

IX 000039

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Construction Industry Group, Industry Code 2
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total	Indemnity		Medical		Total	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	(7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	Total (12)	
2011	Fatal	17,188	229,371	7,366	116,048	369,973	103,957	1,428,192	8,729	213,844	1,754,722	48,000,322
	Permanent Total	2,031,725	0	1,806,245	0	3,837,970	10,232,101	0	4,188,140	0	14,420,241	
	Permanent Partial	4,338,515	6,949,559	3,569,478	5,622,832	20,480,384	31,006,164	51,083,013	11,403,002	18,247,603	111,739,782	
	Temporary Total	1,018,384	3,394,526	981,845	3,917,251	9,312,006	7,730,617	25,876,072	3,636,776	15,877,029	53,120,494	
	Medical Only	0	0	0	560,740	560,740	0	0	0	3,137,429	3,137,429	
2012	Fatal	147,193	472,128	102,500	251,465	973,286	737,830	2,772,728	237,777	457,336	4,205,671	51,783,042
	Permanent Total	2,979,931	0	2,602,713	0	5,582,644	15,870,433	0	6,129,232	0	21,999,665	
	Permanent Partial	4,309,366	7,046,802	3,471,572	5,876,818	20,704,558	32,625,435	52,446,703	11,481,089	19,752,537	116,305,764	
	Temporary Total	1,442,216	3,357,852	1,290,516	4,113,836	10,204,420	10,996,963	24,913,936	4,582,367	16,647,709	57,140,975	
	Medical Only	0	0	0	629,613	629,613	0	0	0	3,542,015	3,542,015	
2013	Fatal	24,718	626,390	13,666	346,686	1,011,460	174,292	3,287,909	32,026	628,303	4,122,530	56,065,198
	Permanent Total	2,499,201	0	1,990,244	0	4,489,445	13,946,804	0	5,029,379	0	18,976,183	
	Permanent Partial	3,565,362	8,156,342	2,959,765	6,664,033	21,345,502	27,061,819	59,033,162	9,931,404	21,549,266	117,575,651	
	Temporary Total	1,393,726	3,894,234	1,130,980	4,923,847	11,342,787	11,041,958	30,236,675	3,932,008	20,806,283	66,016,924	
	Medical Only	0	0	0	628,707	628,707	0	0	0	3,484,577	3,484,577	
2014	Fatal	138,971	91,988	64,782	49,708	345,449	912,217	608,265	99,228	101,367	1,721,077	62,967,191
	Permanent Total	1,476,070	0	1,628,755	0	3,104,825	8,291,974	0	4,585,017	0	12,876,991	
	Permanent Partial	5,562,690	8,722,557	4,450,976	7,119,740	25,855,963	39,671,332	65,671,494	13,878,304	23,558,804	142,779,934	
	Temporary Total	2,403,612	4,367,334	2,218,763	4,749,612	13,739,321	18,944,471	33,452,302	8,083,933	18,660,308	79,141,014	
	Medical Only	0	0	0	789,779	789,779	0	0	0	4,394,265	4,394,265	
2015	Fatal	0	1,520,299	0	757,992	2,278,291	0	8,447,683	0	1,346,341	9,794,024	69,893,599
	Permanent Total	327,622	0	527,732	0	855,354	1,794,399	0	1,691,892	0	3,486,291	
	Permanent Partial	4,940,255	6,497,108	3,820,747	5,714,489	20,972,599	34,838,993	48,062,045	11,406,791	19,622,308	113,930,137	
	Temporary Total	4,489,665	6,847,706	4,503,419	7,382,869	23,223,659	31,480,580	52,563,661	15,329,809	28,941,062	128,315,112	
	Medical Only	0	0	0	795,274	795,274	0	0	0	4,482,393	4,482,393	
(14) All Years, All Injury Types		43,106,410	62,174,196	37,142,064	61,011,339	203,434,009	297,462,339	459,883,840	115,666,903	225,450,779	1,098,463,861	288,709,351
(15) Pure Premium							1.030	1.593	0.401	0.781	3.805	

Notes:

(3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).

(5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).

(7) = (3) + (4) + (5) + (6)

(8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.

(12) = (8) + (9) + (10) + (11)

(13): Unit Statistical Plan data, excluding Large Deductibles.

(15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000040

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Office and Clerical Industry Group, Industry Code 3
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2011	Fatal	0	833,023	0	49,485	882,508	0	729,810	0	38,995	768,805
	Permanent Total	4,991,621	0	1,791,844	0	6,783,465	4,384,611	0	1,364,767	0	5,749,378
	Permanent Partial	12,286,225	11,000,847	4,986,607	5,367,166	33,640,845	11,114,087	9,924,863	3,784,167	4,204,951	29,028,068
	Temporary Total	5,248,162	9,678,367	2,871,564	8,328,928	26,127,021	4,532,196	8,384,864	2,234,071	6,564,794	21,715,925
	Medical Only	0	0	0	5,585,418	5,585,418	0	0	0	3,569,717	3,569,717
2012	Fatal	150,000	170,000	0	100	320,100	138,083	157,677	0	78	295,838
	Permanent Total	4,746,637	0	1,620,329	0	6,366,966	4,365,972	0	1,219,439	0	5,585,411
	Permanent Partial	7,224,030	13,369,956	3,302,606	5,430,005	29,326,597	6,821,891	12,661,578	2,463,285	4,201,040	26,147,794
	Temporary Total	5,510,813	9,970,736	2,842,393	9,145,262	27,469,204	4,996,801	9,109,051	2,175,114	7,117,840	23,398,806
	Medical Only	0	0	0	5,564,148	5,564,148	0	0	0	3,732,936	3,732,936
2013	Fatal	232,170	957,696	266	9,804	1,199,936	234,544	961,801	222	8,305	1,204,872
	Permanent Total	1,688,150	0	343,117	0	2,031,267	1,713,296	0	281,987	0	1,995,283
	Permanent Partial	7,934,695	11,764,273	3,701,673	5,693,753	29,094,394	8,198,417	12,022,445	3,033,036	4,802,496	28,056,394
	Temporary Total	4,889,145	9,186,008	2,278,418	8,267,796	24,621,367	4,866,682	9,089,531	1,901,725	7,000,525	22,858,463
	Medical Only	0	0	0	5,525,670	5,525,670	0	0	0	3,871,387	3,871,387
2014	Fatal	0	628,406	0	27,244	655,650	0	666,025	0	21,751	687,776
	Permanent Total	533,262	0	60,933	0	594,195	570,806	0	48,510	0	619,316
	Permanent Partial	9,018,602	12,296,814	3,725,889	6,198,828	31,240,133	10,183,603	13,366,836	2,914,784	4,935,766	31,400,989
	Temporary Total	6,865,493	10,658,342	3,471,889	8,934,087	29,929,811	7,268,352	11,189,699	2,764,033	7,130,341	28,352,425
	Medical Only	0	0	0	5,408,215	5,408,215	0	0	0	4,179,332	4,179,332
2015	Fatal	0	312,711	0	44,100	356,811	0	467,284	0	40,874	508,158
	Permanent Total	151,045	0	10,529	0	161,574	253,918	0	9,798	0	263,716
	Permanent Partial	3,128,918	5,251,928	1,955,347	3,651,152	13,987,345	5,462,242	8,248,674	1,823,066	3,398,811	18,932,793
	Temporary Total	5,428,769	10,961,548	3,386,467	9,484,095	29,260,879	9,165,077	17,002,987	3,164,190	8,861,739	38,193,993
	Medical Only	0	0	0	5,712,002	5,712,002	0	0	0	4,758,644	4,758,644
(13) All Years, All Injury Types		80,027,737	107,040,655	36,349,871	98,427,258	321,845,521	84,270,578	113,983,125	29,182,194	78,440,322	305,876,219

Notes:
 (3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.
 (7)= (3) + (4) + (5) + (6)
 (8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (12)= (8) + (9) + (10) + (11)

IX 000041

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Office and Clerical Industry Group, Industry Code 3
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total	Indemnity		Medical		Total	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	(7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	(12)	
2011	Fatal	0	81,195	0	39,606	120,801	0	793,041	0	93,141	886,182	686,085,808
	Permanent Total	470,945	0	413,260	0	884,205	4,477,941	0	1,640,880	0	6,118,821	
	Permanent Partial	1,339,896	1,096,851	1,178,261	1,146,176	4,761,184	15,170,391	13,425,720	6,048,972	6,522,778	41,167,861	
	Temporary Total	472,549	873,473	521,251	1,340,553	3,207,826	6,145,260	11,368,188	3,385,552	9,713,552	30,612,552	
	Medical Only	0	0	0	552,713	552,713	0	0	0	4,885,079	4,885,079	
2012	Fatal	11,461	25,387	4,912	10,898	52,658	146,232	179,009	5,820	13,007	344,068	701,655,824
	Permanent Total	500,077	0	453,936	0	954,013	4,487,618	0	1,544,299	0	6,031,917	
	Permanent Partial	759,963	1,354,740	713,969	1,212,511	4,041,183	9,235,574	17,073,495	3,872,926	6,598,871	36,780,866	
	Temporary Total	539,494	985,314	575,294	1,496,472	3,596,574	6,797,942	12,394,736	3,379,514	10,584,680	33,156,872	
	Medical Only	0	0	0	574,747	574,747	0	0	0	5,104,604	5,104,604	
2013	Fatal	24,750	111,507	10,641	49,041	195,939	253,550	1,049,535	12,872	67,955	1,383,912	732,939,188
	Permanent Total	173,455	0	112,572	0	286,027	1,740,019	0	364,125	0	2,104,144	
	Permanent Partial	908,378	1,325,602	870,597	1,307,146	4,411,723	11,093,129	16,259,464	4,758,350	7,447,374	39,558,317	
	Temporary Total	577,396	990,532	535,059	1,482,100	3,585,087	6,684,711	12,377,173	2,994,155	10,422,871	32,478,910	
	Medical Only	0	0	0	589,236	589,236	0	0	0	5,285,839	5,285,839	
2014	Fatal	0	64,322	0	30,987	95,309	0	714,170	0	62,494	776,664	770,136,273
	Permanent Total	50,301	0	27,309	0	77,610	572,804	0	69,971	0	642,775	
	Permanent Partial	1,189,838	1,568,320	1,017,349	1,489,142	5,264,649	13,854,164	18,192,746	4,793,090	7,831,668	44,671,668	
	Temporary Total	827,318	1,208,933	792,289	1,590,283	4,418,823	9,940,565	15,224,113	4,369,766	10,715,309	40,249,753	
	Medical Only	0	0	0	642,004	642,004	0	0	0	5,713,283	5,713,283	
2015	Fatal	0	48,224	0	25,576	73,800	0	504,089	0	78,744	582,833	824,488,507
	Permanent Total	36,922	0	17,859	0	54,781	268,221	0	25,524	0	293,745	
	Permanent Partial	621,052	962,241	554,121	1,014,041	3,151,455	7,410,155	11,219,959	2,897,682	5,379,063	26,906,859	
	Temporary Total	989,930	1,924,865	921,074	2,207,239	6,043,108	12,469,197	23,241,256	5,019,694	13,600,805	54,330,952	
	Medical Only	0	0	0	735,213	735,213	0	0	0	6,510,221	6,510,221	
(14) All Years, All Injury Types		9,493,725	12,621,506	8,719,753	17,535,684	48,370,668	110,747,473	154,016,694	45,183,192	116,631,338	426,578,697	3,715,305,600
(15) Pure Premium							0.030	0.041	0.012	0.031	0.115	

Notes:

- (3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
- (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
- (7) = (3) + (4) + (5) + (6)
- (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.
- (12) = (8) + (9) + (10) + (11)
- (13): Unit Statistical Plan data, excluding Large Deductibles.
- (15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000042

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Goods and Services Industry Group, Industry Code 9
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2011	Fatal	132,719	3,101,201	13,739	39,898	3,287,557	117,507	2,728,752	9,733	31,440	2,887,432
	Permanent Total	9,445,375	0	3,369,447	0	12,814,822	8,309,647	0	2,592,724	0	10,902,371
	Permanent Partial	23,685,636	36,597,594	10,321,118	15,687,292	86,291,640	21,424,899	33,038,481	7,826,617	12,295,946	74,585,943
	Temporary Total	11,612,621	25,489,079	6,327,457	20,135,624	63,564,781	10,028,403	22,087,483	4,922,748	15,870,650	52,909,284
	Medical Only	0	0	0	10,285,343	10,285,343	0	0	0	6,574,577	6,574,577
2012	Fatal	383,239	410,011	74,116	2,570	869,936	352,793	380,301	56,717	1,978	791,789
	Permanent Total	9,586,359	0	4,111,300	0	13,697,659	8,821,259	0	3,111,144	0	11,932,403
	Permanent Partial	20,549,102	35,339,526	8,393,545	14,969,584	79,251,757	19,378,215	33,466,965	6,291,192	11,592,319	70,728,691
	Temporary Total	11,698,816	24,496,925	6,230,949	20,175,913	62,602,603	10,607,627	22,379,873	4,768,176	15,697,013	53,452,689
	Medical Only	0	0	0	10,167,600	10,167,600	0	0	0	6,816,442	6,816,442
2013	Fatal	513,995	1,301,179	277,046	95,164	2,187,384	519,624	1,306,107	208,296	80,615	2,114,642
	Permanent Total	4,530,865	0	1,624,889	0	6,155,754	4,573,415	0	1,353,805	0	5,927,220
	Permanent Partial	24,371,214	32,190,007	10,361,876	14,458,083	81,381,180	25,192,845	32,890,429	8,497,066	12,162,270	78,742,610
	Temporary Total	10,447,962	27,426,880	4,318,042	20,889,000	63,081,884	10,399,960	27,138,452	3,604,137	17,681,456	58,824,005
	Medical Only	0	0	0	10,125,961	10,125,961	0	0	0	7,086,939	7,086,939
2014	Fatal	497,977	805,897	54,661	19,797	1,378,332	533,500	854,142	43,517	15,805	1,446,964
	Permanent Total	3,904,577	0	1,286,738	0	5,191,315	4,223,717	0	1,020,977	0	5,244,694
	Permanent Partial	21,094,688	34,796,555	10,482,364	18,323,197	84,696,804	23,349,357	37,733,169	8,281,839	14,600,098	83,964,463
	Temporary Total	13,958,622	29,089,126	7,245,945	23,713,467	74,007,160	14,777,697	30,496,644	5,768,627	18,926,243	69,969,211
	Medical Only	0	0	0	9,595,089	9,595,089	0	0	0	7,413,551	7,413,551
2015	Fatal	0	927,113	0	17,081	944,194	0	1,385,384	0	15,832	1,401,216
	Permanent Total	831,826	0	337,451	0	1,169,277	1,398,360	0	314,014	0	1,712,374
	Permanent Partial	12,278,305	18,426,461	6,313,896	11,097,801	48,116,463	21,113,341	28,328,835	5,893,727	10,328,991	65,664,894
	Temporary Total	12,531,006	29,142,214	9,988,256	25,963,681	77,625,157	21,397,712	44,333,860	9,349,214	24,194,123	99,274,909
	Medical Only	0	0	0	10,355,649	10,355,649	0	0	0	8,627,805	8,627,805
(13) All Years, All Injury Types		192,054,904	299,539,768	91,132,835	236,117,794	818,845,301	206,519,878	318,548,877	73,914,270	190,014,093	788,997,118

Notes:
 (3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.
 (7)= (3) + (4) + (5) + (6)
 (8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (12)= (8) + (9) + (10) + (11)

IX 000043

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Goods and Services Industry Group, Industry Code 9
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total	Indemnity		Medical		Total	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	(7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	Total (12)	
2011	Fatal	9,946	309,194	5,416	138,938	463,494	124,630	2,970,655	17,952	201,898	3,315,135	153,945,334
	Permanent Total	935,122	0	816,612	0	1,751,734	8,525,806	0	3,146,358	0	11,672,164	
	Permanent Partial	2,411,426	3,663,259	2,280,778	3,496,474	11,851,937	29,035,398	44,706,961	12,320,450	19,250,236	105,313,045	
	Temporary Total	1,084,522	2,380,682	1,204,839	3,478,261	8,148,304	13,645,410	30,044,131	7,529,161	23,774,624	74,993,326	
	Medical Only	0	0	0	953,339	953,339	0	0	0	8,920,581	8,920,581	
2012	Fatal	39,525	28,356	28,374	12,370	108,625	383,628	399,605	100,832	17,002	901,067	155,875,245
	Permanent Total	1,093,863	0	1,003,256	0	2,097,119	9,144,025	0	3,797,036	0	12,941,061	
	Permanent Partial	2,177,026	3,624,239	1,977,799	3,342,937	11,122,001	26,256,775	45,181,373	10,079,521	18,205,392	99,723,061	
	Temporary Total	1,285,717	2,475,163	1,353,773	3,506,482	8,621,135	14,603,677	30,519,165	7,522,234	23,595,947	76,241,023	
	Medical Only	0	0	0	991,697	991,697	0	0	0	9,252,645	9,252,645	
2013	Fatal	83,438	140,318	79,028	72,348	375,132	589,704	1,414,386	340,480	181,262	2,525,832	165,546,109
	Permanent Total	511,932	0	420,148	0	932,080	4,689,860	0	1,637,119	0	6,326,979	
	Permanent Partial	2,812,724	3,592,822	2,586,016	3,429,506	12,421,068	34,114,020	44,440,816	13,509,770	19,005,660	111,070,266	
	Temporary Total	1,171,780	3,042,627	1,083,188	4,130,114	9,427,709	14,208,783	37,058,940	5,759,465	26,800,571	83,827,759	
	Medical Only	0	0	0	1,034,038	1,034,038	0	0	0	9,623,358	9,623,358	
2014	Fatal	58,433	90,132	31,723	41,011	221,299	578,822	923,358	89,159	67,327	1,658,666	177,242,116
	Permanent Total	567,687	0	411,029	0	978,716	4,418,778	0	1,321,549	0	5,740,327	
	Permanent Partial	2,531,327	4,105,242	2,357,992	4,023,929	13,018,490	31,525,665	50,964,020	12,969,467	22,701,835	118,160,987	
	Temporary Total	1,673,895	3,494,024	1,643,949	4,521,711	11,333,579	20,200,690	41,736,685	9,108,067	28,811,249	99,856,691	
	Medical Only	0	0	0	1,081,119	1,081,119	0	0	0	10,066,183	10,066,183	
2015	Fatal	0	123,643	0	54,847	178,490	0	1,475,602	0	83,754	1,559,356	186,613,665
	Permanent Total	238,315	0	173,094	0	411,409	1,509,392	0	449,535	0	1,958,927	
	Permanent Partial	2,456,557	3,135,734	2,055,060	2,957,163	10,604,514	28,710,859	38,327,481	9,689,207	16,195,213	92,922,760	
	Temporary Total	2,362,825	4,845,728	2,490,705	5,794,385	15,493,643	29,175,244	60,386,955	14,548,086	36,847,836	140,958,121	
	Medical Only	0	0	0	1,271,884	1,271,884	0	0	0	11,731,132	11,731,132	
(14) All Years, All Injury Types		23,506,060	35,051,163	22,002,779	44,332,553	124,892,555	271,441,166	430,550,133	113,935,448	285,333,705	1,101,260,452	839,222,469
(15) Pure Premium							0.323	0.513	0.136	0.340	1.312	

Notes:

(3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).

(5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).

(7) = (3) + (4) + (5) + (6)

(8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.

(12) = (8) + (9) + (10) + (11)

(13): Unit Statistical Plan data, excluding Large Deductibles.

(15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000044

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Miscellaneous Industry Group, Industry Code 0
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2011	Fatal	0	402,016	0	1,822	403,838	0	353,565	0	1,408	354,973
	Permanent Total	3,937,912	0	1,445,058	0	5,382,970	3,466,962	0	1,110,623	0	4,577,585
	Permanent Partial	13,085,843	17,675,669	5,578,598	6,255,946	42,596,056	11,862,728	15,906,619	4,097,480	4,878,577	36,745,404
	Temporary Total	2,977,625	9,531,869	1,279,758	6,249,203	20,038,455	2,571,411	8,251,601	995,649	4,918,721	16,737,382
	Medical Only	0	0	0	2,405,186	2,405,186	0	0	0	1,533,301	1,533,301
2012	Fatal	0	498,164	0	1,836	500,000	0	462,126	0	1,390	463,516
	Permanent Total	4,631,640	0	1,465,512	0	6,097,152	4,263,200	0	1,106,710	0	5,369,910
	Permanent Partial	11,615,009	13,019,856	4,453,938	5,365,648	34,454,451	10,997,681	12,330,513	3,246,624	4,117,714	30,692,532
	Temporary Total	5,404,876	8,419,861	2,010,488	6,371,981	22,207,206	4,900,745	7,692,292	1,538,507	4,951,790	19,083,334
	Medical Only	0	0	0	2,223,207	2,223,207	0	0	0	1,487,219	1,487,219
2013	Fatal	0	1,010,186	0	71,227	1,081,413	0	1,013,643	0	60,338	1,073,981
	Permanent Total	3,383,675	0	1,370,929	0	4,754,604	3,448,371	0	1,116,961	0	4,565,332
	Permanent Partial	15,596,479	19,069,425	5,856,264	8,470,501	48,992,669	16,199,339	19,471,667	4,689,213	7,105,006	47,465,225
	Temporary Total	4,651,827	10,534,746	2,091,922	6,875,141	24,153,636	4,630,849	10,422,395	1,745,752	5,813,767	22,612,763
	Medical Only	0	0	0	2,614,361	2,614,361	0	0	0	1,827,908	1,827,908
2014	Fatal	98,800	512,777	148,007	125,247	884,831	105,848	543,474	117,831	99,993	867,146
	Permanent Total	956,158	0	403,884	0	1,360,042	1,023,476	0	321,539	0	1,345,015
	Permanent Partial	9,202,336	13,894,261	4,435,328	6,155,434	33,687,359	10,440,774	15,160,240	3,434,978	4,896,845	33,932,837
	Temporary Total	3,848,968	10,870,962	1,967,639	7,318,223	24,005,792	4,076,598	11,408,526	1,564,869	5,839,698	22,889,691
	Medical Only	0	0	0	2,865,163	2,865,163	0	0	0	2,213,259	2,213,259
2015	Fatal	0	2,292,682	0	571,023	2,863,705	0	3,577,565	0	529,600	4,107,165
	Permanent Total	357,035	0	146,374	0	503,409	600,202	0	136,208	0	736,410
	Permanent Partial	5,619,683	8,443,161	3,141,999	5,439,619	22,644,462	9,923,367	13,261,922	2,960,476	5,086,909	31,232,674
	Temporary Total	5,287,986	12,521,125	3,518,585	9,356,590	30,684,286	9,477,046	19,644,243	3,323,057	8,775,424	41,219,770
	Medical Only	0	0	0	2,958,127	2,958,127	0	0	0	2,466,220	2,466,220
(13) All Years, All Injury Types		90,655,852	128,696,760	39,314,283	81,695,485	340,362,380	97,988,597	139,500,391	31,506,477	66,605,087	335,600,552

Notes:
 (3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.
 (7)= (3) + (4) + (5) + (6)
 (8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (12)= (8) + (9) + (10) + (11)

IX 000045

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Miscellaneous Industry Group, Industry Code 0
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total	Indemnity		Medical		Total	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	(7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	Total (12)	
2011	Fatal	0	68,075	0	29,563	97,638	0	412,301	0	36,701	449,002	25,182,855
	Permanent Total	560,165	0	472,610	0	1,032,775	3,713,939	0	1,461,110	0	5,175,049	
	Permanent Partial	1,848,495	2,464,384	1,684,487	2,150,368	8,147,734	16,701,854	22,378,005	7,047,952	8,567,962	54,695,773	
	Temporary Total	384,548	1,278,132	387,947	1,614,175	3,664,802	3,629,582	11,701,430	1,700,069	8,027,178	25,058,259	
	Medical Only	0	0	0	323,674	323,674	0	0	0	2,200,516	2,200,516	
2012	Fatal	0	74,406	0	32,208	106,614	0	524,648	0	39,813	564,461	25,774,276
	Permanent Total	729,514	0	595,980	0	1,325,494	4,604,431	0	1,571,353	0	6,175,784	
	Permanent Partial	1,789,730	1,946,493	1,502,888	1,792,179	7,031,290	15,576,545	17,391,043	5,789,437	7,203,889	45,960,914	
	Temporary Total	715,636	1,160,674	636,549	1,559,298	4,072,157	6,896,279	10,870,437	2,672,561	8,000,381	28,439,658	
	Medical Only	0	0	0	308,837	308,837	0	0	0	2,128,326	2,128,326	
2013	Fatal	0	178,859	0	93,004	271,863	0	1,166,088	0	181,710	1,347,798	27,533,521
	Permanent Total	569,306	0	522,984	0	1,092,290	3,705,224	0	1,513,448	0	5,218,672	
	Permanent Partial	2,552,647	3,192,840	2,148,369	3,039,407	10,933,263	22,842,086	27,607,990	8,334,700	12,365,574	71,150,350	
	Temporary Total	744,652	1,618,647	709,577	1,968,611	5,041,487	6,600,506	14,785,034	3,016,941	9,562,455	33,964,936	
	Medical Only	0	0	0	346,561	346,561	0	0	0	2,576,745	2,576,745	
2014	Fatal	17,179	84,381	36,783	57,259	195,602	120,302	613,949	183,217	186,344	1,103,812	28,311,462
	Permanent Total	165,573	0	150,592	0	316,165	1,096,577	0	435,714	0	1,532,291	
	Permanent Partial	1,683,543	2,352,672	1,499,080	2,115,323	7,650,618	14,768,820	21,332,751	6,014,390	8,547,512	50,663,473	
	Temporary Total	616,181	1,880,659	585,429	2,128,251	5,210,520	5,762,201	16,317,612	2,642,141	9,790,473	34,512,427	
	Medical Only	0	0	0	407,817	407,817	0	0	0	3,105,975	3,105,975	
2015	Fatal	0	652,777	0	423,495	1,076,272	0	4,136,639	0	1,129,417	5,266,056	30,865,142
	Permanent Total	114,769	0	86,455	0	201,224	659,367	0	205,488	0	864,855	
	Permanent Partial	1,587,016	2,104,442	1,314,274	2,053,969	7,059,701	14,020,978	18,718,007	5,210,725	8,704,403	46,654,113	
	Temporary Total	1,495,342	3,182,145	1,392,502	3,324,223	9,394,212	13,472,847	28,028,214	5,794,157	14,867,222	62,162,440	
	Medical Only	0	0	0	458,258	458,258	0	0	0	3,465,507	3,465,507	
(14) All Years, All Injury Types		15,574,296	22,239,586	13,726,506	24,226,480	75,766,868	134,171,538	195,984,148	53,593,403	110,688,103	494,437,192	137,667,255
(15) Pure Premium							0.975	1.424	0.389	0.804	3.592	

Notes:

(3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).

(5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).

(7) = (3) + (4) + (5) + (6)

(8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.

(12) = (8) + (9) + (10) + (11)

(13): Unit Statistical Plan data, excluding Large Deductibles.

(15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000046

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 All Industry Groups
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2011	Fatal	399,738	6,049,841	13,739	172,867	6,636,185	352,717	5,316,622	9,733	136,254	5,815,326
	Permanent Total	34,208,707	0	12,111,640	0	46,320,347	30,079,474	0	9,289,279	0	39,368,753
	Permanent Partial	82,919,807	122,640,701	31,893,505	46,689,288	284,143,301	75,011,819	110,674,633	24,134,035	36,606,341	246,426,828
	Temporary Total	31,800,826	76,239,569	16,318,169	54,717,230	179,075,794	27,464,093	66,056,098	12,691,327	43,123,657	149,335,175
	Medical Only	0	0	0	25,574,006	25,574,006	0	0	0	16,345,442	16,345,442
2012	Fatal	1,193,003	5,553,546	202,384	249,947	7,198,880	1,098,226	5,151,054	154,873	194,569	6,598,722
	Permanent Total	39,088,712	0	14,172,057	0	53,260,769	35,978,295	0	10,725,758	0	46,704,053
	Permanent Partial	71,855,457	116,785,049	27,353,987	44,939,793	260,934,286	67,825,311	110,597,332	20,452,301	34,781,760	233,656,704
	Temporary Total	36,177,460	72,326,331	16,547,940	55,754,068	180,805,799	32,803,065	66,075,906	12,663,156	43,379,421	154,921,548
	Medical Only	0	0	0	25,088,940	25,088,940	0	0	0	16,823,966	16,823,966
2013	Fatal	906,133	6,995,711	293,318	393,821	8,588,983	915,772	7,021,835	221,878	332,786	8,492,271
	Permanent Total	24,334,392	0	8,066,524	0	32,400,916	24,610,090	0	6,690,001	0	31,300,091
	Permanent Partial	73,148,855	117,686,228	28,801,643	47,783,221	267,419,947	75,652,043	120,245,349	23,566,389	40,226,854	259,690,635
	Temporary Total	31,721,731	79,622,539	12,791,729	58,898,545	183,034,544	31,580,979	78,784,525	10,672,549	49,860,833	170,898,886
	Medical Only	0	0	0	25,491,182	25,491,182	0	0	0	17,847,216	17,847,216
2014	Fatal	1,337,824	2,797,986	226,478	217,172	4,579,460	1,433,257	2,965,487	180,304	173,383	4,752,431
	Permanent Total	14,478,445	0	6,456,827	0	20,935,272	15,582,112	0	5,134,609	0	20,716,721
	Permanent Partial	72,305,546	115,117,551	32,137,904	52,121,907	271,682,908	80,462,163	125,063,101	25,281,186	41,519,046	272,325,496
	Temporary Total	41,500,326	85,123,835	19,973,894	62,225,148	208,823,203	43,938,822	89,259,787	15,899,971	49,664,206	198,762,786
	Medical Only	0	0	0	24,772,985	24,772,985	0	0	0	19,140,936	19,140,936
2015	Fatal	0	8,652,477	0	1,081,766	9,734,243	0	13,233,743	0	1,003,159	14,236,902
	Permanent Total	2,354,443	0	1,918,068	0	4,272,511	3,957,991	0	1,784,854	0	5,742,845
	Permanent Partial	38,808,042	61,702,833	19,747,451	36,623,941	156,882,267	67,272,951	95,934,049	18,480,153	34,138,745	215,825,898
	Temporary Total	39,377,153	89,875,815	27,927,482	73,642,345	230,822,795	67,700,548	137,099,727	26,169,776	68,636,003	299,606,054
	Medical Only	0	0	0	25,677,894	25,677,894	0	0	0	21,386,970	21,386,970
(13) All Years, All Injury Types		637,916,600	967,170,012	276,954,739	662,116,066	2,544,157,417	683,719,728	1,033,479,248	224,202,132	535,321,547	2,476,722,655

Notes:
 (3) - (12): Total of Section IX - C, Page 1 of Exhibits 1 through 5.

IX 000047

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 All Industry Groups
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses				Converted Unlimited Losses						Exposure (13)
		Indemnity		Medical		Indemnity		Medical		Total		
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Total (7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	Total (12)	
2011	Fatal	43,720	716,677	19,890	336,516	1,116,803	387,656	5,899,661	35,104	560,232	6,882,653	973,897,623
	Permanent Total	4,539,990	0	4,004,319	0	8,544,309	31,927,118	0	12,268,199	0	44,195,317	
	Permanent Partial	11,088,368	16,173,008	9,689,803	14,271,573	51,222,752	104,879,977	154,515,087	41,229,706	62,017,845	362,642,615	
	Temporary Total	3,496,969	9,027,048	3,704,281	11,905,291	28,133,589	38,016,671	92,193,587	20,145,806	67,615,824	217,971,888	
	Medical Only	0	0	0	2,799,410	2,799,410	0	0	0	22,686,651	22,686,651	
2012	Fatal	198,179	815,225	135,786	412,081	1,561,271	1,267,690	5,834,124	344,429	718,880	8,165,123	995,010,031
	Permanent Total	5,764,630	0	5,043,928	0	10,808,558	38,496,588	0	14,553,292	0	53,049,880	
	Permanent Partial	9,951,320	15,802,305	8,442,225	13,759,241	47,955,091	94,740,927	153,969,365	35,221,101	59,169,254	343,100,647	
	Temporary Total	4,541,176	9,035,347	4,389,684	12,081,976	30,048,183	45,854,491	92,228,098	20,953,369	68,147,188	227,183,146	
	Medical Only	0	0	0	2,891,766	2,891,766	0	0	0	23,363,142	23,363,142	
2013	Fatal	133,577	1,179,600	103,622	613,590	2,030,389	1,026,105	8,019,772	385,719	1,121,456	10,553,052	1,042,315,511
	Permanent Total	3,986,841	0	3,214,998	0	7,201,839	26,372,954	0	9,140,978	0	35,513,932	
	Permanent Partial	10,632,796	18,041,662	9,220,511	16,084,607	53,979,576	105,104,908	168,449,562	39,965,730	68,641,089	382,161,289	
	Temporary Total	4,350,210	10,791,428	3,872,992	14,209,616	33,224,246	44,119,425	109,989,108	17,872,570	78,725,400	250,706,503	
	Medical Only	0	0	0	3,027,292	3,027,292	0	0	0	24,736,293	24,736,293	
2014	Fatal	214,583	370,056	133,288	195,779	913,706	1,611,341	3,261,660	371,604	437,457	5,682,062	1,100,443,492
	Permanent Total	2,485,953	0	2,370,648	0	4,856,601	16,662,917	0	6,926,341	0	23,589,258	
	Permanent Partial	12,089,052	18,241,169	10,468,854	16,162,660	56,961,735	112,738,076	174,561,163	43,577,660	70,311,355	401,188,254	
	Temporary Total	6,036,490	12,405,338	5,695,985	14,781,938	38,919,751	61,364,017	124,833,242	26,535,640	79,187,033	291,919,932	
	Medical Only	0	0	0	3,302,008	3,302,008	0	0	0	26,594,888	26,594,888	
2015	Fatal	0	2,444,516	0	1,312,622	3,757,138	0	15,330,980	0	2,744,200	18,075,180	1,175,891,562
	Permanent Total	726,852	0	811,997	0	1,538,849	4,320,504	0	2,396,544	0	6,717,048	
	Permanent Partial	10,437,836	14,304,648	8,488,197	13,311,929	46,542,610	94,660,721	134,283,471	32,873,184	57,840,195	319,657,571	
	Temporary Total	10,058,615	18,975,475	9,970,989	21,273,736	60,278,815	95,479,431	191,642,642	44,407,309	110,474,962	442,004,344	
	Medical Only	0	0	0	3,653,793	3,653,793	0	0	0	29,673,304	29,673,304	
(14) All Years, All Injury Types		100,777,157	148,323,502	89,781,997	166,387,424	505,270,080	919,031,517	1,435,011,522	369,204,285	854,766,648	3,578,013,972	5,287,558,219
(15) Pure Premium							0.174	0.271	0.070	0.162	0.677	

Notes:

(3) - (13): Total of Section IX - C, Page 2 of Exhibits 1 through 5.

(15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

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Exhibit 1
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MA Full Credibility Standard and Partial Credibility

		Indemnity	Medical
(1)	Average Claim Cost (See Page 2)	32,000	15,000
(2)	Claims	850	400
(3)	Full Credibility Standard =(1) x (2)	27,200,000	6,000,000

Partial Credibility Z is given in terms of E, the expected losses and F, the criterion for full credibility by the formula:

$$Z=(E / F)^{0.4}$$

Credibility of Countrywide Data

		Indemnity	Medical
(4)	Number of Countrywide Claims	1,150	1,000

Notes:

Partial Credibility is determined from the full credibility standard and the observed number of countrywide claims using the same formula as is done for the Massachusetts data.

(2),(4): From the paper "Class Ratemaking for Workers Compensation: NCCI's New Methodology" by Tom Daley.

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 Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Alabama	1	Manufacturing	1	2.310	0.443
		Construction	2	2.386	0.366
		Office and Clerical	3	1.560	0.316
		Goods and Services	9	1.941	0.377
		Miscellaneous	0	1.848	0.394
Arizona	2	Manufacturing	1	3.317	0.482
		Construction	2	2.387	0.402
		Office and Clerical	3	1.992	0.313
		Goods and Services	9	2.560	0.447
		Miscellaneous	0	2.044	0.422
Arkansas	3	Manufacturing	1	3.559	0.889
		Construction	2	3.605	0.853
		Office and Clerical	3	1.327	0.509
		Goods and Services	9	3.399	0.895
		Miscellaneous	0	0.967	0.519
Colorado	5	Manufacturing	1	1.437	0.455
		Construction	2	1.323	0.451
		Office and Clerical	3	1.084	0.389
		Goods and Services	9	1.115	0.388
		Miscellaneous	0	1.347	0.510
Connecticut	6	Manufacturing	1	0.649	0.299
		Construction	2	0.723	0.290
		Office and Clerical	3	0.484	0.262
		Goods and Services	9	0.666	0.303
		Miscellaneous	0	0.664	0.325
D.C.	8	Manufacturing	1	0.273	0.124
		Construction	2	1.074	0.656
		Office and Clerical	3	1.300	1.136
		Goods and Services	9	1.066	0.869
		Miscellaneous	0	0.678	0.496
Florida	9	Manufacturing	1	1.655	0.370
		Construction	2	1.601	0.303
		Office and Clerical	3	0.955	0.228
		Goods and Services	9	1.618	0.354
		Miscellaneous	0	1.828	0.418
Georgia	10	Manufacturing	1	1.309	0.694
		Construction	2	0.673	0.327
		Office and Clerical	3	1.033	0.538
		Goods and Services	9	0.931	0.538
		Miscellaneous	0	1.237	0.678
Idaho	11	Manufacturing	1	1.554	0.379
		Construction	2	1.490	0.352
		Office and Clerical	3	0.881	0.176
		Goods and Services	9	1.438	0.335
		Miscellaneous	0	2.015	0.482

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Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Illinois	12	Manufacturing	1	0.842	0.356
		Construction	2	0.832	0.419
		Office and Clerical	3	0.580	0.348
		Goods and Services	9	0.922	0.407
		Miscellaneous	0	0.811	0.436
Indiana	13	Manufacturing	1	3.824	0.636
		Construction	2	4.310	0.719
		Office and Clerical	3	2.598	0.440
		Goods and Services	9	3.007	0.548
		Miscellaneous	0	3.580	0.702
Iowa	14	Manufacturing	1	0.914	0.301
		Construction	2	1.239	0.405
		Office and Clerical	3	0.713	0.184
		Goods and Services	9	1.079	0.377
		Miscellaneous	0	1.560	0.529
Kansas	15	Manufacturing	1	1.783	0.504
		Construction	2	2.567	0.615
		Office and Clerical	3	1.645	0.530
		Goods and Services	9	2.035	0.560
		Miscellaneous	0	2.570	0.714
Kentucky	16	Manufacturing	1	1.907	0.605
		Construction	2	1.833	0.613
		Office and Clerical	3	1.445	0.582
		Goods and Services	9	1.667	0.633
		Miscellaneous	0	1.584	0.499
Louisiana	17	Manufacturing	1	1.367	0.439
		Construction	2	1.654	0.502
		Office and Clerical	3	0.696	0.274
		Goods and Services	9	1.386	0.448
		Miscellaneous	0	1.304	0.462
Maine	18	Manufacturing	1	1.019	0.439
		Construction	2	1.037	0.436
		Office and Clerical	3	0.667	0.238
		Goods and Services	9	0.883	0.405
		Miscellaneous	0	1.039	0.531
Maryland	19	Manufacturing	1	1.289	0.575
		Construction	2	1.386	0.514
		Office and Clerical	3	1.278	0.666
		Goods and Services	9	1.324	0.638
		Miscellaneous	0	1.195	0.618
Michigan	21	Manufacturing	1	1.869	0.686
		Construction	2	2.071	0.834
		Office and Clerical	3	1.790	0.712
		Goods and Services	9	1.936	0.777
		Miscellaneous	0	2.096	0.931
Minnesota	22	Manufacturing	1	1.525	0.576
		Construction	2	2.058	0.749
		Office and Clerical	3	1.682	0.683
		Goods and Services	9	1.622	0.634
		Miscellaneous	0	1.668	0.636

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 Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Mississippi	23	Manufacturing	1	1.674	0.512
		Construction	2	1.702	0.523
		Office and Clerical	3	0.838	0.306
		Goods and Services	9	1.548	0.526
		Miscellaneous	0	1.462	0.583
Missouri	24	Manufacturing	1	1.232	0.447
		Construction	2	1.454	0.509
		Office and Clerical	3	0.694	0.320
		Goods and Services	9	1.239	0.443
		Miscellaneous	0	1.306	0.471
Montana	25	Manufacturing	1	0.618	0.175
		Construction	2	1.291	0.307
		Office and Clerical	3	0.488	0.134
		Goods and Services	9	1.230	0.303
		Miscellaneous	0	1.615	0.476
Nebraska	26	Manufacturing	1	1.046	0.229
		Construction	2	1.901	0.428
		Office and Clerical	3	0.664	0.220
		Goods and Services	9	1.731	0.430
		Miscellaneous	0	1.894	0.535
Nevada	27	Manufacturing	1	1.280	0.030
		Construction	2	1.369	0.539
		Office and Clerical	3	0.480	0.189
		Goods and Services	9	1.336	0.499
		Miscellaneous	0	1.039	0.464
New Hampshire	28	Manufacturing	1	2.044	0.358
		Construction	2	1.326	0.312
		Office and Clerical	3	1.526	0.325
		Goods and Services	9	1.235	0.270
		Miscellaneous	0	1.914	0.407
New Mexico	30	Manufacturing	1	1.448	0.359
		Construction	2	1.714	0.419
		Office and Clerical	3	0.418	0.147
		Goods and Services	9	1.441	0.410
		Miscellaneous	0	1.433	0.465
North Carolina	32	Manufacturing	1	1.384	0.705
		Construction	2	1.133	0.452
		Office and Clerical	3	0.766	0.463
		Goods and Services	9	1.247	0.602
		Miscellaneous	0	1.127	0.622
Oklahoma	35	Manufacturing	1	0.895	0.434
		Construction	2	1.394	0.570
		Office and Clerical	3	0.325	0.181
		Goods and Services	9	0.943	0.442
		Miscellaneous	0	1.011	0.468
Oregon	36	Manufacturing	1	1.695	0.668
		Construction	2	1.552	0.611
		Office and Clerical	3	0.872	0.383
		Goods and Services	9	1.409	0.526
		Miscellaneous	0	1.685	0.710

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 Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Rhode Island	38	Manufacturing	1	0.637	0.512
		Construction	2	0.845	0.698
		Office and Clerical	3	0.568	0.513
		Goods and Services	9	0.549	0.458
		Miscellaneous	0	0.564	0.502
South Carolina	39	Manufacturing	1	0.867	0.546
		Construction	2	0.736	0.349
		Office and Clerical	3	0.394	0.281
		Goods and Services	9	0.836	0.458
		Miscellaneous	0	0.797	0.458
South Dakota	40	Manufacturing	1	2.345	0.409
		Construction	2	2.075	0.392
		Office and Clerical	3	1.395	0.244
		Goods and Services	9	2.327	0.438
		Miscellaneous	0	2.352	0.588
Tennessee	41	Manufacturing	1	2.164	0.493
		Construction	2	1.989	0.423
		Office and Clerical	3	1.238	0.379
		Goods and Services	9	2.220	0.513
		Miscellaneous	0	1.772	0.587
Utah	43	Manufacturing	1	3.926	0.574
		Construction	2	3.171	0.478
		Office and Clerical	3	2.886	0.525
		Goods and Services	9	3.373	0.548
		Miscellaneous	0	2.125	0.590
Vermont	44	Manufacturing	1	0.888	0.372
		Construction	2	1.018	0.416
		Office and Clerical	3	0.517	0.256
		Goods and Services	9	0.737	0.357
		Miscellaneous	0	0.909	0.439
Virginia	45	Manufacturing	1	2.345	0.612
		Construction	2	2.041	0.414
		Office and Clerical	3	2.261	0.604
		Goods and Services	9	2.090	0.471
		Miscellaneous	0	2.055	0.541
West Virginia	47	Manufacturing	1	2.188	0.515
		Construction	2	2.990	0.839
		Office and Clerical	3	1.087	0.478
		Goods and Services	9	2.289	0.732
		Miscellaneous	0	2.703	0.550
Wisconsin	48	Manufacturing	1	1.532	0.353
		Construction	2	1.399	0.348
		Office and Clerical	3	1.211	0.330
		Goods and Services	9	1.287	0.327
		Miscellaneous	0	1.554	0.427
Hawaii	52	Manufacturing	1	0.911	0.467
		Construction	2	1.613	0.786
		Office and Clerical	3	0.570	0.283
		Goods and Services	9	0.836	0.406
		Miscellaneous	0	1.154	0.535

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Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Alaska	54	Manufacturing	1	1.640	0.257
		Construction	2	2.228	0.309
		Office and Clerical	3	0.807	0.118
		Goods and Services	9	1.893	0.263
		Miscellaneous	0	2.196	0.303

Notes:

Factors to adjust countrywide data to the same payroll distribution and loss level as MA.

Pitch Factor = (MA Unlimited Losses) / [(State Pure Premium) x (MA Exposure)]

For a sample countrywide pure premium calculation, see Section IX - L, Exhibit 2, Page 2.

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Section IX - D
 Exhibit 3

Countrywide Classification Experience: Database

State (1)	State Code (2)	Experience Data					
		First Report (3)		Second Report (4)		Third Report (5)	
Alabama	1	5/1/2013	- 4/30/2014	5/1/2012	- 4/30/2013	5/1/2011	- 4/30/2012
Arizona	2	3/1/2013	- 2/28/2014	3/1/2012	- 2/28/2013	3/1/2011	- 2/29/2012
Arkansas	3	2/1/2014	- 1/31/2015	2/1/2013	- 1/31/2014	2/1/2012	- 1/31/2013
Colorado	5	3/1/2013	- 2/28/2014	3/1/2012	- 2/28/2013	3/1/2011	- 2/29/2012
Connecticut	6	8/1/2013	- 7/31/2014	8/1/2012	- 7/31/2013	8/1/2011	- 7/31/2012
D.C.	8	2/1/2013	- 1/31/2014	2/1/2012	- 1/31/2013	2/1/2011	- 1/31/2012
Florida	9	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012	1/1/2011	- 12/31/2011
Georgia	10	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
Idaho	11	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
Illinois	12	4/1/2013	- 3/31/2014	4/1/2012	- 3/31/2013	4/1/2011	- 3/31/2012
Indiana	13	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
Iowa	14	3/1/2013	- 2/28/2014	3/1/2012	- 2/28/2013	3/1/2011	- 2/29/2012
Kansas	15	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
Kentucky	16	5/1/2013	- 4/30/2014	5/1/2012	- 4/30/2013	5/1/2011	- 4/30/2012
Louisiana	17	9/1/2013	- 8/31/2014	9/1/2012	- 8/31/2013	9/1/2011	- 8/31/2012
Maine	18	6/1/2013	- 5/31/2014	6/1/2012	- 5/31/2013	6/1/2011	- 5/31/2012
Maryland	19	4/1/2013	- 3/31/2014	4/1/2012	- 3/31/2013	4/1/2011	- 3/31/2012
Michigan	21	4/1/2014	- 3/31/2015	4/1/2013	- 3/31/2014	4/1/2012	- 3/31/2013
Minnesota	22	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012
Mississippi	23	9/1/2013	- 8/31/2014	9/1/2012	- 8/31/2013	9/1/2011	- 8/31/2012
Missouri	24	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
Montana	25	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012
Nebraska	26	8/1/2013	- 7/31/2014	8/1/2012	- 7/31/2013	8/1/2011	- 7/31/2012
Nevada	27	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012	1/1/2011	- 12/31/2011
New Hampshire	28	4/1/2013	- 3/31/2014	4/1/2012	- 3/31/2013	4/1/2011	- 3/31/2012
New Mexico	30	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
North Carolina	32	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012	1/1/2011	- 12/31/2011
Oklahoma	35	6/1/2013	- 5/31/2014	6/1/2012	- 5/31/2013	6/1/2011	- 5/31/2012
Oregon	36	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012	1/1/2011	- 12/31/2011
Rhode Island	38	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012	1/1/2011	- 12/31/2011
South Carolina	39	5/1/2013	- 4/30/2014	5/1/2012	- 4/30/2013	5/1/2011	- 4/30/2012
South Dakota	40	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012
Tennessee	41	6/1/2013	- 5/31/2014	6/1/2012	- 5/31/2013	6/1/2011	- 5/31/2012
Utah	43	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
Vermont	44	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
Virginia	45	2/1/2013	- 1/31/2014	2/1/2012	- 1/31/2013	2/1/2011	- 1/31/2012
West Virginia	47	7/1/2013	- 6/30/2014	7/1/2012	- 6/30/2013	7/1/2011	- 6/30/2012
Wisconsin	48	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013	1/1/2012	- 12/31/2012
Hawaii	52	6/1/2013	- 5/31/2014	6/1/2012	- 5/31/2013	6/1/2011	- 5/31/2012
Alaska	54	4/1/2013	- 3/31/2014	4/1/2012	- 3/31/2013	4/1/2011	- 3/31/2012

Calculation of Pure Premium Underlying Present Rate Factor

Industry Group (1)	Injury Type (2)	Uncapped Rate Level Factor (3)	Industry Group Pure Premium From Previous Revision (4)	Percent of Pure Premium =(4) / [Total of (4)] (5)	Expected Loss and LAE Ratio (6)	Benefit Level Change Factor (7)	Trend Factor (8)	Pure Premium Underlying Present Rate Factor = (3) x (5) x (6) x (7) x (8) (9)
Manufacturing	Indemnity	2.037	1.080	0.626	0.770	1.019	0.948	0.949
	Medical	2.037	0.644	0.374	0.770	1.000	0.942	0.552
	Total		1.724					
Construction	Indemnity	5.475	3.094	0.666	0.770	1.019	0.948	2.709
	Medical	5.475	1.555	0.334	0.770	1.000	0.942	1.329
	Total		4.649					
Office and Clerical	Indemnity	0.168	0.084	0.596	0.770	1.019	0.948	0.074
	Medical	0.168	0.057	0.404	0.770	1.000	0.942	0.049
	Total		0.141					
Goods and Services	Indemnity	1.832	0.951	0.613	0.770	1.019	0.948	0.835
	Medical	1.832	0.600	0.387	0.770	1.000	0.942	0.514
	Total		1.551					
Miscellaneous	Indemnity	5.139	2.823	0.644	0.770	1.019	0.948	2.459
	Medical	5.139	1.563	0.356	0.770	1.000	0.942	1.329
	Total		4.386					

Notes:

- (3): Section IX - H, Exhibit 1 of 07/01/16 stipulation.
- (4): Section IX - G of 07/01/16 stipulation.
- (6): Section VI - J, Exhibit 1 of 07/01/16 stipulation.
- (7): Section IV - A, Exhibit 1.
- (8): Net Indemnity and Medical Trends from Section V - A, Exhibit 1.

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IX 000058

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2018

Section IX - F
 Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
1430	3.036	1.975	2.881	1.090	3.972
1438	1.676	1.541	1.590	0.851	2.441
1463	4.792	4.104	4.548	2.265	6.813
1701	1.736	1.343	1.647	0.741	2.388
1747	1.548	1.307	1.469	0.721	2.191
1748	1.472	1.846	1.396	1.019	2.416
1853	0.933	0.577	0.885	0.318	1.204
1924	1.007	0.949	0.956	0.524	1.480
1925	1.610	7.052	1.528	3.892	5.420
2003	1.750	1.686	1.661	0.931	2.592
2014	1.795	1.697	1.703	0.937	2.640
2021	1.422	1.366	1.350	0.754	2.103
2039	1.645	1.499	1.561	0.827	2.389
2041	1.385	1.283	1.315	0.708	2.023
2070	2.120	1.944	2.012	1.073	3.085
2081	1.741	2.737	1.652	1.511	3.163
2089	1.551	1.443	1.472	0.796	2.269
2095	1.814	1.617	1.721	0.892	2.613
2101	1.551	1.443	1.472	0.796	2.269
2111	1.120	1.043	1.063	0.576	1.638
2114	1.551	1.443	1.472	0.796	2.269
2115	2.021	2.343	1.918	1.293	3.211
2121	0.681	0.786	0.646	0.434	1.080
2130	0.969	0.889	0.920	0.491	1.411
2131	1.185	1.168	1.125	0.645	1.770
2143	0.878	1.011	0.833	0.558	1.391
2150	2.514	2.604	2.386	1.437	3.823
2156	2.823	2.525	2.679	1.394	4.072
2157	2.140	1.834	2.031	1.012	3.043
2172	1.315	0.758	1.248	0.418	1.666
2211	3.586	3.427	3.403	1.892	5.295
2220	1.332	1.515	1.265	0.837	2.101
2260	3.731	3.043	3.541	1.680	5.220
2288	1.683	1.621	1.597	0.895	2.492
2305	1.860	1.684	1.766	0.929	2.695
2362	0.760	0.848	0.721	0.468	1.189
2380	1.191	1.255	1.131	0.693	1.823
2402	1.083	1.093	1.028	0.603	1.631
2413	1.723	1.874	1.635	1.035	2.669
2416	1.334	1.181	1.266	0.652	1.918
2417	2.013	1.445	1.910	0.797	2.708
2501	1.006	1.056	0.955	0.583	1.538
2503	0.552	0.557	0.523	0.308	0.831
2570	2.957	3.425	2.806	1.890	4.697
2576	0.963	0.902	0.914	0.498	1.411
2585	1.630	1.635	1.547	0.903	2.449
2586	0.841	0.812	0.798	0.448	1.246
2623	2.403	2.544	2.280	1.404	3.685
2651	0.859	0.779	0.815	0.430	1.245

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Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2018

Section IX - F
 Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
2660	0.791	1.018	0.751	0.562	1.312
2683	0.838	0.827	0.795	0.457	1.252
2688	1.202	1.214	1.141	0.670	1.811
2710	3.191	3.959	3.028	2.186	5.214
2731	1.690	1.723	1.604	0.951	2.555
2747	2.775	2.809	2.634	1.551	4.184
2790	0.871	0.849	0.827	0.469	1.295
2802	2.230	2.236	2.116	1.234	3.351
2835	0.957	0.948	0.908	0.523	1.431
2836	1.040	0.993	0.987	0.548	1.535
2841	2.067	1.546	1.961	0.853	2.814
2883	1.583	1.518	1.502	0.838	2.340
2923	0.767	0.791	0.728	0.437	1.164
2942	0.850	0.949	0.807	0.524	1.331
3018	1.861	1.484	1.767	0.819	2.586
3022	1.785	1.688	1.694	0.932	2.626
3027	2.060	2.874	1.955	1.587	3.541
3028	1.370	1.375	1.300	0.759	2.059
3030	3.040	3.058	2.885	1.688	4.573
3040	2.955	2.548	2.805	1.406	4.211
3041	2.300	2.548	2.183	1.407	3.590
3042	3.470	2.440	3.293	1.347	4.640
3066	1.378	1.531	1.308	0.845	2.153
3076	1.112	1.243	1.056	0.686	1.742
3081	2.391	2.472	2.269	1.364	3.634
3082	2.391	2.472	2.269	1.364	3.634
3085	2.329	2.036	2.210	1.124	3.334
3110	3.859	4.623	3.662	2.552	6.214
3111	1.023	1.175	0.971	0.648	1.619
3113	0.658	0.693	0.624	0.383	1.007
3114	1.134	1.292	1.076	0.713	1.789
3118	0.902	0.666	0.856	0.368	1.224
3119	0.377	0.469	0.358	0.259	0.617
3120	0.864	0.540	0.820	0.298	1.118
3122	0.795	0.967	0.755	0.534	1.288
3127	0.475	0.640	0.451	0.353	0.804
3131	0.709	0.805	0.672	0.444	1.117
3132	1.608	1.858	1.526	1.026	2.552
3145	0.775	0.814	0.736	0.449	1.185
3146	0.886	0.894	0.841	0.493	1.335
3169	1.372	1.514	1.302	0.836	2.138
3179	0.612	0.507	0.581	0.280	0.861
3180	1.319	1.360	1.252	0.751	2.003
3188	0.817	0.781	0.775	0.431	1.206
3200	1.147	1.184	1.089	0.653	1.742
3220	1.946	1.325	1.847	0.731	2.578
3255	1.310	1.193	1.243	0.659	1.902
3257	1.382	1.172	1.312	0.647	1.959
3270	1.006	1.075	0.955	0.594	1.548

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Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2018

Section IX - F
 Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
3300	1.898	2.105	1.801	1.162	2.963
3315	1.828	1.788	1.735	0.987	2.722
3336	2.311	1.614	2.194	0.891	3.085
3372	1.102	1.375	1.046	0.759	1.805
3373	1.877	1.640	1.781	0.905	2.686
3381	1.299	1.270	1.233	0.701	1.933
3383	0.740	0.673	0.702	0.371	1.073
3385	0.399	0.360	0.379	0.199	0.578
3400	1.372	1.514	1.302	0.836	2.138
3507	1.443	1.321	1.369	0.729	2.099
3515	1.250	1.400	1.186	0.773	1.959
3558	0.379	0.647	0.359	0.357	0.716
3571	0.471	0.437	0.447	0.241	0.688
3574	0.858	0.788	0.814	0.435	1.249
3612	0.929	1.000	0.882	0.552	1.434
3620	2.186	3.576	2.075	1.974	4.049
3629	0.858	0.788	0.814	0.435	1.249
3632	0.858	0.788	0.814	0.435	1.249
3634	0.842	0.767	0.799	0.424	1.222
3635	1.305	1.593	1.238	0.879	2.117
3638	0.858	0.788	0.814	0.435	1.249
3642	0.589	0.459	0.559	0.254	0.812
3643	0.851	0.719	0.808	0.397	1.205
3647	0.943	0.913	0.895	0.504	1.399
3648	0.631	0.738	0.599	0.407	1.007
3681	0.405	0.423	0.384	0.234	0.618
3685	0.331	0.307	0.314	0.169	0.483
3807	1.372	1.514	1.302	0.836	2.138
3808	1.514	1.406	1.437	0.776	2.213
3826	2.355	2.752	2.235	1.519	3.755
3830	0.858	0.788	0.814	0.435	1.249
3841	0.626	0.725	0.594	0.400	0.995
4021	1.858	2.107	1.764	1.163	2.927
4024	1.537	1.367	1.459	0.755	2.213
4034	3.132	3.522	2.972	1.944	4.916
4036	1.267	0.909	1.203	0.501	1.704
4038	1.685	1.484	1.599	0.819	2.418
4053	0.875	0.943	0.830	0.521	1.351
4062	0.902	0.951	0.856	0.525	1.381
4112	0.336	0.300	0.319	0.166	0.484
4113	0.875	0.943	0.830	0.521	1.351
4114	1.123	0.951	1.066	0.525	1.591
4130	1.690	1.659	1.604	0.916	2.520
4133	0.897	0.800	0.851	0.442	1.293
4150	0.345	0.308	0.327	0.170	0.498
4239	1.267	1.261	1.202	0.696	1.898
4243	1.874	1.670	1.778	0.922	2.700
4244	1.239	1.312	1.176	0.724	1.900
4250	1.038	1.251	0.985	0.691	1.676

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Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2018

Section IX - F
 Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
4251	1.258	0.946	1.194	0.522	1.716
4273	1.034	1.042	0.981	0.575	1.556
4279	1.007	1.058	0.956	0.584	1.539
4283	1.015	0.921	0.963	0.509	1.472
4299	0.937	0.950	0.889	0.524	1.413
4304	2.158	2.997	2.048	1.654	3.702
4307	0.844	0.898	0.801	0.496	1.297
4308	1.647	0.399	1.563	0.220	1.784
4351	0.436	0.373	0.413	0.206	0.619
4352	1.006	0.672	0.954	0.371	1.326
4360	0.421	0.396	0.399	0.218	0.618
4410	1.476	1.212	1.401	0.669	2.070
4432	0.518	0.528	0.492	0.292	0.783
4439	1.734	1.803	1.646	0.995	2.641
4452	1.759	1.589	1.669	0.877	2.546
4459	1.351	1.426	1.282	0.787	2.070
4470	0.990	0.860	0.940	0.475	1.415
4484	1.076	1.022	1.021	0.564	1.585
4493	1.251	1.299	1.187	0.717	1.904
4557	0.997	0.941	0.946	0.519	1.465
4558	0.665	0.705	0.632	0.389	1.021
4583	1.985	1.485	1.884	0.820	2.704
4611	0.368	0.321	0.349	0.177	0.526
4635	2.316	2.533	2.198	1.398	3.597
4653	1.059	0.938	1.005	0.518	1.523
4665	3.224	3.130	3.060	1.728	4.787
4692	0.350	0.245	0.332	0.135	0.468
4693	0.472	0.454	0.448	0.250	0.698
4720	0.898	0.999	0.852	0.552	1.404
4740	0.601	0.541	0.571	0.299	0.869
4741	1.193	0.834	1.132	0.461	1.593
4771	4.904	1.285	4.654	0.710	5.363
4777	1.985	1.485	1.884	0.820	2.704
4825	0.335	0.355	0.317	0.196	0.513
4828	0.520	0.430	0.493	0.237	0.731
4829	0.520	0.430	0.493	0.237	0.731
4902	0.850	0.949	0.807	0.524	1.331
4923	0.421	0.396	0.399	0.218	0.618
6504	1.551	1.443	1.472	0.796	2.269
9501	1.142	1.287	1.083	0.710	1.794
9505	1.142	1.287	1.083	0.710	1.794
9521	1.818	1.550	1.725	0.856	2.581
9522	0.954	0.846	0.905	0.467	1.372

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2016 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

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Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
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Section IX - F
Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)

(Indemnity = 0.949, Medical = 0.552).

IX 000063

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2018

Section IX - F
 Exhibit 2

Calculation of Pure Premiums Underlying Present Rate Construction Industry Group, Industry Code 2

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
0050	1.283	1.024	3.476	1.361	4.838
3365	1.323	1.198	3.585	1.593	5.177
3724	0.914	0.917	2.475	1.218	3.693
3726	1.694	1.127	4.589	1.497	6.086
5020	0.983	0.716	2.663	0.951	3.614
5022	1.831	1.675	4.961	2.226	7.187
5037	4.518	3.443	12.239	4.575	16.814
5040	6.672	4.948	18.074	6.576	24.650
5057	4.894	4.560	13.258	6.060	19.317
5059	2.168	2.081	5.874	2.766	8.640
5102	1.209	0.953	3.275	1.267	4.542
5146	1.332	1.420	3.608	1.887	5.495
5160	0.627	0.463	1.699	0.616	2.315
5183	0.658	0.582	1.784	0.773	2.557
5188	1.010	0.850	2.736	1.130	3.867
5190	0.470	0.497	1.272	0.660	1.933
5213	2.919	2.669	7.907	3.547	11.455
5215	1.043	1.022	2.825	1.359	4.184
5221	1.250	1.224	3.387	1.627	5.014
5222	2.116	1.927	5.732	2.561	8.294
5223	0.784	0.798	2.123	1.061	3.183
5348	1.022	0.749	2.769	0.996	3.765
5402	1.363	1.656	3.692	2.201	5.893
5403	2.129	1.795	5.768	2.386	8.153
5437	0.999	1.040	2.706	1.382	4.088
5443	0.724	0.746	1.961	0.991	2.952
5445	1.388	1.022	3.759	1.358	5.118
5462	1.530	1.178	4.144	1.566	5.709
5472	1.818	1.466	4.925	1.948	6.873
5473	1.828	1.985	4.951	2.638	7.589
5474	1.009	1.095	2.732	1.456	4.188
5478	1.184	0.914	3.208	1.214	4.423
5479	1.507	1.881	4.084	2.500	6.584
5480	0.906	0.743	2.454	0.988	3.442
5506	1.260	1.251	3.412	1.663	5.075
5507	1.327	1.553	3.594	2.064	5.658
5508	1.283	1.024	3.476	1.361	4.838
5509	0.666	0.713	1.803	0.947	2.751
5538	0.781	0.767	2.115	1.019	3.135
5545	6.412	7.659	17.371	10.178	27.549
5547	2.265	2.893	6.135	3.845	9.980
5606	0.334	0.362	0.904	0.481	1.385
5610	1.507	1.163	4.083	1.546	5.629
5645	1.384	1.694	3.749	2.252	6.001
5701	3.913	6.138	10.600	8.158	18.758
5703	2.843	2.213	7.702	2.941	10.643
5705	2.529	2.364	6.850	3.141	9.991
6003	2.085	1.588	5.649	2.110	7.759
6005	1.283	1.024	3.476	1.361	4.838

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Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2018

Section IX - F
Exhibit 2

Calculation of Pure Premiums Underlying Present Rate Construction Industry Group, Industry Code 2

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
6204	1.368	1.101	3.707	1.463	5.170
6217	0.815	0.863	2.208	1.147	3.355
6229	0.841	0.829	2.278	1.101	3.379
6233	0.876	0.574	2.373	0.763	3.136
6251	1.410	0.676	3.820	0.898	4.718
6252	1.904	1.876	5.157	2.493	7.650
6306	1.933	1.710	5.237	2.273	7.510
6319	0.774	0.917	2.095	1.219	3.314
6325	0.870	0.893	2.358	1.187	3.545
6400	1.096	1.108	2.968	1.473	4.441
7538	1.173	0.957	3.176	1.272	4.448
7601	0.946	1.068	2.562	1.420	3.982
7855	1.016	0.818	2.752	1.087	3.839
8227	0.884	1.091	2.394	1.450	3.844
9533	3.143	2.610	8.514	3.469	11.983
9534	1.338	1.525	3.624	2.026	5.650
9549	0.925	0.866	2.507	1.151	3.658
9552	1.375	1.239	3.725	1.647	5.372

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2016 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
(Indemnity = 2.709, Medical = 1.329).

IX 000065

Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2018

Section IX - F
Exhibit 3

Calculation of Pure Premiums Underlying Present Rate Office and Clerical Industry Group, Industry Code 3

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
4361	4.370	4.752	0.323	0.233	0.556
7610	3.118	2.182	0.231	0.107	0.338
8601	1.591	1.658	0.118	0.081	0.199
8721	2.028	4.562	0.150	0.224	0.374
8742	0.960	0.973	0.071	0.048	0.119
8748	3.951	3.752	0.292	0.184	0.476
8800	7.843	7.137	0.580	0.350	0.930
8803	0.221	0.241	0.016	0.012	0.028
8810	0.423	0.451	0.031	0.022	0.053
8820	0.562	0.507	0.042	0.025	0.066
8832	2.102	1.735	0.156	0.085	0.241
8833	8.329	7.032	0.616	0.345	0.961
8868	4.872	5.386	0.361	0.264	0.624
8901	0.423	0.451	0.031	0.022	0.053
9156	8.591	10.657	0.636	0.522	1.158

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2016 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
(Indemnity = 0.074, Medical = 0.049).

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Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2018

Section IX - F
 Exhibit 4

Calculation of Pure Premiums Underlying Present Rate Goods and Services Industry Group, Industry Code 9

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
0005	1.429	1.336	1.193	0.687	1.880
0008	1.294	1.512	1.080	0.777	1.858
0016	2.437	2.521	2.034	1.296	3.330
0034	2.232	2.826	1.864	1.453	3.317
0035	1.195	1.485	0.998	0.763	1.761
0036	2.232	2.826	1.864	1.453	3.317
0042	2.293	2.407	1.914	1.237	3.152
0046	1.012	1.154	0.845	0.593	1.438
0079	1.851	2.848	1.546	1.464	3.010
0083	2.051	2.564	1.712	1.318	3.030
0113	2.232	2.826	1.864	1.453	3.317
0170	2.232	2.826	1.864	1.453	3.317
0908	108.723	80.679	90.783	41.469	132.252
0909	136.190	252.407	113.718	129.737	243.456
0912	136.190	252.407	113.718	129.737	243.456
0913	108.723	80.679	90.783	41.469	132.252
0917	1.784	2.252	1.490	1.158	2.647
0918	0.383	0.246	0.320	0.127	0.447
2587	2.243	2.721	1.873	1.399	3.272
3821	2.355	2.205	1.967	1.133	3.100
4362	0.352	0.334	0.294	0.172	0.466
4511	0.158	0.161	0.132	0.083	0.215
4512	0.062	0.076	0.052	0.039	0.091
5191	0.525	0.520	0.438	0.267	0.706
5192	1.758	1.614	1.468	0.830	2.298
8001	0.954	1.224	0.797	0.629	1.426
8002	0.815	0.969	0.680	0.498	1.178
8006	0.786	0.866	0.656	0.445	1.101
8008	0.468	0.447	0.391	0.230	0.620
8010	0.796	0.836	0.665	0.430	1.094
8013	0.225	0.252	0.188	0.130	0.317
8017	0.583	0.651	0.487	0.335	0.822
8018	1.805	1.587	1.507	0.816	2.323
8021	1.698	1.677	1.418	0.862	2.280
8031	1.283	1.077	1.072	0.554	1.625
8032	0.912	0.835	0.762	0.429	1.191
8033	1.019	1.230	0.851	0.632	1.483
8034	1.942	1.632	1.622	0.839	2.461
8039	0.613	0.772	0.512	0.397	0.909
8044	1.985	2.702	1.657	1.389	3.046
8046	1.090	1.262	0.911	0.649	1.559
8048	1.666	1.350	1.391	0.694	2.085
8058	1.240	1.636	1.036	0.841	1.877
8103	1.608	1.421	1.342	0.731	2.073
8105	4.312	3.459	3.600	1.778	5.378
8106	3.520	3.685	2.939	1.894	4.833

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Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2018

Section IX - F
 Exhibit 4

Calculation of Pure Premiums Underlying Present Rate Goods and Services Industry Group, Industry Code 9

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
8107	1.491	1.495	1.245	0.768	2.013
8111	1.542	1.458	1.288	0.749	2.037
8203	3.537	3.813	2.954	1.960	4.913
8204	2.145	1.963	1.791	1.009	2.800
8215	2.330	2.573	1.946	1.323	3.268
8232	3.701	3.866	3.091	1.987	5.078
8233	3.439	3.607	2.872	1.854	4.726
8235	2.471	2.466	2.063	1.268	3.331
8263	2.347	2.769	1.960	1.423	3.383
8264	3.449	3.021	2.880	1.553	4.433
8265	3.439	3.607	2.872	1.854	4.726
8279	2.833	3.672	2.365	1.887	4.253
8291	2.407	2.313	2.010	1.189	3.199
8292	1.628	1.369	1.359	0.704	2.063
8293	5.300	5.539	4.426	2.847	7.273
8350	3.336	3.125	2.786	1.606	4.392
8380	1.785	1.713	1.491	0.881	2.371
8381	0.985	1.303	0.822	0.670	1.492
8385	1.569	1.440	1.310	0.740	2.051
8392	0.914	0.878	0.763	0.451	1.214
8393	1.340	1.107	1.119	0.569	1.688
8500	3.439	3.607	2.872	1.854	4.726
8710	3.528	2.978	2.946	1.530	4.477
8719	3.528	2.978	2.946	1.530	4.477
8720	0.544	0.462	0.455	0.237	0.692
8745	3.291	4.066	2.748	2.090	4.838
8747	0.567	0.503	0.474	0.259	0.732
8829	1.245	1.081	1.040	0.556	1.596
8831	0.426	0.755	0.356	0.388	0.744
8835	1.261	1.000	1.053	0.514	1.567
9014	1.746	1.487	1.458	0.765	2.222
9015	1.944	1.607	1.623	0.826	2.449
9016	0.982	1.725	0.820	0.887	1.707
9033	2.103	1.783	1.756	0.916	2.672
9040	1.749	1.719	1.461	0.884	2.344
9052	1.030	1.022	0.860	0.525	1.386
9058	0.845	0.873	0.706	0.449	1.154
9060	0.496	0.635	0.414	0.326	0.741
9061	0.509	0.571	0.425	0.294	0.719
9063	0.401	0.533	0.335	0.274	0.609
9079	0.567	0.713	0.473	0.366	0.840
9089	0.566	0.685	0.473	0.352	0.824
9093	0.563	0.912	0.470	0.469	0.938
9101	1.527	1.862	1.275	0.957	2.232
9220	1.857	1.736	1.551	0.892	2.443
9410	1.350	1.929	1.127	0.992	2.118

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Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2018

Section IX - F
Exhibit 4

Calculation of Pure Premiums Underlying Present Rate Goods and Services Industry Group, Industry Code 9

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
9519	2.184	2.157	1.824	1.109	2.932
9586	0.221	0.190	0.184	0.097	0.282
9620	0.404	0.434	0.337	0.223	0.560

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2016 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
(Indemnity = 0.835, Medical = 0.514).

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Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2018

Section IX - F
 Exhibit 5

Calculation of Pure Premiums Underlying Present Rate Miscellaneous Industry Group, Industry Code 0

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
0106	2.137	3.560	5.255	4.731	9.986
1624	0.905	1.004	2.224	1.335	3.559
1655	0.792	0.852	1.947	1.132	3.079
1710	0.905	1.004	2.224	1.335	3.559
2702	3.177	3.107	7.813	4.129	11.942
4000	0.905	0.809	2.225	1.076	3.301
6834	0.487	0.533	1.197	0.708	1.905
6836	0.782	0.946	1.922	1.257	3.179
7219	2.085	1.793	5.127	2.382	7.509
7230	2.084	1.992	5.124	2.647	7.770
7231	2.104	1.830	5.174	2.432	7.606
7360	1.105	1.184	2.716	1.574	4.290
7370	0.751	0.870	1.848	1.157	3.004
7380	1.256	1.189	3.089	1.580	4.670
7382	0.701	0.849	1.723	1.129	2.852
7403	0.934	1.302	2.297	1.731	4.028
7405	0.299	0.316	0.735	0.420	1.155
7420	2.083	0.880	5.123	1.170	6.292
7421	0.378	0.248	0.930	0.330	1.261
7422	0.378	0.248	0.930	0.330	1.261
7425	0.669	0.306	1.645	0.407	2.052
7431	0.378	0.248	0.930	0.330	1.261
7502	0.443	0.435	1.090	0.578	1.668
7515	0.334	0.633	0.822	0.841	1.663
7520	0.652	0.618	1.604	0.821	2.425
7539	0.274	0.234	0.674	0.311	0.985
7580	0.627	0.779	1.542	1.036	2.577
7590	0.766	0.708	1.885	0.942	2.826
7600	0.869	0.689	2.137	0.915	3.053
7704	0.854	1.070	2.101	1.422	3.523
7720	0.344	0.353	0.847	0.469	1.316
9019	0.583	0.357	1.433	0.474	1.906
9102	0.496	0.617	1.220	0.819	2.039
9154	0.375	0.492	0.921	0.654	1.576
9178	1.565	4.750	3.849	6.312	10.162
9179	5.518	5.440	13.568	7.230	20.798
9180	0.648	1.164	1.593	1.547	3.140
9182	0.526	1.005	1.293	1.336	2.629
9186	0.648	1.164	1.593	1.547	3.140
9402	0.996	0.930	2.450	1.236	3.687
9403	2.074	1.831	5.099	2.434	7.533

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2016 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
 (Indemnity = 2.459, Medical = 1.329).

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Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2018

Section IX - G

A-Sheet Table of Contents

Class	To find the A-Sheet for:		Look at the A-Sheet for:	
		Description	Class	Exhibit
0005	FARM: NURSERY EMP & DRIVERS		0005	Section IX - G, Exhibit 1
0008	FARM: GARDENING-MARKET OR TRUCK & DRIVERS		0008	Section IX - G, Exhibit 1
0016	FARM: ORCHARDS & DRIVERS		0016	Section IX - G, Exhibit 2
0034	FARM: POULTRY OR EGG PRODUCERS & DRIVERS		0034	Section IX - G, Exhibit 2
0035	FARM: FLORIST & DRIVERS		0035	Section IX - G, Exhibit 3
0036	FARM: DAIRY & DRIVERS		0034	Section IX - G, Exhibit 2
0042	LANDSCAPE GARDENING & DRIVERS		0042	Section IX - G, Exhibit 3
0046	FERTILIZER OR PESTICIDE APPLICATION-COMM OR DOMESTIC, DRIVERS		0046	Section IX - G, Exhibit 4
0050	FARM MACHINERY OPERATION-BY CONTRACTOR & DRIVERS		0050	Section IX - G, Exhibit 4
0079	FARM: BERRY OR VINEYARD & DRIVERS		0079	Section IX - G, Exhibit 5
0083	FARM: CATTLE OR LIVESTOCK RAISING NOC & DRIVERS		0083	Section IX - G, Exhibit 5
0106	TREE PRUNING, SPRAYING, REPAIRING & DRIVERS		0106	Section IX - G, Exhibit 6
0113	FARM: FISH HATCHERY & DRIVERS		0034	Section IX - G, Exhibit 2
0170	FARM: ANIMAL RAISING & DRIVERS		0034	Section IX - G, Exhibit 2
0908	DOMESTIC WORKERS-INSIDE-OCCASIONAL-NOC		0908	Section IX - G, Exhibit 6
0909	DOMESTIC WORKERS-OUTSIDE-OCCASIONAL-INCL OCCASNL PRIV CHAUFF		0909	Section IX - G, Exhibit 7
0912	DOMESTIC WORKERS-OUTSIDE-INCL PRIVATE CHAUFFERS		0909	Section IX - G, Exhibit 7
0913	DOMESTIC WORKERS-INSIDE-NOC		0908	Section IX - G, Exhibit 6
0917	DOMESTIC SERVICE CONTRACTOR-INSIDE		0917	Section IX - G, Exhibit 7
0918	DOMESTIC WORKERS-INSIDE-PHYSICAL ASSISTANCE		0918	Section IX - G, Exhibit 8
1430	SMELTING, SINTERING OR REFINING-LEAD & DRIVERS		1430	Section IX - G, Exhibit 8
1438	SMELTING, SINTERING OR REFINING-METALS-NOT IRON OR LEAD-NOC & D		1438	Section IX - G, Exhibit 9
1463	ASPHALT WORKS & DRIVERS		1463	Section IX - G, Exhibit 9
1624	QUARRY NOC & DRIVERS		1624	Section IX - G, Exhibit 10
1655	LIME MFG-QUARRY-SURFACE & DRIVERS		1655	Section IX - G, Exhibit 10
1701	CEMENT MFG		1701	Section IX - G, Exhibit 11
1710	STONE CRUSHING & DRIVERS		1624	Section IX - G, Exhibit 10
1747	EMERY WORKS & DRIVERS		1747	Section IX - G, Exhibit 11
1748	ABRASIVE WHEEL MFG & DRIVERS		1748	Section IX - G, Exhibit 12
1853	MICA GOODS MFG & MICA PREPARING		1853	Section IX - G, Exhibit 12
1924	WIRE DRAWING OR CABLE MFG-NOT IRON OR STEEL		1924	Section IX - G, Exhibit 13
1925	DIE CASTING MFG		1925	Section IX - G, Exhibit 13
2003	BAKERY & DRIVERS, ROUTE SUPERVISORS		2003	Section IX - G, Exhibit 14
2014	GRAIN MILLING		2014	Section IX - G, Exhibit 14
2021	SUGAR REFINING-ALL OPERATIONS & DRIVERS		2021	Section IX - G, Exhibit 15
2039	ICE CREAM MFG & DRIVERS		2039	Section IX - G, Exhibit 15
2041	CONFECTION MFG		2041	Section IX - G, Exhibit 16
2070	CREAMERY OR DAIRY & ROUTE SUPERVISORS, DRIVERS		2070	Section IX - G, Exhibit 16
2081	BUTCHERING		2081	Section IX - G, Exhibit 17
2089	PACKING HOUSE- ALL OPERATIONS		2089	Section IX - G, Exhibit 17
2095	MEAT PRODUCTS MFG-NOC		2095	Section IX - G, Exhibit 18
2101	FISH CURING		2089	Section IX - G, Exhibit 17
2111	CANNERY NOC		2111	Section IX - G, Exhibit 18
2114	OYSTERMEN		2089	Section IX - G, Exhibit 17
2115	SEAFOOD PRODUCTS MFG-NOC		2115	Section IX - G, Exhibit 19
2121	BREWERY & DRIVERS		2121	Section IX - G, Exhibit 19
2130	SPIRITUOUS LIQUOR DISTILLERY		2130	Section IX - G, Exhibit 20
2131	SPIRITUOUS LIQUOR BOTTLING		2131	Section IX - G, Exhibit 20
2143	FRUIT JUICE MFG		2143	Section IX - G, Exhibit 21
2150	ICE MFG		2150	Section IX - G, Exhibit 21
2156	BOTTLING-NOT CARBONATED LIQUIDS OR SPIRIT LIQRS & RTE SUP,DR		2156	Section IX - G, Exhibit 22
2157	BOTTLING NOC & ROUTE SUPERVISORS, DRIVERS		2157	Section IX - G, Exhibit 22
2172	CIGARETTE MFG		2172	Section IX - G, Exhibit 23
2211	COTTON BATTING,WADDING OR WASTE MFG		2211	Section IX - G, Exhibit 23
2220	YARN OR THREAD MFG-COTTON		2220	Section IX - G, Exhibit 24
2260	WOOL COMBING OR SCOURING		2260	Section IX - G, Exhibit 24
2288	FELTING MFG		2288	Section IX - G, Exhibit 25
2305	TEXTILE FIBER MFG-SYNTHETIC		2305	Section IX - G, Exhibit 25
2362	KNIT GOODS MFG NOC		2362	Section IX - G, Exhibit 26
2380	WEBBING MFG		2380	Section IX - G, Exhibit 26
2402	CARPET OR RUG MFG NOC		2402	Section IX - G, Exhibit 27
2413	TEXTILE - BLEACHING, DYEING, MERCERZNG, FINISH		2413	Section IX - G, Exhibit 27
2416	YARN OR THREAD DYEING OR FINISHING		2416	Section IX - G, Exhibit 28
2417	CLOTH PRINTING		2417	Section IX - G, Exhibit 28
2501	CLOTHING MFG		2501	Section IX - G, Exhibit 29
2503	DRESSMAKING OR TAILORING-CUSTOM EXCLUSIVELY		2503	Section IX - G, Exhibit 29

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Section IX - Classification Pricing
 Subsection G - Class Relativities
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Section IX - G

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To find the A-Sheet for:		Look at the A-Sheet for:	
Class	Description	Class	Exhibit
2570	MATTRESS OR BOX SPRING MFG	2570	Section IX - G, Exhibit 30
2576	CANVAS GOODS MFG NOC-SHOP	2576	Section IX - G, Exhibit 30
2585	LAUNDRY NOC & ROUTE SUPERVISORS, DRIVERS	2585	Section IX - G, Exhibit 31
2586	CLEANING OR DYEING & ROUTE SUPERVISORS, DRIVERS	2586	Section IX - G, Exhibit 31
2587	TOWEL OR TOILET SUPPLY CO & RTE SUPERVISORS, DR	2587	Section IX - G, Exhibit 32
2623	TANNING	2623	Section IX - G, Exhibit 32
2651	SHOE STOCK MFG	2651	Section IX - G, Exhibit 33
2660	BOOT OR SHOE MFG NOC	2660	Section IX - G, Exhibit 33
2683	LUGGAGE MFG	2683	Section IX - G, Exhibit 34
2688	LEATHER GOODS MFG NOC	2688	Section IX - G, Exhibit 34
2702	LOGGING OR LUMBERING & DRIVERS	2702	Section IX - G, Exhibit 35
2710	SAWMILLS	2710	Section IX - G, Exhibit 35
2731	PLANING OR MOLDING MILL	2731	Section IX - G, Exhibit 36
2747	COOPERAGE ASSEMBLY	2747	Section IX - G, Exhibit 36
2790	PATTERN MAKING NOC	2790	Section IX - G, Exhibit 37
2802	CARPENTRY-SHOP ONLY & DRIVERS	2802	Section IX - G, Exhibit 37
2835	BRUSH OR BROOM ASSEMBLY	2835	Section IX - G, Exhibit 38
2836	BRUSH OR BROOM MFG NOC	2836	Section IX - G, Exhibit 38
2841	WOODENWARE MFG NOC	2841	Section IX - G, Exhibit 39
2883	FURNITURE MFG-WOOD-NOC	2883	Section IX - G, Exhibit 39
2923	PIANO MFG	2923	Section IX - G, Exhibit 40
2942	PENCIL, PENHOLDER OR CRAYON MFG	2942	Section IX - G, Exhibit 40
3018	IRON OR STEEL: MFG: ROLLING MILL & DRIVERS	3018	Section IX - G, Exhibit 41
3022	PIPE OR TUBE MFG NOC & DRIVERS	3022	Section IX - G, Exhibit 41
3027	ROLLING MILL NOC & DRIVERS	3027	Section IX - G, Exhibit 42
3028	PIPE OR TUBE MFG - IRON OR STEEL & DRIVERS	3028	Section IX - G, Exhibit 42
3030	IRON OR STEEL: FABRICATION: IRON/STEEL WORK-SHOP-STRUCT & DR	3030	Section IX - G, Exhibit 43
3040	IRON OR STEEL: FABRICATION: IRON WORKS-SHOP-ORNAMENTAL & DR	3040	Section IX - G, Exhibit 43
3041	IRON OR STEEL: FABRICATION: IRON WORKS-SHP-DEC/ART &FNDRS,DR	3041	Section IX - G, Exhibit 44
3042	ELEVATOR OR ESCALATOR MFG	3042	Section IX - G, Exhibit 44
3066	SHEET METAL WORK - SHOP	3066	Section IX - G, Exhibit 45
3076	FIREPROOF EQUIPMENT MFG	3076	Section IX - G, Exhibit 45
3081	FOUNDRY-FERROUS-NOC	3081	Section IX - G, Exhibit 46
3082	FOUNDRY-STEEL CASTINGS	3081	Section IX - G, Exhibit 46
3085	FOUNDRY-NON FERROUS	3085	Section IX - G, Exhibit 46
3110	FORGING WORK - DROP OR MACHINE	3110	Section IX - G, Exhibit 47
3111	BLACKSMITH	3111	Section IX - G, Exhibit 47
3113	TOOL MFG-NOT DROP OR MACHINE FORGED-NOC	3113	Section IX - G, Exhibit 48
3114	TOOL MFG-DROP OR MACHINE FORGED-NOC: MACHINING OR FINISHING	3114	Section IX - G, Exhibit 48
3118	SAW MFG	3118	Section IX - G, Exhibit 49
3119	NEEDLE MFG	3119	Section IX - G, Exhibit 49
3120	RAZOR MFG-SAFETY	3120	Section IX - G, Exhibit 50
3122	CUTLERY MFG-NOC	3122	Section IX - G, Exhibit 50
3127	PRECISION MEASURING TOOL MFG-NOC	3127	Section IX - G, Exhibit 51
3131	BUTTON OR FASTENER MFG-METAL	3131	Section IX - G, Exhibit 51
3132	NUT OR BOLT MFG	3132	Section IX - G, Exhibit 52
3145	SCREW MFG	3145	Section IX - G, Exhibit 52
3146	HARDWARE MFG-NOC	3146	Section IX - G, Exhibit 53
3169	STOVE MFG	3169	Section IX - G, Exhibit 53
3179	ELECTRICAL APPARATUS MFG-NOC	3179	Section IX - G, Exhibit 54
3180	ELECTRIC OR GAS LIGHTING FIXTURES MFG	3180	Section IX - G, Exhibit 54
3188	PLUMBERS SUPPLIES MFG-NOC	3188	Section IX - G, Exhibit 55
3200	ARMS MFG-SMALL	3200	Section IX - G, Exhibit 55
3220	CAN MFG	3220	Section IX - G, Exhibit 56
3255	WIRE CLOTH MFG	3255	Section IX - G, Exhibit 56
3257	WIRE GOODS MFG - NOC	3257	Section IX - G, Exhibit 57
3270	EYELET MFG	3270	Section IX - G, Exhibit 57
3300	BED SPRING OR WIRE MATTRESS MFG	3300	Section IX - G, Exhibit 58
3315	BRASS OR COPPER GOODS MFG	3315	Section IX - G, Exhibit 58
3336	TYPE FOUNDRY	3336	Section IX - G, Exhibit 59
3365	WELDING OR CUTTING - NOC & DRIVERS	3365	Section IX - G, Exhibit 59
3372	ELECTROPLATING	3372	Section IX - G, Exhibit 60
3373	GALVANIZING OR TINNING - NOT ELECTROLYTIC	3373	Section IX - G, Exhibit 60
3381	SILVERWARE MFG	3381	Section IX - G, Exhibit 61
3383	JEWELRY MFG	3383	Section IX - G, Exhibit 61
3385	WATCH MFG	3385	Section IX - G, Exhibit 62

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Section IX - Classification Pricing
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Section IX - G
 Exhibit 1

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
0005 FARM: NURSERY EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	114,881	0	34	0	27,345	0	35,462	62,806	0.238	0.309	0.547
2012	108,045	1	24	71,820	5,321	12,617	10,823	100,581	0.714	0.217	0.931
2013	112,524	0	23	0	5,888	0	24,411	30,299	0.052	0.217	0.269
2014	111,959	1	18	15,968	9,149	23,156	17,625	65,897	0.224	0.364	0.589
2015	117,938	0	17	0	122,935	0	95,135	218,070	1.042	0.807	1.849
MA Total:	565,347	2	116	87,787	170,637	35,772	183,456	477,653	0.457	0.388	0.845

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.546	0.815	.
(14) Massachusetts Credibility:	0.230	0.330	.
(15) Countrywide Pure Premium:	1.458	0.813	2.271
(16) Countrywide Indicated Relativity:	1.748	1.700	.
(17) Countrywide Credibility:	0.390	0.340	.
(18) Countrywide Lost-Time Claims:	1695.0	.	.
(19) Pure Premium Underlying Present Rate:	1.193	0.687	1.880
(20) Relativity to Underlying Present Rate:	1.439	1.347	.
(21) Credibility to Underlying Relativity:	0.380	0.330	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.354	1.292	.
(24) Balanced Formula Relativity:	1.345	1.291	1.326

Class(es):		Effective: 7/1/2018							Goods and Services		
0008 FARM: GARDENING-MARKET OR TRUCK & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	274,639	2	54	23,130	68,077	5,787	180,378	277,371	0.332	0.678	1.010
2012	262,453	0	39	0	26,088	0	68,612	94,700	0.099	0.261	0.361
2013	295,175	0	38	0	136,249	0	309,088	445,337	0.462	1.047	1.509
2014	323,952	0	47	0	152,405	0	241,728	394,133	0.470	0.746	1.217
2015	360,495	1	48	8,206	460,159	5,415	171,180	644,960	1.299	0.490	1.789
MA Total:	1,516,714	3	226	31,336	842,978	11,202	970,984	1,856,501	0.576	0.648	1.224

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.689	1.361	.
(14) Massachusetts Credibility:	0.330	0.520	.
(15) Countrywide Pure Premium:	1.632	0.946	2.578
(16) Countrywide Indicated Relativity:	1.956	1.979	.
(17) Countrywide Credibility:	0.340	0.240	.
(18) Countrywide Lost-Time Claims:	4761.0	.	.
(19) Pure Premium Underlying Present Rate:	1.080	0.777	1.858
(20) Relativity to Underlying Present Rate:	1.303	1.525	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.323	1.549	.
(24) Balanced Formula Relativity:	1.314	1.548	1.399

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 Subsection G - Class Relativities
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Section IX - G
 Exhibit 2

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
0016 FARM: ORCHARDS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	64,358	0	7	0	0	0	4,935	4,935	0.000	0.077	0.077
2012	70,870	0	7	0	67,617	0	36,765	104,382	0.954	0.519	1.473
2013	78,206	0	11	0	191,438	0	66,452	257,889	2.448	0.850	3.298
2014	76,680	0	7	0	1,088	0	6,777	7,866	0.014	0.088	0.103
2015	77,633	0	12	0	25,520	0	37,855	63,374	0.329	0.488	0.816
MA Total:	367,746	0	44	0	285,663	0	152,784	438,447	0.777	0.415	1.192

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.929	0.873	.
(14) Massachusetts Credibility:	0.240	0.360	.
(15) Countrywide Pure Premium:	2.706	1.638	4.345
(16) Countrywide Indicated Relativity:	3.244	3.427	.
(17) Countrywide Credibility:	0.380	0.320	.
(18) Countrywide Lost-Time Claims:	1443.0	.	.
(19) Pure Premium Underlying Present Rate:	2.034	1.296	3.330
(20) Relativity to Underlying Present Rate:	2.454	2.543	.
(21) Credibility to Underlying Relativity:	0.380	0.320	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.388	2.225	.
(24) Balanced Formula Relativity:	2.372	2.224	2.318

Class(es):		Effective: 7/1/2018							Goods and Services		
0034 FARM: POULTRY OR EGG PRODUCERS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	99,357	0	28	0	194,746	0	249,470	444,215	1.960	2.511	4.471
2012	96,161	2	30	340,495	52,959	49,589	102,076	545,119	4.092	1.577	5.669
2013	91,677	0	23	0	51,301	0	89,238	140,539	0.560	0.973	1.533
2014	96,359	0	20	0	8,837	0	35,049	43,887	0.092	0.364	0.455
2015	104,310	1	22	32,256	91,144	33,950	130,674	288,024	1.183	1.578	2.761
MA Total:	487,865	3	123	372,751	398,987	83,539	606,506	1,461,784	1.582	1.414	2.996

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.891	2.973	.
(14) Massachusetts Credibility:	0.260	0.430	.
(15) Countrywide Pure Premium:	1.701	0.956	2.657
(16) Countrywide Indicated Relativity:	2.039	2.001	.
(17) Countrywide Credibility:	0.370	0.290	.
(18) Countrywide Lost-Time Claims:	3438.0	.	.
(19) Pure Premium Underlying Present Rate:	1.864	1.453	3.317
(20) Relativity to Underlying Present Rate:	2.248	2.850	.
(21) Credibility to Underlying Relativity:	0.370	0.280	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.078	2.657	.
(24) Balanced Formula Relativity:	2.064	2.656	2.278

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Section IX - G
 Exhibit 3

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
0035 FARM: FLORIST & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	335,988	1	53	2,719	117,890	2,263	173,412	296,285	0.359	0.523	0.882	
2012	333,768	0	53	0	477,895	0	225,624	703,519	1.432	0.676	2.108	
2013	344,794	2	71	129,429	555,179	87,756	288,480	1,060,844	1.986	1.091	3.077	
2014	381,340	0	41	0	317,234	0	170,106	487,341	0.832	0.446	1.278	
2015	377,169	1	61	9,167	266,588	8,153	170,519	454,428	0.731	0.474	1.205	
MA Total:	1,773,058	4	279	141,316	1,734,787	98,172	1,028,142	3,002,417	1.058	0.635	1.693	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.265	1.335	.
(14) Massachusetts Credibility:	0.340	0.550	.
(15) Countrywide Pure Premium:	0.912	0.635	1.547
(16) Countrywide Indicated Relativity:	1.093	1.329	.
(17) Countrywide Credibility:	0.330	0.230	.
(18) Countrywide Lost-Time Claims:	1396.0	.	.
(19) Pure Premium Underlying Present Rate:	0.998	0.763	1.761
(20) Relativity to Underlying Present Rate:	1.203	1.498	.
(21) Credibility to Underlying Relativity:	0.330	0.220	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.188	1.369	.
(24) Balanced Formula Relativity:	1.180	1.369	1.248

Class(es):		Effective: 7/1/2018							Goods and Services			
0042 LANDSCAPE GARDENING & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	4,026,390	27	824	2,567,236	4,770,629	1,744,548	3,367,371	12,449,785	1.822	1.270	3.092	
2012	4,236,558	38	764	3,620,717	5,087,208	1,756,621	3,588,503	14,053,049	2.055	1.262	3.317	
2013	4,628,357	30	761	3,487,855	5,481,004	1,837,171	3,647,224	14,453,254	1.938	1.185	3.123	
2014	5,040,199	32	753	3,246,355	6,630,650	1,583,955	4,400,054	15,861,014	1.960	1.187	3.147	
2015	5,606,442	25	697	3,065,975	6,262,962	1,295,716	4,358,921	14,983,573	1.664	1.009	2.673	
MA Total:	23,537,946	152	3,799	15,988,138	28,232,453	8,218,010	19,362,074	71,800,675	1.879	1.172	3.050	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.246	2.463	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.392	1.359	3.751
(16) Countrywide Indicated Relativity:	2.867	2.843	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7538.0	.	.
(19) Pure Premium Underlying Present Rate:	1.914	1.237	3.152
(20) Relativity to Underlying Present Rate:	2.309	2.427	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.246	2.463	.
(24) Balanced Formula Relativity:	2.231	2.462	2.315

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
0046 FERTILIZER OR PESTICIDE APPLICATION-COMM OR DOMESTIC, DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	95,292	1	20	3,540	36,310	6,884	79,360	126,094	0.418	0.905	1.323	
2012	105,290	0	10	0	134,561	0	39,152	173,713	1.278	0.372	1.650	
2013	115,931	1	15	154,710	66,689	27,996	52,235	301,630	1.910	0.692	2.602	
2014	133,322	0	21	0	25,973	0	26,378	52,351	0.195	0.198	0.393	
2015	128,416	0	15	0	211,478	0	100,975	312,453	1.647	0.786	2.433	
MA Total:	578,251	2	81	158,250	475,011	34,880	298,099	966,241	1.095	0.576	1.671	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.309	1.210	.
(14) Massachusetts Credibility:	0.200	0.320	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.012	1.155	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.845	0.593	1.438
(20) Relativity to Underlying Present Rate:	1.020	1.164	.
(21) Credibility to Underlying Relativity:	0.800	0.680	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.077	1.179	.
(24) Balanced Formula Relativity:	1.070	1.178	1.109

Class(es):		Effective: 7/1/2018							Construction			
0050 FARM MACHINERY OPERATION-BY CONTRACTOR & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	14,553	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	14,229	0	3	0	26,700	0	11,553	38,253	1.876	0.812	2.688	
2013	15,705	0	1	0	0	0	143	143	0.000	0.009	0.009	
2014	22,996	0	1	0	0	0	1,539	1,539	0.000	0.067	0.067	
2015	19,504	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	86,987	0	5	0	26,700	0	13,234	39,934	0.307	0.152	0.459	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.117	0.129	.
(14) Massachusetts Credibility:	0.170	0.210	.
(15) Countrywide Pure Premium:	2.712	1.300	4.012
(16) Countrywide Indicated Relativity:	1.059	1.149	.
(17) Countrywide Credibility:	0.420	0.400	.
(18) Countrywide Lost-Time Claims:	899.00	.	.
(19) Pure Premium Underlying Present Rate:	3.476	1.361	4.838
(20) Relativity to Underlying Present Rate:	1.267	1.015	.
(21) Credibility to Underlying Relativity:	0.410	0.390	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.984	0.883	.
(24) Balanced Formula Relativity:	0.990	0.884	0.957

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 Exhibit 5

Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
0079 FARM: BERRY OR VINEYARD & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	153,993	2	37	365,200	28,105	207,864	111,850	713,019	2,554	2,076	4,630	
2012	165,436	1	35	178,090	192,948	142,529	165,655	679,221	2,243	1,863	4,106	
2013	162,646	4	30	253,393	31,374	276,585	63,649	625,001	1,751	2,092	3,843	
2014	151,607	0	18	0	55,564	0	73,401	128,964	0,366	0,484	0,851	
2015	159,411	0	24	0	82,435	0	108,884	191,319	0,517	0,683	1,200	
MA Total:	793,092	7	144	796,683	390,425	626,978	523,439	2,337,525	1,497	1,451	2,947	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.789	3.049	.
(14) Massachusetts Credibility:	0.290	0.520	.
(15) Countrywide Pure Premium:	1.176	0.800	1.977
(16) Countrywide Indicated Relativity:	1.410	1.675	.
(17) Countrywide Credibility:	0.360	0.240	.
(18) Countrywide Lost-Time Claims:	223.00	.	.
(19) Pure Premium Underlying Present Rate:	1.546	1.464	3.010
(20) Relativity to Underlying Present Rate:	1.864	2.872	.
(21) Credibility to Underlying Relativity:	0.350	0.240	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.679	2.677	.
(24) Balanced Formula Relativity:	1.668	2.676	2.033

Class(es):		Effective: 7/1/2018							Goods and Services			
0083 FARM: CATTLE OR LIVESTOCK RAISING NOC & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	44,401	0	7	0	10,818	0	16,612	27,430	0,244	0,374	0,618	
2012	66,054	0	7	0	868	0	2,967	3,835	0,013	0,045	0,058	
2013	46,963	0	4	0	1,813	0	80,741	82,555	0,039	1,719	1,758	
2014	55,904	0	8	0	0	0	6,415	6,415	0,000	0,115	0,115	
2015	61,471	0	10	0	63,973	0	7,719	71,692	1,041	0,126	1,166	
MA Total:	274,794	0	36	0	77,473	0	114,454	191,927	0,282	0,417	0,698	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.337	0.875	.
(14) Massachusetts Credibility:	0.200	0.330	.
(15) Countrywide Pure Premium:	2.386	1.389	3.776
(16) Countrywide Indicated Relativity:	2.860	2.907	.
(17) Countrywide Credibility:	0.400	0.340	.
(18) Countrywide Lost-Time Claims:	2940.0	.	.
(19) Pure Premium Underlying Present Rate:	1.712	1.318	3.030
(20) Relativity to Underlying Present Rate:	2.065	2.586	.
(21) Credibility to Underlying Relativity:	0.400	0.330	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.037	2.131	.
(24) Balanced Formula Relativity:	2.024	2.130	2.062

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Section IX - Classification Pricing
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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Miscellaneous		
0106 TREE PRUNING, SPRAYING, REPAIRING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	371,069	2	112	234,426	965,882	513,466	644,930	2,358,703	3,235	3,122	6,357
2012	378,753	6	85	1,103,096	945,299	514,284	694,861	3,257,541	5,408	3,192	8,601
2013	397,328	6	95	628,765	1,033,095	510,674	898,907	3,071,441	4,183	3,548	7,730
2014	410,106	5	90	185,902	1,463,124	497,422	950,886	3,097,334	4,021	3,532	7,553
2015	445,364	6	86	1,127,159	1,981,515	664,898	1,095,565	4,869,138	6,980	3,953	10,933
MA Total:	2,002,620	25	468	3,279,347	6,388,916	2,700,743	4,285,149	16,654,155	4,828	3,488	8,316

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.013	2.923	.
(14) Massachusetts Credibility:	0.680	1.000	.
(15) Countrywide Pure Premium:	4.601	2.781	7.382
(16) Countrywide Indicated Relativity:	2.134	2.618	.
(17) Countrywide Credibility:	0.160	0.000	.
(18) Countrywide Lost-Time Claims:	3202.0	.	.
(19) Pure Premium Underlying Present Rate:	5.255	4.731	9.986
(20) Relativity to Underlying Present Rate:	2.156	3.584	.
(21) Credibility to Underlying Relativity:	0.160	0.000	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	2.055	2.923	.
(24) Balanced Formula Relativity:	2.047	2.943	2.345

Class(es):		Effective: 7/1/2018							Goods and Services		
0908 DOMESTIC WORKERS-INSIDE-OCCASIONAL-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,842	0	15	0	4,273	0	23,505	27,778	1,504	8,272	9,775
2012	2,915	2	18	7,417	371,279	8,132	92,276	479,104	129,933	34,450	164,383
2013	2,989	0	15	0	88,104	0	64,863	152,967	29,476	21,700	51,177
2014	3,340	0	21	0	323,827	0	179,963	503,789	96,969	53,889	150,868
2015	3,433	1	19	136	117,334	520	129,733	247,723	34,222	37,946	72,168
MA Total:	15,517	3	88	7,552	904,817	8,652	490,340	1,411,360	58,797	32,157	90,954

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	70.291	67.590	.
(14) Massachusetts Credibility:	0.320	0.430	.
(15) Countrywide Pure Premium:	145.63	62.572	208.20
(16) Countrywide Indicated Relativity:	123.02	91.380	.
(17) Countrywide Credibility:	0.340	0.290	.
(18) Countrywide Lost-Time Claims:	512.00	.	.
(19) Pure Premium Underlying Present Rate:	102.74	46.933	149.68
(20) Relativity to Underlying Present Rate:	123.91	92.087	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	106.45	81.348	.
(24) Balanced Formula Relativity:	105.74	81.318	96.888

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
0909 DOMESTIC WORKERS-OUTSIDE-OCCASIONAL-INCL OCCASNL PRIV CHAUFF											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	341	0	8	0	1,290	0	5,026	6,316	3,786	14,752	18,538
2012	349	0	5	0	0	0	3,402	3,402	0,000	9,741	9,741
2013	337	0	6	0	101,879	0	47,254	149,133	302,58	140,34	442,93
2014	338	0	5	0	81,129	0	115,148	196,277	240,13	340,83	580,96
2015	336	0	4	0	0	0	3,254	3,254	0,000	9,674	9,674
MA Total:	1,701	0	28	0	184,298	0	174,084	358,382	108,36	102,35	210,71

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	129.54	215.13	.
(14) Massachusetts Credibility:	0.150	0.290	.
(15) Countrywide Pure Premium:	109.25	61.642	170.90
(16) Countrywide Indicated Relativity:	164.77	305.67	.
(17) Countrywide Credibility:	0.100	0.110	.
(18) Countrywide Lost-Time Claims:	4.000	.	.
(19) Pure Premium Underlying Present Rate:	137.61	157.00	294.61
(20) Relativity to Underlying Present Rate:	165.95	308.04	.
(21) Credibility to Underlying Relativity:	0.750	0.600	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	160.37	280.84	.
(24) Balanced Formula Relativity:	159.31	280.73	203.33

Class(es):		Effective: 7/1/2018							Goods and Services		
0917 DOMESTIC SERVICE CONTRACTOR-INSIDE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	290,906	6	45	261,828	179,607	198,699	106,595	746,729	1,517	1,049	2,567
2012	257,647	2	39	40,667	123,487	76,261	306,883	547,299	0,637	1,487	2,124
2013	302,403	4	37	75,234	140,918	5,993	90,862	313,006	0,715	0,320	1,035
2014	372,894	2	47	1,092	212,189	2,134	87,667	303,082	0,572	0,241	0,813
2015	415,154	2	51	100,395	163,553	47,767	199,018	510,734	0,636	0,594	1,230
MA Total:	1,639,004	16	219	479,216	819,755	330,855	791,025	2,420,850	0,793	0,684	1,477

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.947	1.439	.
(14) Massachusetts Credibility:	0.380	0.630	.
(15) Countrywide Pure Premium:	2.303	1.331	3.634
(16) Countrywide Indicated Relativity:	2.761	2.784	.
(17) Countrywide Credibility:	0.310	0.190	.
(18) Countrywide Lost-Time Claims:	893.00	.	.
(19) Pure Premium Underlying Present Rate:	1.490	1.158	2.647
(20) Relativity to Underlying Present Rate:	1.797	2.271	.
(21) Credibility to Underlying Relativity:	0.310	0.180	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.773	1.844	.
(24) Balanced Formula Relativity:	1.761	1.843	1.791

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
0918 DOMESTIC WORKERS-INSIDE-PHYSICAL ASSISTANCE												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	4,665,689	8	76	370,928	797,019	192,798	249,394	1,610,138	0.250	0.095	0.345	
2012	5,291,661	6	81	330,181	568,931	56,502	263,422	1,219,037	0.170	0.060	0.230	
2013	5,801,546	7	70	389,700	1,010,874	355,048	360,920	2,116,542	0.241	0.123	0.365	
2014	6,713,320	11	61	392,403	612,065	142,970	196,157	1,343,585	0.150	0.051	0.200	
2015	7,313,009	9	77	1,094,587	839,022	273,626	369,211	2,576,445	0.264	0.088	0.352	
MA Total:	29,785,225	41	365	2,577,798	3,827,912	1,020,944	1,439,104	8,865,757	0.215	0.083	0.298	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.257	0.174	.
(14) Massachusetts Credibility:	0.660	0.830	.
(15) Countrywide Pure Premium:	0.766	0.320	1.086
(16) Countrywide Indicated Relativity:	0.919	0.669	.
(17) Countrywide Credibility:	0.170	0.090	.
(18) Countrywide Lost-Time Claims:	75,000	.	.
(19) Pure Premium Underlying Present Rate:	0.320	0.127	0.447
(20) Relativity to Underlying Present Rate:	0.386	0.248	.
(21) Credibility to Underlying Relativity:	0.170	0.080	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.391	0.224	.
(24) Balanced Formula Relativity:	0.389	0.224	0.329

Class(es):		Effective: 7/1/2018							Manufacturing			
1430 SMELTING, SINTERING OR REFINING-LEAD & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	92	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	92	0	0	0	0	0	0	0	0.000	0.000	0.000	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.010	0.010	.
(15) Countrywide Pure Premium:	2.169	1.173	3.342
(16) Countrywide Indicated Relativity:	2.421	2.549	.
(17) Countrywide Credibility:	0.360	0.390	.
(18) Countrywide Lost-Time Claims:	92,000	.	.
(19) Pure Premium Underlying Present Rate:	2.881	1.090	3.972
(20) Relativity to Underlying Present Rate:	3.054	1.989	.
(21) Credibility to Underlying Relativity:	0.630	0.600	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.796	2.188	.
(24) Balanced Formula Relativity:	2.772	2.177	2.567

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Calculation of Class Relativities

Class(es): 1438 SMELTING, SINTERING OR REFINING-METALS-NOT IRON OR LEAD-NOC & D												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	68,128	0	10	0	14,112	0	32,368	46,480	0.207	0.475	0.682						
2012	152,586	0	17	0	85,704	0	73,863	159,566	0.562	0.484	1.046						
2013	141,367	0	17	0	88,194	0	67,345	155,539	0.624	0.476	1.100						
2014	141,023	1	19	108,985	61,266	7,821	102,348	280,421	1.207	0.781	1.988						
2015	135,407	0	19	0	89,961	0	91,338	181,299	0.664	0.675	1.339						
MA Total:	638,511	1	82	108,985	339,236	7,821	367,262	823,305	0.702	0.587	1.289						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.718	1.144	.
(14) Massachusetts Credibility:	0.270	0.380	.
(15) Countrywide Pure Premium:	2.173	1.042	3.215
(16) Countrywide Indicated Relativity:	2.425	2.264	.
(17) Countrywide Credibility:	0.370	0.310	.
(18) Countrywide Lost-Time Claims:	746.00	.	.
(19) Pure Premium Underlying Present Rate:	1.590	0.851	2.441
(20) Relativity to Underlying Present Rate:	1.686	1.552	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.698	1.618	.
(24) Balanced Formula Relativity:	1.683	1.610	1.658

Class(es): 1463 ASPHALT WORKS & DRIVERS												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	85,153	3	12	623,841	59,946	242,267	90,743	1,016,798	8,030	3,911	11,941						
2012	115,927	2	27	100,972	114,740	45,459	56,907	318,078	1,861	0,883	2,744						
2013	131,628	1	17	44,836	256,727	5,249	265,056	571,868	2,291	2,054	4,345						
2014	137,992	4	25	779,220	253,275	626,797	161,419	1,820,711	7,482	5,712	13,194						
2015	81,398	1	12	74,717	185,592	41,641	322,034	623,984	3,198	4,468	7,666						
MA Total:	552,099	11	93	1,623,586	870,280	961,413	896,158	4,351,437	4,517	3,365	7,882						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.621	6.551	.
(14) Massachusetts Credibility:	0.390	0.530	.
(15) Countrywide Pure Premium:	4.213	1.934	6.147
(16) Countrywide Indicated Relativity:	4.703	4.202	.
(17) Countrywide Credibility:	0.310	0.240	.
(18) Countrywide Lost-Time Claims:	596.00	.	.
(19) Pure Premium Underlying Present Rate:	4.548	2.265	6.813
(20) Relativity to Underlying Present Rate:	4.821	4.133	.
(21) Credibility to Underlying Relativity:	0.300	0.230	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	4.706	5.431	.
(24) Balanced Formula Relativity:	4.666	5.404	4.920

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Calculation of Class Relativities

Class(es): 1624 QUARRY NOC & DRIVERS		Effective: 7/1/2018							Miscellaneous		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	377,962	2	44	329,705	716,859	66,945	325,788	1,439,298	2,769	1,039	3,808
2012	457,936	1	48	136,682	256,633	26,930	237,234	657,479	0,859	0,577	1,436
2013	460,264	5	49	897,616	383,392	462,963	422,920	2,166,891	2,783	1,925	4,708
2014	492,709	2	62	85,887	813,203	59,487	564,317	1,522,894	1,825	1,266	3,091
2015	492,103	1	74	32,083	454,111	5,424	276,188	767,806	0,988	0,572	1,560
MA Total:	2,280,975	11	277	1,481,974	2,624,198	621,749	1,826,448	6,554,368	1,800	1,073	2,873

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.751	0.899	.
(14) Massachusetts Credibility:	0.510	0.760	.
(15) Countrywide Pure Premium:	1.779	0.842	2.621
(16) Countrywide Indicated Relativity:	0.825	0.793	.
(17) Countrywide Credibility:	0.250	0.120	.
(18) Countrywide Lost-Time Claims:	1190.0	.	.
(19) Pure Premium Underlying Present Rate:	2.224	1.335	3.559
(20) Relativity to Underlying Present Rate:	0.913	1.011	.
(21) Credibility to Underlying Relativity:	0.240	0.120	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.808	0.900	.
(24) Balanced Formula Relativity:	0.805	0.906	0.839

Class(es): 1655 LIME MFG-QUARRY-SURFACE & DRIVERS		Effective: 7/1/2018							Miscellaneous		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	3,182	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	2,731	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	3,333	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	3,780	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	6,197	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	19,222	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.070	0.110	.
(15) Countrywide Pure Premium:	1.093	0.489	1.582
(16) Countrywide Indicated Relativity:	0.507	0.461	.
(17) Countrywide Credibility:	0.220	0.230	.
(18) Countrywide Lost-Time Claims:	26.000	.	.
(19) Pure Premium Underlying Present Rate:	1.947	1.132	3.079
(20) Relativity to Underlying Present Rate:	0.799	0.858	.
(21) Credibility to Underlying Relativity:	0.710	0.660	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.679	0.672	.
(24) Balanced Formula Relativity:	0.676	0.677	0.676

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Calculation of Class Relativities

Class(es): 1701 CEMENT MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	8,470	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	8,530	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	10,053	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	8,079	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	6,989	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	42,122	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.090	0.120	.
(15) Countrywide Pure Premium:	1.372	0.651	2.023
(16) Countrywide Indicated Relativity:	1.531	1.415	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	419.00	.	.
(19) Pure Premium Underlying Present Rate:	1.647	0.741	2.388
(20) Relativity to Underlying Present Rate:	1.746	1.353	.
(21) Credibility to Underlying Relativity:	0.450	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.490	1.218	.
(24) Balanced Formula Relativity:	1.477	1.212	1.386

Class(es): 1747 EMERY WORKS & DRIVERS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	47,154	1	13	68,564	20,796	11,502	9,589	110,452	1,895	0,447	2,342
2012	45,855	1	10	244,136	153,329	66,343	28,982	492,791	8,668	2,079	10,747
2013	18,821	0	4	0	14,541	0	12,581	27,122	0,773	0,668	1,441
2014	46,843	2	6	165,771	31,544	155,256	19,870	372,442	4,212	3,739	7,951
2015	47,083	0	9	0	25,940	0	18,749	44,688	0,551	0,398	0,949
MA Total:	205,756	4	42	478,472	246,150	233,102	89,771	1,047,495	3,522	1,569	5,091

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.602	3.055	.
(14) Massachusetts Credibility:	0.170	0.230	.
(15) Countrywide Pure Premium:	0.890	0.321	1.211
(16) Countrywide Indicated Relativity:	0.993	0.698	.
(17) Countrywide Credibility:	0.320	0.340	.
(18) Countrywide Lost-Time Claims:	65.000	.	.
(19) Pure Premium Underlying Present Rate:	1.469	0.721	2.191
(20) Relativity to Underlying Present Rate:	1.558	1.316	.
(21) Credibility to Underlying Relativity:	0.510	0.430	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.725	1.506	.
(24) Balanced Formula Relativity:	1.710	1.498	1.637

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Calculation of Class Relativities

Class(es): 1748 ABRASIVE WHEEL MFG & DRIVERS											
Effective: 7/1/2018											
Manufacturing											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	53,366	0	14	0	19,440	0	13,185	32,625	0.364	0.247	0.611
2012	44,500	0	14	0	1,516	0	8,259	9,775	0.034	0.186	0.220
2013	39,087	0	14	0	39,997	0	70,811	110,808	1.023	1.812	2.835
2014	40,371	0	14	0	5,042	0	19,697	24,739	0.125	0.488	0.613
2015	38,198	0	8	0	8,212	0	30,828	39,040	0.215	0.807	1.022
MA Total:	215,522	0	64	0	74,208	0	142,779	216,987	0.344	0.662	1.007

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.352	1.290	.
(14) Massachusetts Credibility:	0.170	0.270	.
(15) Countrywide Pure Premium:	1.579	1.050	2.629
(16) Countrywide Indicated Relativity:	1.762	2.282	.
(17) Countrywide Credibility:	0.320	0.340	.
(18) Countrywide Lost-Time Claims:	68.000	.	.
(19) Pure Premium Underlying Present Rate:	1.396	1.019	2.416
(20) Relativity to Underlying Present Rate:	1.480	1.859	.
(21) Credibility to Underlying Relativity:	0.510	0.390	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.379	1.849	.
(24) Balanced Formula Relativity:	1.367	1.840	1.530

Class(es): 1853 MICA GOODS MFG & MICA PREPARING											
Effective: 7/1/2018											
Manufacturing											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,796	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	1,555	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	1,525	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	1,611	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,161	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	7,647	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.040	.
(15) Countrywide Pure Premium:	0.701	0.122	0.823
(16) Countrywide Indicated Relativity:	0.783	0.265	.
(17) Countrywide Credibility:	0.100	0.110	.
(18) Countrywide Lost-Time Claims:	4.000	.	.
(19) Pure Premium Underlying Present Rate:	0.885	0.318	1.204
(20) Relativity to Underlying Present Rate:	0.938	0.581	.
(21) Credibility to Underlying Relativity:	0.860	0.850	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.885	0.523	.
(24) Balanced Formula Relativity:	0.878	0.520	0.755

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Manufacturing			
1924 WIRE DRAWING OR CABLE MFG-NOT IRON OR STEEL												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	135.160	0	24	0	110.208	0	46.531	156.739	0.815	0.344	1.160	
2012	166.303	1	40	35.335	190.508	6.131	166.667	398.641	1.358	1.039	2.397	
2013	164.303	1	16	108.183	282.391	11.524	101.339	503.438	2.377	0.687	3.064	
2014	142.738	0	20	0	154.676	0	59.236	213.911	1.084	0.415	1.499	
2015	152.446	0	23	0	30.715	0	41.823	72.538	0.201	0.274	0.476	
MA Total:	760.950	2	123	143.518	768.498	17.655	415.596	1,345,267	1.199	0.569	1.768	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.226	1.109	.
(14) Massachusetts Credibility:	0.230	0.340	.
(15) Countrywide Pure Premium:	1.106	0.552	1.658
(16) Countrywide Indicated Relativity:	1.234	1.200	.
(17) Countrywide Credibility:	0.390	0.330	.
(18) Countrywide Lost-Time Claims:	544.00	.	.
(19) Pure Premium Underlying Present Rate:	0.956	0.524	1.480
(20) Relativity to Underlying Present Rate:	1.013	0.955	.
(21) Credibility to Underlying Relativity:	0.380	0.330	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.148	1.088	.
(24) Balanced Formula Relativity:	1.138	1.083	1.119

Class(es):		Effective: 7/1/2018							Manufacturing			
1925 DIE CASTING MFG												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	4.035	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	3.274	0	0	0	0	0	0	0	0.000	0.000	0.000	
2013	5.017	0	2	0	78.577	0	559.252	637.828	15.662	111.47	127.13	
2014	3.090	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	240	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	15.656	0	2	0	78.577	0	559.252	637.828	5.019	35.721	40.740	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.134	69.554	.
(14) Massachusetts Credibility:	0.060	0.160	.
(15) Countrywide Pure Premium:	1.551	0.976	2.527
(16) Countrywide Indicated Relativity:	1.732	2.120	.
(17) Countrywide Credibility:	0.470	0.420	.
(18) Countrywide Lost-Time Claims:	793.00	.	.
(19) Pure Premium Underlying Present Rate:	1.528	3.892	5.420
(20) Relativity to Underlying Present Rate:	1.619	7.102	.
(21) Credibility to Underlying Relativity:	0.470	0.420	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.883	15.002	.
(24) Balanced Formula Relativity:	1.867	14.927	6.365

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Calculation of Class Relativities

Class(es): 2003 BAKERY & DRIVERS, ROUTE SUPERVISORS												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	1,818,000	6	401	431,264	1,570,549	407,851	899,979	3,309,644	1,101	0,719	1,820						
2012	1,946,756	17	425	1,423,885	2,570,541	587,071	1,196,289	5,777,787	2,052	0,916	2,968						
2013	1,918,912	18	310	1,404,701	1,827,942	451,737	871,398	4,555,778	1,685	0,690	2,374						
2014	2,018,456	15	299	1,680,838	3,548,335	515,640	2,061,750	7,806,563	2,591	1,277	3,868						
2015	2,132,497	6	322	1,313,164	3,268,561	402,796	2,052,333	7,036,854	2,149	1,151	3,300						
MA Total:	9,834,621	62	1,757	6,253,852	12,785,929	2,365,095	7,081,749	28,486,625	1,936	0,961	2,897						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.980	1.870	.
(14) Massachusetts Credibility:	0.820	1.000	.
(15) Countrywide Pure Premium:	1.909	0.818	2.727
(16) Countrywide Indicated Relativity:	2.130	1.778	.
(17) Countrywide Credibility:	0.090	0.000	.
(18) Countrywide Lost-Time Claims:	7273.0	.	.
(19) Pure Premium Underlying Present Rate:	1.661	0.931	2.592
(20) Relativity to Underlying Present Rate:	1.761	1.698	.
(21) Credibility to Underlying Relativity:	0.090	0.000	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.974	1.870	.
(24) Balanced Formula Relativity:	1.957	1.861	1.924

Class(es): 2014 GRAIN MILLING												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	25,666	0	1	0	0	0	890	890	0.000	0.035	0.035						
2012	24,857	0	0	0	0	0	0	0	0.000	0.000	0.000						
2013	21,420	0	0	0	0	0	0	0	0.000	0.000	0.000						
2014	1,984	0	1	0	0	0	113	113	0.000	0.057	0.057						
2015	1,861	0	0	0	0	0	0	0	0.000	0.000	0.000						
MA Total:	75,788	0	2	0	0	0	1,003	1,003	0.000	0.013	0.013						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.026	.
(14) Massachusetts Credibility:	0.120	0.170	.
(15) Countrywide Pure Premium:	2.110	0.985	3.095
(16) Countrywide Indicated Relativity:	2.356	2.140	.
(17) Countrywide Credibility:	0.440	0.420	.
(18) Countrywide Lost-Time Claims:	1176.0	.	.
(19) Pure Premium Underlying Present Rate:	1.703	0.937	2.640
(20) Relativity to Underlying Present Rate:	1.805	1.709	.
(21) Credibility to Underlying Relativity:	0.440	0.410	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.831	1.604	.
(24) Balanced Formula Relativity:	1.815	1.596	1.740

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Calculation of Class Relativities

Class(es): 2021 SUGAR REFINING-ALL OPERATIONS & DRIVERS												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	1,438	0	1	0	0	0	1,052	1,052	0.000	0.731	0.731						
2012	1,289	0	0	0	0	0	0	0	0.000	0.000	0.000						
2013	1,788	0	0	0	0	0	0	0	0.000	0.000	0.000						
2014	1,490	0	1	0	0	0	508	508	0.000	0.341	0.341						
2015	2,197	0	0	0	0	0	0	0	0.000	0.000	0.000						
MA Total:	8,201	0	2	0	0	0	1,560	1,560	0.000	0.190	0.190						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.370	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	1.034	0.550	1.584
(16) Countrywide Indicated Relativity:	1.154	1.195	.
(17) Countrywide Credibility:	0.480	0.470	.
(18) Countrywide Lost-Time Claims:	256.00	.	.
(19) Pure Premium Underlying Present Rate:	1.350	0.754	2.103
(20) Relativity to Underlying Present Rate:	1.431	1.376	.
(21) Credibility to Underlying Relativity:	0.480	0.470	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.241	1.231	.
(24) Balanced Formula Relativity:	1.230	1.224	1.228

Class(es): 2039 ICE CREAM MFG & DRIVERS												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	22,929	0	4	0	0	0	433	433	0.000	0.019	0.019						
2012	128,989	1	15	283,737	229,153	264,189	84,771	861,850	3.976	2,705	6,682						
2013	144,801	1	18	469,159	25,343	182,679	28,612	705,792	3.415	1,459	4,874						
2014	160,530	3	35	371,097	125,502	190,212	153,455	840,266	3.093	2,141	5,234						
2015	173,109	1	36	6,305	250,066	20,614	146,800	423,785	1.481	0.967	2,448						
MA Total:	630,358	6	108	1,130,297	630,064	657,693	414,070	2,832,125	2.793	1.700	4.493						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.857	3.311	.
(14) Massachusetts Credibility:	0.270	0.380	.
(15) Countrywide Pure Premium:	1.117	0.535	1.653
(16) Countrywide Indicated Relativity:	1.247	1.163	.
(17) Countrywide Credibility:	0.370	0.310	.
(18) Countrywide Lost-Time Claims:	438.00	.	.
(19) Pure Premium Underlying Present Rate:	1.561	0.827	2.389
(20) Relativity to Underlying Present Rate:	1.655	1.510	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.828	2.087	.
(24) Balanced Formula Relativity:	1.813	2.076	1.904

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Calculation of Class Relativities

Class(es): 2041 CONFECTION MFG		Effective: 7/1/2018							Manufacturing			
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	189,619	1	23	143,085	118,753	16,292	62,592	340,722	1,381	0,416	1,797	
2012	204,538	1	25	11,157	531,053	1,905	278,158	822,274	2,651	1,369	4,020	
2013	225,929	1	16	23,800	276,731	3,133	91,595	395,260	1,330	0,419	1,749	
2014	216,574	4	15	283,405	424,689	25,452	249,370	982,916	3,270	1,269	4,538	
2015	235,757	0	16	0	66,867	0	60,499	127,366	0,284	0,257	0,540	
MA Total:	1,072,417	7	95	461,447	1,418,094	46,782	742,213	2,668,537	1,753	0,736	2,488	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.793	1.433	.
(14) Massachusetts Credibility:	0.310	0.440	.
(15) Countrywide Pure Premium:	1.230	0.569	1.799
(16) Countrywide Indicated Relativity:	1.373	1.235	.
(17) Countrywide Credibility:	0.350	0.280	.
(18) Countrywide Lost-Time Claims:	1070.0	.	.
(19) Pure Premium Underlying Present Rate:	1.315	0.708	2.023
(20) Relativity to Underlying Present Rate:	1.393	1.292	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.510	1.338	.
(24) Balanced Formula Relativity:	1.497	1.331	1.440

Class(es): 2070 CREAMERY OR DAIRY & ROUTE SUPERVISORS, DRIVERS		Effective: 7/1/2018							Manufacturing			
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	269,575	2	40	43,320	650,252	418,992	206,649	1,319,213	2,573	2,321	4,894	
2012	288,812	1	25	271,923	272,633	40,283	120,503	705,341	1,886	0,557	2,442	
2013	293,456	3	36	578,739	493,566	140,186	174,353	1,386,844	3,654	1,072	4,726	
2014	298,686	3	30	267,955	352,068	107,826	169,559	897,408	2,076	0,929	3,005	
2015	297,506	1	21	177,785	49,595	51,658	106,955	385,993	0,764	0,533	1,297	
MA Total:	1,448,036	10	152	1,339,723	1,818,114	758,945	778,018	4,694,800	2,181	1,061	3,242	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.231	2.067	.
(14) Massachusetts Credibility:	0.410	0.580	.
(15) Countrywide Pure Premium:	1.809	0.799	2.609
(16) Countrywide Indicated Relativity:	2.020	1.737	.
(17) Countrywide Credibility:	0.300	0.210	.
(18) Countrywide Lost-Time Claims:	3358.0	.	.
(19) Pure Premium Underlying Present Rate:	2.012	1.073	3.085
(20) Relativity to Underlying Present Rate:	2.133	1.958	.
(21) Credibility to Underlying Relativity:	0.290	0.210	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.139	1.975	.
(24) Balanced Formula Relativity:	2.121	1.965	2.067

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Calculation of Class Relativities

Class(es): 2081 BUTCHERING		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	18,553	0	25	0	15,336	0	36,924	52,259	0.827	1.990	2.817
2012	16,408	0	9	0	38,622	0	25,962	64,583	2.354	1.582	3.936
2013	16,802	0	20	0	1,604	0	10,842	12,446	0.095	0.645	0.741
2014	18,882	0	10	0	50	0	5,984	6,034	0.003	0.317	0.320
2015	21,751	0	7	0	5,521	0	6,427	11,948	0.254	0.295	0.549
MA Total:	92,395	0	71	0	61,132	0	86,138	147,270	0.662	0.932	1.594

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.677	1.815	.
(14) Massachusetts Credibility:	0.130	0.220	.
(15) Countrywide Pure Premium:	1.266	0.778	2.044
(16) Countrywide Indicated Relativity:	1.413	1.691	.
(17) Countrywide Credibility:	0.440	0.390	.
(18) Countrywide Lost-Time Claims:	869.00	.	.
(19) Pure Premium Underlying Present Rate:	1.652	1.511	3.163
(20) Relativity to Underlying Present Rate:	1.752	2.757	.
(21) Credibility to Underlying Relativity:	0.430	0.390	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.463	2.134	.
(24) Balanced Formula Relativity:	1.450	2.124	1.682

Class(es): 2089 PACKING HOUSE- ALL OPERATIONS		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,027,494	9	214	440,781	1,499,034	80,440	716,608	2,736,864	1.888	0.776	2.664
2012	1,115,663	14	208	1,208,398	1,042,342	336,015	444,404	3,031,159	2.017	0.700	2.717
2013	1,286,083	10	203	846,391	1,656,735	329,136	546,762	3,379,024	1.946	0.681	2.627
2014	1,419,407	7	212	786,335	812,888	289,998	486,275	2,375,496	1.127	0.547	1.674
2015	1,658,481	11	226	1,116,848	2,408,367	219,988	1,175,502	4,920,705	2.126	0.841	2.967
MA Total:	6,507,127	51	1,063	4,398,753	7,419,367	1,255,578	3,369,551	16,443,249	1.816	0.711	2.527

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.858	1.384	.
(14) Massachusetts Credibility:	0.660	0.940	.
(15) Countrywide Pure Premium:	1.201	0.628	1.829
(16) Countrywide Indicated Relativity:	1.341	1.364	.
(17) Countrywide Credibility:	0.170	0.030	.
(18) Countrywide Lost-Time Claims:	10922	.	.
(19) Pure Premium Underlying Present Rate:	1.472	0.796	2.269
(20) Relativity to Underlying Present Rate:	1.561	1.453	.
(21) Credibility to Underlying Relativity:	0.170	0.030	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.719	1.385	.
(24) Balanced Formula Relativity:	1.705	1.379	1.592

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Calculation of Class Relativities

Class(es): 2095 MEAT PRODUCTS MFG-NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	385,043	7	77	465,120	392,057	102,978	189,253	1,149,408	2,226	0,759	2,985
2012	392,719	2	85	236,164	590,359	35,002	315,388	1,176,913	2,105	0,892	2,997
2013	401,525	1	67	256,835	659,458	27,102	268,223	1,211,617	2,282	0,736	3,018
2014	398,697	0	60	0	314,842	0	140,321	455,163	0,790	0,352	1,142
2015	406,845	4	60	760,824	627,348	173,953	311,724	1,873,849	3,412	1,194	4,606
MA Total:	1,984,829	14	349	1,718,943	2,584,063	339,034	1,224,909	5,866,949	2,168	0,788	2,956

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.218	1.534	.
(14) Massachusetts Credibility:	0.440	0.610	.
(15) Countrywide Pure Premium:	1.386	0.743	2.129
(16) Countrywide Indicated Relativity:	1.547	1.615	.
(17) Countrywide Credibility:	0.280	0.200	.
(18) Countrywide Lost-Time Claims:	2998.0	.	.
(19) Pure Premium Underlying Present Rate:	1.721	0.892	2.613
(20) Relativity to Underlying Present Rate:	1.824	1.628	.
(21) Credibility to Underlying Relativity:	0.280	0.190	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.920	1.568	.
(24) Balanced Formula Relativity:	1.903	1.561	1.785

Class(es): 2111 CANNERY NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,478	0	2	0	0	0	1,164	1,164	0.000	0.260	0.260
2012	14,988	0	4	0	6,626	0	3,238	9,864	0.442	0.216	0.658
2013	6,454	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	7,438	0	1	0	2,031	0	1,617	3,648	0.273	0.217	0.490
2015	9,343	0	1	0	0	0	311	311	0.000	0.033	0.033
MA Total:	42,701	0	8	0	8,657	0	6,331	14,987	0.203	0.148	0.351

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.207	0.289	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	1.104	0.576	1.679
(16) Countrywide Indicated Relativity:	1.232	1.251	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	1126.0	.	.
(19) Pure Premium Underlying Present Rate:	1.063	0.576	1.638
(20) Relativity to Underlying Present Rate:	1.126	1.051	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.101	1.057	.
(24) Balanced Formula Relativity:	1.092	1.052	1.078

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Calculation of Class Relativities

Class(es): 2115 SEAFOOD PRODUCTS MFG-NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	224,850	1	55	13,307	916,840	17,825	259,022	1,206,993	4,137	1,231	5,368
2012	208,009	1	52	66,090	587,236	7,717	205,138	866,181	3,141	1,023	4,164
2013	128,207	0	25	0	348,788	0	128,132	476,920	2,721	0,999	3,720
2014	178,880	2	27	878,016	368,499	110,645	145,938	1,503,098	6,968	1,434	8,403
2015	173,410	2	37	236,042	146,325	102,969	122,386	607,722	2,205	1,300	3,505
MA Total:	913,355	6	196	1,193,455	2,367,687	239,157	860,615	4,660,914	3,899	1,204	5,103

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.988	2.345	.
(14) Massachusetts Credibility:	0.330	0.520	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.007	2.327	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.918	1.293	3.211
(20) Relativity to Underlying Present Rate:	2.033	2.359	.
(21) Credibility to Underlying Relativity:	0.670	0.480	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.679	2.352	.
(24) Balanced Formula Relativity:	2.656	2.340	2.547

Class(es): 2121 BREWERY & DRIVERS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	73,032	0	4	0	786	0	3,208	3,994	0.011	0.044	0.055
2012	81,670	0	7	0	3,522	0	29,430	32,952	0.043	0.360	0.403
2013	93,124	0	16	0	5,697	0	25,266	30,963	0.061	0.271	0.332
2014	114,534	0	15	0	3,812	0	10,552	14,364	0.033	0.092	0.125
2015	159,589	0	21	0	123,607	0	41,242	164,850	0.775	0.258	1.033
MA Total:	521,948	0	63	0	137,424	0	109,698	247,122	0.263	0.210	0.473

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.269	0.409	.
(14) Massachusetts Credibility:	0.170	0.270	.
(15) Countrywide Pure Premium:	0.634	0.346	0.981
(16) Countrywide Indicated Relativity:	0.708	0.752	.
(17) Countrywide Credibility:	0.420	0.370	.
(18) Countrywide Lost-Time Claims:	690.00	.	.
(19) Pure Premium Underlying Present Rate:	0.646	0.434	1.080
(20) Relativity to Underlying Present Rate:	0.685	0.792	.
(21) Credibility to Underlying Relativity:	0.410	0.360	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.624	0.674	.
(24) Balanced Formula Relativity:	0.619	0.671	0.637

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Calculation of Class Relativities

Class(es): 2130 SPIRITUOUS LIQUOR DISTILLERY		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,749	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	1,748	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	1,148	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	5,036	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	15,996	0	1	0	0	0	1,309	1,309	0.000	0.082	0.082
MA Total:	25,676	0	1	0	0	0	1,309	1,309	0.000	0.051	0.051

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.099	.
(14) Massachusetts Credibility:	0.060	0.080	.
(15) Countrywide Pure Premium:	0.967	0.398	1.364
(16) Countrywide Indicated Relativity:	1.079	0.864	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	259.00	.	.
(19) Pure Premium Underlying Present Rate:	0.920	0.491	1.411
(20) Relativity to Underlying Present Rate:	0.975	0.896	.
(21) Credibility to Underlying Relativity:	0.470	0.460	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.965	0.818	.
(24) Balanced Formula Relativity:	0.957	0.814	0.908

Class(es): 2131 SPIRITUOUS LIQUOR BOTTLING		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	43,388	0	8	0	15,177	0	51,913	67,090	0.350	1.197	1.546
2012	49,249	0	10	0	4,923	0	6,919	11,842	0.100	0.140	0.240
2013	51,848	0	14	0	177,839	0	115,359	293,198	3.430	2.225	5.655
2014	64,419	0	18	0	283,430	0	158,473	441,903	4.400	2.460	6.860
2015	56,368	0	18	0	30,783	0	21,972	52,755	0.546	0.390	0.936
MA Total:	265,272	0	68	0	512,152	0	354,637	866,789	1.931	1.337	3.268

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.975	2.603	.
(14) Massachusetts Credibility:	0.160	0.240	.
(15) Countrywide Pure Premium:	1.081	0.401	1.482
(16) Countrywide Indicated Relativity:	1.207	0.872	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	183.00	.	.
(19) Pure Premium Underlying Present Rate:	1.125	0.645	1.770
(20) Relativity to Underlying Present Rate:	1.192	1.176	.
(21) Credibility to Underlying Relativity:	0.420	0.380	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.324	1.403	.
(24) Balanced Formula Relativity:	1.312	1.396	1.341

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Calculation of Class Relativities

Class(es): 2143 FRUIT JUICE MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	63,202	0	3	0	0	0	1,034	1,034	0.000	0.016	0.016
2012	62,547	0	6	0	0	0	3,751	3,751	0.000	0.060	0.060
2013	43,418	0	15	0	13,014	0	16,310	29,325	0.300	0.376	0.675
2014	46,627	0	8	0	223	0	7,813	8,036	0.005	0.168	0.172
2015	57,932	1	18	106,999	108,864	35,236	78,443	329,542	3.726	1.962	5.688
MA Total:	273,726	1	50	106,999	122,101	35,236	107,351	371,687	0.837	0.521	1.358

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.856	1.014	.
(14) Massachusetts Credibility:	0.150	0.230	.
(15) Countrywide Pure Premium:	0.993	0.471	1.465
(16) Countrywide Indicated Relativity:	1.109	1.024	.
(17) Countrywide Credibility:	0.430	0.390	.
(18) Countrywide Lost-Time Claims:	248.00	.	.
(19) Pure Premium Underlying Present Rate:	0.833	0.558	1.391
(20) Relativity to Underlying Present Rate:	0.883	1.018	.
(21) Credibility to Underlying Relativity:	0.420	0.380	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.976	1.019	.
(24) Balanced Formula Relativity:	0.968	1.014	0.984

Class(es): 2150 ICE MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	9,732	0	1	0	0	0	393	393	0.000	0.040	0.040
2012	8,181	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	7,624	0	2	0	3,435	0	11,363	14,797	0.451	1.490	1.941
2014	6,795	0	2	0	2,997	0	2,373	5,370	0.441	0.349	0.790
2015	7,338	0	1	0	10,239	0	1,905	12,144	1.395	0.260	1.655
MA Total:	39,670	0	6	0	16,671	0	16,034	32,705	0.420	0.404	0.824

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.430	0.787	.
(14) Massachusetts Credibility:	0.100	0.160	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.496	2.586	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.386	1.437	3.823
(20) Relativity to Underlying Present Rate:	2.529	2.622	.
(21) Credibility to Underlying Relativity:	0.900	0.840	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.319	2.329	.
(24) Balanced Formula Relativity:	2.299	2.317	2.305

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Calculation of Class Relativities

Class(es): 2156 BOTTLING-NOT CARBONATED LIQUIDS OR SPIRIT LIQRS & RTE SUP,DR												Effective: 7/1/2018		Manufacturing	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	89,699	0	19	0	5,900	0	19,234	25,134	0.066	0.214	0.280				
2012	89,562	0	9	0	2,165	0	7,313	9,478	0.024	0.082	0.106				
2013	64,810	1	13	80,531	249,683	9,936	162,553	502,703	5.095	2.661	7.757				
2014	77,369	0	14	0	32,339	0	57,702	90,041	0.418	0.746	1.164				
2015	89,808	1	11	86,137	191,138	69,314	96,555	443,144	3.087	1.847	4.934				
MA Total:	411,248	2	66	166,668	481,226	79,250	343,357	1,070,501	1.575	1.028	2.603				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.612	2.001	.
(14) Massachusetts Credibility:	0.280	0.390	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.802	2.508	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.679	1.394	4.072
(20) Relativity to Underlying Present Rate:	2.839	2.543	.
(21) Credibility to Underlying Relativity:	0.720	0.610	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.496	2.332	.
(24) Balanced Formula Relativity:	2.474	2.320	2.421

Class(es): 2157 BOTTLING NOC & ROUTE SUPERVISORS, DRIVERS												Effective: 7/1/2018		Manufacturing	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	287,750	1	111	143,168	225,911	19,183	216,772	605,034	1.283	0.820	2.103				
2012	294,584	1	104	13,800	639,541	2,801	275,062	931,204	2.218	0.943	3.161				
2013	294,943	2	103	318,215	427,113	55,003	155,987	956,318	2.527	0.715	3.242				
2014	322,436	1	83	98,906	282,872	14,155	201,203	597,136	1.184	0.668	1.852				
2015	344,869	1	89	66,623	282,066	20,239	344,819	713,747	1.011	1.059	2.070				
MA Total:	1,544,582	6	490	640,712	1,857,503	111,381	1,193,843	3,803,440	1.617	0.845	2.462				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.654	1.645	.
(14) Massachusetts Credibility:	0.420	0.580	.
(15) Countrywide Pure Premium:	2.359	0.893	3.252
(16) Countrywide Indicated Relativity:	2.633	1.941	.
(17) Countrywide Credibility:	0.290	0.210	.
(18) Countrywide Lost-Time Claims:	6435.0	.	.
(19) Pure Premium Underlying Present Rate:	2.031	1.012	3.043
(20) Relativity to Underlying Present Rate:	2.153	1.847	.
(21) Credibility to Underlying Relativity:	0.290	0.210	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.083	1.750	.
(24) Balanced Formula Relativity:	2.065	1.741	1.953

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Calculation of Class Relativities

Class(es): 2172 CIGARETTE MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	172	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	52	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,669	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	1,894	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.020	0.030	.
(15) Countrywide Pure Premium:	0.906	0.342	1.248
(16) Countrywide Indicated Relativity:	1.011	0.742	.
(17) Countrywide Credibility:	0.490	0.490	.
(18) Countrywide Lost-Time Claims:	317.00	.	.
(19) Pure Premium Underlying Present Rate:	1.248	0.418	1.666
(20) Relativity to Underlying Present Rate:	1.323	0.763	.
(21) Credibility to Underlying Relativity:	0.490	0.480	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.144	0.730	.
(24) Balanced Formula Relativity:	1.134	0.727	0.994

Class(es): 2211 COTTON BATTING,WADDING OR WASTE MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,416	0	2	0	0	0	1,136	1,136	0.000	0.803	0.803
2012	1,123	0	3	0	2,040	0	3,387	5,427	1.816	3.016	4.832
2013	551	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	468	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	263	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	3,820	0	5	0	2,040	0	4,524	6,563	0.534	1.184	1.718

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.546	2.306	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	2.792	1.715	4.508
(16) Countrywide Indicated Relativity:	3.117	3.727	.
(17) Countrywide Credibility:	0.310	0.330	.
(18) Countrywide Lost-Time Claims:	61.000	.	.
(19) Pure Premium Underlying Present Rate:	3.403	1.892	5.295
(20) Relativity to Underlying Present Rate:	3.607	3.451	.
(21) Credibility to Underlying Relativity:	0.640	0.600	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	3.302	3.462	.
(24) Balanced Formula Relativity:	3.274	3.445	3.333

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Section IX - G
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Calculation of Class Relativities

Class(es): 2220 YARN OR THREAD MFG-COTTON		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	87,449	0	27	0	176,713	0	129,623	306,335	2,021	1,482	3,503
2012	87,512	0	35	0	173,131	0	78,669	251,800	1,978	0,899	2,877
2013	85,462	1	29	131,941	155,592	12,716	57,067	357,316	3,364	0,817	4,181
2014	94,001	0	25	0	71,426	0	56,060	127,486	0,760	0,596	1,356
2015	96,917	1	17	53,179	780	8,756	15,509	78,224	0,557	0,250	0,807
MA Total:	451,341	2	133	185,121	577,641	21,472	336,927	1,121,160	1,690	0,794	2,484

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.729	1.546	.
(14) Massachusetts Credibility:	0.210	0.330	.
(15) Countrywide Pure Premium:	0.785	0.476	1.261
(16) Countrywide Indicated Relativity:	0.876	1.034	.
(17) Countrywide Credibility:	0.400	0.340	.
(18) Countrywide Lost-Time Claims:	795.00	.	.
(19) Pure Premium Underlying Present Rate:	1.265	0.837	2.101
(20) Relativity to Underlying Present Rate:	1.340	1.526	.
(21) Credibility to Underlying Relativity:	0.390	0.330	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.236	1.365	.
(24) Balanced Formula Relativity:	1.226	1.359	1.271

Class(es): 2260 WOOL COMBING OR SCOURING		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	544	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	550	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	405	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	488	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	522	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	2,508	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.050	.
(15) Countrywide Pure Premium:	1.231	0.661	1.892
(16) Countrywide Indicated Relativity:	1.374	1.437	.
(17) Countrywide Credibility:	0.140	0.140	.
(18) Countrywide Lost-Time Claims:	8.000	.	.
(19) Pure Premium Underlying Present Rate:	3.541	1.680	5.220
(20) Relativity to Underlying Present Rate:	3.753	3.065	.
(21) Credibility to Underlying Relativity:	0.820	0.810	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	3.270	2.684	.
(24) Balanced Formula Relativity:	3.242	2.670	3.045

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Calculation of Class Relativities

Class(es): 2288 FELTING MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	107,534	0	18	0	129,420	0	100,246	229,666	1,204	0,932	2,136
2012	120,026	0	20	0	32,142	0	34,570	66,711	0,268	0,288	0,556
2013	128,095	0	26	0	123,963	0	52,526	176,489	0,968	0,410	1,378
2014	110,090	1	17	128,908	249,798	9,697	37,717	426,120	3,440	0,431	3,871
2015	117,630	0	25	0	257,619	0	73,025	330,644	2,190	0,621	2,811
MA Total:	583,375	1	106	128,908	792,941	9,697	298,084	1,229,630	1,580	0,528	2,108

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.616	1.027	.
(14) Massachusetts Credibility:	0.260	0.380	.
(15) Countrywide Pure Premium:	1.425	0.861	2.286
(16) Countrywide Indicated Relativity:	1.591	1.871	.
(17) Countrywide Credibility:	0.370	0.310	.
(18) Countrywide Lost-Time Claims:	193.00	.	.
(19) Pure Premium Underlying Present Rate:	1.597	0.895	2.492
(20) Relativity to Underlying Present Rate:	1.693	1.633	.
(21) Credibility to Underlying Relativity:	0.370	0.310	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.635	1.477	.
(24) Balanced Formula Relativity:	1.621	1.469	1.569

Class(es): 2305 TEXTILE FIBER MFG-SYNTHETIC		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	41,146	0	5	0	26,427	0	13,186	39,613	0,642	0,320	0,963
2012	33,800	1	5	166,405	329,560	115,193	84,537	695,696	14,673	5,909	20,583
2013	13,319	3	2	139,850	28,018	29,499	2,639	200,006	12,604	2,413	15,017
2014	2,148	0	2	0	0	0	1,766	1,766	0,000	0,822	0,822
2015	3,525	0	2	0	3,250	0	1,431	4,682	0,922	0,406	1,328
MA Total:	93,938	4	16	306,255	387,256	144,692	103,559	941,762	7,383	2,643	10,025

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	7.552	5.146	.
(14) Massachusetts Credibility:	0.130	0.180	.
(15) Countrywide Pure Premium:	1.024	0.500	1.525
(16) Countrywide Indicated Relativity:	1.144	1.087	.
(17) Countrywide Credibility:	0.440	0.410	.
(18) Countrywide Lost-Time Claims:	729.00	.	.
(19) Pure Premium Underlying Present Rate:	1.766	0.929	2.695
(20) Relativity to Underlying Present Rate:	1.872	1.696	.
(21) Credibility to Underlying Relativity:	0.430	0.410	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.290	2.067	.
(24) Balanced Formula Relativity:	2.270	2.057	2.197

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Calculation of Class Relativities

Class(es): 2362 KNIT GOODS MFG NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	13,701	0	8	0	7,194	0	14,107	21,301	0.525	1.030	1.555
2012	12,958	0	1	0	0	0	342	342	0.000	0.026	0.026
2013	14,472	0	1	0	0	0	306	306	0.000	0.021	0.021
2014	13,641	0	1	0	0	0	3,046	3,046	0.000	0.223	0.223
2015	9,753	0	2	0	8,424	0	25,777	34,201	0.864	2.643	3.507
MA Total:	64,526	0	13	0	15,618	0	43,579	59,196	0.242	0.675	0.917

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.248	1.315	.
(14) Massachusetts Credibility:	0.080	0.120	.
(15) Countrywide Pure Premium:	0.759	0.467	1.225
(16) Countrywide Indicated Relativity:	0.847	1.014	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	163.00	.	.
(19) Pure Premium Underlying Present Rate:	0.721	0.468	1.189
(20) Relativity to Underlying Present Rate:	0.764	0.854	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.761	0.980	.
(24) Balanced Formula Relativity:	0.754	0.975	0.830

Class(es): 2380 WEBBING MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	72,496	1	13	59,418	1,107	12,398	11,100	84,024	0.835	0.324	1.159
2012	67,197	0	7	0	7,278	0	9,521	16,799	0.108	0.142	0.250
2013	67,407	1	10	178,840	154,008	71,206	55,308	459,363	4.938	1.877	6.815
2014	70,637	0	5	0	7,293	0	9,560	16,854	0.103	0.135	0.239
2015	63,280	0	15	0	22,351	0	32,601	54,952	0.353	0.515	0.868
MA Total:	341,018	2	50	238,259	192,038	83,604	118,091	631,991	1.262	0.591	1.853

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.291	1.152	.
(14) Massachusetts Credibility:	0.180	0.270	.
(15) Countrywide Pure Premium:	1.151	0.643	1.795
(16) Countrywide Indicated Relativity:	1.285	1.398	.
(17) Countrywide Credibility:	0.410	0.370	.
(18) Countrywide Lost-Time Claims:	242.00	.	.
(19) Pure Premium Underlying Present Rate:	1.131	0.693	1.823
(20) Relativity to Underlying Present Rate:	1.198	1.264	.
(21) Credibility to Underlying Relativity:	0.410	0.360	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.251	1.283	.
(24) Balanced Formula Relativity:	1.240	1.277	1.253

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Calculation of Class Relativities

Class(es): 2402 CARPET OR RUG MFG NOC												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	5,165	0	1	0	0	0	368	368	0.000	0.071	0.071						
2012	8,903	0	3	0	146	0	1,883	2,029	0.016	0.212	0.228						
2013	9,491	0	2	0	0	0	261	261	0.000	0.027	0.027						
2014	6,545	0	0	0	0	0	0	0	0.000	0.000	0.000						
2015	8,562	0	0	0	0	0	0	0	0.000	0.000	0.000						
MA Total:	38,666	0	6	0	146	0	2,512	2,658	0.004	0.065	0.069						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.004	0.127	.
(14) Massachusetts Credibility:	0.070	0.110	.
(15) Countrywide Pure Premium:	1.285	0.745	2.031
(16) Countrywide Indicated Relativity:	1.435	1.619	.
(17) Countrywide Credibility:	0.470	0.450	.
(18) Countrywide Lost-Time Claims:	359.00	.	.
(19) Pure Premium Underlying Present Rate:	1.028	0.603	1.631
(20) Relativity to Underlying Present Rate:	1.089	1.101	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.176	1.227	.
(24) Balanced Formula Relativity:	1.166	1.221	1.185

Class(es): 2413 TEXTILE - BLEACHING, DYEING, MERCERZNG, FINISH												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	278,457	0	58	0	366,160	0	170,441	536,601	1,315	0.612	1,927						
2012	228,889	1	56	180,246	390,218	25,388	168,452	764,304	2,492	0.847	3,339						
2013	278,287	0	39	0	423,262	0	143,037	566,299	1,521	0.514	2,035						
2014	328,027	2	42	197,841	460,412	42,850	210,637	911,740	2,007	0.773	2,779						
2015	297,056	1	51	11,414	897,108	5,355	776,800	1,690,678	3,058	2.633	5,691						
MA Total:	1,410,716	4	246	389,502	2,537,161	73,593	1,469,366	4,469,622	2,075	1.094	3,168						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.122	2.130	.
(14) Massachusetts Credibility:	0.370	0.570	.
(15) Countrywide Pure Premium:	1.027	0.630	1.657
(16) Countrywide Indicated Relativity:	1.147	1.369	.
(17) Countrywide Credibility:	0.320	0.220	.
(18) Countrywide Lost-Time Claims:	260.00	.	.
(19) Pure Premium Underlying Present Rate:	1.635	1.035	2.669
(20) Relativity to Underlying Present Rate:	1.733	1.888	.
(21) Credibility to Underlying Relativity:	0.310	0.210	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.689	1.911	.
(24) Balanced Formula Relativity:	1.675	1.902	1.753

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Calculation of Class Relativities

Class(es): 2416 YARN OR THREAD DYEING OR FINISHING		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	18,839	0	3	0	0	0	1,768	1,768	0.000	0.094	0.094
2012	14,636	0	3	0	18,002	0	4,897	22,898	1,230	0.335	1.565
2013	16,577	1	4	97,222	108,626	24,661	32,140	262,649	12,418	3.427	15.844
2014	16,410	0	2	0	0	0	2,656	2,656	0.000	0.162	0.162
2015	14,775	1	3	1,263	695	6,882	17,495	26,334	0.132	1.650	1.782
MA Total:	81,236	2	15	98,484	127,322	31,543	58,956	316,306	2,780	1.114	3.894

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.843	2.169	.
(14) Massachusetts Credibility:	0.110	0.150	.
(15) Countrywide Pure Premium:	1.020	0.386	1.406
(16) Countrywide Indicated Relativity:	1.138	0.839	.
(17) Countrywide Credibility:	0.260	0.280	.
(18) Countrywide Lost-Time Claims:	41.000	.	.
(19) Pure Premium Underlying Present Rate:	1.266	0.652	1.918
(20) Relativity to Underlying Present Rate:	1.342	1.189	.
(21) Credibility to Underlying Relativity:	0.630	0.570	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.454	1.238	.
(24) Balanced Formula Relativity:	1.442	1.232	1.370

Class(es): 2417 CLOTH PRINTING		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	63,184	2	12	245,366	10,710	131,947	18,343	406,367	4,053	2.379	6.432
2012	52,651	0	9	0	95,033	0	19,641	114,674	1,805	0.373	2.178
2013	54,585	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	54,295	0	2	0	94,239	0	16,271	110,510	1,736	0.300	2.035
2015	59,268	0	1	0	477	0	980	1,457	0.008	0.017	0.025
MA Total:	283,984	2	24	245,366	200,459	131,947	55,236	633,008	1,570	0.659	2.229

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.606	1.283	.
(14) Massachusetts Credibility:	0.210	0.270	.
(15) Countrywide Pure Premium:	0.562	0.288	0.850
(16) Countrywide Indicated Relativity:	0.627	0.625	.
(17) Countrywide Credibility:	0.250	0.260	.
(18) Countrywide Lost-Time Claims:	36.000	.	.
(19) Pure Premium Underlying Present Rate:	1.910	0.797	2.708
(20) Relativity to Underlying Present Rate:	2.025	1.455	.
(21) Credibility to Underlying Relativity:	0.540	0.470	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.588	1.193	.
(24) Balanced Formula Relativity:	1.574	1.187	1.441

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Calculation of Class Relativities

Class(es): 2501 CLOTHING MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	928,747	5	131	433,817	447,696	161,560	196,070	1,239,143	0.949	0.385	1,334
2012	919,934	3	122	47,097	699,672	26,874	509,870	1,283,514	0.812	0.583	1,395
2013	887,702	5	106	402,947	236,651	103,568	224,547	967,712	0.721	0.370	1,090
2014	861,626	3	81	329,018	1,221,253	97,110	284,009	1,931,391	1.799	0.442	2,242
2015	911,377	3	107	249,594	452,617	55,832	330,552	1,088,595	0.770	0.424	1,194
MA Total:	4,509,386	19	547	1,462,474	3,057,888	444,944	1,545,049	6,510,355	1.002	0.441	1,444

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.025	0.859	.
(14) Massachusetts Credibility:	0.480	0.720	.
(15) Countrywide Pure Premium:	0.954	0.590	1.544
(16) Countrywide Indicated Relativity:	1.064	1.283	.
(17) Countrywide Credibility:	0.260	0.140	.
(18) Countrywide Lost-Time Claims:	2670.0	.	.
(19) Pure Premium Underlying Present Rate:	0.955	0.583	1.538
(20) Relativity to Underlying Present Rate:	1.012	1.064	.
(21) Credibility to Underlying Relativity:	0.260	0.140	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.032	0.947	.
(24) Balanced Formula Relativity:	1.023	0.942	0.995

Class(es): 2503 DRESSMAKING OR TAILORING-CUSTOM EXCLUSIVELY		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	50,963	0	5	0	18,430	0	10,187	28,617	0.362	0.200	0.562
2012	50,099	0	2	0	4,507	0	19,118	23,625	0.090	0.382	0.472
2013	51,737	1	3	146,720	12,857	14,410	3,060	177,047	3.084	0.338	3,422
2014	62,087	0	2	0	4,875	0	1,631	6,505	0.079	0.026	0.105
2015	54,635	0	2	0	43,247	0	30,155	73,402	0.792	0.552	1,344
MA Total:	269,520	1	14	146,720	83,916	14,410	64,150	309,197	0.856	0.291	1,147

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.875	0.568	.
(14) Massachusetts Credibility:	0.120	0.180	.
(15) Countrywide Pure Premium:	1.106	0.348	1.454
(16) Countrywide Indicated Relativity:	1.234	0.757	.
(17) Countrywide Credibility:	0.250	0.270	.
(18) Countrywide Lost-Time Claims:	37,000	.	.
(19) Pure Premium Underlying Present Rate:	0.523	0.308	0.831
(20) Relativity to Underlying Present Rate:	0.555	0.561	.
(21) Credibility to Underlying Relativity:	0.630	0.550	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.763	0.615	.
(24) Balanced Formula Relativity:	0.757	0.612	0.707

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Calculation of Class Relativities

Class(es): 2570 MATTRESS OR BOX SPRING MFG												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	110,957	3	19	339,329	351,458	107,015	88,714	886,516	6,226	1,764	7,990						
2012	115,813	4	31	690,722	423,255	167,767	103,659	1,385,403	9,619	2,344	11,962						
2013	29,228	0	8	0	55,851	0	10,417	66,268	1,911	0,356	2,267						
2014	33,050	0	4	0	0	0	3,408	3,408	0,000	0,103	0,103						
2015	38,338	0	6	0	1,251	0	2,582	3,833	0,033	0,067	0,100						
MA Total:	327,386	7	68	1,030,051	831,814	274,782	208,780	2,345,428	5,687	1,477	7,164						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.817	2.876	.
(14) Massachusetts Credibility:	0.260	0.400	.
(15) Countrywide Pure Premium:	1.796	0.801	2.598
(16) Countrywide Indicated Relativity:	2.005	1.741	.
(17) Countrywide Credibility:	0.370	0.300	.
(18) Countrywide Lost-Time Claims:	522.00	.	.
(19) Pure Premium Underlying Present Rate:	2.806	1.890	4.697
(20) Relativity to Underlying Present Rate:	2.975	3.449	.
(21) Credibility to Underlying Relativity:	0.370	0.300	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	3.355	2.708	.
(24) Balanced Formula Relativity:	3.326	2.694	3.108

Class(es): 2576 CANVAS GOODS MFG NOC-SHOP												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	84,526	0	11	0	16,719	0	29,187	45,906	0,198	0,345	0,543						
2012	91,237	0	8	0	41	0	3,206	3,247	0,000	0,035	0,036						
2013	101,331	0	11	0	58,370	0	51,011	109,381	0,576	0,503	1,079						
2014	111,278	1	11	2,788	51,070	3,356	60,042	117,255	0,484	0,570	1,054						
2015	117,479	0	11	0	89,183	0	148,064	237,247	0,759	1,260	2,019						
MA Total:	505,850	1	52	2,788	215,383	3,356	291,510	513,036	0,431	0,583	1,014						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.441	1.135	.
(14) Massachusetts Credibility:	0.200	0.280	.
(15) Countrywide Pure Premium:	0.913	0.388	1.301
(16) Countrywide Indicated Relativity:	1.019	0.843	.
(17) Countrywide Credibility:	0.160	0.160	.
(18) Countrywide Lost-Time Claims:	11.000	.	.
(19) Pure Premium Underlying Present Rate:	0.914	0.498	1.411
(20) Relativity to Underlying Present Rate:	0.969	0.908	.
(21) Credibility to Underlying Relativity:	0.640	0.560	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.871	0.961	.
(24) Balanced Formula Relativity:	0.864	0.957	0.896

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Calculation of Class Relativities

Class(es): 2585 LAUNDRY NOC & ROUTE SUPERVISORS, DRIVERS												Effective: 7/1/2018	Manufacturing
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2011	604,030	4	117	664,421	456,887	473,750	222,415	1,817,473	1,856	1,153	3,009		
2012	590,947	5	83	262,072	774,595	85,253	517,657	1,639,577	1,754	1,020	2,774		
2013	674,164	6	75	317,573	290,596	200,017	204,811	1,012,996	0,902	0,600	1,503		
2014	743,820	4	109	219,091	485,495	61,985	333,842	1,100,412	0,947	0,532	1,479		
2015	779,228	6	108	540,660	385,222	306,503	271,642	1,504,026	1,188	0,742	1,930		
MA Total:	3,392,188	25	492	2,003,816	2,392,795	1,127,507	1,550,367	7,074,484	1,296	0,789	2,086		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.326	1.537	.
(14) Massachusetts Credibility:	0.520	0.760	.
(15) Countrywide Pure Premium:	1.708	0.792	2.499
(16) Countrywide Indicated Relativity:	1.906	1.720	.
(17) Countrywide Credibility:	0.240	0.120	.
(18) Countrywide Lost-Time Claims:	3724.0	.	.
(19) Pure Premium Underlying Present Rate:	1.547	0.903	2.449
(20) Relativity to Underlying Present Rate:	1.640	1.647	.
(21) Credibility to Underlying Relativity:	0.240	0.120	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.540	1.572	.
(24) Balanced Formula Relativity:	1.527	1.564	1.540

Class(es): 2586 CLEANING OR DYEING & ROUTE SUPERVISORS, DRIVERS												Effective: 7/1/2018	Manufacturing
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2011	505,594	1	44	45,226	388,046	2,538	186,027	621,837	0,857	0,373	1,230		
2012	514,043	4	32	330,817	146,678	159,726	150,470	787,691	0,929	0,603	1,532		
2013	510,922	1	41	47,293	88,130	4,296	81,989	221,708	0,265	0,169	0,434		
2014	492,235	0	54	0	305,389	0	307,120	612,509	0,620	0,624	1,244		
2015	532,723	2	46	24,284	261,588	20,448	129,731	436,050	0,537	0,282	0,819		
MA Total:	2,555,518	8	217	447,619	1,189,831	187,008	855,338	2,679,796	0,641	0,408	1,049		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.655	0.794	.
(14) Massachusetts Credibility:	0.350	0.520	.
(15) Countrywide Pure Premium:	1.106	0.556	1.662
(16) Countrywide Indicated Relativity:	1.235	1.208	.
(17) Countrywide Credibility:	0.330	0.240	.
(18) Countrywide Lost-Time Claims:	249.00	.	.
(19) Pure Premium Underlying Present Rate:	0.798	0.448	1.246
(20) Relativity to Underlying Present Rate:	0.846	0.818	.
(21) Credibility to Underlying Relativity:	0.320	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.908	0.899	.
(24) Balanced Formula Relativity:	0.900	0.895	0.898

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
2587 TOWEL OR TOILET SUPPLY CO & RTE SUPERVISORS, DR												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	33,600	1	4	1,712	486,311	6,801	89,380	584,205	14,524	2,863	17,387	
2012	22,983	0	2	0	0	0	3,239	3,239	0.000	0.141	0.141	
2013	23,502	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	28,700	1	2	27,063	1,258	30,741	1,157	60,217	0.987	1.111	2.098	
2015	27,234	0	1	0	0	0	295	295	0.000	0.011	0.011	
MA Total:	136,020	2	9	28,775	487,568	37,542	94,071	647,956	3.796	0.968	4.764	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.538	2.034	.
(14) Massachusetts Credibility:	0.150	0.250	.
(15) Countrywide Pure Premium:	1.242	0.472	1.714
(16) Countrywide Indicated Relativity:	1.489	0.987	.
(17) Countrywide Credibility:	0.410	0.380	.
(18) Countrywide Lost-Time Claims:	123.00	.	.
(19) Pure Premium Underlying Present Rate:	1.873	1.399	3.272
(20) Relativity to Underlying Present Rate:	2.259	2.745	.
(21) Credibility to Underlying Relativity:	0.440	0.370	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.285	1.899	.
(24) Balanced Formula Relativity:	2.270	1.898	2.135

Class(es):		Effective: 7/1/2018							Manufacturing			
2623 TANNING												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	132	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	2,086	0	0	0	0	0	0	0	0.000	0.000	0.000	
2013	1,896	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	2,628	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	2,528	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	9,270	0	0	0	0	0	0	0	0.000	0.000	0.000	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.060	0.090	.
(15) Countrywide Pure Premium:	3.037	1.312	4.349
(16) Countrywide Indicated Relativity:	3.390	2.851	.
(17) Countrywide Credibility:	0.390	0.410	.
(18) Countrywide Lost-Time Claims:	107.00	.	.
(19) Pure Premium Underlying Present Rate:	2.280	1.404	3.685
(20) Relativity to Underlying Present Rate:	2.417	2.563	.
(21) Credibility to Underlying Relativity:	0.550	0.500	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.652	2.450	.
(24) Balanced Formula Relativity:	2.629	2.438	2.563

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Calculation of Class Relativities

Class(es): 2651 SHOE STOCK MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	59,515	1	7	199,487	18,361	9,440	45,884	273,173	3,660	0,930	4,590
2012	63,079	0	13	0	1,395	0	14,487	15,882	0,022	0,230	0,252
2013	61,831	0	7	0	0	0	2,612	2,612	0,000	0,042	0,042
2014	61,617	0	4	0	1,816	0	11,298	13,114	0,029	0,183	0,213
2015	58,024	1	3	24,133	0	27,158	412	51,702	0,416	0,475	0,891
MA Total:	304,065	2	34	223,620	21,572	36,598	74,693	356,483	0,806	0,366	1,172

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.825	0.713	.
(14) Massachusetts Credibility:	0.150	0.220	.
(15) Countrywide Pure Premium:	0.632	0.302	0.934
(16) Countrywide Indicated Relativity:	0.706	0.656	.
(17) Countrywide Credibility:	0.380	0.390	.
(18) Countrywide Lost-Time Claims:	104.00	.	.
(19) Pure Premium Underlying Present Rate:	0.815	0.430	1.245
(20) Relativity to Underlying Present Rate:	0.864	0.785	.
(21) Credibility to Underlying Relativity:	0.470	0.390	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.798	0.719	.
(24) Balanced Formula Relativity:	0.791	0.715	0.765

Class(es): 2660 BOOT OR SHOE MFG NOC		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	43,694	0	9	0	17,724	0	47,261	64,985	0,406	1,082	1,487
2012	48,173	0	6	0	12,202	0	4,762	16,964	0,253	0,099	0,352
2013	44,048	0	1	0	1,999	0	8,400	10,399	0,045	0,191	0,236
2014	46,156	1	2	4,967	0	2,112	334	7,413	0,108	0,053	0,161
2015	44,779	0	4	0	198,448	0	84,348	282,796	4,432	1,884	6,315
MA Total:	226,851	1	22	4,967	230,374	2,112	145,104	382,557	1,037	0,649	1,686

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.061	1.264	.
(14) Massachusetts Credibility:	0.130	0.210	.
(15) Countrywide Pure Premium:	0.922	0.485	1.407
(16) Countrywide Indicated Relativity:	1.029	1.054	.
(17) Countrywide Credibility:	0.440	0.400	.
(18) Countrywide Lost-Time Claims:	254.00	.	.
(19) Pure Premium Underlying Present Rate:	0.751	0.562	1.312
(20) Relativity to Underlying Present Rate:	0.796	1.025	.
(21) Credibility to Underlying Relativity:	0.430	0.390	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.933	1.087	.
(24) Balanced Formula Relativity:	0.925	1.081	0.979

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Calculation of Class Relativities

Class(es): 2683 LUGGAGE MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,395	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	2,504	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	3,225	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	1,056	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	2,504	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	10,683	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	0.935	0.893	1.828
(16) Countrywide Indicated Relativity:	1.044	1.941	.
(17) Countrywide Credibility:	0.260	0.280	.
(18) Countrywide Lost-Time Claims:	40.000	.	.
(19) Pure Premium Underlying Present Rate:	0.795	0.457	1.252
(20) Relativity to Underlying Present Rate:	0.843	0.833	.
(21) Credibility to Underlying Relativity:	0.700	0.660	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.861	1.093	.
(24) Balanced Formula Relativity:	0.854	1.088	0.934

Class(es): 2688 LEATHER GOODS MFG NOC		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	71,166	0	16	0	26,278	0	52,410	78,688	0.369	0.736	1.106
2012	69,119	0	9	0	1,790	0	9,479	11,268	0.026	0.137	0.163
2013	70,432	0	8	0	238	0	20,149	20,387	0.003	0.286	0.289
2014	81,800	1	7	69,818	30,784	2,651	23,212	126,466	1.230	0.316	1.546
2015	79,057	0	7	0	5,533	0	11,934	17,467	0.070	0.151	0.221
MA Total:	371,575	1	47	69,818	64,623	2,651	117,184	254,277	0.362	0.323	0.684

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.370	0.628	.
(14) Massachusetts Credibility:	0.190	0.280	.
(15) Countrywide Pure Premium:	1.429	0.659	2.088
(16) Countrywide Indicated Relativity:	1.595	1.432	.
(17) Countrywide Credibility:	0.390	0.360	.
(18) Countrywide Lost-Time Claims:	111.00	.	.
(19) Pure Premium Underlying Present Rate:	1.141	0.670	1.811
(20) Relativity to Underlying Present Rate:	1.209	1.223	.
(21) Credibility to Underlying Relativity:	0.420	0.360	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.200	1.132	.
(24) Balanced Formula Relativity:	1.190	1.126	1.168

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Miscellaneous		
2702 LOGGING OR LUMBERING & DRIVERS											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	28,832	0	7	0	60,995	0	57,814	118,809	2,116	2,005	4,121
2012	28,970	0	6	0	6,514	0	36,841	43,355	0,225	1,272	1,497
2013	30,199	0	8	0	291,628	0	191,326	482,955	9,657	6,335	15,992
2014	33,107	0	6	0	52,096	0	66,732	118,828	1,574	2,016	3,589
2015	42,026	0	8	0	139,682	0	78,787	218,469	3,324	1,875	5,198
MA Total:	163,135	0	35	0	550,914	0	431,502	982,416	3,377	2,645	6,022

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.408	2.217	.
(14) Massachusetts Credibility:	0.290	0.420	.
(15) Countrywide Pure Premium:	8.549	4.444	12.993
(16) Countrywide Indicated Relativity:	3.966	4.185	.
(17) Countrywide Credibility:	0.360	0.290	.
(18) Countrywide Lost-Time Claims:	1806.0	.	.
(19) Pure Premium Underlying Present Rate:	7.813	4.129	11.942
(20) Relativity to Underlying Present Rate:	3.206	3.129	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	2.958	3.052	.
(24) Balanced Formula Relativity:	2.946	3.073	2.988

Class(es):		Effective: 7/1/2018							Manufacturing		
2710 SAWMILLS											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	22,568	2	7	109,218	15,368	113,152	14,270	252,008	5,520	5,646	11,167
2012	25,090	0	17	0	24,673	0	37,461	62,134	0,983	1,493	2,476
2013	32,059	0	10	0	8,183	0	16,958	25,141	0,255	0,529	0,784
2014	30,445	0	8	0	19,205	0	18,349	37,553	0,631	0,603	1,233
2015	36,050	0	7	0	67,274	0	37,737	105,012	1,866	1,047	2,913
MA Total:	146,211	2	49	109,218	134,703	113,152	124,775	481,848	1,668	1,627	3,296

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.706	3.169	.
(14) Massachusetts Credibility:	0.190	0.310	.
(15) Countrywide Pure Premium:	3.804	2.277	6.082
(16) Countrywide Indicated Relativity:	4.247	4.948	.
(17) Countrywide Credibility:	0.410	0.350	.
(18) Countrywide Lost-Time Claims:	2004.0	.	.
(19) Pure Premium Underlying Present Rate:	3.028	2.186	5.214
(20) Relativity to Underlying Present Rate:	3.210	3.988	.
(21) Credibility to Underlying Relativity:	0.400	0.340	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	3.349	4.070	.
(24) Balanced Formula Relativity:	3.321	4.050	3.572

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Calculation of Class Relativities

Class(es): 2731 PLANING OR MOLDING MILL		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	32,143	0	8	0	634	0	3,729	4,363	0.020	0.116	0.136
2012	30,486	0	8	0	0	0	4,427	4,427	0.000	0.145	0.145
2013	35,328	0	8	0	0	0	4,268	4,268	0.000	0.121	0.121
2014	37,484	0	7	0	21,901	0	31,362	53,263	0.584	0.837	1.421
2015	39,539	0	7	0	55,117	0	60,384	115,501	1.394	1.527	2.921
MA Total:	174,978	0	38	0	77,651	0	104,171	181,823	0.444	0.595	1.039

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.454	1.159	.
(14) Massachusetts Credibility:	0.160	0.240	.
(15) Countrywide Pure Premium:	1.665	1.062	2.727
(16) Countrywide Indicated Relativity:	1.858	2.308	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	1382.0	.	.
(19) Pure Premium Underlying Present Rate:	1.604	0.951	2.555
(20) Relativity to Underlying Present Rate:	1.700	1.736	.
(21) Credibility to Underlying Relativity:	0.420	0.380	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.567	1.815	.
(24) Balanced Formula Relativity:	1.554	1.806	1.640

Class(es): 2747 COOPERAGE ASSEMBLY		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	0	0	0	0	0	0	0	0	.	.	.

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.000	0.000	.
(15) Countrywide Pure Premium:	3.444	1.313	4.757
(16) Countrywide Indicated Relativity:	3.845	2.853	.
(17) Countrywide Credibility:	0.290	0.300	.
(18) Countrywide Lost-Time Claims:	51.000	.	.
(19) Pure Premium Underlying Present Rate:	2.634	1.551	4.184
(20) Relativity to Underlying Present Rate:	2.792	2.829	.
(21) Credibility to Underlying Relativity:	0.710	0.700	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	3.097	2.836	.
(24) Balanced Formula Relativity:	3.071	2.822	2.985

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Calculation of Class Relativities

Class(es): 2790 PATTERN MAKING NOC		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	37,339	0	7	0	655	0	4,081	4,736	0,018	0,109	0,127
2012	37,500	0	8	0	89,756	0	25,965	115,721	2,393	0,692	3,086
2013	35,372	0	4	0	213,320	0	39,042	252,363	6,031	1,104	7,135
2014	35,435	0	8	0	26,464	0	24,976	51,440	0,747	0,705	1,452
2015	43,579	0	3	0	1,827	0	4,847	6,674	0,042	0,111	0,153
MA Total:	189,225	0	30	0	332,022	0	98,912	430,934	1,755	0,523	2,277

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.795	1.018	.
(14) Massachusetts Credibility:	0.130	0.190	.
(15) Countrywide Pure Premium:	0.552	0.328	0.879
(16) Countrywide Indicated Relativity:	0.616	0.712	.
(17) Countrywide Credibility:	0.440	0.410	.
(18) Countrywide Lost-Time Claims:	243.00	.	.
(19) Pure Premium Underlying Present Rate:	0.827	0.469	1.295
(20) Relativity to Underlying Present Rate:	0.877	0.855	.
(21) Credibility to Underlying Relativity:	0.430	0.400	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.881	0.827	.
(24) Balanced Formula Relativity:	0.874	0.823	0.856

Class(es): 2802 CARPENTRY-SHOP ONLY & DRIVERS		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,001,798	10	196	1,117,568	1,504,372	170,831	859,228	3,652,000	2,617	1,028	3,645
2012	1,021,005	15	203	1,109,356	1,706,303	615,542	1,053,053	4,484,254	2,758	1,634	4,392
2013	1,074,411	3	209	82,374	1,384,614	38,988	815,524	2,321,501	1,365	0,795	2,161
2014	1,078,940	1	170	18,140	870,298	8,486	720,164	1,617,088	0,823	0,675	1,499
2015	1,138,820	6	166	627,607	1,795,831	300,157	977,105	3,700,700	2,128	1,122	3,250
MA Total:	5,314,974	35	944	2,955,046	7,261,418	1,134,004	4,425,075	15,775,542	1,922	1,046	2,968

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.966	2.037	.
(14) Massachusetts Credibility:	0.700	1.000	.
(15) Countrywide Pure Premium:	2.234	1.267	3.501
(16) Countrywide Indicated Relativity:	2.493	2.753	.
(17) Countrywide Credibility:	0.150	0.000	.
(18) Countrywide Lost-Time Claims:	5500.0	.	.
(19) Pure Premium Underlying Present Rate:	2.116	1.234	3.351
(20) Relativity to Underlying Present Rate:	2.243	2.252	.
(21) Credibility to Underlying Relativity:	0.150	0.000	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.087	2.037	.
(24) Balanced Formula Relativity:	2.069	2.026	2.054

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Calculation of Class Relativities

Class(es): 2835 BRUSH OR BROOM ASSEMBLY		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	16,315	0	1	0	0	0	275	275	0.000	0.017	0.017
2012	47,825	0	4	0	495	0	4,107	4,602	0.010	0.086	0.096
2013	51,653	0	4	0	8,328	0	12,991	21,320	0.161	0.252	0.413
2014	46,309	0	5	0	246	0	5,759	6,004	0.005	0.124	0.130
2015	50,627	0	3	0	202	0	2,304	2,506	0.004	0.046	0.049
MA Total:	212,729	0	17	0	9,270	0	25,436	34,706	0.044	0.120	0.163

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.045	0.233	.
(14) Massachusetts Credibility:	0.140	0.200	.
(15) Countrywide Pure Premium:	1.088	0.651	1.739
(16) Countrywide Indicated Relativity:	1.214	1.415	.
(17) Countrywide Credibility:	0.380	0.400	.
(18) Countrywide Lost-Time Claims:	100.00	.	.
(19) Pure Premium Underlying Present Rate:	0.908	0.523	1.431
(20) Relativity to Underlying Present Rate:	0.963	0.954	.
(21) Credibility to Underlying Relativity:	0.480	0.400	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.930	0.995	.
(24) Balanced Formula Relativity:	0.922	0.990	0.945

Class(es): 2836 BRUSH OR BROOM MFG NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,826	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	5,100	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	5,613	0	3	0	44	0	1,054	1,098	0.008	0.188	0.196
2014	5,804	0	1	0	270	0	626	896	0.047	0.108	0.154
2015	6,979	0	1	0	0	0	92	92	0.000	0.013	0.013
MA Total:	28,321	0	5	0	315	0	1,772	2,087	0.011	0.063	0.074

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.011	0.122	.
(14) Massachusetts Credibility:	0.060	0.090	.
(15) Countrywide Pure Premium:	1.041	0.539	1.580
(16) Countrywide Indicated Relativity:	1.162	1.171	.
(17) Countrywide Credibility:	0.280	0.290	.
(18) Countrywide Lost-Time Claims:	47.000	.	.
(19) Pure Premium Underlying Present Rate:	0.987	0.548	1.535
(20) Relativity to Underlying Present Rate:	1.047	1.000	.
(21) Credibility to Underlying Relativity:	0.660	0.620	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.017	0.971	.
(24) Balanced Formula Relativity:	1.008	0.966	0.993

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Calculation of Class Relativities

Class(es): 2841 WOODENWARE MFG NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	45,111	0	5	0	11,361	0	7,151	18,512	0.252	0.159	0.410
2012	37,113	0	6	0	13,088	0	3,405	16,494	0.353	0.092	0.444
2013	44,738	0	13	0	201,058	0	69,379	270,436	4.494	1.551	6.045
2014	49,723	0	10	0	78,109	0	17,257	95,365	1.571	0.347	1.918
2015	42,775	0	6	0	37,403	0	27,067	64,470	0.874	0.633	1.507
MA Total:	219,459	0	40	0	341,018	0	124,259	465,277	1.554	0.566	2.120

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.590	1.102	.
(14) Massachusetts Credibility:	0.190	0.250	.
(15) Countrywide Pure Premium:	1.649	0.928	2.577
(16) Countrywide Indicated Relativity:	1.840	2.017	.
(17) Countrywide Credibility:	0.410	0.380	.
(18) Countrywide Lost-Time Claims:	177.00	.	.
(19) Pure Premium Underlying Present Rate:	1.961	0.853	2.814
(20) Relativity to Underlying Present Rate:	2.079	1.557	.
(21) Credibility to Underlying Relativity:	0.400	0.370	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.888	1.618	.
(24) Balanced Formula Relativity:	1.872	1.610	1.782

Class(es): 2883 FURNITURE MFG-WOOD-NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	383,665	6	79	580,252	250,003	145,440	164,592	1,140,288	2,164	0.808	2,972
2012	437,606	5	82	249,465	611,441	80,475	221,381	1,162,762	1,967	0.690	2,657
2013	450,967	1	77	30,767	670,812	3,420	386,365	1,091,364	1,556	0.864	2,420
2014	509,563	5	68	585,758	443,026	83,376	269,621	1,381,781	2,019	0.693	2,712
2015	545,609	3	62	381,607	235,836	100,755	297,418	1,015,616	1,132	0.730	1,861
MA Total:	2,327,408	20	368	1,827,850	2,211,118	413,466	1,339,377	5,791,812	1,735	0.753	2,489

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.775	1.466	.
(14) Massachusetts Credibility:	0.440	0.640	.
(15) Countrywide Pure Premium:	1.507	0.764	2.270
(16) Countrywide Indicated Relativity:	1.682	1.660	.
(17) Countrywide Credibility:	0.280	0.180	.
(18) Countrywide Lost-Time Claims:	4935.0	.	.
(19) Pure Premium Underlying Present Rate:	1.502	0.838	2.340
(20) Relativity to Underlying Present Rate:	1.592	1.529	.
(21) Credibility to Underlying Relativity:	0.280	0.180	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.698	1.512	.
(24) Balanced Formula Relativity:	1.683	1.505	1.622

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Calculation of Class Relativities

Class(es): 2923 PIANO MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	59,563	0	6	0	4,131	0	22,794	26,925	0.069	0.383	0.452
2012	50,048	0	2	0	0	0	1,714	1,714	0.000	0.034	0.034
2013	52,244	0	7	0	67,218	0	5,908	73,126	1.287	0.113	1.400
2014	52,592	0	2	0	0	0	2,117	2,117	0.000	0.040	0.040
2015	51,404	1	2	92,088	0	62,000	662	154,749	1.791	1.219	3.010
MA Total:	265,851	1	19	92,088	71,349	62,000	33,195	258,632	0.615	0.358	0.973

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.629	0.697	.
(14) Massachusetts Credibility:	0.140	0.210	.
(15) Countrywide Pure Premium:	0.993	0.480	1.473
(16) Countrywide Indicated Relativity:	1.108	1.043	.
(17) Countrywide Credibility:	0.390	0.400	.
(18) Countrywide Lost-Time Claims:	106.00	.	.
(19) Pure Premium Underlying Present Rate:	0.728	0.437	1.164
(20) Relativity to Underlying Present Rate:	0.771	0.797	.
(21) Credibility to Underlying Relativity:	0.470	0.390	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.883	0.874	.
(24) Balanced Formula Relativity:	0.875	0.870	0.873

Class(es): 2942 PENCIL, PENHOLDER OR CRAYON MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	914,661	2	59	274,681	381,636	134,614	410,790	1,201,721	0.718	0.596	1.314
2012	856,620	3	31	661,532	580,987	230,762	191,025	1,664,307	1.450	0.492	1.943
2013	953,373	1	54	10,177	461,926	334	444,700	917,137	0.495	0.467	0.962
2014	145,227	0	7	0	20,490	0	26,890	47,380	0.141	0.185	0.326
2015	140,412	0	9	0	0	0	5,431	5,431	0.000	0.039	0.039
MA Total:	3,010,294	6	160	946,390	1,445,038	365,711	1,078,836	3,835,975	0.794	0.480	1.274

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.813	0.934	.
(14) Massachusetts Credibility:	0.380	0.590	.
(15) Countrywide Pure Premium:	1.165	0.604	1.770
(16) Countrywide Indicated Relativity:	1.301	1.313	.
(17) Countrywide Credibility:	0.310	0.210	.
(18) Countrywide Lost-Time Claims:	485.00	.	.
(19) Pure Premium Underlying Present Rate:	0.807	0.524	1.331
(20) Relativity to Underlying Present Rate:	0.855	0.956	.
(21) Credibility to Underlying Relativity:	0.310	0.200	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.977	1.018	.
(24) Balanced Formula Relativity:	0.969	1.013	0.984

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Calculation of Class Relativities

Class(es): 3018 IRON OR STEEL: MFG: ROLLING MILL & DRIVERS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	98,762	1	5	355,673	21,427	112,868	7,412	497,380	3,818	1,218	5,036
2012	180,999	1	18	3,129	66,082	33,972	47,883	151,066	0,382	0,452	0,835
2013	206,122	0	19	0	105,427	0	69,605	175,032	0,511	0,338	0,849
2014	185,303	1	17	2,157	144,019	15,561	55,153	216,889	0,789	0,382	1,170
2015	163,539	0	6	0	273,682	0	60,631	334,313	1,673	0,371	2,044
MA Total:	834,726	3	65	360,959	610,637	162,401	240,684	1,374,681	1,164	0,483	1,647

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.191	0.940	.
(14) Massachusetts Credibility:	0.310	0.420	.
(15) Countrywide Pure Premium:	1.220	0.640	1.860
(16) Countrywide Indicated Relativity:	1.362	1.391	.
(17) Countrywide Credibility:	0.350	0.290	.
(18) Countrywide Lost-Time Claims:	416.00	.	.
(19) Pure Premium Underlying Present Rate:	1.767	0.819	2.586
(20) Relativity to Underlying Present Rate:	1.873	1.494	.
(21) Credibility to Underlying Relativity:	0.340	0.290	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.482	1.232	.
(24) Balanced Formula Relativity:	1.470	1.226	1.386

Class(es): 3022 PIPE OR TUBE MFG NOC & DRIVERS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	6,875	0	3	0	0	0	629	629	0.000	0.091	0.091
2012	5,700	0	1	0	0	0	626	626	0.000	0.110	0.110
2013	10,326	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	17,051	1	4	38,960	19,918	51,213	16,176	126,267	3,453	3,952	7,405
2015	18,656	0	6	0	41,077	0	26,891	67,968	2,202	1,441	3,643
MA Total:	58,609	1	14	38,960	60,995	51,213	44,321	195,490	1,705	1,630	3,336

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.745	3.174	.
(14) Massachusetts Credibility:	0.110	0.150	.
(15) Countrywide Pure Premium:	1.720	0.811	2.531
(16) Countrywide Indicated Relativity:	1.920	1.763	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	481.00	.	.
(19) Pure Premium Underlying Present Rate:	1.694	0.932	2.626
(20) Relativity to Underlying Present Rate:	1.795	1.700	.
(21) Credibility to Underlying Relativity:	0.440	0.420	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.846	1.948	.
(24) Balanced Formula Relativity:	1.830	1.938	1.867

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Calculation of Class Relativities

Class(es): 3027 ROLLING MILL NOC & DRIVERS		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	12,389	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	8,438	1	0	270,171	0	211,934	0	482,105	32,018	25,116	57,135
2013	218	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	3,641	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	10,658	0	2	0	0	0	1,161	1,161	0.000	0.109	0.109
MA Total:	35,345	1	2	270,171	0	211,934	1,161	483,266	7,644	6,029	13,673

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	7.819	11.740	.
(14) Massachusetts Credibility:	0.090	0.150	.
(15) Countrywide Pure Premium:	1.289	0.668	1.957
(16) Countrywide Indicated Relativity:	1.438	1.452	.
(17) Countrywide Credibility:	0.460	0.430	.
(18) Countrywide Lost-Time Claims:	460.00	.	.
(19) Pure Premium Underlying Present Rate:	1.955	1.587	3.541
(20) Relativity to Underlying Present Rate:	2.072	2.895	.
(21) Credibility to Underlying Relativity:	0.450	0.420	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.298	3.601	.
(24) Balanced Formula Relativity:	2.278	3.583	2.728

Class(es): 3028 PIPE OR TUBE MFG - IRON OR STEEL & DRIVERS		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	73,718	0	20	0	92,757	0	56,359	149,116	1,258	0,765	2,023
2012	5,317	0	3	0	0	0	3,255	3,255	0.000	0.612	0.612
2013	4,653	0	9	0	23,300	0	22,571	45,871	5,007	4,851	9,858
2014	5,315	0	1	0	9,310	0	8,555	17,865	1,752	1,610	3,362
2015	24,770	0	8	0	12,008	0	15,566	27,574	0,485	0,628	1,113
MA Total:	113,773	0	41	0	137,374	0	106,307	243,681	1,207	0,934	2,142

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.235	1.819	.
(14) Massachusetts Credibility:	0.120	0.180	.
(15) Countrywide Pure Premium:	1.363	0.740	2.102
(16) Countrywide Indicated Relativity:	1.521	1.607	.
(17) Countrywide Credibility:	0.440	0.410	.
(18) Countrywide Lost-Time Claims:	1052.0	.	.
(19) Pure Premium Underlying Present Rate:	1.300	0.759	2.059
(20) Relativity to Underlying Present Rate:	1.379	1.384	.
(21) Credibility to Underlying Relativity:	0.440	0.410	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.424	1.554	.
(24) Balanced Formula Relativity:	1.412	1.546	1.458

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Calculation of Class Relativities

Class(es): 3030 IRON OR STEEL: FABRICATION: IRON/STEEL WORK-SHOP-STRUCT & DR												Effective: 7/1/2018		Manufacturing	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	118,717	2	43	213,300	166,207	41,149	183,205	603,862	3,197	1,890	5,087				
2012	104,498	0	25	0	19,721	0	67,239	86,960	0,189	0,643	0,832				
2013	115,752	0	33	0	1,263,239	0	284,460	1,547,698	10,913	2,457	13,371				
2014	117,891	0	11	0	16,009	0	18,016	34,025	0,136	0,153	0,289				
2015	124,216	0	23	0	311,849	0	224,152	536,001	2,511	1,805	4,315				
MA Total:	581,074	2	135	213,300	1,777,025	41,149	777,072	2,808,546	3,425	1,408	4,833				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.504	2.742	.
(14) Massachusetts Credibility:	0.330	0.480	.
(15) Countrywide Pure Premium:	2.759	1.317	4.076
(16) Countrywide Indicated Relativity:	3.079	2.863	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	2719.0	.	.
(19) Pure Premium Underlying Present Rate:	2.885	1.688	4.573
(20) Relativity to Underlying Present Rate:	3.058	3.080	.
(21) Credibility to Underlying Relativity:	0.330	0.260	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	3.212	2.861	.
(24) Balanced Formula Relativity:	3.185	2.847	3.068

Class(es): 3040 IRON OR STEEL: FABRICATION: IRON WORKS-SHOP-ORNAMENTAL & DR												Effective: 7/1/2018		Manufacturing	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	140,105	0	28	0	263,754	0	224,609	488,363	1,883	1,603	3,486				
2012	151,401	2	25	212,208	41,827	63,286	46,183	363,503	1,678	0,723	2,401				
2013	168,205	1	27	14,190	26,151	844	29,022	70,207	0,240	0,178	0,417				
2014	184,645	1	31	300,859	118,609	26,691	51,657	497,817	2,272	0,424	2,696				
2015	193,587	2	20	899,715	357,203	187,985	105,716	1,550,619	6,493	1,517	8,010				
MA Total:	837,944	6	131	1,426,972	807,544	278,806	457,187	2,970,509	2,667	0,878	3,545				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.728	1.710	.
(14) Massachusetts Credibility:	0.380	0.520	.
(15) Countrywide Pure Premium:	2.397	1.144	3.540
(16) Countrywide Indicated Relativity:	2.675	2.485	.
(17) Countrywide Credibility:	0.310	0.240	.
(18) Countrywide Lost-Time Claims:	1610.0	.	.
(19) Pure Premium Underlying Present Rate:	2.805	1.406	4.211
(20) Relativity to Underlying Present Rate:	2.973	2.566	.
(21) Credibility to Underlying Relativity:	0.310	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.787	2.102	.
(24) Balanced Formula Relativity:	2.764	2.091	2.532

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Manufacturing		
3041 IRON OR STEEL: FABRICATION: IRON WORKS-SHP-DEC/ART &FNDRS,DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	47,557	0	22	0	50,032	0	48,405	98,437	1,052	1,018	2,070
2012	34,678	0	9	0	19,754	0	125,085	144,839	0,570	3,607	4,177
2013	38,530	0	1	0	0	0	1,921	1,921	0,000	0,050	0,050
2014	50,510	0	4	0	0	0	2,536	2,536	0,000	0,050	0,050
2015	40,557	0	3	0	0	0	1,394	1,394	0,000	0,034	0,034
MA Total:	211,833	0	39	0	69,786	0	179,340	249,126	0,329	0,847	1,176

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.337	1.648	.
(14) Massachusetts Credibility:	0.200	0.300	.
(15) Countrywide Pure Premium:	1.607	1.074	2.682
(16) Countrywide Indicated Relativity:	1.794	2.335	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	184.00	.	.
(19) Pure Premium Underlying Present Rate:	2.183	1.407	3.590
(20) Relativity to Underlying Present Rate:	2.314	2.566	.
(21) Credibility to Underlying Relativity:	0.400	0.350	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.711	2.210	.
(24) Balanced Formula Relativity:	1.696	2.199	1.869

Class(es):		Effective: 7/1/2018							Manufacturing		
3042 ELEVATOR OR ESCALATOR MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	7,230	0	1	0	0	0	638	638	0,000	0,088	0,088
2012	6,818	2	3	297,016	14,069	47,982	5,403	364,470	45,625	7,830	53,455
2013	7,294	0	2	0	2,114	0	38,914	41,029	0,290	5,335	5,625
2014	6,749	0	2	0	0	0	761	761	0,000	0,113	0,113
2015	7,198	0	2	0	0	0	1,953	1,953	0,000	0,271	0,271
MA Total:	35,289	2	10	297,016	16,184	47,982	47,669	408,851	8,875	2,710	11,586

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	9.078	5.278	.
(14) Massachusetts Credibility:	0.110	0.140	.
(15) Countrywide Pure Premium:	1.511	0.767	2.278
(16) Countrywide Indicated Relativity:	1.687	1.666	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	166.00	.	.
(19) Pure Premium Underlying Present Rate:	3.293	1.347	4.640
(20) Relativity to Underlying Present Rate:	3.490	2.458	.
(21) Credibility to Underlying Relativity:	0.440	0.430	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	3.293	2.512	.
(24) Balanced Formula Relativity:	3.265	2.500	3.001

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Calculation of Class Relativities

Class(es): 3066 SHEET METAL WORK - SHOP		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	919,743	3	172	345,692	728,546	121,833	577,751	1,773,822	1,168	0,761	1,929
2012	899,054	3	150	155,980	407,899	57,640	334,163	955,682	0,627	0,436	1,063
2013	927,197	3	143	168,486	619,858	53,387	651,984	1,493,716	0,850	0,761	1,611
2014	920,719	4	139	297,960	669,247	94,255	440,762	1,502,224	1,050	0,581	1,632
2015	951,107	3	157	268,791	394,559	181,392	373,560	1,218,302	0,697	0,583	1,281
MA Total:	4,617,820	16	761	1,236,909	2,820,110	508,507	2,378,221	6,943,747	0,879	0,625	1,504

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.899	1.217	.
(14) Massachusetts Credibility:	0.550	0.840	.
(15) Countrywide Pure Premium:	1.491	0.863	2.354
(16) Countrywide Indicated Relativity:	1.664	1.876	.
(17) Countrywide Credibility:	0.230	0.080	.
(18) Countrywide Lost-Time Claims:	1066.0	.	.
(19) Pure Premium Underlying Present Rate:	1.308	0.845	2.153
(20) Relativity to Underlying Present Rate:	1.386	1.542	.
(21) Credibility to Underlying Relativity:	0.220	0.080	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.182	1.296	.
(24) Balanced Formula Relativity:	1.172	1.289	1.212

Class(es): 3076 FIREPROOF EQUIPMENT MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	277,161	0	41	0	61,732	0	102,564	164,296	0,223	0,370	0,593
2012	241,644	1	49	11,519	304,206	379	135,950	452,054	1,307	0,564	1,871
2013	303,824	0	33	0	263,679	0	109,661	373,341	0,868	0,361	1,229
2014	364,179	0	34	0	26,089	0	54,815	80,904	0,072	0,151	0,222
2015	281,599	3	45	102,799	631,314	107,468	203,690	1,045,271	2,607	1,105	3,712
MA Total:	1,468,408	4	202	114,318	1,287,020	107,847	606,681	2,115,865	0,954	0,487	1,441

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.976	0.947	.
(14) Massachusetts Credibility:	0.320	0.490	.
(15) Countrywide Pure Premium:	1.247	0.690	1.937
(16) Countrywide Indicated Relativity:	1.392	1.500	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	8366.0	.	.
(19) Pure Premium Underlying Present Rate:	1.056	0.686	1.742
(20) Relativity to Underlying Present Rate:	1.119	1.252	.
(21) Credibility to Underlying Relativity:	0.340	0.250	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.166	1.167	.
(24) Balanced Formula Relativity:	1.156	1.161	1.158

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Calculation of Class Relativities

Class(es): 3081 FOUNDRY-FERROUS-NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	76,954	2	21	27,883	92,054	6,614	121,754	248,305	1,559	1,668	3,227
2012	74,736	1	20	219,535	61,296	30,228	34,007	345,066	3,758	0,859	4,617
2013	16,664	0	4	0	11,919	0	141,826	153,745	0,715	8,511	9,226
2014	18,779	2	4	244,371	64	55,539	3,326	303,300	13,016	3,135	16,151
2015	15,003	0	4	0	10,970	0	35,395	46,366	0,731	2,359	3,090
MA Total:	202,136	5	53	491,789	176,303	92,382	336,308	1,096,781	3,305	2,121	5,426

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.381	4.130	.
(14) Massachusetts Credibility:	0.200	0.290	.
(15) Countrywide Pure Premium:	1.816	0.989	2.805
(16) Countrywide Indicated Relativity:	2.028	2.148	.
(17) Countrywide Credibility:	0.400	0.360	.
(18) Countrywide Lost-Time Claims:	2312.0	.	.
(19) Pure Premium Underlying Present Rate:	2.269	1.364	3.634
(20) Relativity to Underlying Present Rate:	2.405	2.490	.
(21) Credibility to Underlying Relativity:	0.400	0.350	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.449	2.842	.
(24) Balanced Formula Relativity:	2.428	2.828	2.566

Class(es): 3085 FOUNDRY-NON FERROUS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	125,948	5	23	589,063	156,478	162,265	120,265	1,028,071	5,919	2,243	8,163
2012	109,479	0	28	0	251,205	0	65,527	316,732	2,295	0,599	2,893
2013	114,230	4	25	458,297	44,119	120,360	62,707	685,483	4,398	1,603	6,001
2014	116,847	0	23	0	167,193	0	62,329	229,522	1,431	0,533	1,964
2015	112,511	2	10	313,150	259,356	304,977	64,667	942,150	5,088	3,285	8,374
MA Total:	579,016	11	109	1,360,510	878,352	587,602	375,495	3,201,958	3,867	1,663	5,530

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.955	3.239	.
(14) Massachusetts Credibility:	0.290	0.410	.
(15) Countrywide Pure Premium:	1.395	0.892	2.287
(16) Countrywide Indicated Relativity:	1.558	1.938	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	823.00	.	.
(19) Pure Premium Underlying Present Rate:	2.210	1.124	3.334
(20) Relativity to Underlying Present Rate:	2.343	2.051	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.528	2.504	.
(24) Balanced Formula Relativity:	2.506	2.492	2.501

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Calculation of Class Relativities

Class(es): 3110 FORGING WORK - DROP OR MACHINE		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	16,479	0	14	0	252,493	0	85,502	337,995	15,322	5,188	20,510
2012	19,069	1	8	439,280	2,207	172,826	2,846	617,159	23,152	9,213	32,365
2013	14,727	0	11	0	51,672	0	38,033	89,705	3,509	2,583	6,091
2014	14,155	0	5	0	34,201	0	11,246	45,447	2,416	0,795	3,211
2015	11,186	0	6	0	103,471	0	48,484	151,954	9,250	4,334	13,585
MA Total:	75,616	1	44	439,280	444,044	172,826	186,110	1,242,261	11,682	4,747	16,429

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	11.949	9.243	.
(14) Massachusetts Credibility:	0.160	0.250	.
(15) Countrywide Pure Premium:	2.283	1.019	3.303
(16) Countrywide Indicated Relativity:	2.548	2.215	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	553.00	.	.
(19) Pure Premium Underlying Present Rate:	3.662	2.552	6.214
(20) Relativity to Underlying Present Rate:	3.882	4.656	.
(21) Credibility to Underlying Relativity:	0.420	0.370	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	4.613	4.875	.
(24) Balanced Formula Relativity:	4.573	4.851	4.669

Class(es): 3111 BLACKSMITH		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	95,744	1	14	31,856	447	12,920	9,340	54,563	0,337	0,232	0,570
2012	55,644	0	13	0	1,393	0	5,499	6,892	0,025	0,099	0,124
2013	60,460	0	10	0	704	0	5,017	5,721	0,012	0,083	0,095
2014	67,119	2	12	134,916	17,965	39,136	19,715	211,732	2,278	0,877	3,155
2015	72,504	0	9	0	11,347	0	28,305	39,652	0,157	0,390	0,547
MA Total:	351,473	3	58	166,772	31,856	52,056	67,876	318,560	0,565	0,341	0,906

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.578	0.664	.
(14) Massachusetts Credibility:	0.170	0.270	.
(15) Countrywide Pure Premium:	1.017	0.571	1.588
(16) Countrywide Indicated Relativity:	1.136	1.241	.
(17) Countrywide Credibility:	0.420	0.370	.
(18) Countrywide Lost-Time Claims:	258.00	.	.
(19) Pure Premium Underlying Present Rate:	0.971	0.648	1.619
(20) Relativity to Underlying Present Rate:	1.029	1.183	.
(21) Credibility to Underlying Relativity:	0.410	0.360	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.997	1.064	.
(24) Balanced Formula Relativity:	0.989	1.059	1.013

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Calculation of Class Relativities

Class(es): 3113 TOOL MFG-NOT DROP OR MACHINE FORGED-NOC												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	729,266	0	104	0	485,439	0	208,420	693,859	0.666	0.286	0.951						
2012	838,290	0	115	0	385,009	0	183,998	569,006	0.459	0.219	0.679						
2013	794,761	0	81	0	339,706	0	212,267	551,973	0.427	0.267	0.695						
2014	848,311	3	65	285,560	241,945	79,887	186,520	793,911	0.622	0.314	0.936						
2015	877,818	5	71	748,341	463,195	397,629	324,671	1,933,837	1.380	0.823	2.203						
MA Total:	4,088,447	8	436	1,033,901	1,915,293	477,516	1,115,876	4,542,586	0.721	0.390	1.111						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.738	0.759	.
(14) Massachusetts Credibility:	0.390	0.580	.
(15) Countrywide Pure Premium:	0.829	0.430	1.259
(16) Countrywide Indicated Relativity:	0.925	0.935	.
(17) Countrywide Credibility:	0.310	0.210	.
(18) Countrywide Lost-Time Claims:	1830.0	.	.
(19) Pure Premium Underlying Present Rate:	0.624	0.383	1.007
(20) Relativity to Underlying Present Rate:	0.662	0.698	.
(21) Credibility to Underlying Relativity:	0.300	0.210	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.773	0.783	.
(24) Balanced Formula Relativity:	0.766	0.779	0.771

Class(es): 3114 TOOL MFG-DROP OR MACHINE FORGED-NOC: MACHINING OR FINISHING												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	16,070	0	1	0	0	0	252	252	0.000	0.016	0.016						
2012	36,462	0	17	0	12,560	0	14,950	27,511	0.344	0.410	0.755						
2013	34,544	1	9	3,055	101,108	2,670	76,324	183,156	3.015	2.287	5.302						
2014	34,349	1	7	24,495	161,569	19,987	50,211	256,262	5.417	2.044	7.461						
2015	38,343	0	13	0	2,357	0	11,712	14,070	0.061	0.305	0.367						
MA Total:	159,767	2	47	27,551	277,594	22,657	153,449	481,250	1.910	1.102	3.012						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.954	2.146	.
(14) Massachusetts Credibility:	0.130	0.200	.
(15) Countrywide Pure Premium:	1.144	0.647	1.790
(16) Countrywide Indicated Relativity:	1.277	1.405	.
(17) Countrywide Credibility:	0.440	0.400	.
(18) Countrywide Lost-Time Claims:	300.00	.	.
(19) Pure Premium Underlying Present Rate:	1.076	0.713	1.789
(20) Relativity to Underlying Present Rate:	1.141	1.302	.
(21) Credibility to Underlying Relativity:	0.430	0.400	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.306	1.512	.
(24) Balanced Formula Relativity:	1.295	1.504	1.367

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Calculation of Class Relativities

Class(es): 3118 SAW MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	319,351	3	32	263,777	328,786	24,954	69,517	687,034	1,856	0,296	2,151
2012	319,398	0	28	0	301,629	0	83,832	385,461	0,944	0,262	1,207
2013	326,043	0	21	0	175,226	0	46,676	221,902	0,537	0,143	0,681
2014	329,012	1	20	386,490	373,856	46,036	70,754	877,136	2,311	0,355	2,666
2015	332,654	0	15	0	331,098	0	56,246	387,344	0,995	0,169	1,164
MA Total:	1,626,457	4	116	650,267	1,510,595	70,990	327,024	2,558,877	1,329	0,245	1,573

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.359	0.476	.
(14) Massachusetts Credibility:	0.300	0.400	.
(15) Countrywide Pure Premium:	1.016	0.387	1.403
(16) Countrywide Indicated Relativity:	1.134	0.841	.
(17) Countrywide Credibility:	0.350	0.300	.
(18) Countrywide Lost-Time Claims:	133.00	.	.
(19) Pure Premium Underlying Present Rate:	0.856	0.368	1.224
(20) Relativity to Underlying Present Rate:	0.907	0.671	.
(21) Credibility to Underlying Relativity:	0.350	0.300	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.122	0.644	.
(24) Balanced Formula Relativity:	1.113	0.641	0.950

Class(es): 3119 NEEDLE MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	61,467	0	7	0	4,422	0	34,988	39,410	0,072	0,569	0,641
2012	69,433	0	5	0	0	0	1,831	1,831	0,000	0,026	0,026
2013	77,087	0	3	0	0	0	3,311	3,311	0,000	0,043	0,043
2014	57,363	1	7	58,324	4,479	19,787	13,236	95,827	1,095	0,576	1,671
2015	65,239	1	6	76,276	0	56,482	2,980	135,738	1,169	0,911	2,081
MA Total:	330,589	2	28	134,600	8,901	76,269	56,347	276,117	0,434	0,401	0,835

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.444	0.781	.
(14) Massachusetts Credibility:	0.110	0.180	.
(15) Countrywide Pure Premium:	0.130	0.111	0.241
(16) Countrywide Indicated Relativity:	0.145	0.241	.
(17) Countrywide Credibility:	0.160	0.170	.
(18) Countrywide Lost-Time Claims:	12.000	.	.
(19) Pure Premium Underlying Present Rate:	0.358	0.259	0.617
(20) Relativity to Underlying Present Rate:	0.379	0.473	.
(21) Credibility to Underlying Relativity:	0.730	0.650	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.349	0.489	.
(24) Balanced Formula Relativity:	0.346	0.486	0.394

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Calculation of Class Relativities

Class(es): 3120 RAZOR MFG-SAFETY		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	10,289	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	1,689	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	7,300	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	6,869	1	0	10,962	0	6,147	0	17,109	1,596	0,895	2,491
2015	34,123	0	1	0	0	0	2,493	2,493	0.000	0.073	0.073
MA Total:	60,270	1	1	10,962	0	6,147	2,493	19,602	0.182	0.143	0.325

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.186	0.279	.
(14) Massachusetts Credibility:	0.080	0.100	.
(15) Countrywide Pure Premium:	0.840	0.522	1.361
(16) Countrywide Indicated Relativity:	0.937	1.133	.
(17) Countrywide Credibility:	0.170	0.180	.
(18) Countrywide Lost-Time Claims:	14.000	.	.
(19) Pure Premium Underlying Present Rate:	0.820	0.298	1.118
(20) Relativity to Underlying Present Rate:	0.869	0.543	.
(21) Credibility to Underlying Relativity:	0.750	0.720	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.826	0.623	.
(24) Balanced Formula Relativity:	0.819	0.620	0.750

Class(es): 3122 CUTLERY MFG-NOG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	104,035	0	31	0	67,047	0	26,735	93,782	0.644	0.257	0.901
2012	101,101	0	35	0	77,798	0	88,236	166,033	0.770	0.873	1.642
2013	108,468	3	41	190,950	29,855	30,401	99,818	351,024	2,036	1,201	3,236
2014	111,219	1	24	145,807	180,174	18,509	71,057	415,547	2,931	0.805	3,736
2015	122,922	1	38	61,309	67,587	14,421	79,797	223,115	1,049	0.766	1,815
MA Total:	547,745	5	169	398,066	422,462	63,331	365,644	1,249,502	1.498	0.783	2.281

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.532	1.525	.
(14) Massachusetts Credibility:	0.190	0.300	.
(15) Countrywide Pure Premium:	0.901	0.547	1.447
(16) Countrywide Indicated Relativity:	1.005	1.188	.
(17) Countrywide Credibility:	0.380	0.350	.
(18) Countrywide Lost-Time Claims:	100.00	.	.
(19) Pure Premium Underlying Present Rate:	0.755	0.534	1.288
(20) Relativity to Underlying Present Rate:	0.800	0.974	.
(21) Credibility to Underlying Relativity:	0.430	0.350	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.017	1.214	.
(24) Balanced Formula Relativity:	1.008	1.208	1.077

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Calculation of Class Relativities

Class(es): 3127 PRECISION MEASURING TOOL MFG-NOC												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	182,630	0	34	0	44,278	0	73,692	117,969	0.242	0.404	0.646						
2012	163,401	0	26	0	491,200	0	167,601	658,801	3.006	1.026	4.032						
2013	2,144	0	0	0	0	0	0	0	0.000	0.000	0.000						
2014	1,665	0	1	0	123,053	0	17,408	140,462	73,925	10,458	84,384						
2015	2,614	0	0	0	0	0	0	0	0.000	0.000	0.000						
MA Total:	352,455	0	61	0	658,531	0	258,702	917,232	1.868	0.734	2.602						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.911	1.429	.
(14) Massachusetts Credibility:	0.130	0.210	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.471	0.636	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.451	0.353	0.804
(20) Relativity to Underlying Present Rate:	0.478	0.645	.
(21) Credibility to Underlying Relativity:	0.870	0.790	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.664	0.809	.
(24) Balanced Formula Relativity:	0.658	0.805	0.709

Class(es): 3131 BUTTON OR FASTENER MFG-METAL												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	8,386	0	0	0	0	0	0	0	0.000	0.000	0.000						
2012	7,417	0	0	0	0	0	0	0	0.000	0.000	0.000						
2013	6,832	0	0	0	0	0	0	0	0.000	0.000	0.000						
2014	7,090	0	0	0	0	0	0	0	0.000	0.000	0.000						
2015	7,968	0	1	0	0	0	1,980	1,980	0.000	0.248	0.248						
MA Total:	37,693	0	1	0	0	0	1,980	1,980	0.000	0.053	0.053						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.102	.
(14) Massachusetts Credibility:	0.060	0.100	.
(15) Countrywide Pure Premium:	0.811	0.454	1.265
(16) Countrywide Indicated Relativity:	0.905	0.988	.
(17) Countrywide Credibility:	0.470	0.450	.
(18) Countrywide Lost-Time Claims:	270.00	.	.
(19) Pure Premium Underlying Present Rate:	0.672	0.444	1.117
(20) Relativity to Underlying Present Rate:	0.713	0.810	.
(21) Credibility to Underlying Relativity:	0.470	0.450	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.760	0.819	.
(24) Balanced Formula Relativity:	0.754	0.815	0.775

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Calculation of Class Relativities

Class(es): 3132 NUT OR BOLT MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,604	0	4	0	38,946	0	10,101	49,047	8,460	2,194	10,654
2012	6,680	1	2	615	0	25	2,941	3,581	0,092	0,444	0,536
2013	10,119	0	1	0	9,320	0	5,354	14,673	0,921	0,529	1,450
2014	10,358	0	4	0	99,899	0	35,830	135,729	9,645	3,459	13,104
2015	13,189	0	2	0	2,210	0	10,028	12,238	0,168	0,760	0,928
MA Total:	44,951	1	13	615	150,375	25	64,254	215,270	3,359	1,430	4,789

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.436	2.784	.
(14) Massachusetts Credibility:	0.090	0.140	.
(15) Countrywide Pure Premium:	0.958	0.584	1.542
(16) Countrywide Indicated Relativity:	1.069	1.268	.
(17) Countrywide Credibility:	0.460	0.430	.
(18) Countrywide Lost-Time Claims:	314.00	.	.
(19) Pure Premium Underlying Present Rate:	1.526	1.026	2.552
(20) Relativity to Underlying Present Rate:	1.618	1.871	.
(21) Credibility to Underlying Relativity:	0.450	0.430	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.529	1.740	.
(24) Balanced Formula Relativity:	1.516	1.731	1.590

Class(es): 3145 SCREW MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	217,920	0	21	0	18,906	0	30,011	48,917	0,087	0,138	0,224
2012	207,820	0	22	0	24,308	0	28,104	52,411	0,117	0,135	0,252
2013	190,150	0	34	0	226,274	0	87,748	314,022	1,190	0,461	1,651
2014	199,751	0	15	0	184,577	0	48,038	232,615	0,924	0,240	1,165
2015	205,780	1	25	89,125	101,736	24,105	105,705	320,670	0,927	0,631	1,558
MA Total:	1,021,420	1	117	89,125	555,800	24,105	299,605	968,634	0,631	0,317	0,948

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.646	0.617	.
(14) Massachusetts Credibility:	0.240	0.360	.
(15) Countrywide Pure Premium:	0.876	0.480	1.355
(16) Countrywide Indicated Relativity:	0.978	1.042	.
(17) Countrywide Credibility:	0.380	0.320	.
(18) Countrywide Lost-Time Claims:	649.00	.	.
(19) Pure Premium Underlying Present Rate:	0.736	0.449	1.185
(20) Relativity to Underlying Present Rate:	0.780	0.820	.
(21) Credibility to Underlying Relativity:	0.380	0.320	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.823	0.818	.
(24) Balanced Formula Relativity:	0.816	0.814	0.815

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Calculation of Class Relativities

Class(es): 3146 HARDWARE MFG-NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	77,881	0	7	0	40	0	2,412	2,452	0.001	0.031	0.031
2012	75,843	0	11	0	363,910	0	165,320	529,231	4,798	2,180	6,978
2013	79,044	1	7	51,504	6,195	15,515	10,306	83,521	0.730	0.327	1.057
2014	105,273	0	11	0	201,431	0	60,527	261,958	1,913	0.575	2,488
2015	86,768	1	12	29,960	78,791	39,080	105,539	253,369	1,253	1,667	2,920
MA Total:	424,809	2	48	81,464	650,367	54,595	344,104	1,130,531	1,723	0.939	2,661

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.762	1.827	.
(14) Massachusetts Credibility:	0.180	0.260	.
(15) Countrywide Pure Premium:	0.892	0.545	1.437
(16) Countrywide Indicated Relativity:	0.996	1.183	.
(17) Countrywide Credibility:	0.410	0.370	.
(18) Countrywide Lost-Time Claims:	1874.0	.	.
(19) Pure Premium Underlying Present Rate:	0.841	0.493	1.335
(20) Relativity to Underlying Present Rate:	0.892	0.900	.
(21) Credibility to Underlying Relativity:	0.410	0.370	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.091	1.246	.
(24) Balanced Formula Relativity:	1.082	1.240	1.136

Class(es): 3169 STOVE MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	380,953	3	84	82,646	94,256	27,836	149,894	354,633	0.464	0.467	0.931
2012	381,617	3	66	17,483	378,770	57,186	286,533	739,973	1.038	0.901	1.939
2013	376,468	2	62	136,825	339,361	13,246	362,463	851,895	1.265	0.998	2,263
2014	437,315	1	51	38,044	463,590	16,470	430,564	948,669	1.147	1.022	2,169
2015	415,233	3	48	182,827	144,374	223,662	146,926	697,788	0.788	0.892	1,680
MA Total:	1,991,585	12	311	457,825	1,420,352	338,401	1,376,380	3,592,958	0.943	0.861	1,804

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.965	1.677	.
(14) Massachusetts Credibility:	0.390	0.600	.
(15) Countrywide Pure Premium:	1.288	0.721	2.008
(16) Countrywide Indicated Relativity:	1.437	1.566	.
(17) Countrywide Credibility:	0.310	0.200	.
(18) Countrywide Lost-Time Claims:	6640.0	.	.
(19) Pure Premium Underlying Present Rate:	1.302	0.836	2.138
(20) Relativity to Underlying Present Rate:	1.380	1.525	.
(21) Credibility to Underlying Relativity:	0.300	0.200	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.236	1.624	.
(24) Balanced Formula Relativity:	1.225	1.616	1.360

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Calculation of Class Relativities

Class(es): 3179 ELECTRICAL APPARATUS MFG-NOC											
Effective: 7/1/2018											
Manufacturing											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,470,601	0	106	0	978,539	0	353,251	1,331,790	0.665	0.240	0.906
2012	1,448,367	3	79	463,277	263,245	44,596	221,231	992,349	0.502	0.184	0.685
2013	1,507,501	5	112	441,410	403,425	84,876	238,579	1,168,290	0.560	0.215	0.775
2014	1,236,577	2	85	72,689	484,533	42,230	123,030	722,483	0.451	0.134	0.584
2015	1,367,248	1	69	114,347	371,107	44,046	296,980	826,479	0.355	0.249	0.604
MA Total:	7,030,294	11	451	1,091,723	2,500,850	215,748	1,233,071	5,041,391	0.511	0.206	0.717

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.523	0.401	.
(14) Massachusetts Credibility:	0.470	0.640	.
(15) Countrywide Pure Premium:	0.843	0.421	1.263
(16) Countrywide Indicated Relativity:	0.941	0.914	.
(17) Countrywide Credibility:	0.270	0.180	.
(18) Countrywide Lost-Time Claims:	4458.0	.	.
(19) Pure Premium Underlying Present Rate:	0.581	0.280	0.861
(20) Relativity to Underlying Present Rate:	0.616	0.510	.
(21) Credibility to Underlying Relativity:	0.260	0.180	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.660	0.513	.
(24) Balanced Formula Relativity:	0.654	0.511	0.605

Class(es): 3180 ELECTRIC OR GAS LIGHTING FIXTURES MFG											
Effective: 7/1/2018											
Manufacturing											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	314,685	3	51	312,580	489,798	53,132	240,860	1,096,371	2,550	0.934	3,484
2012	158,066	2	48	120,906	233,847	93,753	61,778	510,284	2,244	0.984	3,228
2013	152,488	0	33	0	22,849	0	47,604	70,452	0.150	0.312	0.462
2014	120,495	0	30	0	148,631	0	62,304	210,934	1,234	0.517	1,751
2015	119,660	2	23	180,947	108,805	54,224	58,616	402,592	2,421	0.943	3,364
MA Total:	865,393	7	185	614,433	1,003,930	201,110	471,161	2,290,634	1,870	0.777	2,647

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.913	1.513	.
(14) Massachusetts Credibility:	0.280	0.410	.
(15) Countrywide Pure Premium:	1.142	0.534	1.676
(16) Countrywide Indicated Relativity:	1.275	1.160	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	407.00	.	.
(19) Pure Premium Underlying Present Rate:	1.252	0.751	2.003
(20) Relativity to Underlying Present Rate:	1.327	1.370	.
(21) Credibility to Underlying Relativity:	0.360	0.290	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.472	1.365	.
(24) Balanced Formula Relativity:	1.460	1.359	1.425

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Calculation of Class Relativities

Class(es): 3188 PLUMBERS SUPPLIES MFG-NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	29,712	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	23,754	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	18,059	0	4	0	25,952	0	14,388	40,340	1.437	0.797	2.234
2014	22,598	0	7	0	15,206	0	13,560	28,766	0.673	0.600	1.273
2015	21,597	0	5	0	160,932	0	47,700	208,632	7.452	2.209	9.660
MA Total:	115,720	0	16	0	202,090	0	75,649	277,739	1.746	0.654	2.400

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.786	1.273	.
(14) Massachusetts Credibility:	0.100	0.150	.
(15) Countrywide Pure Premium:	1.004	0.543	1.546
(16) Countrywide Indicated Relativity:	1.121	1.179	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	398.00	.	.
(19) Pure Premium Underlying Present Rate:	0.775	0.431	1.206
(20) Relativity to Underlying Present Rate:	0.822	0.786	.
(21) Credibility to Underlying Relativity:	0.450	0.420	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.053	1.028	.
(24) Balanced Formula Relativity:	1.044	1.023	1.037

Class(es): 3200 ARMS MFG-SMALL		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	174,009	0	38	0	62,979	0	74,869	137,848	0.362	0.430	0.792
2012	221,072	1	64	28,431	132,861	11,530	83,628	256,451	0.730	0.430	1.160
2013	78,866	0	14	0	4,875	0	16,419	21,295	0.062	0.208	0.270
2014	69,092	2	12	69,718	51,675	11,984	29,981	163,359	1.757	0.607	2.364
2015	69,171	0	7	0	41,556	0	28,182	69,738	0.601	0.407	1.008
MA Total:	612,210	3	135	98,150	293,947	23,514	233,080	648,690	0.640	0.419	1.060

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.655	0.816	.
(14) Massachusetts Credibility:	0.230	0.340	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.139	1.176	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.089	0.653	1.742
(20) Relativity to Underlying Present Rate:	1.154	1.192	.
(21) Credibility to Underlying Relativity:	0.770	0.660	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.040	1.064	.
(24) Balanced Formula Relativity:	1.031	1.059	1.040

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Calculation of Class Relativities

Class(es): 3220 CAN MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	63,105	4	9	1,315,673	29,110	132,635	14,505	1,491,924	21,310	2,332	23,642
2012	103,474	1	12	277,442	26,654	30,451	30,441	364,988	2,939	0,588	3,527
2013	97,625	1	10	195,608	9,606	8,235	15,643	229,092	2,102	0,245	2,347
2014	100,269	2	12	266,340	10,313	442,983	10,993	730,629	2,759	4,528	7,287
2015	98,802	0	11	0	103,226	0	43,940	147,167	1,045	0,445	1,490
MA Total:	463,275	8	54	2,055,063	178,910	614,304	115,522	2,963,800	4,822	1,575	6,397

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.933	3.067	.
(14) Massachusetts Credibility:	0.250	0.320	.
(15) Countrywide Pure Premium:	0.736	0.366	1.102
(16) Countrywide Indicated Relativity:	0.821	0.796	.
(17) Countrywide Credibility:	0.380	0.340	.
(18) Countrywide Lost-Time Claims:	333.00	.	.
(19) Pure Premium Underlying Present Rate:	1.847	0.731	2.578
(20) Relativity to Underlying Present Rate:	1.958	1.334	.
(21) Credibility to Underlying Relativity:	0.370	0.340	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.270	1.706	.
(24) Balanced Formula Relativity:	2.250	1.697	2.060

Class(es): 3255 WIRE CLOTH MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,158	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	1,634	0	1	0	0	0	694	694	0.000	0.425	0.425
2013	1,948	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	1,620	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,937	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	8,297	0	1	0	0	0	694	694	0.000	0.084	0.084

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.163	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	0.834	0.505	1.339
(16) Countrywide Indicated Relativity:	0.931	1.096	.
(17) Countrywide Credibility:	0.270	0.280	.
(18) Countrywide Lost-Time Claims:	42,000	.	.
(19) Pure Premium Underlying Present Rate:	1.243	0.659	1.902
(20) Relativity to Underlying Present Rate:	1.318	1.202	.
(21) Credibility to Underlying Relativity:	0.690	0.660	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.161	1.110	.
(24) Balanced Formula Relativity:	1.151	1.105	1.135

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Calculation of Class Relativities

Class(es): 3257 WIRE GOODS MFG - NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	163,038	2	25	358,540	89,147	248,801	43,389	739,878	2,746	1,792	4,538
2012	183,590	1	42	87,797	108,798	36,390	86,745	319,730	1,071	0,671	1,742
2013	205,502	0	29	0	23,693	0	34,896	58,589	0,115	0,170	0,285
2014	210,922	1	44	38,739	173,520	5,830	84,269	302,358	1,006	0,427	1,434
2015	217,374	0	61	0	399,050	0	238,443	637,493	1,836	1,097	2,933
MA Total:	980,426	4	201	485,076	794,208	291,021	487,743	2,058,048	1,305	0,794	2,099

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.335	1.547	.
(14) Massachusetts Credibility:	0.300	0.410	.
(15) Countrywide Pure Premium:	1.147	0.630	1.777
(16) Countrywide Indicated Relativity:	1.281	1.369	.
(17) Countrywide Credibility:	0.350	0.300	.
(18) Countrywide Lost-Time Claims:	1098.0	.	.
(19) Pure Premium Underlying Present Rate:	1.312	0.647	1.959
(20) Relativity to Underlying Present Rate:	1.391	1.180	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.335	1.387	.
(24) Balanced Formula Relativity:	1.324	1.380	1.343

Class(es): 3270 EYELET MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	12,312	0	1	0	0	0	442	442	0.000	0.036	0.036
2012	8,897	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	5,234	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	6,237	0	1	0	0	0	585	585	0.000	0.094	0.094
2015	6,211	0	1	0	0	0	59	59	0.000	0.009	0.009
MA Total:	38,891	0	3	0	0	0	1,086	1,086	0.000	0.028	0.028

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.054	.
(14) Massachusetts Credibility:	0.070	0.110	.
(15) Countrywide Pure Premium:	1.124	0.566	1.691
(16) Countrywide Indicated Relativity:	1.255	1.231	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	167.00	.	.
(19) Pure Premium Underlying Present Rate:	0.955	0.594	1.548
(20) Relativity to Underlying Present Rate:	1.012	1.083	.
(21) Credibility to Underlying Relativity:	0.470	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.053	1.036	.
(24) Balanced Formula Relativity:	1.044	1.031	1.040

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Calculation of Class Relativities

Class(es): 3300 BED SPRING OR WIRE MATTRESS MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	6,792	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	5,957	0	1	0	0	0	107	107	0.000	0.018	0.018
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	113	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	12,862	0	1	0	0	0	107	107	0.000	0.008	0.008

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.016	.
(14) Massachusetts Credibility:	0.060	0.090	.
(15) Countrywide Pure Premium:	1.614	1.184	2.798
(16) Countrywide Indicated Relativity:	1.801	2.573	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	314.00	.	.
(19) Pure Premium Underlying Present Rate:	1.801	1.162	2.963
(20) Relativity to Underlying Present Rate:	1.909	2.120	.
(21) Credibility to Underlying Relativity:	0.470	0.450	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.744	2.139	.
(24) Balanced Formula Relativity:	1.729	2.129	1.867

Class(es): 3315 BRASS OR COPPER GOODS MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	210,916	0	44	0	424,821	0	141,858	566,679	2,014	0.673	2,687
2012	196,336	2	53	209,981	68,426	59,296	84,706	422,408	1,418	0.733	2,151
2013	196,174	1	32	92,633	46,329	11,233	86,933	237,128	0.708	0.500	1,209
2014	199,184	0	36	0	59,665	0	45,718	105,383	0.300	0.230	0,529
2015	212,728	0	48	0	255,635	0	210,236	465,871	1,202	0.988	2,190
MA Total:	1,015,338	3	213	302,614	854,875	70,529	569,452	1,797,469	1,140	0.630	1,770

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.166	1.227	.
(14) Massachusetts Credibility:	0.330	0.490	.
(15) Countrywide Pure Premium:	1.799	0.751	2.550
(16) Countrywide Indicated Relativity:	2.008	1.633	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	225.00	.	.
(19) Pure Premium Underlying Present Rate:	1.735	0.987	2.722
(20) Relativity to Underlying Present Rate:	1.839	1.800	.
(21) Credibility to Underlying Relativity:	0.330	0.250	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.674	1.476	.
(24) Balanced Formula Relativity:	1.660	1.469	1.594

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Calculation of Class Relativities

Class(es): 3336 TYPE FOUNDRY		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	5,154	0	3	0	48,174	0	14,580	62,755	9,346	2,829	12,175
2012	6,167	0	3	0	13,287	0	6,067	19,354	2,154	0,984	3,138
2013	7,023	0	2	0	3,363	0	1,882	5,245	0,479	0,268	0,747
2014	9,353	0	0	0	0	0	0	0	0,000	0,000	0,000
2015	5,644	0	2	0	2,809	0	1,215	4,024	0,498	0,215	0,713
MA Total:	33,342	0	10	0	67,633	0	23,745	91,378	2,028	0,712	2,741

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.075	1.387	.
(14) Massachusetts Credibility:	0.090	0.120	.
(15) Countrywide Pure Premium:	1.545	0.599	2.144
(16) Countrywide Indicated Relativity:	1.725	1.301	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	293.00	.	.
(19) Pure Premium Underlying Present Rate:	2.194	0.891	3.085
(20) Relativity to Underlying Present Rate:	2.325	1.626	.
(21) Credibility to Underlying Relativity:	0.450	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.027	1.454	.
(24) Balanced Formula Relativity:	2.009	1.447	1.816

Class(es): 3365 WELDING OR CUTTING - NOC & DRIVERS		Effective: 7/1/2018							Construction		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	107,860	2	26	224,361	83,271	45,599	68,238	421,470	2,852	1,055	3,908
2012	121,714	1	17	158,518	531,352	25,741	198,537	914,148	5,668	1,843	7,511
2013	122,325	1	31	67,642	716,730	20,134	284,805	1,089,312	6,412	2,493	8,905
2014	139,858	2	31	16,920	52,862	10,200	89,719	169,702	0,499	0,714	1,213
2015	154,118	1	23	5,941	379,055	3,868	320,842	709,706	2,498	2,107	4,605
MA Total:	645,875	7	128	473,383	1,763,270	105,542	962,142	3,304,338	3,463	1,653	5,116

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.320	1.399	.
(14) Massachusetts Credibility:	0.370	0.490	.
(15) Countrywide Pure Premium:	2.556	0.953	3.508
(16) Countrywide Indicated Relativity:	0.998	0.842	.
(17) Countrywide Credibility:	0.320	0.260	.
(18) Countrywide Lost-Time Claims:	1122.0	.	.
(19) Pure Premium Underlying Present Rate:	3.585	1.593	5.177
(20) Relativity to Underlying Present Rate:	1.306	1.188	.
(21) Credibility to Underlying Relativity:	0.310	0.250	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.213	1.201	.
(24) Balanced Formula Relativity:	1.220	1.203	1.214

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Calculation of Class Relativities

Class(es): 3372 ELECTROPLATING		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	525,677	1	71	100,132	580,496	17,650	718,026	1,416,304	1,295	1,399	2,694
2012	538,632	2	66	149,409	47,332	37,087	107,186	341,014	0,365	0,268	0,633
2013	541,986	0	82	0	386,056	0	394,303	780,360	0,712	0,728	1,440
2014	542,333	0	76	0	484,722	0	246,466	731,188	0,894	0,454	1,348
2015	562,107	1	46	118,285	203,086	33,838	125,927	481,135	0,572	0,284	0,856
MA Total:	2,710,736	4	341	367,826	1,701,692	88,575	1,591,908	3,750,001	0,763	0,620	1,383

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.781	1.207	.
(14) Massachusetts Credibility:	0.400	0.650	.
(15) Countrywide Pure Premium:	1.313	0.767	2.080
(16) Countrywide Indicated Relativity:	1.466	1.667	.
(17) Countrywide Credibility:	0.300	0.180	.
(18) Countrywide Lost-Time Claims:	1083.0	.	.
(19) Pure Premium Underlying Present Rate:	1.046	0.759	1.805
(20) Relativity to Underlying Present Rate:	1.108	1.385	.
(21) Credibility to Underlying Relativity:	0.300	0.170	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.085	1.320	.
(24) Balanced Formula Relativity:	1.075	1.314	1.157

Class(es): 3373 GALVANIZING OR TINNING - NOT ELECTROLYTIC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	12,269	0	2	0	2,914	0	3,338	6,251	0,237	0,272	0,510
2012	17,048	0	2	0	1,026	0	1,965	2,990	0,060	0,115	0,175
2013	9,776	0	0	0	0	0	0	0	0,000	0,000	0,000
2014	9,304	1	0	205,686	0	25,841	0	231,526	22,107	2,777	24,884
2015	7,823	0	1	0	0	0	445	445	0,000	0,057	0,057
MA Total:	56,220	1	5	205,686	3,939	25,841	5,747	241,213	3,729	0,562	4,290

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.814	1.094	.
(14) Massachusetts Credibility:	0.110	0.150	.
(15) Countrywide Pure Premium:	1.814	0.825	2.639
(16) Countrywide Indicated Relativity:	2.025	1.793	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	166.00	.	.
(19) Pure Premium Underlying Present Rate:	1.781	0.905	2.686
(20) Relativity to Underlying Present Rate:	1.888	1.651	.
(21) Credibility to Underlying Relativity:	0.440	0.420	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.161	1.629	.
(24) Balanced Formula Relativity:	2.143	1.620	1.963

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Calculation of Class Relativities

Class(es): 3381 SILVERWARE MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,893	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	5,810	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	5,499	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	8,487	0	2	0	0	0	1,291	1,291	0.000	0.152	0.152
2015	8,683	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	33,372	0	2	0	0	0	1,291	1,291	0.000	0.039	0.039

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.075	.
(14) Massachusetts Credibility:	0.070	0.110	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.290	1.261	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.233	0.701	1.933
(20) Relativity to Underlying Present Rate:	1.307	1.279	.
(21) Credibility to Underlying Relativity:	0.930	0.890	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.215	1.146	.
(24) Balanced Formula Relativity:	1.205	1.141	1.183

Class(es): 3383 JEWELRY MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	379,078	0	33	0	76,998	0	46,057	123,054	0.203	0.121	0.325
2012	598,819	5	81	522,139	621,607	175,880	211,895	1,531,521	1.910	0.648	2,558
2013	650,118	1	74	145,331	457,581	447,909	204,524	1,255,345	0.927	1.004	1.931
2014	601,071	3	65	390,198	795,633	114,510	439,422	1,739,763	1.973	0.922	2,894
2015	671,675	2	50	57,887	366,295	46,106	314,902	785,190	0.632	0.537	1,169
MA Total:	2,900,760	11	303	1,115,556	2,318,113	784,405	1,216,800	5,434,873	1.184	0.690	1,874

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.211	1.343	.
(14) Massachusetts Credibility:	0.350	0.500	.
(15) Countrywide Pure Premium:	0.613	0.361	0.974
(16) Countrywide Indicated Relativity:	0.684	0.785	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	317.00	.	.
(19) Pure Premium Underlying Present Rate:	0.702	0.371	1.073
(20) Relativity to Underlying Present Rate:	0.744	0.677	.
(21) Credibility to Underlying Relativity:	0.320	0.250	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.888	1.037	.
(24) Balanced Formula Relativity:	0.880	1.032	0.932

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Calculation of Class Relativities

Class(es): 3385 WATCH MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	25,703	0	2	0	0	0	915	915	0.000	0.036	0.036
2012	26,063	0	2	0	451	0	818	1,269	0.017	0.031	0.049
2013	27,418	0	2	0	0	0	798	798	0.000	0.029	0.029
2014	27,438	0	2	0	0	0	533	533	0.000	0.019	0.019
2015	28,623	0	3	0	10,441	0	12,004	22,445	0.365	0.419	0.784
MA Total:	135,245	0	11	0	10,892	0	15,068	25,960	0.081	0.111	0.192

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.082	0.217	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	0.280	0.207	0.488
(16) Countrywide Indicated Relativity:	0.313	0.451	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	18.000	.	.
(19) Pure Premium Underlying Present Rate:	0.379	0.199	0.578
(20) Relativity to Underlying Present Rate:	0.402	0.363	.
(21) Credibility to Underlying Relativity:	0.730	0.690	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.359	0.364	.
(24) Balanced Formula Relativity:	0.356	0.363	0.358

Class(es): 3507 CONSTRUCTION OR AGRICULTURAL MACHINERY MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	30,920	0	4	0	0	0	2,401	2,401	0.000	0.078	0.078
2012	37,035	1	6	166,774	0	15,838	5,235	187,847	4,503	0.569	5.072
2013	52,458	0	16	0	93,906	0	47,504	141,411	1.790	0.906	2.696
2014	55,651	0	12	0	16,106	0	7,582	23,688	0.289	0.136	0.426
2015	35,050	0	7	0	9,074	0	25,648	34,723	0.259	0.732	0.991
MA Total:	211,115	1	45	166,774	119,087	15,838	88,370	390,070	1.354	0.494	1.848

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.385	0.961	.
(14) Massachusetts Credibility:	0.160	0.230	.
(15) Countrywide Pure Premium:	1.267	0.627	1.894
(16) Countrywide Indicated Relativity:	1.414	1.362	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	5721.0	.	.
(19) Pure Premium Underlying Present Rate:	1.369	0.729	2.099
(20) Relativity to Underlying Present Rate:	1.452	1.331	.
(21) Credibility to Underlying Relativity:	0.420	0.380	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.425	1.258	.
(24) Balanced Formula Relativity:	1.413	1.252	1.357

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Calculation of Class Relativities

Class(es): 3515 TEXTILE MACHINERY MFG												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	30.947	0	11	0	11.804	0	12.553	24.358	0.381	0.406	0.787						
2012	33.046	1	14	277.283	32.677	21.459	45.235	376.654	9.380	2.018	11.398						
2013	33.505	0	19	0	13.059	0	22.174	35.233	0.390	0.662	1.052						
2014	35.015	0	24	0	44.138	0	30.551	74.689	1.261	0.872	2.133						
2015	43.110	1	18	45.259	41.998	12.379	25.349	124.985	2.024	0.875	2.899						
MA Total:	175.622	2	86	322.542	143.678	33.838	135.862	635.920	2.655	0.966	3.621						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.715	1.881	.
(14) Massachusetts Credibility:	0.140	0.220	.
(15) Countrywide Pure Premium:	1.096	0.822	1.918
(16) Countrywide Indicated Relativity:	1.224	1.787	.
(17) Countrywide Credibility:	0.320	0.340	.
(18) Countrywide Lost-Time Claims:	68.000	.	.
(19) Pure Premium Underlying Present Rate:	1.186	0.773	1.959
(20) Relativity to Underlying Present Rate:	1.257	1.410	.
(21) Credibility to Underlying Relativity:	0.540	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.451	1.642	.
(24) Balanced Formula Relativity:	1.438	1.634	1.506

Class(es): 3558 BOOT OR SHOE MACHINERY MFG												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	9.780	0	1	0	0	0	466	466	0.000	0.048	0.048						
2012	1.695	0	0	0	0	0	0	0	0.000	0.000	0.000						
2013	2.219	0	0	0	0	0	0	0	0.000	0.000	0.000						
2014	2.251	0	0	0	0	0	0	0	0.000	0.000	0.000						
2015	2.313	0	0	0	0	0	0	0	0.000	0.000	0.000						
MA Total:	18.257	0	1	0	0	0	466	466	0.000	0.026	0.026						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.050	.
(14) Massachusetts Credibility:	0.040	0.070	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.376	0.642	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.359	0.357	0.716
(20) Relativity to Underlying Present Rate:	0.381	0.651	.
(21) Credibility to Underlying Relativity:	0.960	0.930	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.366	0.609	.
(24) Balanced Formula Relativity:	0.363	0.606	0.446

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Calculation of Class Relativities

Class(es): 3571 STEAM OR AIR PRESSURE GAUGE MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	5,200	0	1	0	0	0	303	303	0.000	0.058	0.058
2012	6,485	0	1	0	0	0	413	413	0.000	0.064	0.064
2013	4,046	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	7,421	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	8,824	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	31,976	0	2	0	0	0	716	716	0.000	0.022	0.022

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.044	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	0.341	0.164	0.505
(16) Countrywide Indicated Relativity:	0.381	0.357	.
(17) Countrywide Credibility:	0.100	0.110	.
(18) Countrywide Lost-Time Claims:	4.000	.	.
(19) Pure Premium Underlying Present Rate:	0.447	0.241	0.688
(20) Relativity to Underlying Present Rate:	0.474	0.440	.
(21) Credibility to Underlying Relativity:	0.850	0.820	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.441	0.403	.
(24) Balanced Formula Relativity:	0.437	0.401	0.425

Class(es): 3574 CASH REGISTER MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	5,565,824	15	658	1,921,269	4,217,341	528,305	2,215,535	8,882,450	1,103	0.493	1,596
2012	5,594,093	15	571	1,467,065	2,818,188	372,568	1,718,156	6,375,977	0.766	0.374	1,140
2013	5,988,002	9	541	1,200,593	4,362,560	457,067	1,981,046	8,001,266	0.929	0.407	1,336
2014	6,014,990	14	520	1,311,605	2,436,646	935,848	1,856,803	6,540,901	0.623	0.464	1,087
2015	6,280,321	8	466	807,464	4,508,418	471,710	1,949,759	7,737,351	0.846	0.386	1,232
MA Total:	29,443,229	61	2,756	6,707,995	18,343,154	2,765,498	9,721,298	37,537,945	0.851	0.424	1,275

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.870	0.826	.
(14) Massachusetts Credibility:	0.950	1.000	.
(15) Countrywide Pure Premium:	0.853	0.430	1.283
(16) Countrywide Indicated Relativity:	0.952	0.934	.
(17) Countrywide Credibility:	0.030	0.000	.
(18) Countrywide Lost-Time Claims:	20616	.	.
(19) Pure Premium Underlying Present Rate:	0.814	0.435	1.249
(20) Relativity to Underlying Present Rate:	0.863	0.794	.
(21) Credibility to Underlying Relativity:	0.020	0.000	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.873	0.826	.
(24) Balanced Formula Relativity:	0.865	0.822	0.850

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Calculation of Class Relativities

Class(es): 3612 PUMP MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	280,271	1	30	198,476	49,639	29,060	49,689	326,865	0.885	0.281	1.166
2012	264,910	1	25	54,316	60,762	55,342	82,128	252,548	0.434	0.519	0.953
2013	294,411	0	25	0	197,587	0	356,401	553,988	0.671	1.211	1.882
2014	293,375	0	22	0	17,527	0	24,550	42,077	0.060	0.084	0.143
2015	279,141	0	19	0	44,965	0	76,723	121,688	0.161	0.275	0.436
MA Total:	1,412,108	2	121	252,792	370,481	84,403	589,490	1,297,166	0.441	0.477	0.919

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.451	0.929	.
(14) Massachusetts Credibility:	0.290	0.440	.
(15) Countrywide Pure Premium:	0.985	0.470	1.454
(16) Countrywide Indicated Relativity:	1.099	1.020	.
(17) Countrywide Credibility:	0.360	0.280	.
(18) Countrywide Lost-Time Claims:	1971.0	.	.
(19) Pure Premium Underlying Present Rate:	0.882	0.552	1.434
(20) Relativity to Underlying Present Rate:	0.935	1.008	.
(21) Credibility to Underlying Relativity:	0.350	0.280	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.854	0.977	.
(24) Balanced Formula Relativity:	0.846	0.972	0.890

Class(es): 3620 BOILERMAKING		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	147,119	4	33	831,625	431,005	919,574	285,686	2,467,890	8.582	8.192	16.775
2012	152,820	1	23	166,512	57,795	15,449	32,214	271,970	1.468	0.312	1.780
2013	179,144	1	18	13,836	43,950	823	110,623	169,232	0.323	0.622	0.945
2014	161,029	0	24	0	45,765	0	48,747	94,512	0.284	0.303	0.587
2015	158,970	1	18	185,374	18,680	33,446	16,327	253,827	1.284	0.313	1.597
MA Total:	799,082	7	116	1,197,346	597,195	969,292	493,598	3,257,431	2.246	1.831	4.076

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.297	3.565	.
(14) Massachusetts Credibility:	0.330	0.590	.
(15) Countrywide Pure Premium:	1.524	0.792	2.316
(16) Countrywide Indicated Relativity:	1.701	1.720	.
(17) Countrywide Credibility:	0.340	0.210	.
(18) Countrywide Lost-Time Claims:	1452.0	.	.
(19) Pure Premium Underlying Present Rate:	2.075	1.974	4.049
(20) Relativity to Underlying Present Rate:	2.199	3.602	.
(21) Credibility to Underlying Relativity:	0.330	0.200	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.062	3.185	.
(24) Balanced Formula Relativity:	2.044	3.169	2.432

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Calculation of Class Relativities

Class(es): 3634 VALVE MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	293,743	0	22	0	198,375	0	162,531	360,906	0.675	0.553	1.229
2012	332,482	0	22	0	50,985	0	46,849	97,834	0.153	0.141	0.294
2013	441,895	0	33	0	273,699	0	117,449	391,149	0.619	0.266	0.885
2014	322,852	2	35	187,925	239,049	25,287	109,298	561,560	1.323	0.417	1.739
2015	460,279	0	23	0	149,954	0	62,971	212,925	0.326	0.137	0.463
MA Total:	1,851,251	2	135	187,925	912,062	25,287	499,099	1,624,374	0.594	0.283	0.877

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.608	0.552	.
(14) Massachusetts Credibility:	0.310	0.440	.
(15) Countrywide Pure Premium:	0.770	0.416	1.187
(16) Countrywide Indicated Relativity:	0.860	0.905	.
(17) Countrywide Credibility:	0.350	0.280	.
(18) Countrywide Lost-Time Claims:	1005.0	.	.
(19) Pure Premium Underlying Present Rate:	0.799	0.424	1.222
(20) Relativity to Underlying Present Rate:	0.847	0.773	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.777	0.712	.
(24) Balanced Formula Relativity:	0.771	0.709	0.749

Class(es): 3635 GEAR MFG OR GRINDING		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	242,217	2	51	139,178	116,510	59,640	142,256	457,584	1.056	0.834	1.889
2012	252,636	1	49	18,463	940,819	756	281,469	1,241,506	3.797	1.117	4.914
2013	257,744	1	48	94,679	302,303	29,910	186,713	613,604	1.540	0.840	2.381
2014	273,066	2	33	140,157	543,045	17,930	241,617	942,749	2.502	0.950	3.452
2015	302,157	0	40	0	65,006	0	76,519	141,524	0.215	0.253	0.468
MA Total:	1,327,819	6	221	392,476	1,967,681	108,235	928,575	3,396,967	1.777	0.781	2.558

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.818	1.520	.
(14) Massachusetts Credibility:	0.330	0.520	.
(15) Countrywide Pure Premium:	1.004	0.523	1.527
(16) Countrywide Indicated Relativity:	1.121	1.137	.
(17) Countrywide Credibility:	0.340	0.240	.
(18) Countrywide Lost-Time Claims:	507.00	.	.
(19) Pure Premium Underlying Present Rate:	1.238	0.879	2.117
(20) Relativity to Underlying Present Rate:	1.312	1.604	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.414	1.449	.
(24) Balanced Formula Relativity:	1.402	1.441	1.416

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Calculation of Class Relativities

Class(es): 3642 BATTERY MFG-DRY		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	170,172	0	6	0	94,462	0	27,496	121,958	0.555	0.162	0.717
2012	317,808	0	15	0	10,461	0	14,187	24,647	0.033	0.045	0.078
2013	157,524	0	5	0	30,793	0	16,744	47,538	0.195	0.106	0.302
2014	196,131	0	14	0	220,209	0	67,069	287,277	1.123	0.342	1.465
2015	167,546	0	9	0	13,357	0	24,602	37,959	0.080	0.147	0.227
MA Total:	1,009,180	0	49	0	369,282	0	150,098	519,379	0.366	0.149	0.515

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.374	0.290	.
(14) Massachusetts Credibility:	0.210	0.280	.
(15) Countrywide Pure Premium:	0.700	0.365	1.066
(16) Countrywide Indicated Relativity:	0.782	0.793	.
(17) Countrywide Credibility:	0.400	0.360	.
(18) Countrywide Lost-Time Claims:	120.00	.	.
(19) Pure Premium Underlying Present Rate:	0.559	0.254	0.812
(20) Relativity to Underlying Present Rate:	0.592	0.463	.
(21) Credibility to Underlying Relativity:	0.390	0.360	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.622	0.533	.
(24) Balanced Formula Relativity:	0.617	0.531	0.587

Class(es): 3643 ELECTRIC POWER OR TRANSMISSION EQUIP MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	699,369	1	35	104,615	35,019	21,938	61,862	223,433	0.200	0.120	0.319
2012	809,473	3	60	706,533	546,690	187,648	291,240	1,732,111	1.548	0.592	2.140
2013	881,007	0	97	0	322,060	0	274,578	596,639	0.366	0.312	0.677
2014	917,874	2	65	18,280	191,996	8,231	162,724	381,231	0.229	0.186	0.415
2015	896,036	2	60	153,018	602,911	64,748	421,521	1,242,199	0.844	0.543	1.386
MA Total:	4,203,759	8	317	982,446	1,698,677	282,565	1,211,925	4,175,613	0.638	0.356	0.993

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.652	0.692	.
(14) Massachusetts Credibility:	0.440	0.600	.
(15) Countrywide Pure Premium:	0.923	0.449	1.372
(16) Countrywide Indicated Relativity:	1.031	0.975	.
(17) Countrywide Credibility:	0.280	0.200	.
(18) Countrywide Lost-Time Claims:	2167.0	.	.
(19) Pure Premium Underlying Present Rate:	0.808	0.397	1.205
(20) Relativity to Underlying Present Rate:	0.856	0.724	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.815	0.755	.
(24) Balanced Formula Relativity:	0.808	0.751	0.789

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Calculation of Class Relativities

Class(es): 3647 BATTERY MFG-STORAGE		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,221	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	10,851	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	3,280	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	791	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	860	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	20,002	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.050	0.080	.
(15) Countrywide Pure Premium:	1.140	0.516	1.656
(16) Countrywide Indicated Relativity:	1.272	1.122	.
(17) Countrywide Credibility:	0.480	0.460	.
(18) Countrywide Lost-Time Claims:	374.00	.	.
(19) Pure Premium Underlying Present Rate:	0.895	0.504	1.399
(20) Relativity to Underlying Present Rate:	0.948	0.920	.
(21) Credibility to Underlying Relativity:	0.470	0.460	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.056	0.939	.
(24) Balanced Formula Relativity:	1.047	0.935	1.009

Class(es): 3648 AUTOMOTIVE LIGHTING, IGNITION APPARATUS MFG NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,822	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	1,014	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	417	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	933	0	1	0	0	0	302	302	0.000	0.324	0.324
2015	1,248	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	6,434	0	1	0	0	0	302	302	0.000	0.047	0.047

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.092	.
(14) Massachusetts Credibility:	0.030	0.050	.
(15) Countrywide Pure Premium:	0.623	0.357	0.980
(16) Countrywide Indicated Relativity:	0.695	0.776	.
(17) Countrywide Credibility:	0.490	0.480	.
(18) Countrywide Lost-Time Claims:	515.00	.	.
(19) Pure Premium Underlying Present Rate:	0.599	0.407	1.007
(20) Relativity to Underlying Present Rate:	0.635	0.743	.
(21) Credibility to Underlying Relativity:	0.480	0.470	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.645	0.726	.
(24) Balanced Formula Relativity:	0.640	0.723	0.668

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Calculation of Class Relativities

Class(es): 3681 TELEVISION, RADIO, TELEPHONE OR TELECOMMUNCTN DEVICE MFG NOC												Effective: 7/1/2018		Manufacturing	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	5,337,843	8	267	772,359	1,004,401	167,945	726,180	2,670,885	0.333	0.168	0.500				
2012	5,306,356	6	193	378,417	1,608,754	241,486	741,182	2,969,839	0.374	0.185	0.560				
2013	5,235,540	11	201	1,349,348	1,561,631	318,981	699,495	3,929,454	0.556	0.195	0.751				
2014	5,584,838	7	197	931,257	537,752	256,818	487,188	2,213,015	0.263	0.133	0.396				
2015	5,297,901	3	184	109,004	1,391,833	46,787	841,721	2,389,345	0.283	0.168	0.451				
MA Total:	26,762,478	35	1,042	3,540,385	6,104,370	1,032,017	3,495,765	14,172,537	0.360	0.169	0.530				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.369	0.329	.
(14) Massachusetts Credibility:	0.680	1.000	.
(15) Countrywide Pure Premium:	0.358	0.196	0.554
(16) Countrywide Indicated Relativity:	0.400	0.425	.
(17) Countrywide Credibility:	0.160	0.000	.
(18) Countrywide Lost-Time Claims:	3037.0	.	.
(19) Pure Premium Underlying Present Rate:	0.384	0.234	0.618
(20) Relativity to Underlying Present Rate:	0.407	0.426	.
(21) Credibility to Underlying Relativity:	0.160	0.000	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.380	0.329	.
(24) Balanced Formula Relativity:	0.377	0.328	0.360

Class(es): 3685 INSTRUMENT MFG NOC												Effective: 7/1/2018		Manufacturing	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	5,578,349	7	238	453,794	727,847	202,099	522,402	1,906,142	0.212	0.130	0.342				
2012	5,477,243	4	241	301,434	1,742,636	55,839	787,987	2,887,895	0.373	0.154	0.527				
2013	5,690,542	11	205	1,092,503	1,283,399	401,656	663,617	3,441,176	0.418	0.187	0.605				
2014	6,761,170	5	251	313,202	1,294,671	79,510	883,430	2,570,813	0.238	0.142	0.380				
2015	7,213,290	9	245	761,600	1,297,219	185,907	795,824	3,040,550	0.285	0.136	0.422				
MA Total:	30,720,595	36	1,180	2,922,533	6,345,772	925,011	3,653,259	13,846,576	0.302	0.149	0.451				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.309	0.290	.
(14) Massachusetts Credibility:	0.660	0.940	.
(15) Countrywide Pure Premium:	0.443	0.225	0.669
(16) Countrywide Indicated Relativity:	0.495	0.490	.
(17) Countrywide Credibility:	0.170	0.030	.
(18) Countrywide Lost-Time Claims:	2437.0	.	.
(19) Pure Premium Underlying Present Rate:	0.314	0.169	0.483
(20) Relativity to Underlying Present Rate:	0.333	0.309	.
(21) Credibility to Underlying Relativity:	0.170	0.030	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.344	0.297	.
(24) Balanced Formula Relativity:	0.341	0.295	0.325

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
3724 MACHINERY OR EQUIPMENT ERECT OR REPAIR NOC &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,175,134	14	332	2,476,889	2,920,405	568,521	1,647,917	7,613,733	2,481	1,019	3,500
2012	2,271,614	16	318	2,594,231	3,946,494	731,695	2,080,224	9,352,644	2,879	1,238	4,117
2013	2,547,705	11	323	2,328,117	5,879,893	602,059	2,404,022	11,214,091	3,222	1,180	4,402
2014	2,742,710	19	316	2,435,825	6,215,612	1,145,330	2,845,174	12,641,940	3,154	1,455	4,609
2015	3,257,850	16	410	2,502,864	5,439,559	867,976	3,423,772	12,234,171	2,438	1,317	3,755
MA Total:	12,995,012	76	1,699	12,337,926	24,401,964	3,915,581	12,401,109	53,056,580	2,827	1,256	4,083

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.078	1.063	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.709	0.734	2.443
(16) Countrywide Indicated Relativity:	0.667	0.649	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7678.0	.	.
(19) Pure Premium Underlying Present Rate:	2.475	1.218	3.693
(20) Relativity to Underlying Present Rate:	0.902	0.909	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.078	1.063	.
(24) Balanced Formula Relativity:	1.084	1.064	1.078

Class(es):		Effective: 7/1/2018							Construction		
3726 BOILER INSTALLATION OR REPAIR-STEAM											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	68,554	1	13	21,340	4,733	15,533	14,305	55,910	0.380	0.435	0.816
2012	66,743	3	7	611,199	69,586	73,782	43,215	797,782	10.200	1.753	11.953
2013	67,705	1	7	65,797	71,922	16,883	36,308	190,910	2.034	0.786	2.820
2014	99,961	1	4	118,806	6,735	33,392	32,966	191,899	1.256	0.664	1.920
2015	113,846	0	6	0	5,488	0	10,032	15,519	0.048	0.088	0.136
MA Total:	416,809	6	37	817,142	158,464	139,589	136,826	1,252,021	2.341	0.663	3.004

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.892	0.561	.
(14) Massachusetts Credibility:	0.350	0.400	.
(15) Countrywide Pure Premium:	1.991	0.709	2.699
(16) Countrywide Indicated Relativity:	0.777	0.626	.
(17) Countrywide Credibility:	0.330	0.300	.
(18) Countrywide Lost-Time Claims:	614.00	.	.
(19) Pure Premium Underlying Present Rate:	4.589	1.497	6.086
(20) Relativity to Underlying Present Rate:	1.672	1.117	.
(21) Credibility to Underlying Relativity:	0.320	0.300	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.104	0.747	.
(24) Balanced Formula Relativity:	1.110	0.748	0.998

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Calculation of Class Relativities

Class(es): 3808 AUTOMOBILE MFG OR ASSEMBLY		Effective: 7/1/2018						Manufacturing			
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	119,558	0	43	0	10,206	0	28,408	38,614	0.085	0.238	0.323
2012	91,227	0	50	0	22,025	0	64,748	86,774	0.241	0.710	0.951
2013	115,967	0	27	0	49,709	0	143,495	193,203	0.429	1.237	1.666
2014	130,689	2	35	106,660	9,074	73,433	35,543	224,709	0.886	0.834	1.719
2015	155,929	0	47	0	230,480	0	178,503	408,984	1.478	1.145	2.623
MA Total:	613,370	2	202	106,660	321,494	73,433	450,697	952,283	0.698	0.855	1.553

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.714	1.664	.
(14) Massachusetts Credibility:	0.250	0.360	.
(15) Countrywide Pure Premium:	1.563	0.673	2.236
(16) Countrywide Indicated Relativity:	1.745	1.463	.
(17) Countrywide Credibility:	0.380	0.320	.
(18) Countrywide Lost-Time Claims:	5294.0	.	.
(19) Pure Premium Underlying Present Rate:	1.437	0.776	2.213
(20) Relativity to Underlying Present Rate:	1.523	1.416	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.405	1.520	.
(24) Balanced Formula Relativity:	1.393	1.513	1.434

Class(es): 3821 AUTOMOBILE DISMANTLING & DRIVERS		Effective: 7/1/2018						Goods and Services			
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	191,480	1	47	25,393	467,452	4,764	215,030	712,638	2.574	1.148	3.722
2012	175,047	0	42	0	198,664	0	144,184	342,849	1.135	0.824	1.959
2013	174,556	1	28	112,031	38,729	97,228	129,006	376,995	0.864	1.296	2.160
2014	160,662	3	27	326,813	29,082	284,862	87,911	728,669	2.215	2.320	4.535
2015	156,663	1	18	3,376	228,759	14,062	75,591	321,788	1.482	0.572	2.054
MA Total:	858,409	6	162	467,614	962,686	400,916	651,723	2,482,939	1.666	1.226	2.892

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.992	2.577	.
(14) Massachusetts Credibility:	0.330	0.480	.
(15) Countrywide Pure Premium:	2.956	1.700	4.656
(16) Countrywide Indicated Relativity:	3.543	3.557	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	1103.0	.	.
(19) Pure Premium Underlying Present Rate:	1.967	1.133	3.100
(20) Relativity to Underlying Present Rate:	2.372	2.224	.
(21) Credibility to Underlying Relativity:	0.330	0.260	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.645	2.740	.
(24) Balanced Formula Relativity:	2.627	2.739	2.668

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Calculation of Class Relativities

Class(es): 3826 AIRCRAFT ENGINE MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,020,234	17	309	2,008,772	2,584,929	752,437	2,285,488	7,631,626	2,274	1,504	3,778
2012	1,903,634	16	244	1,668,899	1,917,675	675,322	1,705,249	5,967,146	1,884	1,251	3,135
2013	1,849,772	15	291	1,411,783	2,951,842	778,875	2,594,889	7,737,390	2,359	1,824	4,183
2014	1,729,388	19	246	1,870,852	2,741,156	856,809	2,332,433	7,801,250	2,667	1,844	4,511
2015	1,607,228	9	258	1,431,173	6,230,188	371,491	3,852,519	11,885,370	4,767	2,628	7,395
MA Total:	9,110,256	76	1,348	8,391,478	16,425,790	3,434,934	12,770,579	41,022,782	2,724	1,779	4,503

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.787	3.464	.
(14) Massachusetts Credibility:	0.890	1.000	.
(15) Countrywide Pure Premium:	0.438	0.154	0.593
(16) Countrywide Indicated Relativity:	0.489	0.335	.
(17) Countrywide Credibility:	0.060	0.000	.
(18) Countrywide Lost-Time Claims:	396.00	.	.
(19) Pure Premium Underlying Present Rate:	2.235	1.519	3.755
(20) Relativity to Underlying Present Rate:	2.370	2.772	.
(21) Credibility to Underlying Relativity:	0.050	0.000	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.628	3.464	.
(24) Balanced Formula Relativity:	2.605	3.446	2.895

Class(es): 3841 TUBULAR METAL PRODUCTS MFG OR ASSEMBLY		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	56,334	0	7	0	0	0	2,579	2,579	0.000	0.046	0.046
2012	51,296	0	3	0	1,287	0	9,953	11,240	0.025	0.194	0.219
2013	46,193	0	2	0	0	0	976	976	0.000	0.021	0.021
2014	57,808	0	5	0	66,152	0	23,807	89,959	1.144	0.412	1.556
2015	59,280	0	2	0	187,437	0	30,663	218,100	3.162	0.517	3.679
MA Total:	270,911	0	19	0	254,877	0	67,978	322,854	0.941	0.251	1.192

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.962	0.489	.
(14) Massachusetts Credibility:	0.130	0.200	.
(15) Countrywide Pure Premium:	0.545	0.410	0.954
(16) Countrywide Indicated Relativity:	0.608	0.890	.
(17) Countrywide Credibility:	0.290	0.310	.
(18) Countrywide Lost-Time Claims:	52.000	.	.
(19) Pure Premium Underlying Present Rate:	0.594	0.400	0.995
(20) Relativity to Underlying Present Rate:	0.630	0.731	.
(21) Credibility to Underlying Relativity:	0.580	0.490	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.667	0.732	.
(24) Balanced Formula Relativity:	0.661	0.728	0.684

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Calculation of Class Relativities

Class(es): 4000 SAND OR GRAVEL DIGGING & DRIVERS		Effective: 7/1/2018							Miscellaneous		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	326,814	1	49	276,955	360,290	121,525	148,909	907,680	1,950	0,827	2,777
2012	344,864	1	32	277,389	317,459	196,116	166,166	957,130	1,725	1,051	2,775
2013	392,176	1	38	301,027	312,685	115,442	296,132	1,025,286	1,565	1,049	2,614
2014	397,186	3	33	542,128	687,535	219,763	252,720	1,702,147	3,096	1,190	4,286
2015	447,688	3	51	864,949	1,205,431	310,467	306,399	2,687,246	4,625	1,378	6,002
MA Total:	1,908,729	9	203	2,262,449	2,883,400	963,313	1,170,326	7,279,489	2,696	1,118	3,814

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.124	0.937	.
(14) Massachusetts Credibility:	0.480	0.650	.
(15) Countrywide Pure Premium:	2.599	1.281	3.880
(16) Countrywide Indicated Relativity:	1.206	1.206	.
(17) Countrywide Credibility:	0.260	0.180	.
(18) Countrywide Lost-Time Claims:	992.00	.	.
(19) Pure Premium Underlying Present Rate:	2.225	1.076	3.301
(20) Relativity to Underlying Present Rate:	0.913	0.815	.
(21) Credibility to Underlying Relativity:	0.260	0.170	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	1.090	0.965	.
(24) Balanced Formula Relativity:	1.086	0.971	1.048

Class(es): 4021 BRICK OR CLAY PRODUCTS MFG NOC & DRIVERS		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	11,703	0	5	0	460	0	2,569	3,029	0.039	0.219	0.259
2012	13,269	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	12,117	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	15,367	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	13,365	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	65,822	0	5	0	460	0	2,569	3,029	0.007	0.039	0.046

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.007	0.076	.
(14) Massachusetts Credibility:	0.110	0.170	.
(15) Countrywide Pure Premium:	2.184	1.247	3.431
(16) Countrywide Indicated Relativity:	2.438	2.709	.
(17) Countrywide Credibility:	0.450	0.420	.
(18) Countrywide Lost-Time Claims:	295.00	.	.
(19) Pure Premium Underlying Present Rate:	1.764	1.163	2.927
(20) Relativity to Underlying Present Rate:	1.870	2.122	.
(21) Credibility to Underlying Relativity:	0.440	0.410	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.920	2.021	.
(24) Balanced Formula Relativity:	1.904	2.011	1.941

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Calculation of Class Relativities

Class(es): 4024 REFRACTORY PRODUCTS MFG & DRIVERS												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	36.915	0	3	0	74.862	0	31.947	106.809	2.028	0.865	2.893						
2012	6.510	0	1	0	0	0	609	609	0.000	0.094	0.094						
2013	4.733	0	1	0	0	0	256	256	0.000	0.054	0.054						
2014	5.869	0	1	0	7.405	0	5.898	13.302	1.262	1.005	2.266						
2015	42	0	0	0	0	0	0	0	0.000	0.000	0.000						
MA Total:	54.070	0	6	0	82.267	0	38.710	120.976	1.521	0.716	2.237						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.556	1.394	.
(14) Massachusetts Credibility:	0.100	0.140	.
(15) Countrywide Pure Premium:	1.479	0.734	2.214
(16) Countrywide Indicated Relativity:	1.651	1.596	.
(17) Countrywide Credibility:	0.400	0.430	.
(18) Countrywide Lost-Time Claims:	119.00	.	.
(19) Pure Premium Underlying Present Rate:	1.459	0.755	2.213
(20) Relativity to Underlying Present Rate:	1.546	1.377	.
(21) Credibility to Underlying Relativity:	0.500	0.430	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.589	1.473	.
(24) Balanced Formula Relativity:	1.576	1.466	1.538

Class(es): 4034 CONCRETE PRODUCTS MFG & DRIVERS												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	161.217	1	38	27.292	636.451	75.358	330.650	1,069.750	4.117	2.518	6.635						
2012	152.103	2	35	41.391	347.700	31.522	299.244	719.857	2.558	2.175	4.733						
2013	155.112	3	39	99.871	323.069	68.012	238.234	729.186	2.727	1.974	4.701						
2014	175.307	2	48	114.628	259.964	172.381	265.608	812.582	2.137	2.498	4.635						
2015	200.529	0	37	0	567.687	0	239.350	807.037	2.831	1.194	4.025						
MA Total:	844.269	8	197	283.181	2,134.871	347.274	1,373.085	4,138.412	2.864	2.038	4.902						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.930	3.968	.
(14) Massachusetts Credibility:	0.390	0.600	.
(15) Countrywide Pure Premium:	2.796	1.467	4.262
(16) Countrywide Indicated Relativity:	3.121	3.187	.
(17) Countrywide Credibility:	0.310	0.200	.
(18) Countrywide Lost-Time Claims:	2598.0	.	.
(19) Pure Premium Underlying Present Rate:	2.972	1.944	4.916
(20) Relativity to Underlying Present Rate:	3.151	3.548	.
(21) Credibility to Underlying Relativity:	0.300	0.200	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	3.055	3.728	.
(24) Balanced Formula Relativity:	3.029	3.709	3.263

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Manufacturing		
4036 PLASTERBOARD OR PLASTER BLOCK MFG & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	10,922	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	11,371	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	11,496	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	10,463	0	2	0	15,140	0	17,789	32,929	1,447	1,700	3,147
2015	10,394	0	1	0	1,031	0	4,786	5,817	0.099	0.460	0.560
MA Total:	54,646	0	3	0	16,171	0	22,576	38,747	0.296	0.413	0.709

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.303	0.804	.
(14) Massachusetts Credibility:	0.090	0.120	.
(15) Countrywide Pure Premium:	1.360	0.640	2.000
(16) Countrywide Indicated Relativity:	1.518	1.392	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	246.00	.	.
(19) Pure Premium Underlying Present Rate:	1.203	0.501	1.704
(20) Relativity to Underlying Present Rate:	1.275	0.915	.
(21) Credibility to Underlying Relativity:	0.450	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.299	1.111	.
(24) Balanced Formula Relativity:	1.288	1.106	1.225

Class(es):		Effective: 7/1/2018							Manufacturing		
4038 PLASTER STATUARY OR ORNAMENT MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	17,974	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	17,308	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	15,298	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	15,837	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	15,537	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	81,953	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.120	0.170	.
(15) Countrywide Pure Premium:	1.766	0.799	2.566
(16) Countrywide Indicated Relativity:	1.971	1.737	.
(17) Countrywide Credibility:	0.310	0.330	.
(18) Countrywide Lost-Time Claims:	64.000	.	.
(19) Pure Premium Underlying Present Rate:	1.599	0.819	2.418
(20) Relativity to Underlying Present Rate:	1.695	1.495	.
(21) Credibility to Underlying Relativity:	0.570	0.500	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.577	1.321	.
(24) Balanced Formula Relativity:	1.564	1.314	1.478

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Calculation of Class Relativities

Class(es): 4053 POTTERY MFG: CHINA OR TABLEWARE												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	50,266	1	13	66,571	18,229	27,979	52,418	165,197	1,687	1,599	3,286						
2012	47,506	0	5	0	17,109	0	22,000	39,109	0,360	0,463	0,823						
2013	59,234	0	8	0	11,378	0	50,842	62,220	0,192	0,858	1,050						
2014	71,577	2	7	142,704	401,918	121,743	23,596	689,962	7,609	2,031	9,639						
2015	78,092	0	11	0	50,489	0	33,544	84,033	0,647	0,430	1,076						
MA Total:	306,676	3	44	209,275	499,123	149,722	182,400	1,040,520	2,310	1,083	3,393						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.363	2.109	.
(14) Massachusetts Credibility:	0.150	0.230	.
(15) Countrywide Pure Premium:	0.826	0.578	1.404
(16) Countrywide Indicated Relativity:	0.922	1.256	.
(17) Countrywide Credibility:	0.260	0.280	.
(18) Countrywide Lost-Time Claims:	41.000	.	.
(19) Pure Premium Underlying Present Rate:	0.830	0.521	1.351
(20) Relativity to Underlying Present Rate:	0.880	0.950	.
(21) Credibility to Underlying Relativity:	0.590	0.490	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.114	1.302	.
(24) Balanced Formula Relativity:	1.104	1.296	1.170

Class(es): 4062 POTTERY MFG: PORCELAIN WARE-MECHANICAL PRESS FORMING												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	30,269	0	3	0	0	0	908	908	0.000	0.030	0.030						
2012	39,662	0	0	0	0	0	0	0	0.000	0.000	0.000						
2013	43,212	0	0	0	0	0	0	0	0.000	0.000	0.000						
2014	58,612	0	2	0	991	0	5,695	6,686	0.017	0.097	0.114						
2015	69,316	0	1	0	0	0	236	236	0.000	0.003	0.003						
MA Total:	241,071	0	6	0	991	0	6,839	7,830	0.004	0.028	0.032						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.004	0.055	.
(14) Massachusetts Credibility:	0.140	0.210	.
(15) Countrywide Pure Premium:	0.993	0.609	1.603
(16) Countrywide Indicated Relativity:	1.109	1.324	.
(17) Countrywide Credibility:	0.430	0.400	.
(18) Countrywide Lost-Time Claims:	321.00	.	.
(19) Pure Premium Underlying Present Rate:	0.856	0.525	1.381
(20) Relativity to Underlying Present Rate:	0.908	0.958	.
(21) Credibility to Underlying Relativity:	0.430	0.390	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.868	0.915	.
(24) Balanced Formula Relativity:	0.860	0.910	0.877

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Calculation of Class Relativities

Class(es): 4112 INCANDESCENT LAMP MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	182.773	0	2	0	0	0	204	204	0.000	0.001	0.001
2012	201.629	0	3	0	1.626	0	9.816	11.442	0.008	0.049	0.057
2013	72.342	0	3	0	0	0	1.200	1.200	0.000	0.017	0.017
2014	55.027	0	5	0	4.635	0	12.379	17.014	0.084	0.225	0.309
2015	54.906	0	8	0	4.202	0	6.582	10.784	0.077	0.120	0.196
MA Total:	566.676	0	21	0	10.463	0	30.180	40.643	0.018	0.053	0.072

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.019	0.104	.
(14) Massachusetts Credibility:	0.130	0.190	.
(15) Countrywide Pure Premium:	0.036	0.046	0.082
(16) Countrywide Indicated Relativity:	0.040	0.100	.
(17) Countrywide Credibility:	0.140	0.150	.
(18) Countrywide Lost-Time Claims:	9.000	.	.
(19) Pure Premium Underlying Present Rate:	0.319	0.166	0.484
(20) Relativity to Underlying Present Rate:	0.338	0.303	.
(21) Credibility to Underlying Relativity:	0.730	0.660	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.255	0.234	.
(24) Balanced Formula Relativity:	0.252	0.233	0.246

Class(es): 4114 GLASSWARE MFG-NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	134.183	1	17	17.173	16.590	11.504	26.685	71.953	0.252	0.285	0.536
2012	153.620	0	18	0	33.399	0	18.630	52.030	0.217	0.121	0.339
2013	136.672	1	13	92.863	5.549	15.942	7.439	121.792	0.720	0.171	0.891
2014	157.682	0	17	0	263.072	0	101.323	364.396	1.668	0.643	2.311
2015	188.417	0	22	0	106.571	0	51.439	158.010	0.566	0.273	0.839
MA Total:	770.574	2	87	110.035	425.182	27.446	205.516	768.180	0.695	0.302	0.997

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.710	0.589	.
(14) Massachusetts Credibility:	0.250	0.340	.
(15) Countrywide Pure Premium:	1.598	0.614	2.212
(16) Countrywide Indicated Relativity:	1.784	1.334	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	384.00	.	.
(19) Pure Premium Underlying Present Rate:	1.066	0.525	1.591
(20) Relativity to Underlying Present Rate:	1.130	0.958	.
(21) Credibility to Underlying Relativity:	0.370	0.330	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.274	0.956	.
(24) Balanced Formula Relativity:	1.263	0.952	1.155

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Calculation of Class Relativities

Class(es): 4130 GLASS MERCHANT		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	172,898	0	40	0	347,709	0	228,536	576,245	2,011	1,322	3,333
2012	188,031	3	36	75,236	24,384	34,728	46,979	181,326	0,530	0,435	0,964
2013	193,870	0	25	0	372,373	0	121,425	493,798	1,921	0,626	2,547
2014	217,699	1	30	324,667	35,666	108,014	58,807	527,154	1,655	0,766	2,421
2015	211,398	1	19	148,119	47,568	20,106	41,959	257,753	0,926	0,294	1,219
MA Total:	983,896	5	150	548,022	827,699	162,848	497,706	2,036,275	1,398	0,671	2,070

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.430	1.307	.
(14) Massachusetts Credibility:	0.320	0.470	.
(15) Countrywide Pure Premium:	1.442	0.853	2.295
(16) Countrywide Indicated Relativity:	1.610	1.853	.
(17) Countrywide Credibility:	0.340	0.270	.
(18) Countrywide Lost-Time Claims:	841.00	.	.
(19) Pure Premium Underlying Present Rate:	1.604	0.916	2.520
(20) Relativity to Underlying Present Rate:	1.700	1.671	.
(21) Credibility to Underlying Relativity:	0.340	0.260	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.583	1.549	.
(24) Balanced Formula Relativity:	1.569	1.541	1.560

Class(es): 4133 CATHEDRAL OR ART GLASS WINDOW MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	8,692	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	8,411	0	1	0	6,074	0	200	6,274	0,722	0,024	0,746
2013	10,431	0	1	0	79	0	609	688	0,008	0,058	0,066
2014	14,947	0	1	0	0	0	1,226	1,226	0,000	0,082	0,082
2015	11,759	0	2	0	0	0	1,480	1,480	0,000	0,126	0,126
MA Total:	54,240	0	5	0	6,153	0	3,515	9,668	0,113	0,065	0,178

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.116	0.126	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	0.970	0.428	1.397
(16) Countrywide Indicated Relativity:	1.082	0.930	.
(17) Countrywide Credibility:	0.230	0.240	.
(18) Countrywide Lost-Time Claims:	29,000	.	.
(19) Pure Premium Underlying Present Rate:	0.851	0.442	1.293
(20) Relativity to Underlying Present Rate:	0.903	0.806	.
(21) Credibility to Underlying Relativity:	0.690	0.650	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.881	0.761	.
(24) Balanced Formula Relativity:	0.873	0.757	0.833

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Calculation of Class Relativities

Class(es): 4150 OPTICAL GOODS MFG-NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,042,029	4	103	378,496	557,312	53,675	265,314	1,254,797	0.458	0.156	0.614
2012	1,803,305	2	103	53,761	377,551	11,205	223,810	666,327	0.239	0.130	0.370
2013	1,758,297	0	107	0	283,420	0	244,322	527,743	0.161	0.139	0.300
2014	1,889,441	1	101	145,550	364,582	44,871	193,171	748,174	0.270	0.126	0.396
2015	1,958,383	2	100	261,361	171,271	35,461	194,878	662,971	0.221	0.118	0.339
MA Total:	9,451,455	9	514	839,168	1,754,136	145,213	1,121,496	3,860,012	0.274	0.134	0.408

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.281	0.261	.
(14) Massachusetts Credibility:	0.420	0.590	.
(15) Countrywide Pure Premium:	0.387	0.189	0.576
(16) Countrywide Indicated Relativity:	0.432	0.410	.
(17) Countrywide Credibility:	0.290	0.210	.
(18) Countrywide Lost-Time Claims:	92.000	.	.
(19) Pure Premium Underlying Present Rate:	0.327	0.170	0.498
(20) Relativity to Underlying Present Rate:	0.347	0.311	.
(21) Credibility to Underlying Relativity:	0.290	0.200	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.344	0.302	.
(24) Balanced Formula Relativity:	0.341	0.301	0.327

Class(es): 4239 PAPER MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	446,925	1	54	355,757	466,428	190,528	247,189	1,259,902	1.840	0.979	2.819
2012	410,444	0	48	0	308,602	0	195,931	504,533	0.752	0.477	1.229
2013	163,576	0	27	0	59,411	0	38,066	97,477	0.363	0.233	0.596
2014	171,243	1	43	63,212	84,382	6,086	90,420	244,100	0.862	0.564	1.425
2015	192,752	0	38	0	99,401	0	154,220	253,621	0.516	0.800	1.316
MA Total:	1,384,941	2	210	418,969	1,018,224	196,614	725,826	2,359,634	1.038	0.666	1.704

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.062	1.297	.
(14) Massachusetts Credibility:	0.330	0.480	.
(15) Countrywide Pure Premium:	1.154	0.430	1.584
(16) Countrywide Indicated Relativity:	1.288	0.935	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	2014.0	.	.
(19) Pure Premium Underlying Present Rate:	1.202	0.696	1.898
(20) Relativity to Underlying Present Rate:	1.274	1.270	.
(21) Credibility to Underlying Relativity:	0.330	0.260	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.209	1.196	.
(24) Balanced Formula Relativity:	1.198	1.190	1.195

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Calculation of Class Relativities

Class(es): 4243 BOX MFG-FOLDING PAPER-NOC												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	272,750	4	56	155,513	497,528	71,269	142,394	866,705	2,394	0,783	3,178						
2012	271,995	2	38	283,368	699,861	244,207	220,455	1,447,891	3,615	1,708	5,323						
2013	226,965	1	30	14,926	304,746	7,487	97,416	424,574	1,408	0,462	1,871						
2014	243,323	1	27	190,908	155,847	38,684	140,100	525,539	1,425	0,735	2,160						
2015	213,373	1	35	56,576	304,477	6,263	151,387	518,703	1,692	0,739	2,431						
MA Total:	1,228,407	9	186	701,291	1,962,460	367,910	751,751	3,783,413	2,168	0,911	3,080						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.218	1.775	.
(14) Massachusetts Credibility:	0.360	0.510	.
(15) Countrywide Pure Premium:	0.902	0.447	1.349
(16) Countrywide Indicated Relativity:	1.007	0.971	.
(17) Countrywide Credibility:	0.320	0.250	.
(18) Countrywide Lost-Time Claims:	1163.0	.	.
(19) Pure Premium Underlying Present Rate:	1.778	0.922	2.700
(20) Relativity to Underlying Present Rate:	1.885	1.682	.
(21) Credibility to Underlying Relativity:	0.320	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.724	1.552	.
(24) Balanced Formula Relativity:	1.709	1.544	1.652

Class(es): 4244 CORRUGATED OR FIBERBOARD CONTAINER MFG												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	372,335	0	44	0	142,311	0	137,113	279,424	0,382	0,368	0,750						
2012	333,313	0	31	0	127,035	0	110,676	237,711	0,381	0,332	0,713						
2013	310,612	2	34	539,790	95,184	61,910	119,068	815,951	2,044	0,583	2,627						
2014	325,214	5	37	277,566	384,031	76,979	168,275	906,851	2,034	0,754	2,788						
2015	205,715	0	29	0	503,265	0	81,901	585,166	2,446	0,398	2,845						
MA Total:	1,547,190	7	175	817,356	1,251,826	138,889	617,032	2,825,103	1,337	0,489	1,826						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.368	0.951	.
(14) Massachusetts Credibility:	0.340	0.510	.
(15) Countrywide Pure Premium:	1.126	0.538	1.663
(16) Countrywide Indicated Relativity:	1.256	1.168	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	1207.0	.	.
(19) Pure Premium Underlying Present Rate:	1.176	0.724	1.900
(20) Relativity to Underlying Present Rate:	1.247	1.321	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.291	1.094	.
(24) Balanced Formula Relativity:	1.280	1.089	1.214

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Calculation of Class Relativities

Class(es): 4250 PAPER COATING		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	811,526	1	88	17,453	720,079	23,974	568,187	1,329,693	0.909	0.730	1.639
2012	870,006	3	77	524,715	874,161	272,234	465,074	2,136,184	1.608	0.847	2.455
2013	926,296	1	85	74,997	464,623	12,081	308,878	860,580	0.583	0.346	0.929
2014	923,429	1	93	82,730	834,443	4,997	395,005	1,317,176	0.993	0.433	1.426
2015	945,444	0	78	0	473,652	0	278,892	752,544	0.501	0.295	0.796
MA Total:	4,476,702	6	421	699,895	3,366,959	313,286	2,016,036	6,396,176	0.908	0.520	1.429

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.929	1.013	.
(14) Massachusetts Credibility:	0.480	0.770	.
(15) Countrywide Pure Premium:	0.748	0.408	1.156
(16) Countrywide Indicated Relativity:	0.835	0.886	.
(17) Countrywide Credibility:	0.260	0.120	.
(18) Countrywide Lost-Time Claims:	741.00	.	.
(19) Pure Premium Underlying Present Rate:	0.985	0.691	1.676
(20) Relativity to Underlying Present Rate:	1.044	1.260	.
(21) Credibility to Underlying Relativity:	0.260	0.110	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.935	1.025	.
(24) Balanced Formula Relativity:	0.927	1.020	0.959

Class(es): 4251 STATIONERY MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	149,014	0	7	0	37,710	0	20,514	58,224	0.253	0.138	0.391
2012	147,754	0	7	0	550,711	0	106,796	657,506	3.727	0.723	4.450
2013	138,853	0	8	0	9,758	0	9,944	19,702	0.070	0.072	0.142
2014	109,254	0	3	0	306,913	0	63,274	370,187	2.809	0.579	3.388
2015	113,342	0	7	0	41,936	0	15,655	57,591	0.370	0.138	0.508
MA Total:	658,217	0	32	0	947,027	0	216,184	1,163,210	1.439	0.328	1.767

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.472	0.640	.
(14) Massachusetts Credibility:	0.240	0.320	.
(15) Countrywide Pure Premium:	1.097	0.543	1.641
(16) Countrywide Indicated Relativity:	1.225	1.181	.
(17) Countrywide Credibility:	0.380	0.340	.
(18) Countrywide Lost-Time Claims:	348.00	.	.
(19) Pure Premium Underlying Present Rate:	1.194	0.522	1.716
(20) Relativity to Underlying Present Rate:	1.265	0.953	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.299	0.930	.
(24) Balanced Formula Relativity:	1.288	0.925	1.163

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Calculation of Class Relativities

Class(es): 4273 BAG MFG-PAPER OR PLASTIC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	39,265	0	11	0	2,324	0	6,530	8,854	0.059	0.166	0.225
2012	51,959	0	13	0	10,606	0	17,670	28,275	0.204	0.340	0.544
2013	48,010	1	15	74,373	78,203	24,772	35,710	213,059	3.178	1.260	4.438
2014	48,334	0	11	0	205,592	0	90,223	295,815	4.254	1.867	6.120
2015	46,720	2	15	273,989	45,299	47,395	42,801	409,485	6.834	1.931	8.765
MA Total:	234,288	3	65	348,362	342,025	72,168	192,934	955,488	2.947	1.132	4.078

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.014	2.203	.
(14) Massachusetts Credibility:	0.150	0.220	.
(15) Countrywide Pure Premium:	1.009	0.496	1.505
(16) Countrywide Indicated Relativity:	1.126	1.078	.
(17) Countrywide Credibility:	0.430	0.390	.
(18) Countrywide Lost-Time Claims:	715.00	.	.
(19) Pure Premium Underlying Present Rate:	0.981	0.575	1.556
(20) Relativity to Underlying Present Rate:	1.040	1.050	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.373	1.314	.
(24) Balanced Formula Relativity:	1.361	1.308	1.343

Class(es): 4279 PAPER GOODS MFG NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	327,007	2	47	56,806	179,801	102,502	168,895	508,003	0.724	0.830	1.553
2012	316,717	2	46	80,324	47,634	9,716	81,549	219,223	0.404	0.288	0.692
2013	349,087	1	40	132,038	188,492	17,946	113,572	452,047	0.918	0.377	1.295
2014	407,010	3	74	79,258	228,328	55,639	161,019	524,243	0.756	0.532	1.288
2015	566,214	1	59	240,870	234,554	9,860	221,265	706,550	0.840	0.408	1.248
MA Total:	1,966,036	9	266	589,297	878,808	195,663	746,299	2,410,067	0.747	0.479	1.226

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.764	0.933	.
(14) Massachusetts Credibility:	0.340	0.520	.
(15) Countrywide Pure Premium:	1.134	0.511	1.645
(16) Countrywide Indicated Relativity:	1.266	1.111	.
(17) Countrywide Credibility:	0.330	0.240	.
(18) Countrywide Lost-Time Claims:	1410.0	.	.
(19) Pure Premium Underlying Present Rate:	0.956	0.584	1.539
(20) Relativity to Underlying Present Rate:	1.013	1.065	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.012	1.007	.
(24) Balanced Formula Relativity:	1.003	1.002	1.003

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Manufacturing		
4283 BUILDING OR ROOFING PAPER OR FELT PREPARATION-NO INSTALLATION											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,317	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	4,842	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	15,366	0	3	0	5,469	0	3,350	8,819	0.356	0.218	0.574
2014	6,683	0	1	0	15,535	0	753	16,288	2.325	0.113	2.437
2015	10,701	0	2	0	112,124	0	50,908	163,031	10.478	4.757	15.235
MA Total:	39,909	0	6	0	133,128	0	55,011	188,139	3.336	1.378	4.714

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.412	2.684	.
(14) Massachusetts Credibility:	0.070	0.100	.
(15) Countrywide Pure Premium:	0.688	0.358	1.046
(16) Countrywide Indicated Relativity:	0.768	0.778	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	164.00	.	.
(19) Pure Premium Underlying Present Rate:	0.963	0.509	1.472
(20) Relativity to Underlying Present Rate:	1.021	0.928	.
(21) Credibility to Underlying Relativity:	0.470	0.450	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.072	1.036	.
(24) Balanced Formula Relativity:	1.063	1.031	1.052

Class(es):		Effective: 7/1/2018							Manufacturing		
4299 PRINTING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,215,530	15	243	1,365,382	827,857	329,646	559,653	3,082,539	0.990	0.401	1.391
2012	2,134,945	7	189	1,199,578	660,213	651,263	352,498	2,863,552	0.871	0.470	1.341
2013	2,269,803	8	302	809,300	1,554,858	235,383	1,043,564	3,643,105	1.042	0.563	1.605
2014	2,210,087	11	191	1,001,790	983,776	146,443	594,844	2,726,853	0.898	0.335	1.234
2015	2,439,778	15	226	1,197,866	1,083,974	1,015,251	791,628	4,088,719	0.935	0.741	1.676
MA Total:	11,270,142	56	1,151	5,573,916	5,110,678	2,377,987	3,342,187	16,404,767	0.948	0.508	1.456

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.970	0.988	.
(14) Massachusetts Credibility:	0.670	0.990	.
(15) Countrywide Pure Premium:	0.781	0.432	1.213
(16) Countrywide Indicated Relativity:	0.872	0.938	.
(17) Countrywide Credibility:	0.170	0.010	.
(18) Countrywide Lost-Time Claims:	5697.0	.	.
(19) Pure Premium Underlying Present Rate:	0.889	0.524	1.413
(20) Relativity to Underlying Present Rate:	0.943	0.957	.
(21) Credibility to Underlying Relativity:	0.160	0.000	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.949	0.988	.
(24) Balanced Formula Relativity:	0.941	0.983	0.955

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Calculation of Class Relativities

Class(es): 4304 NEWSPAPER PUBLISHING		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	245,611	5	32	480,382	125,996	650,691	122,479	1,379,548	2,469	3,148	5,617
2012	208,899	7	34	735,055	81,980	384,615	68,712	1,270,363	3,911	2,170	6,081
2013	594,154	4	72	458,968	982,275	283,322	460,407	2,184,972	2,426	1,252	3,677
2014	598,084	2	76	371,206	676,410	139,666	343,155	1,530,437	1,752	0,807	2,559
2015	694,569	5	66	565,524	1,777,336	274,519	854,371	3,471,750	3,373	1,625	4,998
MA Total:	2,341,317	23	280	2,611,136	3,643,997	1,732,814	1,849,124	9,837,071	2,672	1,530	4,202

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.733	2.979	.
(14) Massachusetts Credibility:	0.500	0.840	.
(15) Countrywide Pure Premium:	1.940	1.102	3.042
(16) Countrywide Indicated Relativity:	2.166	2.394	.
(17) Countrywide Credibility:	0.250	0.080	.
(18) Countrywide Lost-Time Claims:	1402.0	.	.
(19) Pure Premium Underlying Present Rate:	2.048	1.654	3.702
(20) Relativity to Underlying Present Rate:	2.171	3.019	.
(21) Credibility to Underlying Relativity:	0.250	0.080	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.451	2.935	.
(24) Balanced Formula Relativity:	2.429	2.921	2.599

Class(es): 4307 BOOKBINDING		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	143,040	3	13	52,883	25,289	127,161	55,959	261,293	0.547	1.280	1.827
2012	156,087	1	8	173,285	25,337	10,396	26,747	235,764	1.273	0.238	1.510
2013	149,037	0	10	0	285,967	0	68,654	354,621	1.919	0.461	2.379
2014	159,570	0	11	0	14,321	0	31,736	46,057	0.090	0.199	0.289
2015	156,716	1	14	169,156	3,902	42,471	19,323	234,853	1.104	0.394	1.499
MA Total:	764,449	5	56	395,324	354,816	180,029	202,418	1,132,587	0.981	0.500	1.482

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.004	0.974	.
(14) Massachusetts Credibility:	0.220	0.330	.
(15) Countrywide Pure Premium:	0.567	0.358	0.926
(16) Countrywide Indicated Relativity:	0.633	0.778	.
(17) Countrywide Credibility:	0.390	0.340	.
(18) Countrywide Lost-Time Claims:	232.00	.	.
(19) Pure Premium Underlying Present Rate:	0.801	0.496	1.297
(20) Relativity to Underlying Present Rate:	0.849	0.905	.
(21) Credibility to Underlying Relativity:	0.390	0.330	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.799	0.885	.
(24) Balanced Formula Relativity:	0.792	0.880	0.822

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Calculation of Class Relativities

Class(es): 4308 LINOTYPE OR HAND COMPOSITION		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	114	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	115	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	118	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	105	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	106	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	559	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.020	0.010	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.636	0.396	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.563	0.220	1.784
(20) Relativity to Underlying Present Rate:	1.657	0.402	.
(21) Credibility to Underlying Relativity:	0.980	0.990	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.624	0.398	.
(24) Balanced Formula Relativity:	1.610	0.396	1.192

Class(es): 4351 PHOTOENGRAVING		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	240,577	0	25	0	66,749	0	14,432	81,181	0.277	0.060	0.337
2012	243,488	0	15	0	7,800	0	5,999	13,799	0.032	0.025	0.057
2013	264,619	1	25	382,187	75,218	129,200	28,999	615,604	1.729	0.598	2.326
2014	270,241	1	29	162,475	45,231	6,651	49,378	263,736	0.769	0.207	0.976
2015	285,673	1	25	70,151	41,409	2,872	66,980	181,412	0.391	0.245	0.635
MA Total:	1,304,597	3	119	614,813	236,408	138,723	165,788	1,155,732	0.652	0.233	0.886

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.667	0.454	.
(14) Massachusetts Credibility:	0.210	0.290	.
(15) Countrywide Pure Premium:	0.397	0.254	0.650
(16) Countrywide Indicated Relativity:	0.443	0.551	.
(17) Countrywide Credibility:	0.260	0.270	.
(18) Countrywide Lost-Time Claims:	39.000	.	.
(19) Pure Premium Underlying Present Rate:	0.413	0.206	0.619
(20) Relativity to Underlying Present Rate:	0.438	0.376	.
(21) Credibility to Underlying Relativity:	0.530	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.488	0.446	.
(24) Balanced Formula Relativity:	0.483	0.444	0.470

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Calculation of Class Relativities

Class(es): 4352 ENGRAVING		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	58,801	0	3	0	327	0	2,105	2,432	0.006	0.036	0.041
2012	52,698	0	4	0	191,176	0	58,135	249,311	3.628	1.103	4.731
2013	46,244	0	1	0	0	0	171	171	0.000	0.004	0.004
2014	50,295	0	2	0	0	0	572	572	0.000	0.011	0.011
2015	64,195	0	1	0	0	0	475	475	0.000	0.007	0.007
MA Total:	272,233	0	11	0	191,504	0	61,458	252,962	0.703	0.226	0.929

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.720	0.440	.
(14) Massachusetts Credibility:	0.160	0.200	.
(15) Countrywide Pure Premium:	0.530	0.265	0.795
(16) Countrywide Indicated Relativity:	0.591	0.576	.
(17) Countrywide Credibility:	0.360	0.380	.
(18) Countrywide Lost-Time Claims:	89.000	.	.
(19) Pure Premium Underlying Present Rate:	0.954	0.371	1.326
(20) Relativity to Underlying Present Rate:	1.012	0.677	.
(21) Credibility to Underlying Relativity:	0.480	0.420	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.814	0.591	.
(24) Balanced Formula Relativity:	0.807	0.588	0.732

Class(es): 4360 MOTION PICTURE: DEVLPMNT OF NEGATIVES, PRINTING & ALL SUB OP		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	113,515	0	3	0	20,462	0	27,930	48,392	0.180	0.246	0.426
2012	122,081	0	3	0	971	0	6,455	7,426	0.008	0.053	0.061
2013	576,029	0	5	0	0	0	22,261	22,261	0.000	0.039	0.039
2014	572,166	0	6	0	2,097	0	6,029	8,127	0.004	0.011	0.014
2015	567,136	0	1	0	0	0	303	303	0.000	0.001	0.001
MA Total:	1,950,925	0	18	0	23,530	0	62,978	86,508	0.012	0.032	0.044

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.012	0.063	.
(14) Massachusetts Credibility:	0.240	0.350	.
(15) Countrywide Pure Premium:	0.390	0.198	0.589
(16) Countrywide Indicated Relativity:	0.436	0.431	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	179.00	.	.
(19) Pure Premium Underlying Present Rate:	0.399	0.218	0.618
(20) Relativity to Underlying Present Rate:	0.423	0.399	.
(21) Credibility to Underlying Relativity:	0.380	0.320	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.329	0.292	.
(24) Balanced Formula Relativity:	0.327	0.290	0.314

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Office and Clerical			
4361 PHOTOGRAPHER - ALL EMP & CLERICAL, SALES, DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	640.956	2	35	93.103	21.127	14.269	33.223	161.722	0.178	0.074	0.252	
2012	643.701	1	19	22.318	50.046	80.350	35.700	188.414	0.112	0.180	0.293	
2013	610.285	1	24	224.476	25.109	386.427	38.604	674.616	0.409	0.696	1.105	
2014	610.340	0	23	0	55.176	0	85.331	140.507	0.090	0.140	0.230	
2015	611.318	1	13	146.515	12.571	25.279	11.599	195.965	0.260	0.060	0.321	
MA Total:	3,116.600	5	114	486.413	164.029	506.325	204.457	1,361.224	0.209	0.228	0.437	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.929	5.236	.
(14) Massachusetts Credibility:	0.270	0.430	.
(15) Countrywide Pure Premium:	0.374	0.201	0.575
(16) Countrywide Indicated Relativity:	6.155	5.205	.
(17) Countrywide Credibility:	0.370	0.290	.
(18) Countrywide Lost-Time Claims:	600.00	.	.
(19) Pure Premium Underlying Present Rate:	0.323	0.233	0.556
(20) Relativity to Underlying Present Rate:	4.440	4.823	.
(21) Credibility to Underlying Relativity:	0.360	0.280	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	4.667	5.111	.
(24) Balanced Formula Relativity:	4.698	5.125	4.860

Class(es):		Effective: 7/1/2018							Goods and Services			
4362 MOTION PICTURE: FILM EXCH & PROJECTION RMS, CL												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	10.871	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	9.920	0	0	0	0	0	0	0	0.000	0.000	0.000	
2013	8.720	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	5.625	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	4.486	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	39.622	0	0	0	0	0	0	0	0.000	0.000	0.000	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.070	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.352	0.335	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.294	0.172	0.466
(20) Relativity to Underlying Present Rate:	0.354	0.337	.
(21) Credibility to Underlying Relativity:	0.960	0.930	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.340	0.314	.
(24) Balanced Formula Relativity:	0.338	0.313	0.329

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Calculation of Class Relativities

Class(es): 4410 RUBBER GOODS MFG NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	481,322	3	89	685,381	266,145	160,438	279,057	1,391,021	1,977	0,913	2,890
2012	482,758	0	74	0	203,199	0	148,402	351,600	0,421	0,307	0,728
2013	575,846	3	94	116,854	198,069	44,087	201,937	560,947	0,547	0,427	0,974
2014	482,606	4	69	354,845	786,554	93,159	669,481	1,904,040	2,365	1,580	3,945
2015	455,152	1	76	69,810	252,262	47,593	216,842	586,507	0,708	0,581	1,289
MA Total:	2,477,684	11	402	1,226,890	1,706,229	345,278	1,515,719	4,794,116	1,184	0,751	1,935

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.211	1.463	.
(14) Massachusetts Credibility:	0.440	0.600	.
(15) Countrywide Pure Premium:	1.252	0.663	1.915
(16) Countrywide Indicated Relativity:	1.397	1.442	.
(17) Countrywide Credibility:	0.280	0.200	.
(18) Countrywide Lost-Time Claims:	2816.0	.	.
(19) Pure Premium Underlying Present Rate:	1.401	0.669	2.070
(20) Relativity to Underlying Present Rate:	1.485	1.221	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.340	1.410	.
(24) Balanced Formula Relativity:	1.328	1.403	1.354

Class(es): 4432 FOUNTAIN PEN MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	44,121	0	4	0	5,479	0	4,458	9,937	0,124	0,101	0,225
2012	56,910	0	2	0	451	0	2,848	3,299	0,008	0,050	0,058
2013	57,316	0	5	0	5,612	0	18,266	23,878	0,098	0,319	0,417
2014	60,186	0	3	0	6,080	0	12,022	18,102	0,101	0,200	0,301
2015	73,496	0	4	0	14,490	0	1,813	16,303	0,197	0,025	0,222
MA Total:	292,030	0	18	0	32,113	0	39,406	71,520	0,110	0,135	0,245

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.112	0.263	.
(14) Massachusetts Credibility:	0.120	0.180	.
(15) Countrywide Pure Premium:	0.317	0.303	0.620
(16) Countrywide Indicated Relativity:	0.354	0.658	.
(17) Countrywide Credibility:	0.240	0.250	.
(18) Countrywide Lost-Time Claims:	31,000	.	.
(19) Pure Premium Underlying Present Rate:	0.492	0.292	0.783
(20) Relativity to Underlying Present Rate:	0.521	0.532	.
(21) Credibility to Underlying Relativity:	0.640	0.570	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.432	0.515	.
(24) Balanced Formula Relativity:	0.428	0.513	0.457

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Calculation of Class Relativities

Class(es): 4439 LACQUER OR SPIRIT VARNISH MFG		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	37,214	2	5	163,749	85,391	23,804	61,121	334,065	6,695	2,282	8,977
2012	37,210	0	7	0	5,611	0	10,988	16,598	0,151	0,295	0,446
2013	41,149	0	4	0	0	0	1,788	1,788	0,000	0,043	0,043
2014	38,754	1	4	341,867	0	352,246	5,034	699,147	8,822	9,219	18,041
2015	41,771	0	10	0	485,645	0	214,858	700,504	11,626	5,144	16,770
MA Total:	196,098	3	30	505,616	576,647	376,050	293,789	1,752,102	5,519	3,416	8,935

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.645	6.651	.
(14) Massachusetts Credibility:	0.170	0.250	.
(15) Countrywide Pure Premium:	0.654	0.439	1.093
(16) Countrywide Indicated Relativity:	0.730	0.953	.
(17) Countrywide Credibility:	0.180	0.190	.
(18) Countrywide Lost-Time Claims:	16.000	.	.
(19) Pure Premium Underlying Present Rate:	1.646	0.995	2.641
(20) Relativity to Underlying Present Rate:	1.745	1.816	.
(21) Credibility to Underlying Relativity:	0.650	0.560	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.225	2.861	.
(24) Balanced Formula Relativity:	2.206	2.847	2.427

Class(es): 4452 PLASTICS MFG: FABRICATED PRODUCTS NOC		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	562,578	9	96	857,942	648,404	151,201	278,697	1,936,243	2,678	0,764	3,442
2012	635,188	2	93	36,853	232,100	6,020	141,674	416,647	0,423	0,233	0,656
2013	558,468	3	88	393,047	312,471	210,607	248,414	1,164,539	1,263	0,822	2,085
2014	697,898	4	87	255,867	634,535	290,667	233,924	1,414,993	1,276	0,752	2,028
2015	694,840	5	103	518,043	1,276,317	206,330	570,517	2,571,207	2,582	1,118	3,700
MA Total:	3,148,971	23	467	2,061,752	3,103,827	864,825	1,473,227	7,503,630	1,640	0,742	2,383

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.678	1.446	.
(14) Massachusetts Credibility:	0.520	0.730	.
(15) Countrywide Pure Premium:	1.138	0.634	1.772
(16) Countrywide Indicated Relativity:	1.270	1.378	.
(17) Countrywide Credibility:	0.240	0.140	.
(18) Countrywide Lost-Time Claims:	2088.0	.	.
(19) Pure Premium Underlying Present Rate:	1.669	0.877	2.546
(20) Relativity to Underlying Present Rate:	1.769	1.601	.
(21) Credibility to Underlying Relativity:	0.240	0.130	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.602	1.456	.
(24) Balanced Formula Relativity:	1.588	1.449	1.540

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Calculation of Class Relativities

Class(es): 4459 PLASTICS MFG: SHEETS, RODS OR TUBES		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	616,126	2	120	70,772	474,573	25,975	371,377	942,698	0.885	0.645	1,530
2012	495,097	4	87	397,748	567,775	145,735	261,885	1,373,144	1.950	0.823	2,773
2013	628,364	1	109	72,608	972,415	6,400	412,347	1,463,769	1.663	0.666	2,329
2014	658,725	2	117	230,532	789,933	48,846	390,063	1,459,374	1.549	0.666	2,215
2015	491,464	2	61	108,575	381,436	63,392	292,845	846,249	0.997	0.725	1,722
MA Total:	2,889,777	11	494	880,235	3,186,133	290,349	1,728,517	6,085,234	1.407	0.699	2,106

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.439	1.360	.
(14) Massachusetts Credibility:	0.450	0.680	.
(15) Countrywide Pure Premium:	1.075	0.576	1.651
(16) Countrywide Indicated Relativity:	1.200	1.251	.
(17) Countrywide Credibility:	0.280	0.160	.
(18) Countrywide Lost-Time Claims:	2604.0	.	.
(19) Pure Premium Underlying Present Rate:	1.282	0.787	2.070
(20) Relativity to Underlying Present Rate:	1.359	1.436	.
(21) Credibility to Underlying Relativity:	0.270	0.160	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.351	1.355	.
(24) Balanced Formula Relativity:	1.339	1.348	1.342

Class(es): 4470 CABLE MFG - INSULATED ELECTRICAL		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	471,694	1	48	47,564	404,053	14,906	145,076	611,600	0.957	0.339	1,297
2012	528,113	0	60	0	586,523	0	253,421	839,944	1.111	0.480	1,590
2013	503,684	1	57	210,882	322,238	52,621	129,235	714,975	1.058	0.361	1,419
2014	423,595	3	52	649,914	510,644	169,050	184,892	1,514,501	2.740	0.836	3,575
2015	475,096	1	38	75,184	202,843	16,981	101,598	396,606	0.585	0.250	0,835
MA Total:	2,402,181	6	255	983,544	2,026,301	253,558	814,223	4,077,626	1.253	0.445	1,697

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.282	0.866	.
(14) Massachusetts Credibility:	0.370	0.510	.
(15) Countrywide Pure Premium:	1.006	0.476	1.482
(16) Countrywide Indicated Relativity:	1.123	1.035	.
(17) Countrywide Credibility:	0.320	0.250	.
(18) Countrywide Lost-Time Claims:	470.00	.	.
(19) Pure Premium Underlying Present Rate:	0.940	0.475	1.415
(20) Relativity to Underlying Present Rate:	0.996	0.866	.
(21) Credibility to Underlying Relativity:	0.310	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.142	0.908	.
(24) Balanced Formula Relativity:	1.133	0.903	1.054

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Calculation of Class Relativities

Class(es): 4484 PLASTICS MFG: MOLDED PRODUCTS NOC												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	1,781,311	13	266	1,135,953	1,170,317	591,704	921,728	3,819,702	1,295	0,850	2,144						
2012	1,769,191	11	226	839,052	844,534	385,360	462,732	2,531,679	0,952	0,479	1,431						
2013	1,736,689	7	213	444,807	543,773	87,726	494,384	1,570,690	0,569	0,335	0,904						
2014	1,990,910	9	222	681,322	897,145	625,916	642,447	2,846,830	0,793	0,637	1,430						
2015	2,311,914	4	327	271,500	1,868,901	85,549	1,121,032	3,346,982	0,926	0,522	1,448						
MA Total:	9,590,015	44	1,254	3,372,634	5,324,672	1,776,255	3,642,323	14,115,884	0,907	0,565	1,472						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.928	1.100	.
(14) Massachusetts Credibility:	0.660	0.960	.
(15) Countrywide Pure Premium:	1.019	0.592	1.611
(16) Countrywide Indicated Relativity:	1.138	1.286	.
(17) Countrywide Credibility:	0.170	0.020	.
(18) Countrywide Lost-Time Claims:	10053	.	.
(19) Pure Premium Underlying Present Rate:	1.021	0.564	1.585
(20) Relativity to Underlying Present Rate:	1.083	1.029	.
(21) Credibility to Underlying Relativity:	0.170	0.020	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.990	1.102	.
(24) Balanced Formula Relativity:	0.981	1.097	1.021

Class(es): 4493 FABRIC COATING OR IMPREGNATING NOC												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	357,513	2	73	18,763	301,201	44,256	218,231	582,451	0,895	0,734	1,629						
2012	398,253	2	107	23,673	214,256	8,527	177,190	423,646	0,597	0,466	1,064						
2013	408,814	0	58	0	153,569	0	99,550	253,119	0,376	0,244	0,619						
2014	402,658	1	61	279,341	560,397	20,606	262,506	1,122,850	2,085	0,703	2,789						
2015	336,027	0	43	0	118,782	0	67,702	186,484	0,353	0,201	0,555						
MA Total:	1,903,264	5	342	321,776	1,348,206	73,389	825,179	2,568,550	0,877	0,472	1,350						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.898	0.919	.
(14) Massachusetts Credibility:	0.370	0.550	.
(15) Countrywide Pure Premium:	1.089	0.546	1.634
(16) Countrywide Indicated Relativity:	1.215	1.186	.
(17) Countrywide Credibility:	0.320	0.230	.
(18) Countrywide Lost-Time Claims:	184.00	.	.
(19) Pure Premium Underlying Present Rate:	1.187	0.717	1.904
(20) Relativity to Underlying Present Rate:	1.258	1.308	.
(21) Credibility to Underlying Relativity:	0.310	0.220	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.111	1.066	.
(24) Balanced Formula Relativity:	1.102	1.061	1.088

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Calculation of Class Relativities

Class(es): 4511 ANALYTICAL CHEMIST		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,885,748	1	100	80,016	311,538	61,722	280,383	733,659	0.080	0.070	0.150
2012	5,995,616	4	109	86,236	385,694	166,635	280,411	918,977	0.079	0.075	0.153
2013	5,650,471	4	106	208,564	157,421	217,789	160,812	744,586	0.065	0.067	0.132
2014	6,578,399	4	100	816,692	193,004	117,652	275,124	1,402,472	0.153	0.060	0.213
2015	5,386,613	1	73	135,567	596,274	171,762	272,738	1,176,341	0.136	0.083	0.218
MA Total:	28,496,847	14	488	1,327,075	1,643,932	735,559	1,269,468	4,976,035	0.104	0.070	0.175

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.125	0.148	.
(14) Massachusetts Credibility:	0.450	0.690	.
(15) Countrywide Pure Premium:	0.263	0.137	0.400
(16) Countrywide Indicated Relativity:	0.315	0.287	.
(17) Countrywide Credibility:	0.280	0.160	.
(18) Countrywide Lost-Time Claims:	1787.0	.	.
(19) Pure Premium Underlying Present Rate:	0.132	0.083	0.215
(20) Relativity to Underlying Present Rate:	0.159	0.163	.
(21) Credibility to Underlying Relativity:	0.270	0.150	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.187	0.172	.
(24) Balanced Formula Relativity:	0.186	0.172	0.181

Class(es): 4512 BIOMEDICAL RESEARCH LABS-INCL OUTSIDE OPERATNS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	8,083,552	3	112	376,818	57,153	153,249	142,070	729,290	0.054	0.037	0.090
2012	6,632,185	0	86	0	282,306	0	190,296	472,602	0.043	0.029	0.071
2013	9,156,498	0	84	0	183,964	0	104,629	288,593	0.020	0.011	0.032
2014	10,033,497	0	90	0	104,775	0	144,521	249,295	0.010	0.014	0.025
2015	12,280,563	2	116	307,535	384,325	91,437	359,319	1,142,617	0.056	0.037	0.093
MA Total:	46,186,294	5	488	684,353	1,012,523	244,687	940,835	2,882,398	0.037	0.026	0.062

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.044	0.054	.
(14) Massachusetts Credibility:	0.380	0.620	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.062	0.076	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.052	0.039	0.091
(20) Relativity to Underlying Present Rate:	0.063	0.077	.
(21) Credibility to Underlying Relativity:	0.620	0.380	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.056	0.063	.
(24) Balanced Formula Relativity:	0.055	0.063	0.058

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Calculation of Class Relativities

Class(es): 4557 INK MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	687,635	5	94	492,364	146,530	400,608	164,248	1,203,749	0.929	0.821	1.751
2012	641,594	2	80	216,448	125,432	169,290	103,213	614,383	0.533	0.425	0.958
2013	380,076	2	53	200,030	169,774	185,932	106,164	661,901	0.973	0.769	1.741
2014	412,269	0	33	0	386,115	0	91,327	477,442	0.937	0.222	1.158
2015	832,698	1	52	123,599	264,284	54,832	177,438	620,153	0.466	0.279	0.745
MA Total:	2,954,271	10	312	1,032,441	1,092,135	810,662	642,391	3,577,629	0.719	0.492	1.211

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.736	0.958	.
(14) Massachusetts Credibility:	0.400	0.580	.
(15) Countrywide Pure Premium:	0.823	0.436	1.260
(16) Countrywide Indicated Relativity:	0.919	0.948	.
(17) Countrywide Credibility:	0.300	0.210	.
(18) Countrywide Lost-Time Claims:	577.00	.	.
(19) Pure Premium Underlying Present Rate:	0.946	0.519	1.465
(20) Relativity to Underlying Present Rate:	1.003	0.948	.
(21) Credibility to Underlying Relativity:	0.300	0.210	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.871	0.953	.
(24) Balanced Formula Relativity:	0.863	0.949	0.893

Class(es): 4558 PAINT MFG		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	75,761	0	3	0	8,406	0	33,162	41,568	0.111	0.438	0.549
2012	75,903	0	4	0	2,427	0	3,236	5,663	0.032	0.043	0.075
2013	85,298	0	8	0	11,457	0	22,027	33,484	0.134	0.258	0.393
2014	90,338	1	4	15,350	46,630	66,124	10,949	139,053	0.686	0.853	1.539
2015	78,794	1	7	47,114	224	59,068	4,055	110,461	0.601	0.801	1.402
MA Total:	406,095	2	26	62,464	69,144	125,192	73,429	330,229	0.324	0.489	0.813

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.332	0.952	.
(14) Massachusetts Credibility:	0.150	0.230	.
(15) Countrywide Pure Premium:	0.703	0.324	1.027
(16) Countrywide Indicated Relativity:	0.785	0.704	.
(17) Countrywide Credibility:	0.430	0.390	.
(18) Countrywide Lost-Time Claims:	519.00	.	.
(19) Pure Premium Underlying Present Rate:	0.632	0.389	1.021
(20) Relativity to Underlying Present Rate:	0.669	0.710	.
(21) Credibility to Underlying Relativity:	0.420	0.380	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.668	0.763	.
(24) Balanced Formula Relativity:	0.663	0.759	0.696

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Calculation of Class Relativities

Class(es): 4583 FERTILIZER MFG & DRIVERS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	48,205	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	46,510	0	3	0	214,686	0	17,701	232,387	4,616	0,381	4,997
2013	43,040	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	44,430	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	53,919	0	2	0	7,295	0	11,578	18,872	0.135	0.215	0.350
MA Total:	236,104	0	5	0	221,980	0	29,279	251,259	0.940	0.124	1.064

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.962	0.241	.
(14) Massachusetts Credibility:	0.190	0.250	.
(15) Countrywide Pure Premium:	1.787	0.959	2.746
(16) Countrywide Indicated Relativity:	1.995	2.083	.
(17) Countrywide Credibility:	0.410	0.380	.
(18) Countrywide Lost-Time Claims:	542.00	.	.
(19) Pure Premium Underlying Present Rate:	1.884	0.820	2.704
(20) Relativity to Underlying Present Rate:	1.997	1.495	.
(21) Credibility to Underlying Relativity:	0.400	0.370	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.799	1.405	.
(24) Balanced Formula Relativity:	1.784	1.398	1.651

Class(es): 4611 DRUG MEDICINE OR PHARMACEUTICAL PREP-NO MFG OF INGREDIENTS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,524,088	2	42	96,233	213,957	40,765	133,279	484,234	0.204	0.114	0.318
2012	1,651,920	1	35	9,299	92,360	791	44,070	146,520	0.062	0.027	0.089
2013	1,011,513	1	42	9,928	47,756	326	78,619	136,629	0.057	0.078	0.135
2014	906,497	0	28	0	218,559	0	91,350	309,909	0.241	0.101	0.342
2015	1,118,881	2	39	225,395	105,195	41,077	69,044	440,711	0.295	0.098	0.394
MA Total:	6,212,899	6	186	340,855	677,828	82,959	416,362	1,518,003	0.164	0.080	0.244

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.168	0.156	.
(14) Massachusetts Credibility:	0.360	0.510	.
(15) Countrywide Pure Premium:	0.367	0.202	0.569
(16) Countrywide Indicated Relativity:	0.410	0.439	.
(17) Countrywide Credibility:	0.320	0.250	.
(18) Countrywide Lost-Time Claims:	2006.0	.	.
(19) Pure Premium Underlying Present Rate:	0.349	0.177	0.526
(20) Relativity to Underlying Present Rate:	0.370	0.323	.
(21) Credibility to Underlying Relativity:	0.320	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.310	0.267	.
(24) Balanced Formula Relativity:	0.307	0.266	0.293

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Calculation of Class Relativities

Class(es): 4635 OXYGEN OR HYDROGEN MFG & DRIVERS		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	170,287	1	34	112,082	687,035	37,379	311,840	1,148,335	4,693	2,051	6,744
2012	152,871	3	35	336,599	147,680	102,742	119,420	706,442	3,168	1,453	4,621
2013	145,252	3	28	366,702	195,490	132,208	208,576	902,977	3,870	2,346	6,217
2014	159,756	0	25	0	113,555	0	128,072	241,628	0,711	0,802	1,512
2015	96,425	1	17	253,744	394,290	63,451	307,249	1,018,735	6,721	3,844	10,565
MA Total:	724,591	8	139	1,069,128	1,538,051	335,780	1,075,158	4,018,117	3,598	1,947	5,545

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.681	3.792	.
(14) Massachusetts Credibility:	0.320	0.490	.
(15) Countrywide Pure Premium:	1.277	0.587	1.864
(16) Countrywide Indicated Relativity:	1.426	1.275	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	739.00	.	.
(19) Pure Premium Underlying Present Rate:	2.198	1.398	3.597
(20) Relativity to Underlying Present Rate:	2.330	2.552	.
(21) Credibility to Underlying Relativity:	0.340	0.250	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.455	2.827	.
(24) Balanced Formula Relativity:	2.434	2.813	2.564

Class(es): 4653 GLUE MFG & DRIVERS		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	27,065	0	1	0	481	0	986	1,467	0.018	0.036	0.054
2012	17,929	0	0	0	0	0	0	0.000	0.000	0.000	
2013	43,947	0	2	0	0	0	550	550	0.000	0.013	0.013
2014	39,196	0	0	0	0	0	0	0.000	0.000	0.000	
2015	43,331	0	4	0	149,465	0	56,939	206,404	3,449	1,314	4,763
MA Total:	171,469	0	7	0	149,946	0	58,475	208,421	0.874	0.341	1.215

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.895	0.664	.
(14) Massachusetts Credibility:	0.130	0.190	.
(15) Countrywide Pure Premium:	0.553	0.253	0.806
(16) Countrywide Indicated Relativity:	0.618	0.550	.
(17) Countrywide Credibility:	0.310	0.330	.
(18) Countrywide Lost-Time Claims:	64.000	.	.
(19) Pure Premium Underlying Present Rate:	1.005	0.518	1.523
(20) Relativity to Underlying Present Rate:	1.065	0.945	.
(21) Credibility to Underlying Relativity:	0.560	0.480	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.904	0.761	.
(24) Balanced Formula Relativity:	0.896	0.757	0.849

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Manufacturing		
4665 RENDERING WORKS NOC & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	46,413	1	19	2,486	58,539	767	118,358	180,150	1,315	2,567	3,881
2012	50,236	1	14	78,517	23,960	10,205	29,755	142,438	2,040	0,795	2,835
2013	53,599	0	10	0	124,579	0	54,921	179,499	2,324	1,025	3,349
2014	51,440	2	17	371,860	410,142	258,074	220,293	1,260,369	15,202	9,300	24,502
2015	53,466	2	10	817,926	47,191	129,643	27,407	1,022,167	16,181	2,937	19,118
MA Total:	255,153	6	70	1,270,790	664,411	398,689	450,733	2,784,623	7,584	3,329	10,914

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	7.758	6.482	.
(14) Massachusetts Credibility:	0.240	0.350	.
(15) Countrywide Pure Premium:	2.696	1.301	3.997
(16) Countrywide Indicated Relativity:	3.010	2.826	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	357.00	.	.
(19) Pure Premium Underlying Present Rate:	3.060	1.728	4.787
(20) Relativity to Underlying Present Rate:	3.244	3.152	.
(21) Credibility to Underlying Relativity:	0.380	0.320	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	4.238	4.210	.
(24) Balanced Formula Relativity:	4.202	4.189	4.197

Class(es):		Effective: 7/1/2018							Manufacturing		
4692 DENTAL LABORATORY											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	258,513	2	7	167,138	1,005	109,428	27,006	304,577	0,650	0,528	1,178
2012	274,869	0	13	0	14,127	0	22,885	37,011	0,051	0,083	0,135
2013	314,706	0	6	0	0	0	6,756	6,756	0,000	0,021	0,021
2014	274,992	0	4	0	14,279	0	16,909	31,188	0,052	0,061	0,113
2015	320,551	0	3	0	5,614	0	6,920	12,534	0,018	0,022	0,039
MA Total:	1,443,631	2	33	167,138	35,025	109,428	80,475	392,065	0,140	0,132	0,272

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.143	0.256	.
(14) Massachusetts Credibility:	0.200	0.250	.
(15) Countrywide Pure Premium:	0.339	0.170	0.508
(16) Countrywide Indicated Relativity:	0.378	0.369	.
(17) Countrywide Credibility:	0.400	0.380	.
(18) Countrywide Lost-Time Claims:	231.00	.	.
(19) Pure Premium Underlying Present Rate:	0.332	0.135	0.468
(20) Relativity to Underlying Present Rate:	0.352	0.247	.
(21) Credibility to Underlying Relativity:	0.400	0.370	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.321	0.295	.
(24) Balanced Formula Relativity:	0.318	0.294	0.310

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Calculation of Class Relativities

Class(es): 4693 PHARMACEUTICAL OR SURGICAL GOODS MFG NOC												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	818,342	2	60	226,195	221,065	36,997	201,454	685,712	0.547	0.291	0.838						
2012	823,963	1	39	319,073	281,170	47,332	121,444	769,019	0.728	0.205	0.933						
2013	695,851	1	36	73,477	405,607	6,765	242,695	728,543	0.688	0.358	1.047						
2014	835,735	2	26	100,185	24,820	32,225	50,610	207,840	0.150	0.099	0.249						
2015	491,780	1	43	18,687	203,105	20,172	125,169	367,133	0.451	0.296	0.747						
MA Total:	3,665,672	7	204	737,618	1,135,766	143,492	741,372	2,758,248	0.511	0.241	0.752						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.523	0.470	.
(14) Massachusetts Credibility:	0.330	0.470	.
(15) Countrywide Pure Premium:	0.376	0.207	0.583
(16) Countrywide Indicated Relativity:	0.420	0.449	.
(17) Countrywide Credibility:	0.340	0.270	.
(18) Countrywide Lost-Time Claims:	766.00	.	.
(19) Pure Premium Underlying Present Rate:	0.448	0.250	0.698
(20) Relativity to Underlying Present Rate:	0.475	0.457	.
(21) Credibility to Underlying Relativity:	0.330	0.260	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.472	0.461	.
(24) Balanced Formula Relativity:	0.468	0.459	0.465

Class(es): 4720 SOAP OR SYNTHETIC DETERGENT MFG												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	172,292	2	16	148,704	121,833	61,700	161,389	493,625	1.570	1.295	2.865						
2012	174,199	1	16	9,144	16,238	374	18,073	43,830	0.146	0.106	0.252						
2013	187,957	1	26	88,258	98,808	61,567	78,148	326,781	0.995	0.743	1.739						
2014	214,134	0	24	0	97,220	0	45,038	142,258	0.454	0.210	0.664						
2015	224,362	0	12	0	383,804	0	123,280	507,084	1.711	0.549	2.260						
MA Total:	972,945	4	94	246,105	717,903	123,641	425,928	1,513,577	0.991	0.565	1.556						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.014	1.100	.
(14) Massachusetts Credibility:	0.250	0.380	.
(15) Countrywide Pure Premium:	0.899	0.431	1.330
(16) Countrywide Indicated Relativity:	1.003	0.936	.
(17) Countrywide Credibility:	0.380	0.310	.
(18) Countrywide Lost-Time Claims:	500.00	.	.
(19) Pure Premium Underlying Present Rate:	0.852	0.552	1.404
(20) Relativity to Underlying Present Rate:	0.903	1.007	.
(21) Credibility to Underlying Relativity:	0.370	0.310	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.969	1.020	.
(24) Balanced Formula Relativity:	0.961	1.015	0.979

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Calculation of Class Relativities

Class(es): 4740 OIL REFINING - PETROLEUM & DRIVERS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	12,335	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	12,334	0	1	0	140,952	0	71,730	212,682	11,428	5,816	17,244
2013	19,339	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	20,625	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	19,582	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	84,215	0	1	0	140,952	0	71,730	212,682	1,674	0,852	2,525

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.712	1.658	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	0.384	0.179	0.563
(16) Countrywide Indicated Relativity:	0.428	0.389	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	504.00	.	.
(19) Pure Premium Underlying Present Rate:	0.571	0.299	0.869
(20) Relativity to Underlying Present Rate:	0.605	0.545	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.612	0.597	.
(24) Balanced Formula Relativity:	0.607	0.594	0.603

Class(es): 4741 ASPHALT OR TAR DISTILLING OR REFINING & DRIVERS		Effective: 7/1/2018							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	9,977	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	6,605	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	6,337	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	3,660	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	2,905	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	29,484	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	1.517	0.577	2.094
(16) Countrywide Indicated Relativity:	1.693	1.253	.
(17) Countrywide Credibility:	0.410	0.430	.
(18) Countrywide Lost-Time Claims:	122.00	.	.
(19) Pure Premium Underlying Present Rate:	1.132	0.461	1.593
(20) Relativity to Underlying Present Rate:	1.200	0.840	.
(21) Credibility to Underlying Relativity:	0.520	0.480	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.318	0.942	.
(24) Balanced Formula Relativity:	1.307	0.938	1.180

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Calculation of Class Relativities

Class(es): 4771 EXPLOSIVES OR AMMUNITION MFG: NOC - & DRIVERS												Effective: 7/1/2018		Manufacturing	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	0	0	0	0	0	0	0	0	0.000	0.000	0.000				
2012	0	0	0	0	0	0	0	0	0.000	0.000	0.000				
2013	1,024	0	0	0	0	0	0	0	0.000	0.000	0.000				
2014	3,997	0	1	0	0	0	1,939	1,939	0.000	0.485	0.485				
2015	5,140	0	0	0	0	0	0	0	0.000	0.000	0.000				
MA Total:	10,160	0	1	0	0	0	1,939	1,939	0.000	0.191	0.191				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.372	.
(14) Massachusetts Credibility:	0.080	0.070	.
(15) Countrywide Pure Premium:	0.973	0.487	1.460
(16) Countrywide Indicated Relativity:	1.086	1.057	.
(17) Countrywide Credibility:	0.460	0.470	.
(18) Countrywide Lost-Time Claims:	344.00	.	.
(19) Pure Premium Underlying Present Rate:	4.654	0.710	5.363
(20) Relativity to Underlying Present Rate:	4.933	1.295	.
(21) Credibility to Underlying Relativity:	0.460	0.460	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	2.769	1.119	.
(24) Balanced Formula Relativity:	2.745	1.113	2.183

Class(es): 4825 DRUG, MEDICINE OR PHARM PREP MFG & INCIDENTAL MFG INGREDIENTS												Effective: 7/1/2018		Manufacturing	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	3,998,672	7	137	618,128	1,062,298	157,334	478,680	2,316,440	0.420	0.159	0.579				
2012	2,800,589	1	57	65,743	622,111	9,547	180,850	878,250	0.246	0.068	0.314				
2013	2,572,314	0	38	0	260,131	0	268,474	528,605	0.101	0.104	0.205				
2014	2,606,420	2	33	66,616	295,029	52,074	170,929	584,649	0.139	0.086	0.224				
2015	2,586,809	0	33	0	35,465	0	37,232	72,697	0.014	0.014	0.028				
MA Total:	14,564,803	10	298	750,487	2,275,034	218,955	1,136,165	4,380,642	0.208	0.093	0.301				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.212	0.181	.
(14) Massachusetts Credibility:	0.490	0.740	.
(15) Countrywide Pure Premium:	0.387	0.207	0.594
(16) Countrywide Indicated Relativity:	0.431	0.450	.
(17) Countrywide Credibility:	0.260	0.130	.
(18) Countrywide Lost-Time Claims:	793.00	.	.
(19) Pure Premium Underlying Present Rate:	0.317	0.196	0.513
(20) Relativity to Underlying Present Rate:	0.337	0.358	.
(21) Credibility to Underlying Relativity:	0.250	0.130	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.300	0.239	.
(24) Balanced Formula Relativity:	0.298	0.238	0.277

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Calculation of Class Relativities

Class(es): 4828 CHEMICAL BLENDING OR MIXING NOC- ALL OPERS & DR												Effective: 7/1/2018			Manufacturing		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	755,743	0	33	0	122,034	0	94,950	216,985	0.161	0.126	0.287						
2012	780,938	1	28	109,664	520,220	20,368	155,413	805,664	0.807	0.225	1.032						
2013	863,221	0	22	0	158,073	0	121,509	279,582	0.183	0.141	0.324						
2014	935,225	1	21	429,449	173,943	78,670	121,266	803,328	0.645	0.214	0.859						
2015	858,792	3	25	245,848	752,933	200,930	418,924	1,618,635	1.163	0.722	1.885						
MA Total:	4,193,919	5	129	784,961	1,727,203	299,968	912,061	3,724,193	0.599	0.289	0.888						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.613	0.563	.
(14) Massachusetts Credibility:	0.360	0.490	.
(15) Countrywide Pure Premium:	0.516	0.266	0.782
(16) Countrywide Indicated Relativity:	0.576	0.578	.
(17) Countrywide Credibility:	0.320	0.260	.
(18) Countrywide Lost-Time Claims:	2072.0	.	.
(19) Pure Premium Underlying Present Rate:	0.493	0.237	0.731
(20) Relativity to Underlying Present Rate:	0.523	0.433	.
(21) Credibility to Underlying Relativity:	0.320	0.250	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.572	0.534	.
(24) Balanced Formula Relativity:	0.567	0.532	0.555

Class(es): 5020 CEILING INSTALLATION-SUSPENDED ACOUSTICAL GRID												Effective: 7/1/2018			Construction		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	167,829	1	11	91,460	1,326	6,377	10,259	109,423	0.553	0.099	0.652						
2012	183,861	1	14	313,786	545,661	40,706	125,237	1,025,390	4.674	0.903	5.577						
2013	242,440	0	16	0	412,422	0	105,890	518,312	1.701	0.437	2.138						
2014	218,297	1	17	20,438	230,944	2,899	120,877	375,158	1.152	0.567	1.719						
2015	210,939	1	16	319,115	124,183	218,293	74,501	736,092	2.102	1.388	3.490						
MA Total:	1,023,365	4	74	744,800	1,314,536	268,275	436,765	2,764,375	2.012	0.689	2.701						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.767	0.583	.
(14) Massachusetts Credibility:	0.400	0.480	.
(15) Countrywide Pure Premium:	3.032	1.258	4.289
(16) Countrywide Indicated Relativity:	1.184	1.112	.
(17) Countrywide Credibility:	0.300	0.260	.
(18) Countrywide Lost-Time Claims:	303.00	.	.
(19) Pure Premium Underlying Present Rate:	2.663	0.951	3.614
(20) Relativity to Underlying Present Rate:	0.970	0.710	.
(21) Credibility to Underlying Relativity:	0.300	0.260	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.953	0.753	.
(24) Balanced Formula Relativity:	0.959	0.754	0.895

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Calculation of Class Relativities

Class(es): 5022 MASONRY NOC		Effective: 7/1/2018							Construction			
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	907,464	14	136	1,387,343	3,653,288	490,324	1,215,678	6,746,633	5,555	1,880	7,435	
2012	1,073,384	10	124	1,266,494	2,117,680	729,162	1,382,627	5,495,964	3,153	1,967	5,120	
2013	1,103,370	14	126	4,234,707	3,373,329	1,279,526	1,131,621	10,019,183	6,895	2,185	9,081	
2014	1,169,015	13	109	3,687,675	3,338,450	1,248,277	1,383,535	9,657,937	6,010	2,251	8,262	
2015	1,291,093	12	109	3,203,689	3,940,753	1,107,844	2,647,212	10,899,498	5,534	2,908	8,442	
MA Total:	5,544,326	63	604	13,779,909	16,423,501	4,855,133	7,760,673	42,819,215	5,448	2,275	7,723	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.077	1.926	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	4.154	1.640	5.794
(16) Countrywide Indicated Relativity:	1.622	1.449	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	5077.0	.	.
(19) Pure Premium Underlying Present Rate:	4.961	2.226	7.187
(20) Relativity to Underlying Present Rate:	1.808	1.660	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	2.077	1.926	.
(24) Balanced Formula Relativity:	2.089	1.928	2.039

Class(es): 5037 PAINTING: METAL STRUCTURES-OVER 2 STORIES IN HEIGHT & DRIVERS		Effective: 7/1/2018							Construction			
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	51,806	0	9	0	64,814	0	62,636	127,450	1,251	1,209	2,460	
2012	69,799	0	10	0	937,671	0	339,806	1,277,477	13,434	4,868	18,302	
2013	95,019	2	11	514,885	816,402	102,755	194,137	1,628,180	14,011	3,125	17,135	
2014	105,650	1	11	12,446	855,377	1,355	319,503	1,188,680	8,214	3,037	11,251	
2015	80,013	3	7	402,733	523,523	169,518	237,879	1,333,653	11,576	5,092	16,668	
MA Total:	402,287	6	48	930,065	3,197,786	273,628	1,153,961	5,555,440	10,261	3,549	13,810	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.912	3.003	.
(14) Massachusetts Credibility:	0.500	0.620	.
(15) Countrywide Pure Premium:	7.467	3.096	10.563
(16) Countrywide Indicated Relativity:	2.915	2.736	.
(17) Countrywide Credibility:	0.250	0.190	.
(18) Countrywide Lost-Time Claims:	88.000	.	.
(19) Pure Premium Underlying Present Rate:	12.239	4.575	16.814
(20) Relativity to Underlying Present Rate:	4.460	3.413	.
(21) Credibility to Underlying Relativity:	0.250	0.190	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	3.799	3.030	.
(24) Balanced Formula Relativity:	3.821	3.034	3.577

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5040 IRON OR STEEL: ERECTION: ERECTION-FRAME STRUCTURES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	142,586	1	48	246,261	2,167,088	294,026	823,522	3,530,896	16,926	7,838	24,763
2012	142,332	3	37	1,002,323	1,596,844	291,946	402,919	3,294,031	18,261	4,882	23,143
2013	220,982	5	43	1,494,678	1,993,215	312,925	581,771	4,382,589	15,784	4,049	19,832
2014	282,222	5	63	1,724,557	2,092,078	681,027	866,967	5,364,630	13,524	5,485	19,009
2015	258,402	4	55	2,014,949	1,299,812	416,574	498,103	4,229,439	12,828	3,540	16,368
MA Total:	1,046,524	18	246	6,482,767	9,149,037	1,996,499	3,173,282	20,801,586	14,937	4,940	19,877

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.694	4.181	.
(14) Massachusetts Credibility:	0.860	1.000	.
(15) Countrywide Pure Premium:	4.142	1.623	5.765
(16) Countrywide Indicated Relativity:	1.617	1.434	.
(17) Countrywide Credibility:	0.070	0.000	.
(18) Countrywide Lost-Time Claims:	895.00	.	.
(19) Pure Premium Underlying Present Rate:	18.074	6.576	24.650
(20) Relativity to Underlying Present Rate:	6.586	4.905	.
(21) Credibility to Underlying Relativity:	0.070	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	5.471	4.181	.
(24) Balanced Formula Relativity:	5.503	4.186	5.094

Class(es):		Effective: 7/1/2018							Construction		
5057 IRON OR STEEL: ERECTION-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	8,755	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	5,761	3	2	614,559	87,940	354,215	21,784	1,078,499	121.93	65,262	187.20
2013	7,100	0	4	0	26,946	0	10,480	37,426	3,795	1,476	5,272
2014	11,700	0	8	0	408,022	0	219,702	627,724	34,873	18,778	53,651
2015	20,211	0	2	0	122,440	0	123,762	246,202	6,058	6,123	12,182
MA Total:	53,527	3	16	614,559	645,348	354,215	375,728	1,989,851	23,538	13,637	37,175

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	8.973	11.542	.
(14) Massachusetts Credibility:	0.230	0.310	.
(15) Countrywide Pure Premium:	2.095	0.866	2.961
(16) Countrywide Indicated Relativity:	0.818	0.765	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	864.00	.	.
(19) Pure Premium Underlying Present Rate:	13.258	6.060	19.317
(20) Relativity to Underlying Present Rate:	4.831	4.520	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	4.218	5.383	.
(24) Balanced Formula Relativity:	4.243	5.390	4.599

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Calculation of Class Relativities

Class(es): 5059 IRON OR STEEL: ERECTION: FRAME STRUCT NOT OVER 2 STRS IN HGT												Effective: 7/1/2018		Construction	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	73,350	1	20	103,187	119,242	47,377	57,035	326,840	3,032	1,423	4,456				
2012	66,671	1	13	10,614	296,974	231,971	148,709	688,268	4,614	5,710	10,323				
2013	65,252	0	9	0	926,158	0	379,811	1,305,969	14,194	5,821	20,014				
2014	67,619	1	15	424,912	138,956	87,654	78,571	730,092	8,339	2,458	10,797				
2015	103,546	4	13	1,403,525	774,031	505,120	553,000	3,235,676	21,030	10,219	31,249				
MA Total:	376,438	7	70	1,942,237	2,255,360	872,122	1,217,126	6,286,845	11,151	5,550	16,701				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.251	4.697	.
(14) Massachusetts Credibility:	0.370	0.500	.
(15) Countrywide Pure Premium:	9.144	4.455	13.599
(16) Countrywide Indicated Relativity:	3.570	3.937	.
(17) Countrywide Credibility:	0.320	0.250	.
(18) Countrywide Lost-Time Claims:	382.00	.	.
(19) Pure Premium Underlying Present Rate:	5.874	2.766	8.640
(20) Relativity to Underlying Present Rate:	2.141	2.063	.
(21) Credibility to Underlying Relativity:	0.310	0.250	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	3.379	3.849	.
(24) Balanced Formula Relativity:	3.398	3.854	3.540

Class(es): 5102 DOOR, DOOR FRAME OR SASH ERECTION - METAL OR METAL COVERED												Effective: 7/1/2018		Construction	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	442,066	2	60	277,015	1,311,499	207,824	553,875	2,350,213	3,593	1,723	5,316				
2012	488,087	8	52	1,137,569	161,311	132,500	106,329	1,537,708	2,661	0,489	3,150				
2013	534,699	6	59	838,038	1,417,553	176,461	454,411	2,886,464	4,218	1,180	5,398				
2014	688,790	6	67	951,299	2,120,470	259,388	771,604	4,102,761	4,460	1,497	5,956				
2015	765,350	4	93	851,612	2,581,534	216,379	752,644	4,402,170	4,486	1,266	5,752				
MA Total:	2,918,992	26	331	4,055,533	7,592,367	992,552	2,638,864	15,279,316	3,990	1,244	5,234				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.521	1.053	.
(14) Massachusetts Credibility:	0.660	0.820	.
(15) Countrywide Pure Premium:	2.932	1.286	4.218
(16) Countrywide Indicated Relativity:	1.145	1.136	.
(17) Countrywide Credibility:	0.170	0.090	.
(18) Countrywide Lost-Time Claims:	1681.0	.	.
(19) Pure Premium Underlying Present Rate:	3.275	1.267	4.542
(20) Relativity to Underlying Present Rate:	1.193	0.945	.
(21) Credibility to Underlying Relativity:	0.170	0.090	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.401	1.051	.
(24) Balanced Formula Relativity:	1.410	1.052	1.299

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5146 FURNITURE OR FIXTURES INSTALLATION - PORTABLE - NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	580,883	8	116	799,898	2,606,193	483,329	1,003,836	4,893,255	5,864	2,560	8,424
2012	657,968	7	115	1,094,314	1,435,776	280,030	683,587	3,493,707	3,845	1,465	5,310
2013	564,860	10	93	1,744,648	623,983	387,104	432,574	3,188,310	4,193	1,451	5,644
2014	611,742	6	110	1,496,083	1,250,579	306,333	597,405	3,650,400	4,490	1,477	5,967
2015	690,640	4	81	439,977	1,759,733	108,522	829,010	3,137,241	3,185	1,357	4,543
MA Total:	3,106,094	35	515	5,574,920	7,676,263	1,565,319	3,546,412	18,362,914	4,266	1,646	5,912

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.626	1.393	.
(14) Massachusetts Credibility:	0.700	0.990	.
(15) Countrywide Pure Premium:	2.450	0.984	3.434
(16) Countrywide Indicated Relativity:	0.957	0.869	.
(17) Countrywide Credibility:	0.150	0.010	.
(18) Countrywide Lost-Time Claims:	1735.0	.	.
(19) Pure Premium Underlying Present Rate:	3.608	1.887	5.495
(20) Relativity to Underlying Present Rate:	1.315	1.408	.
(21) Credibility to Underlying Relativity:	0.150	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.479	1.388	.
(24) Balanced Formula Relativity:	1.488	1.389	1.457

Class(es):		Effective: 7/1/2018							Construction		
5160 ELEVATOR ERECTION OR REPAIR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	635,473	1	37	509,818	37,095	69,697	116,985	733,595	0,861	0,294	1,154
2012	720,638	6	40	1,560,501	430,206	534,265	171,441	2,696,413	2,762	0,979	3,742
2013	735,826	0	29	0	742,570	0	226,998	969,568	1,009	0,308	1,318
2014	859,239	4	34	405,221	574,461	297,695	353,030	1,630,407	1,140	0,757	1,898
2015	901,871	6	47	1,089,299	940,431	378,037	559,084	2,966,851	2,251	1,039	3,290
MA Total:	3,853,048	17	187	3,564,839	2,724,764	1,279,693	1,427,538	8,996,834	1,632	0,703	2,335

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.622	0.595	.
(14) Massachusetts Credibility:	0.570	0.690	.
(15) Countrywide Pure Premium:	1.307	0.469	1.776
(16) Countrywide Indicated Relativity:	0.510	0.415	.
(17) Countrywide Credibility:	0.220	0.160	.
(18) Countrywide Lost-Time Claims:	509.00	.	.
(19) Pure Premium Underlying Present Rate:	1.699	0.616	2.315
(20) Relativity to Underlying Present Rate:	0.619	0.459	.
(21) Credibility to Underlying Relativity:	0.210	0.150	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.597	0.546	.
(24) Balanced Formula Relativity:	0.600	0.546	0.584

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Calculation of Class Relativities

Class(es): 5183 PLUMBING NOC & DRIVERS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	5,302,613	24	606	2,577,400	4,558,555	595,387	2,571,257	10,302,598	1,346	0,597	1,943
2012	5,774,564	23	612	3,464,645	5,190,289	1,257,599	2,895,486	12,808,019	1,499	0,719	2,218
2013	6,237,829	32	633	5,801,463	5,162,629	1,783,110	2,928,229	15,675,430	1,758	0,755	2,513
2014	6,791,198	23	609	3,576,432	8,382,004	936,675	3,113,781	16,008,891	1,761	0,596	2,357
2015	7,475,422	30	611	5,042,217	8,471,941	2,444,358	3,609,143	19,567,659	1,808	0,810	2,618
MA Total:	31,581,627	132	3,071	20,462,157	31,765,418	7,017,128	15,117,895	74,362,597	1,654	0,701	2,355

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.630	0.593	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.684	0.655	2.340
(16) Countrywide Indicated Relativity:	0.658	0.579	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	10755	.	.
(19) Pure Premium Underlying Present Rate:	1.784	0.773	2.557
(20) Relativity to Underlying Present Rate:	0.650	0.577	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.630	0.593	.
(24) Balanced Formula Relativity:	0.634	0.594	0.622

Class(es): 5188 AUTOMATIC SPRINKLER INSTALLATION & DRIVERS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	647,041	2	71	52,962	598,526	50,348	190,439	892,275	1,007	0,372	1,379
2012	713,987	8	72	1,252,182	918,890	535,236	573,274	3,279,582	3,041	1,553	4,593
2013	805,354	4	70	780,222	1,236,937	193,901	389,474	2,600,535	2,505	0,724	3,229
2014	877,868	7	66	1,900,555	1,174,996	879,925	376,485	4,331,960	3,503	1,431	4,935
2015	927,756	6	68	1,169,498	1,246,761	300,810	403,299	3,120,369	2,604	0,759	3,363
MA Total:	3,972,007	27	347	5,155,419	5,176,110	1,960,220	1,932,971	14,224,721	2,601	0,980	3,581

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.992	0.830	.
(14) Massachusetts Credibility:	0.690	0.890	.
(15) Countrywide Pure Premium:	1.959	0.693	2.653
(16) Countrywide Indicated Relativity:	0.765	0.613	.
(17) Countrywide Credibility:	0.160	0.060	.
(18) Countrywide Lost-Time Claims:	1036.0	.	.
(19) Pure Premium Underlying Present Rate:	2.736	1.130	3.867
(20) Relativity to Underlying Present Rate:	0.997	0.843	.
(21) Credibility to Underlying Relativity:	0.150	0.050	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.956	0.817	.
(24) Balanced Formula Relativity:	0.962	0.818	0.917

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5190 ELECTRICAL WIRING - WITHIN BUILDINGS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	5,958,210	16	577	1,865,039	5,039,484	1,030,272	2,776,968	10,711,763	1,159	0,639	1,798
2012	6,443,411	30	528	3,999,610	3,850,629	1,146,752	2,203,129	11,200,120	1,218	0,520	1,738
2013	6,951,294	18	594	1,531,814	5,451,673	881,020	3,016,244	10,880,750	1,005	0,561	1,565
2014	8,115,269	21	639	2,424,516	6,881,781	1,903,908	3,798,145	15,008,350	1,147	0,703	1,849
2015	8,564,677	18	610	3,204,114	7,066,949	876,374	3,822,560	14,969,997	1,199	0,549	1,748
MA Total:	36,032,862	103	2,948	13,025,093	28,290,516	5,838,326	15,617,046	62,770,980	1,147	0,595	1,742

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.437	0.504	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.449	0.618	2.067
(16) Countrywide Indicated Relativity:	0.566	0.547	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	10633	.	.
(19) Pure Premium Underlying Present Rate:	1.272	0.660	1.933
(20) Relativity to Underlying Present Rate:	0.464	0.492	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.437	0.504	.
(24) Balanced Formula Relativity:	0.440	0.505	0.460

Class(es):		Effective: 7/1/2018							Goods and Services		
5191 OFFICE MACHICE OR APPLIANCE INSTALL, INSP, ADJUSTMT OR REPAIR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	3,845,403	8	134	1,131,949	681,391	474,247	353,975	2,641,562	0,472	0,215	0,687
2012	3,636,802	8	156	700,691	234,723	412,389	287,148	1,634,952	0,257	0,192	0,450
2013	4,369,368	6	133	1,143,819	1,312,284	276,242	606,440	3,338,785	0,562	0,202	0,764
2014	4,654,885	7	156	762,747	812,288	225,005	606,310	2,406,349	0,338	0,179	0,517
2015	4,360,581	4	172	675,534	1,221,574	160,565	935,387	2,993,060	0,435	0,251	0,686
MA Total:	20,867,039	33	751	4,414,741	4,262,260	1,548,447	2,789,260	13,014,707	0,416	0,208	0,624

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.497	0.437	.
(14) Massachusetts Credibility:	0.650	0.970	.
(15) Countrywide Pure Premium:	0.423	0.190	0.613
(16) Countrywide Indicated Relativity:	0.507	0.398	.
(17) Countrywide Credibility:	0.180	0.020	.
(18) Countrywide Lost-Time Claims:	3860.0	.	.
(19) Pure Premium Underlying Present Rate:	0.438	0.267	0.706
(20) Relativity to Underlying Present Rate:	0.529	0.525	.
(21) Credibility to Underlying Relativity:	0.170	0.010	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.504	0.437	.
(24) Balanced Formula Relativity:	0.501	0.437	0.478

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Calculation of Class Relativities

Class(es): 5192 VENDING OR COIN OPERTD MACHINES-INSTALL, SRVC OR RPR &SALES, DR												Effective: 7/1/2018			Goods and Services		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	318.658	4	70	208.292	240.231	336.115	136.517	921.155	1.408	1.483	2.891						
2012	295.012	3	52	196.098	52.602	47.258	45.563	341.522	0.843	0.315	1.158						
2013	307.852	1	50	6.996	247.274	16.702	110.334	381.305	0.826	0.413	1.239						
2014	376.378	4	50	606.692	774.880	197.017	258.117	1,836.706	3.671	1.209	4.880						
2015	391.274	0	42	0	292.258	0	258.790	551.048	0.747	0.661	1.408						
MA Total:	1,689.174	12	264	1,018.078	1,607.245	597.092	809.320	4,031.736	1.554	0.833	2.387						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.858	1.750	.
(14) Massachusetts Credibility:	0.380	0.560	.
(15) Countrywide Pure Premium:	1.389	0.680	2.069
(16) Countrywide Indicated Relativity:	1.664	1.424	.
(17) Countrywide Credibility:	0.310	0.220	.
(18) Countrywide Lost-Time Claims:	1666.0	.	.
(19) Pure Premium Underlying Present Rate:	1.468	0.830	2.298
(20) Relativity to Underlying Present Rate:	1.771	1.628	.
(21) Credibility to Underlying Relativity:	0.310	0.220	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.771	1.651	.
(24) Balanced Formula Relativity:	1.759	1.651	1.720

Class(es): 5213 CONCRETE CONSTRUCTION-NOC												Effective: 7/1/2018			Construction		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	412.428	7	143	1,110.366	1,090.064	457.898	500.495	3,158.824	5.335	2.324	7.659						
2012	439.076	9	131	2,012.533	2,350.690	386.212	817.961	5,567.396	9.937	2.743	12.680						
2013	475.058	8	120	1,287.632	2,017.331	239.186	1,046.981	4,591.131	6.957	2.707	9.664						
2014	543.252	7	136	2,437.522	3,281.794	944.168	1,125.638	7,789.123	10.528	3.810	14.338						
2015	620.402	5	97	886.480	1,484.347	234.230	804.557	3,409.614	3.821	1.674	5.496						
MA Total:	2,490.216	36	627	7,734.534	10,224.226	2,261.695	4,295.633	24,516.088	7.212	2.633	9.845						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.749	2.229	.
(14) Massachusetts Credibility:	0.880	1.000	.
(15) Countrywide Pure Premium:	3.294	1.359	4.654
(16) Countrywide Indicated Relativity:	1.286	1.201	.
(17) Countrywide Credibility:	0.060	0.000	.
(18) Countrywide Lost-Time Claims:	4503.0	.	.
(19) Pure Premium Underlying Present Rate:	7.907	3.547	11.455
(20) Relativity to Underlying Present Rate:	2.881	2.646	.
(21) Credibility to Underlying Relativity:	0.060	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	2.669	2.229	.
(24) Balanced Formula Relativity:	2.685	2.232	2.544

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Calculation of Class Relativities

Class(es): 5215 CONCRETE WORK - INCIDENTAL TO CONSTRUCTION OF PRIVATE RES												Effective: 7/1/2018			Construction		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	240,434	1	24	177,699	662,490	11,431	196,785	1,048,405	3,494	0,866	4,360						
2012	255,803	2	32	91,576	327,224	13,955	163,554	596,309	1,637	0,694	2,331						
2013	281,377	1	28	136,395	468,913	12,444	239,608	857,360	2,151	0,896	3,047						
2014	265,067	1	26	121,427	437,782	14,784	197,836	771,829	2,110	0,802	2,912						
2015	318,542	1	19	17,826	373,657	7,820	80,258	479,561	1,229	0,277	1,505						
MA Total:	1,361,223	6	129	544,923	2,270,066	60,433	878,042	3,753,463	2,068	0,689	2,757						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.788	0.584	.
(14) Massachusetts Credibility:	0.460	0.620	.
(15) Countrywide Pure Premium:	3.157	1.350	4.507
(16) Countrywide Indicated Relativity:	1.232	1.193	.
(17) Countrywide Credibility:	0.270	0.190	.
(18) Countrywide Lost-Time Claims:	1540.0	.	.
(19) Pure Premium Underlying Present Rate:	2.825	1.359	4.184
(20) Relativity to Underlying Present Rate:	1.029	1.013	.
(21) Credibility to Underlying Relativity:	0.270	0.190	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.973	0.781	.
(24) Balanced Formula Relativity:	0.979	0.782	0.918

Class(es): 5221 CONCRETE OR CEMENT WORK-FLOORS DRIVEWAYS YRDS OR SIDEWALKS & DR												Effective: 7/1/2018			Construction		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	1,154,366	15	166	2,093,092	2,455,565	918,779	843,784	6,311,220	3,940	1,527	5,467						
2012	1,202,598	8	157	1,485,373	2,934,494	776,926	1,135,281	6,332,074	3,675	1,590	5,265						
2013	1,278,823	8	159	1,984,233	3,637,111	630,091	1,762,950	8,014,385	4,396	1,871	6,267						
2014	1,523,870	18	165	4,026,857	4,862,942	1,087,249	1,400,511	11,377,560	5,834	1,633	7,466						
2015	1,837,494	11	176	3,052,257	2,488,639	1,176,642	1,036,987	7,754,524	3,015	1,205	4,220						
MA Total:	6,997,150	60	823	12,641,813	16,378,751	4,589,687	6,179,512	39,789,763	4,147	1,539	5,687						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.581	1.303	.
(14) Massachusetts Credibility:	0.950	1.000	.
(15) Countrywide Pure Premium:	2.446	1.004	3.451
(16) Countrywide Indicated Relativity:	0.955	0.888	.
(17) Countrywide Credibility:	0.030	0.000	.
(18) Countrywide Lost-Time Claims:	7435.0	.	.
(19) Pure Premium Underlying Present Rate:	3.387	1.627	5.014
(20) Relativity to Underlying Present Rate:	1.234	1.213	.
(21) Credibility to Underlying Relativity:	0.020	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.555	1.303	.
(24) Balanced Formula Relativity:	1.564	1.304	1.484

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5222 CONCRETE CONSTRUCTION IN CONNECTION WITH BRIDGES OR CULVERTS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	330,861	6	60	673,887	1,569,904	161,308	632,813	3,037,912	6,782	2,400	9,182
2012	295,763	1	49	6,640	1,797,684	460	546,153	2,350,938	6,101	1,848	7,949
2013	241,376	2	31	782,105	829,644	300,229	316,074	2,228,052	6,677	2,553	9,231
2014	257,758	3	29	186,905	568,619	42,667	137,208	935,399	2,931	0,698	3,629
2015	325,326	4	54	754,957	583,859	127,404	209,724	1,675,944	4,115	1,036	5,152
MA Total:	1,451,083	16	223	2,404,495	5,349,709	632,069	1,841,972	10,228,244	5,344	1,705	7,049

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.037	1.443	.
(14) Massachusetts Credibility:	0.620	0.830	.
(15) Countrywide Pure Premium:	4.148	1.577	5.726
(16) Countrywide Indicated Relativity:	1.620	1.394	.
(17) Countrywide Credibility:	0.190	0.090	.
(18) Countrywide Lost-Time Claims:	1102.0	.	.
(19) Pure Premium Underlying Present Rate:	5.732	2.561	8.294
(20) Relativity to Underlying Present Rate:	2.089	1.911	.
(21) Credibility to Underlying Relativity:	0.190	0.080	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.968	1.476	.
(24) Balanced Formula Relativity:	1.979	1.478	1.823

Class(es):		Effective: 7/1/2018							Construction		
5223 SWIMMING POOL CONSTRUCTN-NOT IRON OR STEEL &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	169,161	0	23	0	60,707	0	55,347	116,054	0,359	0,327	0,686
2012	175,421	1	34	163,439	208,045	76,525	103,985	551,994	2,118	1,029	3,147
2013	183,083	0	27	0	143,655	0	232,149	375,804	0,785	1,268	2,053
2014	199,238	1	22	446,362	166,697	72,752	147,162	832,972	3,077	1,104	4,181
2015	219,098	1	41	190,937	345,979	81,675	262,731	881,322	2,451	1,572	4,022
MA Total:	946,001	3	147	800,737	925,082	230,953	801,374	2,758,146	1,824	1,091	2,916

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.695	0.924	.
(14) Massachusetts Credibility:	0.350	0.490	.
(15) Countrywide Pure Premium:	2.804	1.325	4.129
(16) Countrywide Indicated Relativity:	1.095	1.171	.
(17) Countrywide Credibility:	0.330	0.260	.
(18) Countrywide Lost-Time Claims:	656.00	.	.
(19) Pure Premium Underlying Present Rate:	2.123	1.061	3.183
(20) Relativity to Underlying Present Rate:	0.774	0.791	.
(21) Credibility to Underlying Relativity:	0.320	0.250	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.852	0.955	.
(24) Balanced Formula Relativity:	0.857	0.956	0.888

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Calculation of Class Relativities

Class(es): 5348 STONE, MOSAIC, TERRAZZO OR CERAMIC TILE WORK - INSIDE												Effective: 7/1/2018			Construction		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums								
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	429,401	4	45	191,530	832,264	89,578	307,750	1,421,122	2,384	0,925	3,310						
2012	521,891	6	38	458,440	422,325	50,899	194,255	1,125,919	1,688	0,470	2,157						
2013	578,176	4	49	1,002,560	347,087	301,000	212,741	1,863,387	2,334	0,889	3,223						
2014	731,119	6	66	908,643	982,415	353,567	335,167	2,579,792	2,587	0,942	3,529						
2015	751,838	6	66	898,848	1,458,062	144,282	461,179	2,962,371	3,135	0,805	3,940						
MA Total:	3,012,425	26	264	3,460,020	4,042,152	939,326	1,511,092	9,952,591	2,490	0,813	3,304						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.949	0.688	.
(14) Massachusetts Credibility:	0.620	0.760	.
(15) Countrywide Pure Premium:	2.341	0.877	3.218
(16) Countrywide Indicated Relativity:	0.914	0.775	.
(17) Countrywide Credibility:	0.190	0.120	.
(18) Countrywide Lost-Time Claims:	1619.0	.	.
(19) Pure Premium Underlying Present Rate:	2.769	0.996	3.765
(20) Relativity to Underlying Present Rate:	1.009	0.743	.
(21) Credibility to Underlying Relativity:	0.190	0.120	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.954	0.705	.
(24) Balanced Formula Relativity:	0.959	0.706	0.881

Class(es): 5402 HOTHOUSE ERECTION - ALL OPERATIONS												Effective: 7/1/2018			Construction		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums								
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	3,467	0	2	0	760	0	4,892	5,651	0,219	1,411	1,630						
2012	2,464	0	2	0	1,740	0	2,147	3,887	0,706	0,871	1,577						
2013	5,485	0	1	0	0	0	2,803	2,803	0,000	0,511	0,511						
2014	2,571	0	0	0	0	0	0	0	0,000	0,000	0,000						
2015	4,016	0	2	0	0	0	3,910	3,910	0,000	0,974	0,974						
MA Total:	18,002	0	7	0	2,499	0	13,752	16,251	0,139	0,764	0,903						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.053	0.647	.
(14) Massachusetts Credibility:	0.090	0.130	.
(15) Countrywide Pure Premium:	1.073	0.860	1.932
(16) Countrywide Indicated Relativity:	0.419	0.760	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	19,000	.	.
(19) Pure Premium Underlying Present Rate:	3.692	2.201	5.893
(20) Relativity to Underlying Present Rate:	1.345	1.642	.
(21) Credibility to Underlying Relativity:	0.720	0.670	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.053	1.336	.
(24) Balanced Formula Relativity:	1.059	1.338	1.146

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Calculation of Class Relativities

Class(es): 5403 CARPENTRY NOC		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	961.333	8	197	1,646,418	3,422,599	477,677	1,631,135	7,177,829	5,273	2,194	7,467
2012	1,087,884	14	165	2,988,315	3,776,133	890,918	1,447,590	9,102,956	6,218	2,150	8,368
2013	1,340,770	13	201	1,869,848	4,143,265	437,784	1,818,066	8,268,963	4,485	1,683	6,167
2014	1,566,145	20	222	2,378,935	4,157,965	614,165	1,862,005	9,013,071	4,174	1,581	5,755
2015	1,781,748	12	226	1,305,849	4,276,520	298,112	1,925,740	7,806,220	3,133	1,248	4,381
MA Total:	6,737,880	67	1,011	10,189,364	19,776,483	2,718,656	8,684,536	41,369,039	4,447	1,692	6,140

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.695	1.432	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.363	1.540	4.903
(16) Countrywide Indicated Relativity:	1.313	1.361	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	6974.0	.	.
(19) Pure Premium Underlying Present Rate:	5.768	2.386	8.153
(20) Relativity to Underlying Present Rate:	2.102	1.780	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.695	1.432	.
(24) Balanced Formula Relativity:	1.705	1.434	1.621

Class(es): 5437 CARPENTRY-INSTALL OF CABINET WORK OR INT TRIM		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,067,851	10	261	978,631	2,277,871	391,186	1,054,528	4,702,216	1,575	0,699	2,274
2012	2,269,587	12	249	2,440,034	3,671,267	723,814	1,708,722	8,543,836	2,693	1,072	3,764
2013	2,413,903	20	246	1,809,754	4,438,956	1,031,157	2,207,238	9,487,105	2,589	1,342	3,930
2014	2,592,365	14	241	2,146,092	4,819,820	483,238	2,003,977	9,453,127	2,687	0,959	3,647
2015	2,827,388	10	229	3,048,822	5,592,220	505,442	2,559,218	11,705,702	3,056	1,084	4,140
MA Total:	12,171,094	66	1,226	10,423,333	20,800,133	3,134,837	9,533,683	43,891,985	2,565	1,041	3,606

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.978	0.881	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.935	1.265	4.200
(16) Countrywide Indicated Relativity:	1.146	1.118	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	4410.0	.	.
(19) Pure Premium Underlying Present Rate:	2.706	1.382	4.088
(20) Relativity to Underlying Present Rate:	0.986	1.031	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.978	0.881	.
(24) Balanced Formula Relativity:	0.984	0.882	0.952

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Calculation of Class Relativities

Class(es): 5443 LATHING & DRIVERS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	132	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	718	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	1,223	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	977	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	431	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	3,480	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.050	.
(15) Countrywide Pure Premium:	1.755	0.840	2.595
(16) Countrywide Indicated Relativity:	0.685	0.743	.
(17) Countrywide Credibility:	0.370	0.390	.
(18) Countrywide Lost-Time Claims:	97.000	.	.
(19) Pure Premium Underlying Present Rate:	1.961	0.991	2.952
(20) Relativity to Underlying Present Rate:	0.715	0.739	.
(21) Credibility to Underlying Relativity:	0.590	0.560	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.675	0.704	.
(24) Balanced Formula Relativity:	0.679	0.705	0.687

Class(es): 5445 WALLBOARD INSTALLATION WITHIN BUILDINGS & DR		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,398,164	6	151	1,414,961	3,850,956	407,349	1,348,949	7,022,214	3,766	1,256	5,022
2012	1,860,075	14	185	2,649,224	4,357,706	1,041,913	1,352,508	9,401,351	3,767	1,287	5,054
2013	1,928,802	8	197	2,085,748	5,132,544	290,953	2,290,380	9,799,626	3,742	1,338	5,081
2014	2,479,771	14	227	3,001,119	6,206,723	727,119	2,438,566	12,373,526	3,713	1,277	4,990
2015	2,273,856	11	152	2,834,356	4,312,666	1,083,651	1,762,515	9,993,187	3,143	1,252	4,395
MA Total:	9,940,667	53	912	11,985,408	23,860,595	3,550,985	9,192,917	48,589,904	3,606	1,282	4,888

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.375	1.085	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.305	1.312	4.617
(16) Countrywide Indicated Relativity:	1.290	1.160	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	4322.0	.	.
(19) Pure Premium Underlying Present Rate:	3.759	1.358	5.118
(20) Relativity to Underlying Present Rate:	1.370	1.013	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.375	1.085	.
(24) Balanced Formula Relativity:	1.383	1.086	1.291

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5462 GLAZIER-AWAY FROM SHOP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	393,443	5	77	961,805	566,447	170,440	425,388	2,124,080	3,884	1,514	5,399
2012	494,577	9	82	1,834,087	654,874	443,794	425,011	3,357,765	5,033	1,757	6,789
2013	489,969	6	71	1,292,800	1,001,349	316,099	358,239	2,968,487	4,682	1,376	6,059
2014	625,998	1	80	169,848	1,018,700	24,806	420,351	1,633,705	1,899	0,711	2,610
2015	647,821	6	88	475,888	1,395,022	214,416	657,833	2,743,160	2,888	1,346	4,234
MA Total:	2,651,808	27	398	4,734,428	4,636,392	1,169,556	2,286,821	12,827,197	3,534	1,303	4,837

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.347	1.103	.
(14) Massachusetts Credibility:	0.700	0.860	.
(15) Countrywide Pure Premium:	3.755	1.459	5.214
(16) Countrywide Indicated Relativity:	1.466	1.289	.
(17) Countrywide Credibility:	0.150	0.070	.
(18) Countrywide Lost-Time Claims:	1455.0	.	.
(19) Pure Premium Underlying Present Rate:	4.144	1.566	5.709
(20) Relativity to Underlying Present Rate:	1.510	1.168	.
(21) Credibility to Underlying Relativity:	0.150	0.070	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.389	1.121	.
(24) Balanced Formula Relativity:	1.397	1.122	1.312

Class(es):		Effective: 7/1/2018							Construction		
5472 ASBESTOS REMOVAL OP: ASBESTOS CONTR-PIPE&BOILR WORK EXCL &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	137,258	1	29	42,439	845,749	7,141	353,247	1,248,576	6,471	2,626	9,097
2012	132,495	3	17	702,254	423,005	276,886	172,989	1,575,134	8,493	3,395	11,888
2013	122,203	0	19	0	957,520	0	310,557	1,268,077	7,835	2,541	10,377
2014	144,765	2	11	179,021	117,782	73,694	52,796	423,294	2,050	0,874	2,924
2015	158,535	2	14	243,318	630,517	65,900	202,446	1,142,181	5,512	1,693	7,205
MA Total:	695,256	8	90	1,167,032	2,974,574	423,620	1,092,036	5,657,261	5,957	2,180	8,137

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.271	1.845	.
(14) Massachusetts Credibility:	0.440	0.550	.
(15) Countrywide Pure Premium:	4.137	1.393	5.530
(16) Countrywide Indicated Relativity:	1.615	1.231	.
(17) Countrywide Credibility:	0.280	0.230	.
(18) Countrywide Lost-Time Claims:	128.00	.	.
(19) Pure Premium Underlying Present Rate:	4.925	1.948	6.873
(20) Relativity to Underlying Present Rate:	1.794	1.453	.
(21) Credibility to Underlying Relativity:	0.280	0.220	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.954	1.618	.
(24) Balanced Formula Relativity:	1.965	1.620	1.858

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Calculation of Class Relativities

Class(es): 5473 ASBESTOS REMOVAL OP: ASBESTOS CONTRCTR-NOC &DR												Effective: 7/1/2018			Construction		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	174,494	4	16	709,475	928,732	236,266	343,901	2,218,374	9,388	3,325	12,713						
2012	204,295	3	30	845,778	201,672	642,669	182,019	1,872,137	5,127	4,037	9,164						
2013	250,155	5	32	1,067,173	461,650	602,229	274,640	2,405,692	6,111	3,505	9,617						
2014	317,963	3	28	505,688	628,156	375,113	207,633	1,716,590	3,566	1,833	5,399						
2015	329,860	9	30	2,606,405	1,480,089	1,180,945	435,952	5,703,392	12,389	4,902	17,290						
MA Total:	1,276,768	24	136	5,734,519	3,700,299	3,037,222	1,444,145	13,916,185	7,390	3,510	10,900						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.817	2.971	.
(14) Massachusetts Credibility:	0.560	0.790	.
(15) Countrywide Pure Premium:	4.150	1.884	6.035
(16) Countrywide Indicated Relativity:	1.620	1.665	.
(17) Countrywide Credibility:	0.220	0.110	.
(18) Countrywide Lost-Time Claims:	521.00	.	.
(19) Pure Premium Underlying Present Rate:	4.951	2.638	7.589
(20) Relativity to Underlying Present Rate:	1.804	1.968	.
(21) Credibility to Underlying Relativity:	0.220	0.100	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	2.331	2.727	.
(24) Balanced Formula Relativity:	2.344	2.730	2.464

Class(es): 5474 PAINTING OR PAPERHANGING NOC & SHOP OPERS, DR												Effective: 7/1/2018			Construction		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	2,531,347	22	190	2,993,049	4,993,258	1,280,134	2,705,512	11,971,952	3,155	1,575	4,729						
2012	2,605,341	19	155	3,294,968	2,280,316	1,582,425	1,394,082	8,551,790	2,140	1,142	3,282						
2013	2,890,957	16	171	1,558,274	4,018,611	812,832	1,942,895	8,332,611	1,929	0,953	2,882						
2014	3,215,007	17	162	2,152,495	4,509,997	971,775	2,382,350	10,016,618	2,072	1,043	3,116						
2015	3,776,295	15	191	2,340,947	6,084,047	1,226,516	2,810,294	12,461,803	2,231	1,069	3,300						
MA Total:	15,018,946	89	869	12,339,733	21,886,229	5,873,681	11,235,132	51,334,775	2,279	1,139	3,418						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.869	0.964	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.045	1.372	4.416
(16) Countrywide Indicated Relativity:	1.189	1.212	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	5468.0	.	.
(19) Pure Premium Underlying Present Rate:	2.732	1.456	4.188
(20) Relativity to Underlying Present Rate:	0.996	1.086	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.869	0.964	.
(24) Balanced Formula Relativity:	0.874	0.965	0.902

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5478 CARPET, LINOLEUM, VINYL, ASPHALT OR RUBBER FLOOR TILE INSTAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	568,020	7	70	1,374,307	1,258,420	410,671	444,748	3,488,147	4,635	1,506	6,141
2012	597,835	4	48	595,445	457,477	118,026	120,746	1,291,694	1,761	0,399	2,161
2013	675,220	3	53	226,471	712,551	158,342	261,153	1,358,517	1,391	0,621	2,012
2014	713,615	6	58	874,135	880,290	377,990	393,076	2,525,490	2,459	1,081	3,539
2015	814,457	3	52	671,084	1,018,023	115,037	359,177	2,163,321	2,074	0,582	2,656
MA Total:	3,369,147	23	281	3,741,442	4,326,761	1,180,066	1,578,899	10,827,168	2,395	0,819	3,214

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.913	0.693	.
(14) Massachusetts Credibility:	0.690	0.860	.
(15) Countrywide Pure Premium:	2.442	0.870	3.312
(16) Countrywide Indicated Relativity:	0.953	0.769	.
(17) Countrywide Credibility:	0.160	0.070	.
(18) Countrywide Lost-Time Claims:	1198.0	.	.
(19) Pure Premium Underlying Present Rate:	3.208	1.214	4.423
(20) Relativity to Underlying Present Rate:	1.169	0.906	.
(21) Credibility to Underlying Relativity:	0.150	0.070	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.958	0.713	.
(24) Balanced Formula Relativity:	0.963	0.714	0.886

Class(es):		Effective: 7/1/2018							Construction		
5479 INSULATION WORK NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	358,437	4	75	648,142	1,110,428	259,013	438,293	2,455,876	4,906	1,945	6,852
2012	389,341	6	100	517,948	964,065	186,662	637,661	2,306,336	3,806	2,117	5,924
2013	394,048	3	83	190,303	1,828,304	44,940	706,693	2,770,240	5,123	1,907	7,030
2014	487,723	5	102	803,045	1,195,914	326,405	446,440	2,771,804	4,099	1,585	5,683
2015	550,581	1	88	277,445	1,393,174	30,745	629,754	2,331,118	3,034	1,200	4,234
MA Total:	2,180,130	19	448	2,436,884	6,491,885	847,764	2,858,841	12,635,374	4,096	1,700	5,796

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.561	1.439	.
(14) Massachusetts Credibility:	0.640	0.960	.
(15) Countrywide Pure Premium:	2.918	1.278	4.196
(16) Countrywide Indicated Relativity:	1.139	1.129	.
(17) Countrywide Credibility:	0.180	0.020	.
(18) Countrywide Lost-Time Claims:	1418.0	.	.
(19) Pure Premium Underlying Present Rate:	4.084	2.500	6.584
(20) Relativity to Underlying Present Rate:	1.488	1.865	.
(21) Credibility to Underlying Relativity:	0.180	0.020	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.472	1.441	.
(24) Balanced Formula Relativity:	1.481	1.443	1.469

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Calculation of Class Relativities

Class(es): 5480 PLASTERING NOC & DRIVERS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	313,780	1	20	26,218	187,765	13,914	132,776	360,673	0.682	0.467	1.149
2012	348,559	0	20	0	240,695	0	123,060	363,756	0.691	0.353	1.044
2013	391,333	2	23	373,460	472,374	151,982	270,202	1,268,018	2.161	1.079	3.240
2014	418,393	2	17	354,490	44,453	68,394	47,258	514,596	0.954	0.276	1.230
2015	475,742	0	28	0	1,790,419	0	713,103	2,503,522	3.763	1.499	5.262
MA Total:	1,947,806	5	108	754,169	2,735,707	234,290	1,286,399	5,010,564	1.792	0.781	2.572

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.683	0.661	.
(14) Massachusetts Credibility:	0.500	0.630	.
(15) Countrywide Pure Premium:	3.407	1.202	4.609
(16) Countrywide Indicated Relativity:	1.330	1.062	.
(17) Countrywide Credibility:	0.250	0.190	.
(18) Countrywide Lost-Time Claims:	141.00	.	.
(19) Pure Premium Underlying Present Rate:	2.454	0.988	3.442
(20) Relativity to Underlying Present Rate:	0.894	0.737	.
(21) Credibility to Underlying Relativity:	0.250	0.180	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.898	0.751	.
(24) Balanced Formula Relativity:	0.903	0.752	0.856

Class(es): 5506 STREET OR ROAD CONSTRUCTION: PAVING OR REPAVING & DRIVERS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	485,651	7	61	1,546,943	1,354,375	1,075,786	481,235	4,458,338	5.974	3.206	9.180
2012	536,923	6	56	534,408	547,862	132,699	319,230	1,534,199	2.016	0.842	2.857
2013	507,855	0	38	0	143,354	0	188,322	331,676	0.282	0.371	0.653
2014	604,601	5	47	1,031,690	712,258	149,276	541,217	2,434,442	2.884	1.142	4.027
2015	648,460	2	37	826,763	937,573	135,149	418,542	2,318,028	2.721	0.854	3.575
MA Total:	2,783,489	20	239	3,939,804	3,695,423	1,492,910	1,948,546	11,076,683	2.743	1.236	3.979

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.046	1.046	.
(14) Massachusetts Credibility:	0.660	0.900	.
(15) Countrywide Pure Premium:	3.229	1.383	4.613
(16) Countrywide Indicated Relativity:	1.261	1.223	.
(17) Countrywide Credibility:	0.170	0.050	.
(18) Countrywide Lost-Time Claims:	4651.0	.	.
(19) Pure Premium Underlying Present Rate:	3.412	1.663	5.075
(20) Relativity to Underlying Present Rate:	1.243	1.240	.
(21) Credibility to Underlying Relativity:	0.170	0.050	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.116	1.065	.
(24) Balanced Formula Relativity:	1.122	1.066	1.105

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5507 STREET OR ROAD CONSTRUCTION: SUB-SURFACE WORK & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	254,930	4	22	723,029	99,071	319,668	54,507	1,196,275	3,225	1,468	4,693
2012	211,374	5	20	1,037,422	966,736	222,060	799,013	3,025,231	9,482	4,831	14,312
2013	203,031	0	19	0	285,365	0	81,563	366,928	1,406	0,402	1,807
2014	239,317	0	19	0	483,106	0	115,304	598,410	2,019	0,482	2,500
2015	350,440	0	24	0	509,543	0	248,479	758,022	1,454	0,709	2,163
MA Total:	1,259,093	9	104	1,760,450	2,343,822	541,728	1,298,866	5,944,866	3,260	1,462	4,722

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.243	1.237	.
(14) Massachusetts Credibility:	0.490	0.720	.
(15) Countrywide Pure Premium:	2.280	0.881	3.161
(16) Countrywide Indicated Relativity:	0.890	0.779	.
(17) Countrywide Credibility:	0.260	0.140	.
(18) Countrywide Lost-Time Claims:	1380.0	.	.
(19) Pure Premium Underlying Present Rate:	3.594	2.064	5.658
(20) Relativity to Underlying Present Rate:	1.309	1.540	.
(21) Credibility to Underlying Relativity:	0.250	0.140	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.168	1.215	.
(24) Balanced Formula Relativity:	1.174	1.217	1.188

Class(es):		Effective: 7/1/2018							Construction		
5509 STREET OR ROAD MAINTENANCE BY COUNTY OR MUNICIPAL EMP & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	86,137	0	11	0	58,024	0	35,575	93,599	0,674	0,413	1,087
2012	48,277	2	13	278,952	121,976	248,366	124,240	773,533	8,305	7,718	16,023
2013	49,458	0	12	0	8,438	0	6,855	15,293	0,171	0,139	0,309
2014	62,924	0	8	0	12,228	0	16,330	28,558	0,194	0,260	0,454
2015	62,088	0	18	0	182,375	0	171,771	354,147	2,937	2,767	5,704
MA Total:	308,885	2	62	278,952	383,041	248,366	354,771	1,265,130	2,143	1,953	4,096

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.817	1.653	.
(14) Massachusetts Credibility:	0.210	0.300	.
(15) Countrywide Pure Premium:	2.209	1.050	3.259
(16) Countrywide Indicated Relativity:	0.862	0.928	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	571.00	.	.
(19) Pure Premium Underlying Present Rate:	1.803	0.947	2.751
(20) Relativity to Underlying Present Rate:	0.657	0.707	.
(21) Credibility to Underlying Relativity:	0.390	0.350	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.773	1.068	.
(24) Balanced Formula Relativity:	0.777	1.069	0.868

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5538 SHEET METAL WORK-SHOP & OUTSIDE-NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,519,463	11	250	1,034,883	1,909,999	301,402	1,218,595	4,464,879	1,938	1,000	2,938
2012	1,797,265	6	267	623,060	3,212,306	189,927	1,213,160	5,238,453	2,134	0,781	2,915
2013	1,969,517	16	249	1,987,571	1,496,805	714,562	965,084	5,164,021	1,769	0,853	2,622
2014	2,229,874	15	285	3,205,560	3,092,960	1,173,922	1,906,084	9,378,526	2,825	1,381	4,206
2015	2,512,692	7	275	1,254,251	3,045,868	235,161	1,779,245	6,314,526	1,711	0,802	2,513
MA Total:	10,028,811	55	1,326	8,105,326	12,757,937	2,614,974	7,082,167	30,560,404	2,080	0,967	3,047

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.793	0.818	.
(14) Massachusetts Credibility:	0.910	1.000	.
(15) Countrywide Pure Premium:	2.472	1.067	3.539
(16) Countrywide Indicated Relativity:	0.965	0.943	.
(17) Countrywide Credibility:	0.050	0.000	.
(18) Countrywide Lost-Time Claims:	292.00	.	.
(19) Pure Premium Underlying Present Rate:	2.115	1.019	3.135
(20) Relativity to Underlying Present Rate:	0.771	0.760	.
(21) Credibility to Underlying Relativity:	0.040	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.801	0.818	.
(24) Balanced Formula Relativity:	0.805	0.819	0.810

Class(es):		Effective: 7/1/2018							Construction		
5545 ROOFING NOC & YARD EMP, DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	158,754	12	33	1,531,466	460,710	660,697	355,110	3,007,984	12,549	6,399	18,948
2012	135,540	8	33	907,159	1,120,817	826,431	831,872	3,686,279	14,962	12,235	27,197
2013	150,875	2	36	163,741	640,590	69,022	471,002	1,344,355	5,331	3,579	8,910
2014	139,948	10	43	2,090,723	1,827,056	1,197,179	944,385	6,059,343	27,995	15,303	43,297
2015	218,194	12	32	3,426,943	1,916,371	2,251,863	1,538,260	9,133,437	24,489	17,370	41,859
MA Total:	803,310	44	177	8,120,032	5,965,544	5,005,192	4,140,629	23,231,397	17,534	11,385	28,920

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.684	9.636	.
(14) Massachusetts Credibility:	0.770	1.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	6.048	7.177	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	17.371	10.178	27.549
(20) Relativity to Underlying Present Rate:	6.330	7.592	.
(21) Credibility to Underlying Relativity:	0.230	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	6.603	9.636	.
(24) Balanced Formula Relativity:	6.641	9.649	7.575

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Calculation of Class Relativities

Class(es): 5547 ROOFING-BUILT UP - YARD EMP & DRIVERS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	519,411	7	76	2,615,636	1,946,927	1,112,459	980,330	6,655,351	8,784	4,029	12,813
2012	488,246	4	68	438,782	1,775,166	324,668	1,278,860	3,817,477	4,534	3,284	7,819
2013	528,152	3	68	511,959	2,054,128	103,298	1,368,545	4,037,930	4,859	2,787	7,645
2014	639,457	11	67	1,862,598	1,365,204	1,505,373	700,022	5,433,197	5,048	3,449	8,497
2015	642,977	6	70	819,133	2,002,052	2,076,726	896,136	5,794,046	4,388	4,624	9,011
MA Total:	2,818,242	31	349	6,248,107	9,143,478	5,122,523	5,223,893	25,738,001	5,461	3,671	9,133

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.082	3.107	.
(14) Massachusetts Credibility:	0.830	1.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.136	2.711	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	6.135	3.845	9.980
(20) Relativity to Underlying Present Rate:	2.236	2.868	.
(21) Credibility to Underlying Relativity:	0.170	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	2.108	3.107	.
(24) Balanced Formula Relativity:	2.120	3.111	2.428

Class(es): 5606 CONTRACTOR-EXECUTIVE SUPERVISOR OR CONSTRUCT SUPERINTENDENT		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,958,485	10	212	2,112,355	3,437,806	735,842	1,715,989	8,001,992	1,119	0,494	1,614
2012	5,210,325	15	211	3,280,135	2,615,350	1,097,206	1,571,068	8,563,759	1,132	0,512	1,644
2013	5,917,190	10	163	1,525,152	2,367,598	912,131	1,482,722	6,287,603	0,658	0,405	1,063
2014	6,458,343	9	181	1,926,030	1,911,913	764,501	1,334,208	5,936,651	0,594	0,325	0,919
2015	7,217,138	15	175	2,607,732	1,592,013	868,770	1,295,242	6,363,757	0,582	0,300	0,882
MA Total:	29,761,482	59	942	11,451,404	11,924,679	4,378,449	7,399,229	35,153,761	0,785	0,396	1,181

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.299	0.335	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.549	0.254	0.804
(16) Countrywide Indicated Relativity:	0.214	0.225	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	3715.0	.	.
(19) Pure Premium Underlying Present Rate:	0.904	0.481	1.385
(20) Relativity to Underlying Present Rate:	0.330	0.359	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.299	0.335	.
(24) Balanced Formula Relativity:	0.301	0.335	0.312

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Calculation of Class Relativities

Class(es): 5610 CLEANER - DEBRIS REMOVAL		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	304,354	4	28	443,170	772,835	131,699	193,650	1,541,354	3,995	1,069	5,064
2012	346,771	3	26	480,428	579,340	105,921	340,528	1,506,218	3,056	1,287	4,344
2013	365,358	2	31	329,515	799,750	33,980	303,093	1,466,338	3,091	0,923	4,013
2014	503,061	4	43	1,070,218	1,203,013	153,281	322,962	2,749,474	4,519	0,947	5,465
2015	584,488	3	45	326,881	1,740,758	42,802	455,096	2,565,536	3,538	0,852	4,389
MA Total:	2,104,032	16	173	2,650,212	5,095,695	467,683	1,615,329	9,828,919	3,681	0,990	4,671

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.403	0.838	.
(14) Massachusetts Credibility:	0.630	0.780	.
(15) Countrywide Pure Premium:	2.448	1.144	3.592
(16) Countrywide Indicated Relativity:	0.956	1.011	.
(17) Countrywide Credibility:	0.190	0.110	.
(18) Countrywide Lost-Time Claims:	572.00	.	.
(19) Pure Premium Underlying Present Rate:	4.083	1.546	5.629
(20) Relativity to Underlying Present Rate:	1.488	1.153	.
(21) Credibility to Underlying Relativity:	0.180	0.110	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.334	0.892	.
(24) Balanced Formula Relativity:	1.341	0.893	1.202

Class(es): 5645 CARPENTRY-DETACHED ONE OR TWO FAMILY DWELLINGS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,338,134	40	671	4,863,233	8,239,197	2,257,008	4,592,146	19,951,584	3,020	1,579	4,599
2012	4,572,090	54	658	6,934,302	10,262,971	3,986,559	6,092,178	27,276,009	3,761	2,204	5,966
2013	4,956,063	49	661	7,615,343	13,748,047	3,457,604	8,492,087	33,313,080	4,311	2,411	6,722
2014	5,442,040	49	669	7,219,353	12,188,444	3,675,075	7,383,128	30,466,001	3,566	2,032	5,598
2015	6,211,495	54	697	8,322,693	14,126,813	3,845,580	8,397,912	34,692,998	3,614	1,971	5,585
MA Total:	25,519,822	246	3,356	34,954,924	58,565,471	17,221,826	34,957,450	145,699,672	3,665	2,045	5,709

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.397	1.731	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	5.307	2.702	8.009
(16) Countrywide Indicated Relativity:	2.072	2.388	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	12905	.	.
(19) Pure Premium Underlying Present Rate:	3.749	2.252	6.001
(20) Relativity to Underlying Present Rate:	1.366	1.680	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.397	1.731	.
(24) Balanced Formula Relativity:	1.405	1.733	1.507

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Calculation of Class Relativities

Class(es): 5701 WRECKING: BUILDING OR STRUCTURES-NOT MARINE- ALL OPERATIONS												Effective: 7/1/2018		Construction	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	32,613	2	5	495,507	92,272	381,749	99,803	1,069,331	18,023	14,766	32,788				
2012	45,950	1	3	403,341	2,873	112,949	19,903	539,066	8,840	2,891	11,732				
2013	30,546	0	3	0	295,771	0	72,492	368,264	9,683	2,373	12,056				
2014	52,267	0	10	0	105,063	0	76,049	181,112	2,010	1,455	3,465				
2015	92,770	2	5	476,888	896,838	640,744	450,731	2,465,201	14,808	11,765	26,573				
MA Total:	254,146	5	26	1,375,736	1,392,817	1,135,442	718,979	4,622,974	10,894	7,297	18,190				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.153	6.176	.
(14) Massachusetts Credibility:	0.400	0.650	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	3.690	5.753	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	10.600	8.158	18.758
(20) Relativity to Underlying Present Rate:	3.862	6.085	.
(21) Credibility to Underlying Relativity:	0.600	0.350	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	3.979	6.144	.
(24) Balanced Formula Relativity:	4.002	6.152	4.669

Class(es): 5703 BUILDING RAISING OR MOVING & DRIVERS												Effective: 7/1/2018		Construction	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	11,802	0	1	0	0	0	1,605	1,605	0.000	0.136	0.136				
2012	7,351	0	1	0	4,672	0	2,952	7,623	0.635	0.402	1.037				
2013	8,169	0	1	0	78,303	0	34,016	112,319	9,586	4,164	13,750				
2014	12,331	0	1	0	0	0	1,507	1,507	0.000	0.122	0.122				
2015	11,512	0	0	0	0	0	0	0	0.000	0.000	0.000				
MA Total:	51,165	0	4	0	82,975	0	40,079	123,054	1.622	0.783	2.405				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.618	0.663	.
(14) Massachusetts Credibility:	0.180	0.230	.
(15) Countrywide Pure Premium:	7.444	3.818	11.261
(16) Countrywide Indicated Relativity:	2.906	3.374	.
(17) Countrywide Credibility:	0.280	0.300	.
(18) Countrywide Lost-Time Claims:	49.000	.	.
(19) Pure Premium Underlying Present Rate:	7.702	2.941	10.643
(20) Relativity to Underlying Present Rate:	2.807	2.193	.
(21) Credibility to Underlying Relativity:	0.540	0.470	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	2.441	2.196	.
(24) Balanced Formula Relativity:	2.455	2.198	2.375

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
5705 SALVAGE OPERATION - NO WRECKING OR ANY STRUCTURAL OPERATIONS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	87	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	821	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	248	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	242	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,927	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	3,325	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.060	0.080	.
(15) Countrywide Pure Premium:	10.496	5.417	15.913
(16) Countrywide Indicated Relativity:	4.098	4.787	.
(17) Countrywide Credibility:	0.230	0.250	.
(18) Countrywide Lost-Time Claims:	30.000	.	.
(19) Pure Premium Underlying Present Rate:	6.850	3.141	9.991
(20) Relativity to Underlying Present Rate:	2.496	2.343	.
(21) Credibility to Underlying Relativity:	0.710	0.670	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	2.715	2.767	.
(24) Balanced Formula Relativity:	2.730	2.770	2.743

Class(es):		Effective: 7/1/2018							Construction		
6003 PILE DRIVING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	51,651	0	14	0	658,118	0	120,600	778,719	12,742	2,335	15,077
2012	48,725	1	6	85,143	158,933	29,819	60,153	334,048	5,009	1,847	6,856
2013	70,991	0	5	0	733,800	0	254,867	988,666	10,336	3,590	13,927
2014	67,315	0	10	0	337,862	0	64,084	401,946	5,019	0,952	5,971
2015	105,118	0	5	0	329,061	0	321,757	650,818	3,130	3,061	6,191
MA Total:	343,800	1	40	85,143	2,217,775	29,819	821,461	3,154,198	6,698	2,476	9,175

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.554	2.096	.
(14) Massachusetts Credibility:	0.350	0.430	.
(15) Countrywide Pure Premium:	3.717	1.430	5.147
(16) Countrywide Indicated Relativity:	1.451	1.263	.
(17) Countrywide Credibility:	0.330	0.290	.
(18) Countrywide Lost-Time Claims:	134.00	.	.
(19) Pure Premium Underlying Present Rate:	5.649	2.110	7.759
(20) Relativity to Underlying Present Rate:	2.058	1.574	.
(21) Credibility to Underlying Relativity:	0.320	0.280	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	2.031	1.708	.
(24) Balanced Formula Relativity:	2.043	1.710	1.940

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Calculation of Class Relativities

Class(es): 6204 DRILLING NOC & DRIVERS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	127,019	1	17	4,142	146,520	624	89,788	241,074	1,186	0,712	1,898
2012	123,520	2	8	256,133	234,116	56,520	81,878	628,647	3,969	1,120	5,089
2013	126,747	0	14	0	30,488	0	27,441	57,929	0,241	0,217	0,457
2014	139,839	1	16	7,096	106,748	11,499	68,909	194,252	0,814	0,575	1,389
2015	192,032	1	22	40,076	982,888	66,220	413,450	1,502,634	5,327	2,498	7,825
MA Total:	709,157	5	77	307,447	1,500,759	134,863	681,466	2,624,536	2,550	1,151	3,701

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.972	0.974	.
(14) Massachusetts Credibility:	0.390	0.500	.
(15) Countrywide Pure Premium:	4.161	1.619	5.780
(16) Countrywide Indicated Relativity:	1.624	1.431	.
(17) Countrywide Credibility:	0.310	0.250	.
(18) Countrywide Lost-Time Claims:	1051.0	.	.
(19) Pure Premium Underlying Present Rate:	3.707	1.463	5.170
(20) Relativity to Underlying Present Rate:	1.351	1.091	.
(21) Credibility to Underlying Relativity:	0.300	0.250	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.288	1.118	.
(24) Balanced Formula Relativity:	1.295	1.119	1.241

Class(es): 6217 EXCAVATION & DRIVERS		Effective: 7/1/2018							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,914,712	22	255	3,717,960	4,474,672	1,579,876	2,450,287	12,222,795	2,811	1,383	4,193
2012	2,970,870	13	211	815,439	4,711,028	327,006	1,967,005	7,820,477	1,860	0,772	2,632
2013	3,226,563	15	257	2,784,255	4,186,221	1,005,110	2,499,175	10,474,761	2,160	1,086	3,246
2014	3,609,976	23	258	3,664,277	4,152,587	1,280,451	2,311,487	11,408,803	2,165	0,995	3,160
2015	4,118,483	18	261	4,051,269	4,900,240	1,308,141	2,385,790	12,645,440	2,173	0,897	3,070
MA Total:	16,840,604	91	1,242	15,033,200	22,424,748	5,500,584	11,613,744	54,572,276	2,224	1,016	3,241

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.848	0.860	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.430	1.014	3.444
(16) Countrywide Indicated Relativity:	0.949	0.896	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	6379.0	.	.
(19) Pure Premium Underlying Present Rate:	2.208	1.147	3.355
(20) Relativity to Underlying Present Rate:	0.804	0.856	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.848	0.860	.
(24) Balanced Formula Relativity:	0.853	0.861	0.855

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
6229 IRRIGATION OR DRAINAGE SYSTEM CONSTRUCTION & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	302,266	1	36	292,044	864,284	99,650	235,452	1,491,430	3,826	1,109	4,934
2012	328,181	0	25	0	222,624	0	112,949	335,574	0,678	0,344	1,023
2013	347,669	3	30	240,668	370,033	201,951	118,076	930,728	1,757	0,920	2,677
2014	339,587	4	22	499,560	388,196	165,045	216,825	1,269,626	2,614	1,125	3,739
2015	390,971	0	20	0	511,817	0	141,042	652,860	1,309	0,361	1,670
MA Total:	1,708,675	8	133	1,032,272	2,356,955	466,646	824,345	4,680,218	1,984	0,756	2,739

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.756	0.639	.
(14) Massachusetts Credibility:	0.460	0.630	.
(15) Countrywide Pure Premium:	2.358	1.166	3.524
(16) Countrywide Indicated Relativity:	0.921	1.030	.
(17) Countrywide Credibility:	0.270	0.190	.
(18) Countrywide Lost-Time Claims:	660.00	.	.
(19) Pure Premium Underlying Present Rate:	2.278	1.101	3.379
(20) Relativity to Underlying Present Rate:	0.830	0.821	.
(21) Credibility to Underlying Relativity:	0.270	0.180	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.820	0.746	.
(24) Balanced Formula Relativity:	0.825	0.747	0.801

Class(es):		Effective: 7/1/2018							Construction		
6233 OIL OR GAS PIPELINE CONSTRUCTION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	14,231	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	9,896	0	1	0	0	0	988	988	0.000	0.100	0.100
2013	11,870	0	1	0	0	0	876	876	0.000	0.074	0.074
2014	13,405	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	45,365	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	94,767	0	2	0	0	0	1,865	1,865	0.000	0.020	0.020

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.017	.
(14) Massachusetts Credibility:	0.150	0.170	.
(15) Countrywide Pure Premium:	1.316	0.537	1.854
(16) Countrywide Indicated Relativity:	0.514	0.475	.
(17) Countrywide Credibility:	0.430	0.420	.
(18) Countrywide Lost-Time Claims:	591.00	.	.
(19) Pure Premium Underlying Present Rate:	2.373	0.763	3.136
(20) Relativity to Underlying Present Rate:	0.865	0.569	.
(21) Credibility to Underlying Relativity:	0.420	0.410	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.584	0.436	.
(24) Balanced Formula Relativity:	0.588	0.436	0.541

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
6251 TUNNELING - NOT PNEUMATIC - ALL OPERATIONS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	2,882	0	1	0	0	0	2,564	2,564	0.000	0.890	0.890
2013	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	2,882	0	1	0	0	0	2,564	2,564	0.000	0.890	0.890

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.753	.
(14) Massachusetts Credibility:	0.040	0.050	.
(15) Countrywide Pure Premium:	3.007	0.933	3.940
(16) Countrywide Indicated Relativity:	1.174	0.824	.
(17) Countrywide Credibility:	0.280	0.300	.
(18) Countrywide Lost-Time Claims:	48.000	.	.
(19) Pure Premium Underlying Present Rate:	3.820	0.898	4.718
(20) Relativity to Underlying Present Rate:	1.392	0.670	.
(21) Credibility to Underlying Relativity:	0.680	0.650	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.275	0.721	.
(24) Balanced Formula Relativity:	1.283	0.721	1.108

Class(es):		Effective: 7/1/2018							Construction		
6252 SHAFT SINKING - ALL OPERATIONS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	42,672	3	5	758,734	272,199	219,522	127,619	1,378,075	24,159	8,135	32,294
2012	22,218	0	2	0	754	0	31,832	32,587	0.034	1,433	1,467
2013	21,227	0	1	0	0	0	321	321	0.000	0.015	0.015
2014	34,212	0	2	0	0	0	3,470	3,470	0.000	0.101	0.101
2015	32,930	0	1	0	0	0	15,316	15,316	0.000	0.465	0.465
MA Total:	153,259	3	11	758,734	272,954	219,522	178,560	1,429,770	6,732	2,597	9,329

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.566	2.198	.
(14) Massachusetts Credibility:	0.240	0.330	.
(15) Countrywide Pure Premium:	3.194	0.972	4.166
(16) Countrywide Indicated Relativity:	1.247	0.859	.
(17) Countrywide Credibility:	0.370	0.340	.
(18) Countrywide Lost-Time Claims:	93.000	.	.
(19) Pure Premium Underlying Present Rate:	5.157	2.493	7.650
(20) Relativity to Underlying Present Rate:	1.879	1.860	.
(21) Credibility to Underlying Relativity:	0.390	0.330	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.810	1.631	.
(24) Balanced Formula Relativity:	1.821	1.633	1.762

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Calculation of Class Relativities

Class(es): 6306 SEWER CONSTRUCTION - ALL OPERATIONS & DRIVERS												Effective: 7/1/2018		Construction	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	206,132	2	27	365,570	668,236	69,122	241,025	1,343,953	5,015	1,505	6,520				
2012	196,673	3	25	627,071	1,077,059	73,762	426,903	2,204,796	8,665	2,546	11,210				
2013	222,989	3	22	736,236	138,634	438,591	140,192	1,453,652	3,923	2,596	6,519				
2014	248,200	3	29	779,552	625,134	398,462	203,332	2,006,481	5,659	2,425	8,084				
2015	262,556	2	26	378,175	574,242	71,603	197,709	1,221,730	3,627	1,026	4,653				
MA Total:	1,136,550	13	129	2,886,605	3,083,306	1,051,540	1,209,161	8,230,611	5,253	1,989	7,242				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.002	1.683	.
(14) Massachusetts Credibility:	0.540	0.710	.
(15) Countrywide Pure Premium:	2.778	1.165	3.943
(16) Countrywide Indicated Relativity:	1.085	1.029	.
(17) Countrywide Credibility:	0.230	0.150	.
(18) Countrywide Lost-Time Claims:	1272.0	.	.
(19) Pure Premium Underlying Present Rate:	5.237	2.273	7.510
(20) Relativity to Underlying Present Rate:	1.908	1.696	.
(21) Credibility to Underlying Relativity:	0.230	0.140	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.770	1.587	.
(24) Balanced Formula Relativity:	1.780	1.589	1.721

Class(es): 6319 GAS MAIN OR CONNECTION CONSTRUCTION & DRIVERS												Effective: 7/1/2018		Construction	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	517,858	1	56	9,775	1,071,552	6,344	434,748	1,522,420	2,088	0,852	2,940				
2012	566,589	4	32	1,123,493	1,152,622	245,354	844,444	3,365,912	4,017	1,923	5,941				
2013	637,794	1	29	115,663	266,983	30,033	276,013	688,693	0,600	0,480	1,080				
2014	707,483	3	30	318,380	518,650	120,008	223,714	1,180,751	1,183	0,486	1,669				
2015	823,864	2	34	79,439	1,485,659	285,594	627,079	2,477,771	1,900	1,108	3,008				
MA Total:	3,253,588	11	181	1,646,751	4,495,466	687,333	2,405,998	9,235,548	1,888	0,951	2,839				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.720	0.805	.
(14) Massachusetts Credibility:	0.570	0.850	.
(15) Countrywide Pure Premium:	1.828	0.789	2.617
(16) Countrywide Indicated Relativity:	0.714	0.697	.
(17) Countrywide Credibility:	0.220	0.080	.
(18) Countrywide Lost-Time Claims:	1297.0	.	.
(19) Pure Premium Underlying Present Rate:	2.095	1.219	3.314
(20) Relativity to Underlying Present Rate:	0.764	0.909	.
(21) Credibility to Underlying Relativity:	0.210	0.070	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.728	0.803	.
(24) Balanced Formula Relativity:	0.732	0.804	0.754

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
6325 CONDUIT CONSTRUCTION - FOR CABLES OR WIRES & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	199,587	2	8	156,221	23,379	46,061	19,904	245,565	0.900	0.331	1.230
2012	200,232	1	10	139,397	79,041	35,830	79,126	333,393	1.091	0.574	1.665
2013	224,228	1	7	215,330	2,825	124,264	11,062	353,480	0.973	0.604	1.576
2014	245,517	2	14	422,796	379,237	75,556	203,565	1,081,155	3.267	1.137	4.404
2015	263,205	0	10	0	200,865	0	130,068	330,932	0.763	0.494	1.257
MA Total:	1,132,770	6	49	933,744	685,346	281,711	443,724	2,344,525	1.429	0.640	2.070

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.545	0.542	.
(14) Massachusetts Credibility:	0.400	0.550	.
(15) Countrywide Pure Premium:	2.287	0.868	3.155
(16) Countrywide Indicated Relativity:	0.893	0.767	.
(17) Countrywide Credibility:	0.300	0.230	.
(18) Countrywide Lost-Time Claims:	1376.0	.	.
(19) Pure Premium Underlying Present Rate:	2.358	1.187	3.545
(20) Relativity to Underlying Present Rate:	0.859	0.885	.
(21) Credibility to Underlying Relativity:	0.300	0.220	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.743	0.669	.
(24) Balanced Formula Relativity:	0.748	0.670	0.724

Class(es):		Effective: 7/1/2018							Construction		
6400 FENCE ERECTION - ALL TYPES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	281,649	6	57	556,981	389,845	392,694	223,351	1,562,870	3.362	2.187	5.549
2012	296,702	1	63	434,185	254,136	68,692	174,622	931,634	2.320	0.820	3.140
2013	319,322	3	35	191,964	288,846	86,132	111,985	678,928	1.506	0.620	2.126
2014	314,443	1	40	123,621	266,364	126,613	116,419	633,017	1.240	0.773	2.013
2015	355,853	3	40	340,077	551,971	234,618	275,031	1,401,697	2.507	1.432	3.939
MA Total:	1,567,969	14	235	1,646,827	1,751,163	908,749	901,408	5,208,146	2.167	1.154	3.322

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.826	0.977	.
(14) Massachusetts Credibility:	0.490	0.680	.
(15) Countrywide Pure Premium:	3.009	1.342	4.352
(16) Countrywide Indicated Relativity:	1.175	1.186	.
(17) Countrywide Credibility:	0.260	0.160	.
(18) Countrywide Lost-Time Claims:	954.00	.	.
(19) Pure Premium Underlying Present Rate:	2.968	1.473	4.441
(20) Relativity to Underlying Present Rate:	1.082	1.099	.
(21) Credibility to Underlying Relativity:	0.250	0.160	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.981	1.030	.
(24) Balanced Formula Relativity:	0.986	1.031	1.000

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Miscellaneous		
6834 BOAT BUILDING OR REPAIRING & DRIVERS: MA ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	149,943	0	14	0	2,265	0	15,831	18,096	0.015	0.106	0.121
2012	165,688	0	22	0	20,300	0	139,761	160,060	0.123	0.844	0.966
2013	196,116	0	22	0	64,968	0	83,845	148,813	0.331	0.428	0.759
2014	219,221	0	20	0	169,540	0	96,437	265,977	0.773	0.440	1.213
2015	245,363	0	27	0	72,749	0	102,723	175,472	0.296	0.419	0.715
MA Total:	976,331	0	105	0	329,822	0	438,596	768,419	0.338	0.449	0.787

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.141	0.376	.
(14) Massachusetts Credibility:	0.280	0.420	.
(15) Countrywide Pure Premium:	1.512	0.881	2.394
(16) Countrywide Indicated Relativity:	0.701	0.830	.
(17) Countrywide Credibility:	0.360	0.290	.
(18) Countrywide Lost-Time Claims:	1032.0	.	.
(19) Pure Premium Underlying Present Rate:	1.197	0.708	1.905
(20) Relativity to Underlying Present Rate:	0.491	0.537	.
(21) Credibility to Underlying Relativity:	0.360	0.290	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.469	0.554	.
(24) Balanced Formula Relativity:	0.467	0.558	0.497

Class(es):		Effective: 7/1/2018							Miscellaneous		
6836 MARINA & DRIVERS: MA ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	415,469	1	57	14,272	186,145	33,723	156,819	390,959	0.482	0.459	0.941
2012	421,495	1	80	76,200	637,888	11,426	587,030	1,312,545	1.694	1.420	3.114
2013	441,967	3	71	354,628	1,401,112	133,161	912,567	2,801,469	3.973	2.366	6.339
2014	449,884	3	46	490,979	300,021	371,990	346,838	1,509,828	1.758	1.598	3.356
2015	478,705	0	56	0	853,543	0	433,562	1,287,105	1.783	0.906	2.689
MA Total:	2,207,521	8	310	936,079	3,378,709	550,300	2,436,816	7,301,904	1.955	1.353	3.308

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.815	1.134	.
(14) Massachusetts Credibility:	0.480	0.730	.
(15) Countrywide Pure Premium:	1.635	0.995	2.631
(16) Countrywide Indicated Relativity:	0.758	0.937	.
(17) Countrywide Credibility:	0.260	0.140	.
(18) Countrywide Lost-Time Claims:	636.00	.	.
(19) Pure Premium Underlying Present Rate:	1.922	1.257	3.179
(20) Relativity to Underlying Present Rate:	0.789	0.952	.
(21) Credibility to Underlying Relativity:	0.260	0.130	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.793	1.083	.
(24) Balanced Formula Relativity:	0.790	1.090	0.890

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Miscellaneous		
7219 TRUCKING: NOC - ALL EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,517,188	30	445	4,031,798	6,882,167	1,126,882	2,838,449	14,879,296	4,336	1,575	5,911
2012	2,492,571	43	424	4,912,174	5,188,325	2,135,698	2,750,919	14,987,116	4,052	1,960	6,013
2013	2,846,663	51	506	5,781,654	10,778,602	2,276,702	4,955,932	23,792,891	5,817	2,541	8,358
2014	2,842,205	35	462	5,045,316	8,690,332	1,610,060	4,117,652	19,463,360	4,833	2,015	6,848
2015	3,112,986	39	410	7,314,799	10,238,416	2,298,994	4,340,399	24,192,609	5,639	2,133	7,772
MA Total:	13,811,612	198	2,247	27,085,742	41,777,842	9,448,336	19,003,352	97,315,272	4,986	2,060	7,046

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.079	1.726	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.943	1.552	5.494
(16) Countrywide Indicated Relativity:	1.829	1.461	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	11454	.	.
(19) Pure Premium Underlying Present Rate:	5.127	2.382	7.509
(20) Relativity to Underlying Present Rate:	2.103	1.805	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	2.079	1.726	.
(24) Balanced Formula Relativity:	2.070	1.738	1.960

Class(es):		Effective: 7/1/2018							Miscellaneous		
7230 TRUCKING: PARCEL OR PACKAGE DELIVERY- ALL EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	33,108	1	8	124,910	33,009	52,116	14,617	224,651	4,770	2,016	6,785
2012	38,270	4	6	262,427	58,258	75,605	27,085	423,375	8,380	2,683	11,063
2013	63,371	2	16	239,779	176,351	263,517	60,330	739,977	6,567	5,110	11,677
2014	53,922	1	10	84,053	113,276	19,013	35,015	251,357	3,660	1,002	4,662
2015	52,121	2	10	129,488	275,359	50,504	90,918	546,269	7,767	2,713	10,481
MA Total:	240,791	10	50	840,656	656,252	460,756	227,965	2,185,629	6,217	2,860	9,077

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.592	2.397	.
(14) Massachusetts Credibility:	0.290	0.410	.
(15) Countrywide Pure Premium:	4.085	1.964	6.049
(16) Countrywide Indicated Relativity:	1.895	1.849	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	463.00	.	.
(19) Pure Premium Underlying Present Rate:	5.124	2.647	7.770
(20) Relativity to Underlying Present Rate:	2.102	2.005	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	2.170	2.119	.
(24) Balanced Formula Relativity:	2.161	2.134	2.152

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Calculation of Class Relativities

Class(es): 7231 TRUCKING: MAIL, PARCEL OR PACKAGE DELIVERY-ALL EMP & DRIVERS												Miscellaneous		
Converted Unlimited Losses														
Amount														
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2011	429,381	15	79	1,969,603	1,463,223	613,064	670,798	4,716,689	7,995	2,990	10,985			
2012	398,429	8	66	1,269,117	1,579,828	251,660	643,400	3,744,005	7,150	2,246	9,397			
2013	452,583	12	90	875,454	1,294,637	515,502	619,744	3,305,337	4,795	2,508	7,303			
2014	484,082	18	95	1,108,043	836,777	477,078	572,068	2,993,966	4,018	2,167	6,185			
2015	554,280	14	124	1,506,075	2,252,180	954,158	1,094,928	5,807,342	6,780	3,697	10,477			
MA Total:	2,318,755	67	454	6,728,292	7,426,646	2,811,462	3,600,939	20,567,339	6,105	2,765	8,870			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.545	2.317	.
(14) Massachusetts Credibility:	0.720	0.980	.
(15) Countrywide Pure Premium:	4.541	1.947	6.488
(16) Countrywide Indicated Relativity:	2.107	1.833	.
(17) Countrywide Credibility:	0.140	0.010	.
(18) Countrywide Lost-Time Claims:	4538.0	.	.
(19) Pure Premium Underlying Present Rate:	5.174	2.432	7.606
(20) Relativity to Underlying Present Rate:	2.123	1.842	.
(21) Credibility to Underlying Relativity:	0.140	0.010	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	2.425	2.308	.
(24) Balanced Formula Relativity:	2.415	2.324	2.384

Class(es): 7360 FREIGHT HANDLING NOC: MA ACT												Miscellaneous		
Converted Unlimited Losses														
Amount														
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2011	93,269	2	23	267,739	229,537	70,277	171,499	739,052	5,332	2,592	7,924			
2012	96,257	0	16	0	111,789	0	107,430	219,219	1,161	1,116	2,277			
2013	92,377	1	8	195,901	253,124	17,214	179,525	645,764	4,861	2,130	6,990			
2014	103,693	0	20	0	35,822	0	42,338	78,160	0,345	0,408	0,754			
2015	114,817	0	12	0	33,959	0	13,803	47,761	0,296	0,120	0,416			
MA Total:	500,413	3	79	463,640	664,232	87,491	514,593	1,729,956	2,254	1,203	3,457			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.940	1.008	.
(14) Massachusetts Credibility:	0.300	0.440	.
(15) Countrywide Pure Premium:	1.971	1.080	3.051
(16) Countrywide Indicated Relativity:	0.914	1.017	.
(17) Countrywide Credibility:	0.350	0.280	.
(18) Countrywide Lost-Time Claims:	1382.0	.	.
(19) Pure Premium Underlying Present Rate:	2.716	1.574	4.290
(20) Relativity to Underlying Present Rate:	1.115	1.192	.
(21) Credibility to Underlying Relativity:	0.350	0.280	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.992	1.062	.
(24) Balanced Formula Relativity:	0.988	1.070	1.015

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Calculation of Class Relativities

Class(es): 7370 TAXICAB CO: ALL OTHER EMP & DRIVERS												Effective: 7/1/2018			Miscellaneous		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	1,222,697	13	423	965,595	1,027,989	331,614	1,040,162	3,365,361	1,630	1,122	2,752						
2012	1,332,332	15	445	674,542	1,053,255	344,739	1,097,783	3,170,319	1,297	1,083	2,380						
2013	1,210,842	13	317	894,977	945,528	320,266	853,254	3,014,025	1,520	0,969	2,489						
2014	1,346,353	14	383	328,736	1,162,468	330,024	1,103,953	2,925,181	1,108	1,065	2,173						
2015	1,397,906	13	285	434,328	1,542,451	262,951	1,150,710	3,390,440	1,414	1,011	2,425						
MA Total:	6,510,131	68	1,853	3,298,179	5,731,692	1,589,593	5,245,863	15,865,327	1,387	1,050	2,437						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.578	0.880	.
(14) Massachusetts Credibility:	0.720	1.000	.
(15) Countrywide Pure Premium:	2.066	1.192	3.258
(16) Countrywide Indicated Relativity:	0.958	1.123	.
(17) Countrywide Credibility:	0.140	0.000	.
(18) Countrywide Lost-Time Claims:	2239.0	.	.
(19) Pure Premium Underlying Present Rate:	1.848	1.157	3.004
(20) Relativity to Underlying Present Rate:	0.758	0.876	.
(21) Credibility to Underlying Relativity:	0.140	0.000	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.657	0.880	.
(24) Balanced Formula Relativity:	0.654	0.886	0.731

Class(es): 7380 DRIVERS, CHAUFFEURS AND HELPERS-NOC-COMMERCIAL												Effective: 7/1/2018			Miscellaneous		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	3,326,250	57	784	5,035,960	5,297,237	2,437,523	3,041,161	15,811,881	3,107	1,647	4,754						
2012	3,414,347	56	680	4,873,165	4,199,280	2,191,816	2,459,550	13,723,812	2,657	1,362	4,019						
2013	4,171,713	68	820	7,274,536	8,091,355	2,309,575	4,799,076	22,474,542	3,683	1,704	5,387						
2014	3,936,272	52	817	5,992,206	8,178,033	1,608,602	4,027,545	19,806,386	3,600	1,432	5,032						
2015	4,154,743	54	761	6,347,220	8,995,598	2,241,958	5,456,007	23,040,783	3,693	1,853	5,546						
MA Total:	19,003,326	287	3,862	29,523,087	34,761,503	10,789,474	19,783,339	94,857,403	3,383	1,609	4,992						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.411	1.348	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.507	1.201	3.709
(16) Countrywide Indicated Relativity:	1.163	1.131	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	26564	.	.
(19) Pure Premium Underlying Present Rate:	3.089	1.580	4.670
(20) Relativity to Underlying Present Rate:	1.267	1.197	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	1.411	1.348	.
(24) Balanced Formula Relativity:	1.405	1.357	1.389

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Calculation of Class Relativities

Class(es): 7382 BUS CO: ALL OTHER EMPLOYEES & DRIVERS												Effective: 7/1/2018			Miscellaneous		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	2,907,601	51	625	2,254,184	2,849,395	1,107,454	1,546,936	7,757,969	1,755	0,913	2,668						
2012	3,000,470	48	632	1,882,891	2,465,924	966,975	1,594,892	6,910,682	1,449	0,854	2,303						
2013	3,226,618	54	637	2,693,231	3,617,607	1,119,634	2,255,606	9,686,078	1,956	1,046	3,002						
2014	3,264,238	45	650	2,724,823	3,518,074	1,707,307	2,178,539	10,128,743	1,913	1,190	3,103						
2015	3,563,943	34	624	3,355,711	3,702,483	1,042,254	2,496,015	10,596,462	1,980	0,993	2,973						
MA Total:	15,962,869	232	3,168	12,910,839	16,153,483	5,943,624	10,071,988	45,079,934	1,821	1,003	2,824						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.759	0.841	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.839	1.081	2.920
(16) Countrywide Indicated Relativity:	0.853	1.018	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7229.0	.	.
(19) Pure Premium Underlying Present Rate:	1.723	1.129	2.852
(20) Relativity to Underlying Present Rate:	0.707	0.855	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.759	0.841	.
(24) Balanced Formula Relativity:	0.756	0.847	0.786

Class(es): 7403 AIRCRAFT OR HELICOP OP: AIR CARRIER-SCHD/ SUPPL: A/O EMP & DR												Effective: 7/1/2018			Miscellaneous		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	1,271,902	13	356	1,181,714	1,738,300	469,801	1,228,504	4,618,320	2,296	1,335	3,631						
2012	1,317,993	14	366	1,569,281	1,807,038	607,816	1,206,620	5,190,755	2,562	1,377	3,938						
2013	1,226,142	13	296	1,665,306	2,800,138	368,423	1,625,927	6,459,794	3,642	1,627	5,268						
2014	1,314,032	11	246	1,175,111	1,789,242	713,941	1,285,123	4,963,417	2,256	1,521	3,777						
2015	1,829,046	14	341	1,000,976	2,728,068	528,961	1,757,849	6,015,855	2,039	1,250	3,289						
MA Total:	6,959,116	65	1,605	6,592,389	10,862,786	2,688,942	7,104,023	27,248,140	2,508	1,407	3,915						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.046	1.179	.
(14) Massachusetts Credibility:	0.810	1.000	.
(15) Countrywide Pure Premium:	1.916	0.998	2.914
(16) Countrywide Indicated Relativity:	0.889	0.939	.
(17) Countrywide Credibility:	0.100	0.000	.
(18) Countrywide Lost-Time Claims:	16664	.	.
(19) Pure Premium Underlying Present Rate:	2.297	1.731	4.028
(20) Relativity to Underlying Present Rate:	0.943	1.311	.
(21) Credibility to Underlying Relativity:	0.090	0.000	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	1.021	1.179	.
(24) Balanced Formula Relativity:	1.017	1.187	1.073

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Calculation of Class Relativities

Class(es): 7405 AIRCRAFT OR HELICOP OP: AIR CARRIER-SCHD/ SUPPL: FLYING CREW												Effective: 7/1/2018		Miscellaneous	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	1,455,711	7	77	428,556	313,202	142,083	338,591	1,222,432	0.510	0.330	0.840				
2012	1,538,596	4	76	481,738	462,670	162,486	305,538	1,412,432	0.614	0.304	0.918				
2013	1,618,054	4	76	291,871	839,324	147,737	276,051	1,554,982	0.699	0.262	0.961				
2014	2,062,734	6	68	62,465	1,205,152	40,746	429,554	1,737,917	0.615	0.228	0.843				
2015	3,120,307	8	102	747,154	736,059	352,651	513,039	2,348,903	0.475	0.277	0.753				
MA Total:	9,795,402	29	399	2,011,783	3,556,406	845,704	1,862,774	8,276,667	0.568	0.277	0.845				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.237	0.232	.
(14) Massachusetts Credibility:	0.590	0.860	.
(15) Countrywide Pure Premium:	0.678	0.285	0.962
(16) Countrywide Indicated Relativity:	0.314	0.268	.
(17) Countrywide Credibility:	0.210	0.070	.
(18) Countrywide Lost-Time Claims:	4950.0	.	.
(19) Pure Premium Underlying Present Rate:	0.735	0.420	1.155
(20) Relativity to Underlying Present Rate:	0.302	0.318	.
(21) Credibility to Underlying Relativity:	0.200	0.070	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.266	0.240	.
(24) Balanced Formula Relativity:	0.265	0.242	0.257

Class(es): 7420 AIRCRAFT OR HELICOP OP: PUBLIC EXHIB STUNT FLYING: FLY CREW												Effective: 7/1/2018		Miscellaneous	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	3,515	0	0	0	0	0	0	0	0.000	0.000	0.000				
2012	3,364	0	0	0	0	0	0	0	0.000	0.000	0.000				
2013	5,081	0	0	0	0	0	0	0	0.000	0.000	0.000				
2014	3,164	0	0	0	0	0	0	0	0.000	0.000	0.000				
2015	4,438	0	1	0	4,276	0	7,777	12,053	0.963	1.752	2.716				
MA Total:	19,562	0	1	0	4,276	0	7,777	12,053	0.219	0.398	0.616				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.091	0.333	.
(14) Massachusetts Credibility:	0.110	0.110	.
(15) Countrywide Pure Premium:	3.790	0.995	4.785
(16) Countrywide Indicated Relativity:	1.758	0.936	.
(17) Countrywide Credibility:	0.210	0.220	.
(18) Countrywide Lost-Time Claims:	24.000	.	.
(19) Pure Premium Underlying Present Rate:	5.123	1.170	6.292
(20) Relativity to Underlying Present Rate:	2.102	0.886	.
(21) Credibility to Underlying Relativity:	0.680	0.670	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	1.808	0.836	.
(24) Balanced Formula Relativity:	1.801	0.842	1.482

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Calculation of Class Relativities

Class(es): 7421 AIRCRAFT OR HELICOP OP: TRANSPORT PERS IN EMPLR BUS: FLY CRW												Effective: 7/1/2018		Miscellaneous	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	233,925	0	7	0	5,093	0	25,851	30,944	0.022	0.111	0.132				
2012	255,660	0	6	0	69,090	0	52,916	122,007	0.270	0.207	0.477				
2013	265,053	0	9	0	595,514	0	297,789	893,303	2.247	1.124	3.370				
2014	271,060	0	3	0	0	0	4,334	4,334	0.000	0.016	0.016				
2015	339,776	1	1	7,900	8,333	6,806	907	23,947	0.048	0.023	0.070				
MA Total:	1,365,474	1	26	7,900	678,030	6,806	381,797	1,074,534	0.502	0.285	0.787				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.209	0.238	.
(14) Massachusetts Credibility:	0.290	0.360	.
(15) Countrywide Pure Premium:	0.671	0.198	0.869
(16) Countrywide Indicated Relativity:	0.311	0.186	.
(17) Countrywide Credibility:	0.360	0.320	.
(18) Countrywide Lost-Time Claims:	420.00	.	.
(19) Pure Premium Underlying Present Rate:	0.930	0.330	1.261
(20) Relativity to Underlying Present Rate:	0.382	0.250	.
(21) Credibility to Underlying Relativity:	0.350	0.320	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.306	0.226	.
(24) Balanced Formula Relativity:	0.305	0.227	0.279

Class(es): 7425 AIRCRAFT OR HELICOP OP: NOC- HELICOPTERS: FLYING CREW												Effective: 7/1/2018		Miscellaneous	
Converted Unlimited Losses															
Amount															
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)				
2011	66,164	0	0	0	0	0	0	0	0.000	0.000	0.000				
2012	65,394	0	5	0	0	0	4,583	4,583	0.000	0.070	0.070				
2013	68,665	0	4	0	661	0	4,023	4,684	0.010	0.059	0.068				
2014	70,934	0	2	0	2,556	0	2,973	5,529	0.036	0.042	0.078				
2015	75,417	0	6	0	276,768	0	173,162	449,930	3.670	2.296	5.966				
MA Total:	346,574	0	17	0	279,985	0	184,741	464,726	0.808	0.533	1.341				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.337	0.447	.
(14) Massachusetts Credibility:	0.210	0.220	.
(15) Countrywide Pure Premium:	1.689	0.332	2.021
(16) Countrywide Indicated Relativity:	0.783	0.313	.
(17) Countrywide Credibility:	0.400	0.390	.
(18) Countrywide Lost-Time Claims:	160.00	.	.
(19) Pure Premium Underlying Present Rate:	1.645	0.407	2.052
(20) Relativity to Underlying Present Rate:	0.675	0.308	.
(21) Credibility to Underlying Relativity:	0.390	0.390	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.647	0.341	.
(24) Balanced Formula Relativity:	0.645	0.343	0.544

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Miscellaneous			
7502 GAS COMPANY: GAS CO-NATURAL GAS-LOCAL DISTRIBUTION & DR												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	197,405	1	30	4,927	31,741	4,439	68,953	110,060	0.186	0.372	0.558	
2012	108,406	0	10	0	50,810	0	34,337	85,147	0.469	0.317	0.785	
2013	129,354	0	13	0	15,814	0	20,080	35,894	0.122	0.155	0.277	
2014	262,467	0	11	0	138,834	0	61,692	200,526	0.529	0.235	0.764	
2015	219,283	1	8	94,274	26,799	50,838	22,275	194,186	0.552	0.333	0.886	
MA Total:	916,914	2	72	99,201	263,998	55,277	207,337	625,813	0.396	0.286	0.683	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.165	0.240	.
(14) Massachusetts Credibility:	0.270	0.380	.
(15) Countrywide Pure Premium:	0.937	0.472	1.409
(16) Countrywide Indicated Relativity:	0.435	0.445	.
(17) Countrywide Credibility:	0.370	0.310	.
(18) Countrywide Lost-Time Claims:	469.00	.	.
(19) Pure Premium Underlying Present Rate:	1.090	0.578	1.668
(20) Relativity to Underlying Present Rate:	0.447	0.438	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.366	0.365	.
(24) Balanced Formula Relativity:	0.365	0.367	0.366

Class(es):		Effective: 7/1/2018							Miscellaneous			
7515 OIL OR GAS PIPELINE OPERATION & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	13,382	0	0	0	0	0	0	0	0.000	0.000	0.000	
2012	12,749	0	1	0	5,498	0	5,112	10,610	0.431	0.401	0.832	
2013	12,168	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	7,723	2	11	255,612	33,400	289,092	48,593	626,697	37,422	43,725	81,147	
2015	8,561	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	54,583	2	12	255,612	38,898	289,092	53,705	637,307	5.396	6.280	11.676	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.250	5.263	.
(14) Massachusetts Credibility:	0.080	0.140	.
(15) Countrywide Pure Premium:	0.579	0.269	0.848
(16) Countrywide Indicated Relativity:	0.269	0.253	.
(17) Countrywide Credibility:	0.460	0.430	.
(18) Countrywide Lost-Time Claims:	387.00	.	.
(19) Pure Premium Underlying Present Rate:	0.822	0.841	1.663
(20) Relativity to Underlying Present Rate:	0.337	0.637	.
(21) Credibility to Underlying Relativity:	0.460	0.430	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.459	1.120	.
(24) Balanced Formula Relativity:	0.457	1.128	0.680

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Calculation of Class Relativities

Class(es): 7520 WATERWORKS OPERATION & DRIVERS		Effective: 7/1/2018							Miscellaneous			
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	220,200	3	38	149,667	442,127	32,467	223,021	847,283	2,688	1,160	3,848	
2012	233,939	1	37	81,770	173,000	10,938	94,978	360,685	1,089	0,453	1,542	
2013	260,963	0	49	0	94,050	0	137,694	231,744	0,360	0,528	0,888	
2014	193,082	1	25	3,807	32,358	10,700	52,852	99,718	0,187	0,329	0,516	
2015	241,367	1	33	368,829	187,102	47,751	180,754	784,437	2,303	0,947	3,250	
MA Total:	1,149,549	6	182	604,073	928,637	101,856	689,300	2,323,866	1,333	0,688	2,022	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.556	0.577	.
(14) Massachusetts Credibility:	0.340	0.480	.
(15) Countrywide Pure Premium:	1.603	0.794	2.397
(16) Countrywide Indicated Relativity:	0.743	0.748	.
(17) Countrywide Credibility:	0.330	0.260	.
(18) Countrywide Lost-Time Claims:	2101.0	.	.
(19) Pure Premium Underlying Present Rate:	1.604	0.821	2.425
(20) Relativity to Underlying Present Rate:	0.658	0.622	.
(21) Credibility to Underlying Relativity:	0.330	0.260	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.652	0.633	.
(24) Balanced Formula Relativity:	0.649	0.637	0.645

Class(es): 7538 ELECTRIC LIGHT OR POWER LINE CONSTRUCTION & DRIVERS		Effective: 7/1/2018							Construction			
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	165,799	1	9	73,112	298,072	51,369	110,458	533,011	2,239	0,976	3,215	
2012	263,385	0	9	0	76,634	0	85,996	162,631	0,291	0,327	0,617	
2013	184,275	0	22	0	1,430,106	0	608,930	2,039,036	7,761	3,304	11,065	
2014	91,964	0	14	0	607,806	0	300,387	908,193	6,609	3,266	9,876	
2015	127,358	1	14	129,167	706,882	65,909	307,616	1,209,574	6,565	2,933	9,497	
MA Total:	832,781	2	68	202,279	3,119,500	117,278	1,413,387	4,852,444	3,989	1,838	5,827	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.521	1.556	.
(14) Massachusetts Credibility:	0.390	0.500	.
(15) Countrywide Pure Premium:	2.797	1.306	4.104
(16) Countrywide Indicated Relativity:	1.092	1.154	.
(17) Countrywide Credibility:	0.310	0.250	.
(18) Countrywide Lost-Time Claims:	1104.0	.	.
(19) Pure Premium Underlying Present Rate:	3.176	1.272	4.448
(20) Relativity to Underlying Present Rate:	1.157	0.949	.
(21) Credibility to Underlying Relativity:	0.300	0.250	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.279	1.304	.
(24) Balanced Formula Relativity:	1.286	1.305	1.292

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Calculation of Class Relativities

Class(es): 7539 ELECTRIC LIGHT OR POWER CO NOC-ALL EMP & DRIVERS												Effective: 7/1/2018			Miscellaneous		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	766,913	2	37	272,547	249,799	58,266	159,754	740,365	0.681	0.284	0.965						
2012	1,129,266	0	31	0	148,612	0	90,857	239,469	0.132	0.080	0.212						
2013	1,012,938	1	20	435,909	108,083	300,586	50,946	895,525	0.537	0.347	0.884						
2014	1,003,814	0	29	0	137,146	0	151,955	289,100	0.137	0.151	0.288						
2015	1,128,567	2	42	666,383	527,303	302,732	269,788	1,766,206	1.058	0.507	1.565						
MA Total:	5,041,498	5	159	1,374,839	1,170,942	661,583	723,300	3,930,665	0.505	0.275	0.780						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.211	0.230	.
(14) Massachusetts Credibility:	0.440	0.580	.
(15) Countrywide Pure Premium:	0.743	0.377	1.120
(16) Countrywide Indicated Relativity:	0.345	0.355	.
(17) Countrywide Credibility:	0.280	0.210	.
(18) Countrywide Lost-Time Claims:	1395.0	.	.
(19) Pure Premium Underlying Present Rate:	0.674	0.311	0.985
(20) Relativity to Underlying Present Rate:	0.276	0.236	.
(21) Credibility to Underlying Relativity:	0.280	0.210	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.267	0.258	.
(24) Balanced Formula Relativity:	0.265	0.259	0.263

Class(es): 7580 SEWAGE DISPOSAL PLANT OPERATION & DRIVERS												Effective: 7/1/2018			Miscellaneous		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	395,495	4	35	1,114,051	467,020	284,125	280,313	2,145,509	3.998	1.427	5.425						
2012	417,711	5	38	585,828	333,901	223,974	156,691	1,300,395	2.202	0.911	3.113						
2013	341,832	1	24	286,137	103,842	32,945	158,526	581,450	1.141	0.560	1.701						
2014	296,448	4	23	347,078	97,462	72,279	55,572	572,391	1.500	0.431	1.931						
2015	276,182	1	30	398,577	541,232	63,552	145,421	1,148,783	3.403	0.757	4.160						
MA Total:	1,727,667	15	150	2,731,671	1,543,457	676,876	796,523	5,748,527	2.475	0.853	3.327						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.032	0.715	.
(14) Massachusetts Credibility:	0.390	0.620	.
(15) Countrywide Pure Premium:	1.012	0.585	1.596
(16) Countrywide Indicated Relativity:	0.469	0.551	.
(17) Countrywide Credibility:	0.310	0.190	.
(18) Countrywide Lost-Time Claims:	705.00	.	.
(19) Pure Premium Underlying Present Rate:	1.542	1.036	2.577
(20) Relativity to Underlying Present Rate:	0.632	0.785	.
(21) Credibility to Underlying Relativity:	0.300	0.190	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.738	0.697	.
(24) Balanced Formula Relativity:	0.735	0.702	0.724

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Calculation of Class Relativities

Class(es): 7590 GARBAGE WORKS		Effective: 7/1/2018							Miscellaneous		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	22,429	0	1	0	50,180	0	17,269	67,449	2,237	0,770	3,007
2012	27,563	0	1	0	0	0	1,796	1,796	0,000	0,065	0,065
2013	23,882	1	7	9,028	29,371	492	8,510	47,401	1,608	0,377	1,985
2014	29,485	1	8	31,087	29,794	8,783	18,359	88,024	2,065	0,921	2,985
2015	27,464	0	19	0	243,392	0	84,155	327,547	8,862	3,064	11,926
MA Total:	130,824	2	36	40,116	352,738	9,275	130,089	532,217	3,003	1,065	4,068

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.252	0.893	.
(14) Massachusetts Credibility:	0.150	0.210	.
(15) Countrywide Pure Premium:	1.583	0.851	2.435
(16) Countrywide Indicated Relativity:	0.734	0.802	.
(17) Countrywide Credibility:	0.430	0.400	.
(18) Countrywide Lost-Time Claims:	418.00	.	.
(19) Pure Premium Underlying Present Rate:	1.885	0.942	2.826
(20) Relativity to Underlying Present Rate:	0.773	0.713	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.828	0.786	.
(24) Balanced Formula Relativity:	0.825	0.792	0.814

Class(es): 7600 TELEPHONE OR TELEGRAPH CO: ALL OTHER EMP & DR		Effective: 7/1/2018							Miscellaneous		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	3,568,603	20	339	2,249,068	3,691,232	842,391	1,928,201	8,710,892	1,665	0,776	2,441
2012	3,379,626	19	256	2,554,889	3,720,426	690,789	1,646,290	8,612,395	1,857	0,692	2,548
2013	3,682,689	34	285	5,499,666	3,713,448	1,622,374	1,660,911	12,496,399	2,502	0,892	3,393
2014	3,550,287	8	126	1,690,338	1,336,263	592,638	848,925	4,468,164	0,852	0,406	1,259
2015	3,068,634	13	164	1,778,394	4,446,746	534,154	1,786,666	8,545,960	2,029	0,756	2,785
MA Total:	17,249,839	94	1,170	13,772,356	16,908,115	4,282,347	7,870,993	42,833,810	1,779	0,705	2,483

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.742	0.590	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.179	1.007	3.185
(16) Countrywide Indicated Relativity:	1.011	0.948	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	12013	.	.
(19) Pure Premium Underlying Present Rate:	2.137	0.915	3.053
(20) Relativity to Underlying Present Rate:	0.877	0.694	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.742	0.590	.
(24) Balanced Formula Relativity:	0.739	0.594	0.691

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
7601 TELEPHONE, TELEGRAPH OR FIRE ALARM LINE CONSTRUCTION & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	187,329	0	27	0	64,696	0	72,337	137,034	0.345	0.386	0.732
2012	255,263	2	38	384,416	253,705	71,061	248,232	957,414	2.500	1.251	3.751
2013	259,744	1	29	71,312	412,291	101,691	163,367	748,661	1.862	1.020	2.882
2014	271,376	0	22	0	416,248	0	148,605	564,853	1.534	0.548	2.081
2015	236,429	5	26	1,288,445	20,213	1,162,145	49,110	2,519,914	5.535	5.123	10.658
MA Total:	1,210,142	8	142	1,744,173	1,167,153	1,334,897	681,652	4,927,875	2.406	1.666	4.072

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.917	1.410	.
(14) Massachusetts Credibility:	0.420	0.610	.
(15) Countrywide Pure Premium:	6.470	3.460	9.930
(16) Countrywide Indicated Relativity:	2.526	3.058	.
(17) Countrywide Credibility:	0.240	0.200	.
(18) Countrywide Lost-Time Claims:	32.000	.	.
(19) Pure Premium Underlying Present Rate:	2.562	1.420	3.982
(20) Relativity to Underlying Present Rate:	0.934	1.059	.
(21) Credibility to Underlying Relativity:	0.340	0.190	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.309	1.673	.
(24) Balanced Formula Relativity:	1.316	1.675	1.428

Class(es):		Effective: 7/1/2018							Office and Clerical		
7610 RADIO OR TV BROADCAST STATION-ALL EMP & CL, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,704,321	9	125	2,019,309	765,462	315,821	371,210	3,471,802	0.592	0.146	0.738
2012	4,652,946	4	60	492,844	326,877	80,894	199,307	1,099,922	0.176	0.060	0.236
2013	4,443,777	3	56	53,444	511,443	8,004	254,982	827,873	0.127	0.059	0.186
2014	4,075,551	3	73	319,107	300,544	133,197	265,819	1,018,668	0.152	0.098	0.250
2015	3,750,575	5	56	1,096,632	1,724,288	258,794	521,233	3,600,947	0.752	0.208	0.960
MA Total:	21,627,171	24	370	3,981,336	3,628,614	796,711	1,612,551	10,019,212	0.352	0.111	0.463

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.938	2.558	.
(14) Massachusetts Credibility:	0.510	0.680	.
(15) Countrywide Pure Premium:	0.149	0.085	0.234
(16) Countrywide Indicated Relativity:	2.448	2.203	.
(17) Countrywide Credibility:	0.250	0.160	.
(18) Countrywide Lost-Time Claims:	1851.0	.	.
(19) Pure Premium Underlying Present Rate:	0.231	0.107	0.338
(20) Relativity to Underlying Present Rate:	3.168	2.214	.
(21) Credibility to Underlying Relativity:	0.240	0.160	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	3.891	2.446	.
(24) Balanced Formula Relativity:	3.916	2.453	3.361

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Calculation of Class Relativities

Class(es): 7704 FIREFIGHTERS & DRIVERS		Effective: 7/1/2018							Miscellaneous		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	12,606	0	2	0	0	0	465	465	0.000	0.037	0.037
2012	15,913	0	1	0	3,858	0	1,887	5,745	0.242	0.119	0.361
2013	17,642	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	15,028	0	4	0	3,630	0	7,357	10,986	0.242	0.490	0.731
2015	15,131	0	3	0	191,731	0	79,906	271,637	12.672	5.281	17.953
MA Total:	76,320	0	10	0	199,219	0	89,615	288,833	2.610	1.174	3.784

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.088	0.984	.
(14) Massachusetts Credibility:	0.130	0.200	.
(15) Countrywide Pure Premium:	1.761	1.245	3.006
(16) Countrywide Indicated Relativity:	0.817	1.172	.
(17) Countrywide Credibility:	0.440	0.400	.
(18) Countrywide Lost-Time Claims:	851.00	.	.
(19) Pure Premium Underlying Present Rate:	2.101	1.422	3.523
(20) Relativity to Underlying Present Rate:	0.862	1.077	.
(21) Credibility to Underlying Relativity:	0.430	0.400	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.872	1.096	.
(24) Balanced Formula Relativity:	0.868	1.104	0.946

Class(es): 7720 POLICE OFFICERS & DRIVERS		Effective: 7/1/2018							Miscellaneous		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,869,927	4	136	765,079	533,198	463,359	491,038	2,252,673	0.694	0.510	1.205
2012	1,841,806	5	121	151,230	536,903	36,786	415,625	1,140,544	0.374	0.246	0.619
2013	1,678,734	4	105	341,574	850,215	378,755	446,400	2,016,944	0.710	0.492	1.201
2014	1,668,982	4	130	166,938	470,281	122,921	279,954	1,040,094	0.382	0.241	0.623
2015	1,819,810	8	107	560,401	270,763	220,469	261,248	1,312,882	0.457	0.265	0.721
MA Total:	8,879,260	25	599	1,985,221	2,661,360	1,222,291	1,894,265	7,763,136	0.523	0.351	0.874

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.218	0.294	.
(14) Massachusetts Credibility:	0.600	0.860	.
(15) Countrywide Pure Premium:	1.162	0.694	1.856
(16) Countrywide Indicated Relativity:	0.539	0.654	.
(17) Countrywide Credibility:	0.200	0.070	.
(18) Countrywide Lost-Time Claims:	12167	.	.
(19) Pure Premium Underlying Present Rate:	0.847	0.469	1.316
(20) Relativity to Underlying Present Rate:	0.347	0.355	.
(21) Credibility to Underlying Relativity:	0.200	0.070	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.308	0.324	.
(24) Balanced Formula Relativity:	0.307	0.326	0.313

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
7855 RAILROAD CONSTR: LAYING/RELAYING TRACK OR MAINT BY CONTR &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	20,444	0	1	0	1,261	0	2,415	3,676	0.062	0.118	0.180
2012	14,570	0	6	0	216,586	0	71,357	287,943	14.865	4.897	19.762
2013	13,133	0	1	0	6,072	0	4,870	10,942	0.462	0.371	0.833
2014	19,919	0	1	0	4,514	0	1,577	6,091	0.227	0.079	0.306
2015	60,790	0	4	0	69,810	0	33,310	103,121	1.148	0.548	1.696
MA Total:	128,857	0	13	0	298,243	0	113,530	411,772	2.315	0.881	3.196

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.882	0.746	.
(14) Massachusetts Credibility:	0.180	0.220	.
(15) Countrywide Pure Premium:	2.251	0.983	3.233
(16) Countrywide Indicated Relativity:	0.879	0.869	.
(17) Countrywide Credibility:	0.410	0.390	.
(18) Countrywide Lost-Time Claims:	314.00	.	.
(19) Pure Premium Underlying Present Rate:	2.752	1.087	3.839
(20) Relativity to Underlying Present Rate:	1.003	0.811	.
(21) Credibility to Underlying Relativity:	0.410	0.390	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.930	0.819	.
(24) Balanced Formula Relativity:	0.936	0.820	0.900

Class(es):		Effective: 7/1/2018							Goods and Services		
8001 STORE: FLORISTS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	619,691	2	64	2,722	449,110	4,828	169,819	626,480	0.729	0.282	1.011
2012	598,695	3	65	358,152	293,206	334,174	304,201	1,289,733	1.088	1.066	2.154
2013	619,868	3	79	179,487	196,577	39,215	268,462	683,741	0.607	0.496	1.103
2014	624,565	6	50	486,651	280,986	404,697	110,175	1,282,509	1.229	0.824	2.053
2015	634,706	6	51	230,590	114,787	180,804	126,436	652,617	0.544	0.484	1.028
MA Total:	3,097,525	20	309	1,257,603	1,334,667	963,718	979,093	4,535,080	0.837	0.627	1.464

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.000	1.318	.
(14) Massachusetts Credibility:	0.380	0.640	.
(15) Countrywide Pure Premium:	0.874	0.583	1.457
(16) Countrywide Indicated Relativity:	1.048	1.221	.
(17) Countrywide Credibility:	0.310	0.180	.
(18) Countrywide Lost-Time Claims:	1229.0	.	.
(19) Pure Premium Underlying Present Rate:	0.797	0.629	1.426
(20) Relativity to Underlying Present Rate:	0.961	1.234	.
(21) Credibility to Underlying Relativity:	0.310	0.180	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.003	1.286	.
(24) Balanced Formula Relativity:	0.996	1.285	1.101

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8002 AUTOMOBILE RENTAL CO: ALL OTHER EMP & COUNTER PERSONNEL, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	185,420	0	32	0	71,246	0	60,334	131,580	0.384	0.325	0.710
2012	183,915	1	30	19,358	132,922	792	45,933	199,006	0.828	0.254	1.082
2013	81,323	0	5	0	12,182	0	11,218	23,400	0.150	0.138	0.288
2014	98,640	0	26	0	47,540	0	133,421	180,961	0.482	1.353	1.835
2015	81,206	1	16	56,786	38,546	44,100	16,748	156,181	1.174	0.749	1.923
MA Total:	630,503	2	109	76,145	302,437	44,892	267,654	691,128	0.600	0.496	1.096

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.718	1.042	.
(14) Massachusetts Credibility:	0.190	0.310	.
(15) Countrywide Pure Premium:	0.671	0.524	1.196
(16) Countrywide Indicated Relativity:	0.805	1.097	.
(17) Countrywide Credibility:	0.410	0.350	.
(18) Countrywide Lost-Time Claims:	1682.0	.	.
(19) Pure Premium Underlying Present Rate:	0.680	0.498	1.178
(20) Relativity to Underlying Present Rate:	0.820	0.977	.
(21) Credibility to Underlying Relativity:	0.400	0.340	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.794	1.039	.
(24) Balanced Formula Relativity:	0.789	1.039	0.880

Class(es):		Effective: 7/1/2018							Goods and Services		
8006 STORE: GROCERY STORES-RETAIL-NO HANDLING OF FRESH MEATS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,373,422	10	250	556,338	251,816	219,685	331,880	1,359,719	0.341	0.232	0.573
2012	2,480,707	4	314	236,241	826,054	55,913	764,173	1,882,381	0.428	0.331	0.759
2013	2,643,382	9	317	647,246	881,191	575,070	776,902	2,880,408	0.578	0.511	1.090
2014	2,795,130	5	300	307,487	1,002,220	524,106	1,085,233	2,919,046	0.469	0.576	1.044
2015	3,031,397	8	260	404,138	1,227,350	166,870	1,096,854	2,895,212	0.538	0.417	0.955
MA Total:	13,324,037	36	1,441	2,151,450	4,188,631	1,541,644	4,055,042	11,936,766	0.476	0.420	0.896

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.569	0.883	.
(14) Massachusetts Credibility:	0.630	1.000	.
(15) Countrywide Pure Premium:	0.881	0.532	1.414
(16) Countrywide Indicated Relativity:	1.057	1.113	.
(17) Countrywide Credibility:	0.190	0.000	.
(18) Countrywide Lost-Time Claims:	11500	.	.
(19) Pure Premium Underlying Present Rate:	0.656	0.445	1.101
(20) Relativity to Underlying Present Rate:	0.791	0.874	.
(21) Credibility to Underlying Relativity:	0.180	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.702	0.883	.
(24) Balanced Formula Relativity:	0.697	0.883	0.764

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
8008 STORE: CLOTHING, WEARING APPAREL OR DRY GOODS - RETAIL												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	3,259,823	5	257	323,681	770,891	63,949	673,930	1,832,452	0.336	0.226	0.562	
2012	3,318,329	6	255	221,681	1,141,564	160,331	755,234	2,278,811	0.411	0.276	0.687	
2013	3,493,509	4	247	160,950	715,129	51,166	353,817	1,281,063	0.251	0.116	0.367	
2014	3,474,094	13	225	629,837	861,392	454,428	494,301	2,439,957	0.429	0.273	0.702	
2015	3,401,290	5	199	213,043	1,001,285	273,091	524,829	2,012,247	0.357	0.235	0.592	
MA Total:	16,947,044	33	1,183	1,549,193	4,490,261	1,002,965	2,802,111	9,844,531	0.356	0.225	0.581	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.426	0.472	.
(14) Massachusetts Credibility:	0.570	0.840	.
(15) Countrywide Pure Premium:	0.425	0.286	0.711
(16) Countrywide Indicated Relativity:	0.510	0.598	.
(17) Countrywide Credibility:	0.220	0.080	.
(18) Countrywide Lost-Time Claims:	9124.0	.	.
(19) Pure Premium Underlying Present Rate:	0.391	0.230	0.620
(20) Relativity to Underlying Present Rate:	0.471	0.451	.
(21) Credibility to Underlying Relativity:	0.210	0.080	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.454	0.480	.
(24) Balanced Formula Relativity:	0.451	0.480	0.462

Class(es):		Effective: 7/1/2018							Goods and Services			
8010 STORE: HARDWARE												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	2,038,636	9	252	407,430	997,983	319,182	745,503	2,470,098	0.689	0.522	1.212	
2012	1,843,982	7	244	276,234	1,281,924	232,965	841,302	2,632,425	0.845	0.583	1.428	
2013	1,889,931	2	195	285,545	879,163	47,636	667,803	1,880,147	0.616	0.379	0.995	
2014	1,940,971	7	176	1,323,363	1,111,351	599,210	664,834	3,698,759	1.254	0.651	1.906	
2015	1,989,390	2	175	100,374	1,311,395	93,149	1,053,621	2,558,538	0.710	0.576	1.286	
MA Total:	9,702,911	27	1,042	2,392,946	5,581,816	1,292,142	3,973,063	13,239,967	0.822	0.543	1.365	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.983	1.141	.
(14) Massachusetts Credibility:	0.560	0.860	.
(15) Countrywide Pure Premium:	0.677	0.424	1.102
(16) Countrywide Indicated Relativity:	0.812	0.888	.
(17) Countrywide Credibility:	0.220	0.070	.
(18) Countrywide Lost-Time Claims:	5387.0	.	.
(19) Pure Premium Underlying Present Rate:	0.665	0.430	1.094
(20) Relativity to Underlying Present Rate:	0.802	0.843	.
(21) Credibility to Underlying Relativity:	0.220	0.070	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.905	1.102	.
(24) Balanced Formula Relativity:	0.899	1.102	0.973

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018						Goods and Services				
8013 STORE: JEWELRY STORES												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	1,389,588	0	30	0	388,849	0	243,331	632,180	0.280	0.175	0.455	
2012	1,392,669	1	27	27,554	47,162	7,362	90,647	172,726	0.054	0.070	0.124	
2013	1,395,293	1	22	56,801	146,798	22,386	88,352	314,337	0.146	0.079	0.225	
2014	1,389,400	1	30	21,370	251,763	49,535	121,500	444,168	0.197	0.123	0.320	
2015	1,426,023	0	9	0	1,416	0	5,217	6,633	0.001	0.004	0.005	
MA Total:	6,992,974	3	118	105,725	835,988	79,283	549,048	1,570,044	0.135	0.090	0.225	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.161	0.189	.
(14) Massachusetts Credibility:	0.300	0.470	.
(15) Countrywide Pure Premium:	0.190	0.092	0.282
(16) Countrywide Indicated Relativity:	0.228	0.193	.
(17) Countrywide Credibility:	0.350	0.270	.
(18) Countrywide Lost-Time Claims:	780.00	.	.
(19) Pure Premium Underlying Present Rate:	0.188	0.130	0.317
(20) Relativity to Underlying Present Rate:	0.226	0.254	.
(21) Credibility to Underlying Relativity:	0.350	0.260	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.207	0.207	.
(24) Balanced Formula Relativity:	0.206	0.207	0.206

Class(es):		Effective: 7/1/2018						Goods and Services				
8017 STORE: RETAIL NOC												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	13,167,432	28	1,315	2,049,108	4,669,735	1,103,047	2,665,084	10,486,976	0.510	0.286	0.796	
2012	13,120,197	35	1,223	1,812,427	4,411,736	1,027,257	3,014,824	10,266,245	0.474	0.308	0.782	
2013	12,433,955	33	1,102	2,858,039	3,067,215	833,255	2,995,892	9,754,401	0.477	0.308	0.784	
2014	13,405,385	35	1,128	2,214,078	3,837,899	1,236,491	3,146,579	10,435,047	0.451	0.327	0.778	
2015	14,169,162	32	1,139	1,772,086	3,906,556	984,327	2,713,866	9,376,835	0.401	0.261	0.662	
MA Total:	66,296,130	163	5,907	10,705,738	19,893,142	5,184,377	14,536,246	50,319,503	0.462	0.297	0.759	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.552	0.625	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.528	0.356	0.884
(16) Countrywide Indicated Relativity:	0.633	0.746	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	35550	.	.
(19) Pure Premium Underlying Present Rate:	0.487	0.335	0.822
(20) Relativity to Underlying Present Rate:	0.588	0.657	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.552	0.625	.
(24) Balanced Formula Relativity:	0.548	0.625	0.576

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8018 STORE: WHOLESALE NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,999,100	22	667	1,783,292	2,592,844	752,450	1,669,103	6,797,690	1,459	0,807	2,267
2012	3,074,910	16	574	1,521,866	2,742,585	422,999	1,846,783	6,534,234	1,387	0,738	2,125
2013	3,423,941	27	717	3,090,800	3,906,141	1,170,272	2,203,245	10,370,459	2,044	0,985	3,029
2014	3,354,346	17	670	1,791,833	5,064,620	626,294	2,900,799	10,383,547	2,044	1,051	3,096
2015	3,673,358	20	602	2,193,226	3,484,236	631,448	1,903,145	8,212,054	1,546	0,690	2,236
MA Total:	16,525,655	102	3,230	10,381,018	17,790,427	3,603,464	10,523,076	42,297,985	1,705	0,855	2,560

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.038	1.797	.
(14) Massachusetts Credibility:	0.970	1.000	.
(15) Countrywide Pure Premium:	1.193	0.629	1.821
(16) Countrywide Indicated Relativity:	1.430	1.316	.
(17) Countrywide Credibility:	0.020	0.000	.
(18) Countrywide Lost-Time Claims:	21755	.	.
(19) Pure Premium Underlying Present Rate:	1.507	0.816	2.323
(20) Relativity to Underlying Present Rate:	1.818	1.600	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.024	1.797	.
(24) Balanced Formula Relativity:	2.010	1.796	1.933

Class(es):		Effective: 7/1/2018							Goods and Services		
8021 STORE: MEAT, FISH OR POULTRY DEALER- WHOLESALE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	706,228	4	130	108,828	1,656,462	26,541	641,499	2,433,330	2,500	0,946	3,446
2012	740,086	3	108	649,388	694,234	174,107	365,931	1,883,661	1,815	0,730	2,545
2013	821,450	6	91	548,178	1,120,870	149,302	663,847	2,482,198	2,032	0,990	3,022
2014	909,778	8	126	469,857	1,245,569	54,685	518,465	2,288,576	1,886	0,630	2,516
2015	963,675	6	139	497,246	1,391,542	182,868	601,674	2,673,331	1,960	0,814	2,774
MA Total:	4,141,216	27	594	2,273,497	6,108,678	587,504	2,791,417	11,761,096	2,024	0,816	2,840

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.420	1.715	.
(14) Massachusetts Credibility:	0.540	0.810	.
(15) Countrywide Pure Premium:	1.238	0.792	2.030
(16) Countrywide Indicated Relativity:	1.484	1.657	.
(17) Countrywide Credibility:	0.230	0.100	.
(18) Countrywide Lost-Time Claims:	3134.0	.	.
(19) Pure Premium Underlying Present Rate:	1.418	0.862	2.280
(20) Relativity to Underlying Present Rate:	1.710	1.691	.
(21) Credibility to Underlying Relativity:	0.230	0.090	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.041	1.707	.
(24) Balanced Formula Relativity:	2.028	1.706	1.911

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
8031 STORE: MEAT, FISH OR POULTRY - RETAIL												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	224,708	0	37	0	268,085	0	55,803	323,888	1.193	0.248	1.441	
2012	215,394	0	26	0	2,997	0	25,422	28,420	0.014	0.118	0.132	
2013	196,932	2	20	386,761	69,394	170,431	57,544	684,131	2.316	1.158	3.474	
2014	199,290	0	23	0	31,599	0	50,146	81,745	0.159	0.252	0.410	
2015	206,820	1	16	6,823	48,133	35,940	49,232	140,129	0.266	0.412	0.678	
MA Total:	1,043,144	3	122	393,584	420,210	206,371	238,147	1,258,312	0.780	0.426	1.206	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.933	0.896	.
(14) Massachusetts Credibility:	0.280	0.390	.
(15) Countrywide Pure Premium:	1.019	0.566	1.586
(16) Countrywide Indicated Relativity:	1.222	1.184	.
(17) Countrywide Credibility:	0.360	0.310	.
(18) Countrywide Lost-Time Claims:	626.00	.	.
(19) Pure Premium Underlying Present Rate:	1.072	0.554	1.625
(20) Relativity to Underlying Present Rate:	1.292	1.086	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.166	1.042	.
(24) Balanced Formula Relativity:	1.159	1.042	1.116

Class(es):		Effective: 7/1/2018							Goods and Services			
8032 STORE: CLOTHING, WEARING APPAREL OR DRY GOODS - WHOLESALE												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	284,815	0	44	0	138,690	0	56,556	195,246	0.487	0.199	0.686	
2012	280,256	0	41	0	353,999	0	87,491	441,490	1.263	0.312	1.575	
2013	294,095	0	31	0	10,123	0	27,311	37,434	0.034	0.093	0.127	
2014	322,133	0	27	0	93,673	0	110,852	204,525	0.291	0.344	0.635	
2015	256,092	0	29	0	27,515	0	42,495	70,011	0.107	0.166	0.273	
MA Total:	1,437,391	0	172	0	624,000	0	324,705	948,705	0.434	0.226	0.660	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.519	0.475	.
(14) Massachusetts Credibility:	0.280	0.400	.
(15) Countrywide Pure Premium:	0.883	0.501	1.384
(16) Countrywide Indicated Relativity:	1.058	1.048	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	1400.0	.	.
(19) Pure Premium Underlying Present Rate:	0.762	0.429	1.191
(20) Relativity to Underlying Present Rate:	0.919	0.842	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.857	0.757	.
(24) Balanced Formula Relativity:	0.851	0.757	0.817

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Class(es): 8033 STORE: MEAT, GROCERY & PROVISION COMBINED RETAIL-NOC												Effective: 7/1/2018			Goods and Services		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	809,521	3	123	242,145	359,195	423,339	311,280	1,335,959	0.743	0.907	1,650						
2012	607,789	1	66	27,303	314,299	1,745	325,980	669,326	0.562	0.539	1,101						
2013	621,958	3	55	302,346	61,674	85,510	99,452	548,982	0.585	0.297	0.883						
2014	893,772	2	120	128,216	973,035	48,473	416,968	1,566,692	1.232	0.521	1,753						
2015	885,239	1	69	127,126	519,797	25,046	283,851	955,820	0.731	0.349	1,080						
MA Total:	3,818,280	10	433	827,135	2,228,000	584,114	1,437,530	5,076,779	0.800	0.529	1,330						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.957	1.113	.
(14) Massachusetts Credibility:	0.430	0.690	.
(15) Countrywide Pure Premium:	0.839	0.520	1.359
(16) Countrywide Indicated Relativity:	1.006	1.088	.
(17) Countrywide Credibility:	0.290	0.160	.
(18) Countrywide Lost-Time Claims:	21844	.	.
(19) Pure Premium Underlying Present Rate:	0.851	0.632	1.483
(20) Relativity to Underlying Present Rate:	1.026	1.240	.
(21) Credibility to Underlying Relativity:	0.280	0.150	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.990	1.128	.
(24) Balanced Formula Relativity:	0.984	1.128	1.036

Class(es): 8034 STORE: GROCERY STORES - WHOLESALE												Effective: 7/1/2018			Goods and Services		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	515,388	7	79	244,471	1,088,937	60,341	444,412	1,838,161	2.587	0.979	3,567						
2012	498,154	4	76	395,719	516,624	164,664	185,800	1,262,807	1.831	0.704	2,535						
2013	621,782	1	76	95,463	452,176	11,843	238,294	797,777	0.881	0.402	1,283						
2014	648,976	4	97	316,542	1,067,313	28,170	426,419	1,838,443	2.132	0.700	2,833						
2015	535,193	9	58	1,581,286	938,362	461,716	787,065	3,768,429	4.708	2.333	7,041						
MA Total:	2,819,493	25	386	2,633,482	4,063,411	726,734	2,081,990	9,505,617	2.375	0.996	3,371						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.840	2.094	.
(14) Massachusetts Credibility:	0.490	0.690	.
(15) Countrywide Pure Premium:	1.120	0.466	1.587
(16) Countrywide Indicated Relativity:	1.343	0.976	.
(17) Countrywide Credibility:	0.260	0.160	.
(18) Countrywide Lost-Time Claims:	219.00	.	.
(19) Pure Premium Underlying Present Rate:	1.622	0.839	2.461
(20) Relativity to Underlying Present Rate:	1.956	1.646	.
(21) Credibility to Underlying Relativity:	0.250	0.150	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.230	1.848	.
(24) Balanced Formula Relativity:	2.215	1.847	2.081

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Class(es): 8039 STORE: DEPARTMENT - RETAIL		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	675,090	4	104	282,324	49,448	91,977	118,469	542,218	0.491	0.312	0.803
2012	663,284	4	72	35,282	365,431	39,937	213,885	654,535	0.604	0.383	0.987
2013	620,608	4	98	75,662	107,875	111,590	117,085	412,211	0.296	0.368	0.664
2014	612,113	2	80	155,888	205,687	35,529	241,582	638,686	0.591	0.453	1.043
2015	617,977	4	70	319,516	67,741	224,375	130,779	742,411	0.627	0.575	1.201
MA Total:	3,189,072	18	424	868,672	796,182	503,407	821,800	2,990,062	0.522	0.416	0.938

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.624	0.873	.
(14) Massachusetts Credibility:	0.320	0.540	.
(15) Countrywide Pure Premium:	0.572	0.441	1.013
(16) Countrywide Indicated Relativity:	0.686	0.922	.
(17) Countrywide Credibility:	0.340	0.230	.
(18) Countrywide Lost-Time Claims:	5105.0	.	.
(19) Pure Premium Underlying Present Rate:	0.512	0.397	0.909
(20) Relativity to Underlying Present Rate:	0.617	0.779	.
(21) Credibility to Underlying Relativity:	0.340	0.230	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.643	0.863	.
(24) Balanced Formula Relativity:	0.638	0.863	0.720

Class(es): 8044 STORE: FURNITURE & DRIVERS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	680,264	10	104	677,941	630,541	337,486	340,833	1,986,800	1.923	0.997	2.921
2012	652,819	1	92	57,872	357,042	21,307	295,173	731,395	0.636	0.485	1.120
2013	704,134	9	84	405,834	515,819	102,543	297,728	1,321,923	1.309	0.568	1.877
2014	847,739	9	103	713,454	846,096	243,546	584,428	2,387,525	1.840	0.977	2.816
2015	880,861	6	124	765,983	740,318	366,310	622,280	2,494,891	1.710	1.122	2.832
MA Total:	3,765,816	35	507	2,621,084	3,089,816	1,071,191	2,140,442	8,922,534	1.517	0.853	2.369

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.813	1.793	.
(14) Massachusetts Credibility:	0.550	0.950	.
(15) Countrywide Pure Premium:	1.357	0.715	2.071
(16) Countrywide Indicated Relativity:	1.626	1.495	.
(17) Countrywide Credibility:	0.230	0.030	.
(18) Countrywide Lost-Time Claims:	7174.0	.	.
(19) Pure Premium Underlying Present Rate:	1.657	1.389	3.046
(20) Relativity to Underlying Present Rate:	1.999	2.725	.
(21) Credibility to Underlying Relativity:	0.220	0.020	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.811	1.802	.
(24) Balanced Formula Relativity:	1.799	1.802	1.800

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
8046 STORE: AUTOMOBILE ACCESSORIES-RETAIL-NOC & DR												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	621,996	5	79	311,064	231,607	107,755	192,545	842,972	0.872	0.483	1.355	
2012	453,279	2	64	69,056	114,290	60,583	117,967	361,896	0.404	0.394	0.798	
2013	475,001	4	38	316,570	20,314	175,459	43,245	555,588	0.709	0.460	1.170	
2014	312,083	3	33	314,777	225,016	138,686	164,048	842,528	1.730	0.970	2.700	
2015	293,969	4	33	188,245	85,408	52,813	104,933	431,399	0.931	0.537	1.468	
MA Total:	2,156,328	18	247	1,199,713	676,636	535,297	622,738	3,034,384	0.870	0.537	1.407	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.040	1.129	.
(14) Massachusetts Credibility:	0.350	0.560	.
(15) Countrywide Pure Premium:	0.892	0.577	1.470
(16) Countrywide Indicated Relativity:	1.069	1.208	.
(17) Countrywide Credibility:	0.330	0.220	.
(18) Countrywide Lost-Time Claims:	5633.0	.	.
(19) Pure Premium Underlying Present Rate:	0.911	0.649	1.559
(20) Relativity to Underlying Present Rate:	1.098	1.273	.
(21) Credibility to Underlying Relativity:	0.320	0.220	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.068	1.178	.
(24) Balanced Formula Relativity:	1.061	1.177	1.103

Class(es):		Effective: 7/1/2018							Goods and Services			
8048 STORE: FRUIT OR VEGETABLE -WHOLESALE												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	309,175	2	38	104,607	104,913	21,320	123,243	354,083	0.678	0.468	1.145	
2012	344,071	4	37	179,030	136,540	30,189	62,459	408,217	0.917	0.269	1.186	
2013	296,936	2	35	320,998	427,944	58,762	198,197	1,005,901	2.522	0.865	3.388	
2014	362,325	2	48	68,622	55,105	44,655	46,266	214,648	0.341	0.251	0.592	
2015	417,111	2	45	240,452	1,234,224	93,141	372,532	1,940,349	3.535	1.116	4.652	
MA Total:	1,729,618	12	203	913,708	1,958,727	248,067	802,697	3,923,198	1.661	0.608	2.268	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.985	1.277	.
(14) Massachusetts Credibility:	0.380	0.530	.
(15) Countrywide Pure Premium:	1.360	0.888	2.248
(16) Countrywide Indicated Relativity:	1.630	1.859	.
(17) Countrywide Credibility:	0.290	0.240	.
(18) Countrywide Lost-Time Claims:	52,000	.	.
(19) Pure Premium Underlying Present Rate:	1.391	0.694	2.085
(20) Relativity to Underlying Present Rate:	1.677	1.361	.
(21) Credibility to Underlying Relativity:	0.330	0.230	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.781	1.436	.
(24) Balanced Formula Relativity:	1.769	1.435	1.648

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
8058 BUILDING MATERIAL DEALER-NEW MATERIALS ONLY-STORE EMP												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	292,056	1	56	261,469	139,931	52,015	161,727	615,142	1,374	0,732	2,106	
2012	279,210	3	44	347,034	510,716	89,681	266,124	1,213,555	3,072	1,274	4,346	
2013	311,495	0	49	0	159,102	0	116,653	275,755	0,511	0,374	0,885	
2014	312,387	4	52	259,592	99,213	171,744	107,342	637,891	1,149	0,893	2,042	
2015	310,392	0	40	0	346,057	0	294,410	640,467	1,115	0,949	2,063	
MA Total:	1,505,539	8	241	868,095	1,255,019	313,439	946,256	3,382,809	1,410	0,837	2,247	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.686	1.759	.
(14) Massachusetts Credibility:	0.320	0.540	.
(15) Countrywide Pure Premium:	0.846	0.650	1.496
(16) Countrywide Indicated Relativity:	1.015	1.359	.
(17) Countrywide Credibility:	0.340	0.230	.
(18) Countrywide Lost-Time Claims:	5010.0	.	.
(19) Pure Premium Underlying Present Rate:	1.036	0.841	1.877
(20) Relativity to Underlying Present Rate:	1.249	1.650	.
(21) Credibility to Underlying Relativity:	0.340	0.230	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.309	1.642	.
(24) Balanced Formula Relativity:	1.300	1.641	1.424

Class(es):		Effective: 7/1/2018							Goods and Services			
8103 WOOL MERCHANT												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	2,381	0	1	0	39,303	0	10,884	50,187	16,509	4,572	21,080	
2012	602	0	0	0	0	0	0	0	0,000	0,000	0,000	
2013	0	0	0	0	0	0	0	0	0,000	0,000	0,000	
2014	0	0	0	0	0	0	0	0	0,000	0,000	0,000	
2015	991	0	0	0	0	0	0	0	0,000	0,000	0,000	
MA Total:	3,974	0	1	0	39,303	0	10,884	50,187	9,891	2,739	12,630	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	11.824	5.757	.
(14) Massachusetts Credibility:	0.030	0.050	.
(15) Countrywide Pure Premium:	0.720	0.749	1.469
(16) Countrywide Indicated Relativity:	0.863	1.567	.
(17) Countrywide Credibility:	0.210	0.220	.
(18) Countrywide Lost-Time Claims:	24,000	.	.
(19) Pure Premium Underlying Present Rate:	1.342	0.731	2.073
(20) Relativity to Underlying Present Rate:	1.619	1.433	.
(21) Credibility to Underlying Relativity:	0.760	0.730	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.766	1.679	.
(24) Balanced Formula Relativity:	1.755	1.678	1.727

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8105 STORE: HIDE OR LEATHER DEALERS OR STORES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	7.906	2	1	103.162	26.336	42.442	866	172.806	16.379	5.478	21.857
2012	10.055	0	1	0	100.855	0	61.410	162.265	10.031	6.108	16.138
2013	9.887	2	1	396.271	172.448	87.929	72.615	729.262	57.523	16.238	73.761
2014	7.022	1	3	138.547	228.214	38.572	75.819	481.152	52.231	16.290	68.521
2015	7.057	0	1	0	194	0	166	360	0.027	0.023	0.051
MA Total:	41.927	5	7	637.979	528.048	168.943	210.874	1,545.844	27.811	9.059	36.870

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	33.248	19.041	.
(14) Massachusetts Credibility:	0.130	0.170	.
(15) Countrywide Pure Premium:	1.661	0.306	1.967
(16) Countrywide Indicated Relativity:	1.991	0.639	.
(17) Countrywide Credibility:	0.060	0.060	.
(18) Countrywide Lost-Time Claims:	1.000	.	.
(19) Pure Premium Underlying Present Rate:	3.600	1.778	5.378
(20) Relativity to Underlying Present Rate:	4.342	3.488	.
(21) Credibility to Underlying Relativity:	0.810	0.770	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	7.959	5.961	.
(24) Balanced Formula Relativity:	7.906	5.959	7.200

Class(es):		Effective: 7/1/2018							Goods and Services		
8106 IRON OR STEEL MERCHANT & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	137.965	3	21	182.688	17.675	74.715	48.837	323.915	1.452	0.896	2.348
2012	144.360	1	32	427.668	402.905	163.309	291.908	1,285.790	5.753	3.153	8.907
2013	147.634	1	38	70	259.949	935	144.370	405.324	1.761	0.984	2.745
2014	168.963	3	44	754.127	225.224	98.832	186.165	1,264.348	5.796	1.687	7.483
2015	153.954	1	43	37.944	505.079	27.150	407.528	977.700	3.527	2.823	6.351
MA Total:	752.875	9	178	1,402.496	1,410.831	364.941	1,078.808	4,257.076	3.737	1.918	5.654

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.467	4.031	.
(14) Massachusetts Credibility:	0.370	0.560	.
(15) Countrywide Pure Premium:	2.086	1.144	3.230
(16) Countrywide Indicated Relativity:	2.501	2.393	.
(17) Countrywide Credibility:	0.320	0.220	.
(18) Countrywide Lost-Time Claims:	2645.0	.	.
(19) Pure Premium Underlying Present Rate:	2.939	1.894	4.833
(20) Relativity to Underlying Present Rate:	3.545	3.717	.
(21) Credibility to Underlying Relativity:	0.310	0.220	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	3.552	3.601	.
(24) Balanced Formula Relativity:	3.528	3.600	3.554

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8107 MACHINERY DEALER- NOC- STORE OR YARD & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	559,450	1	87	113,064	122,779	27,223	180,057	443,123	0.422	0.371	0.792
2012	586,261	5	71	926,234	213,762	390,346	161,890	1,692,231	1.945	0.942	2.886
2013	579,063	2	58	104,692	114,530	38,073	260,129	517,424	0.379	0.515	0.894
2014	732,873	2	98	300,299	1,446,517	35,766	705,469	2,488,051	2.384	1.011	3.395
2015	826,110	0	114	0	1,010,384	0	881,308	1,891,693	1.223	1.067	2.290
MA Total:	3,283,757	10	428	1,444,289	2,907,973	491,408	2,188,853	7,032,523	1.325	0.816	2.142

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.584	1.716	.
(14) Massachusetts Credibility:	0.470	0.710	.
(15) Countrywide Pure Premium:	1.298	0.639	1.937
(16) Countrywide Indicated Relativity:	1.556	1.336	.
(17) Countrywide Credibility:	0.270	0.150	.
(18) Countrywide Lost-Time Claims:	5926.0	.	.
(19) Pure Premium Underlying Present Rate:	1.245	0.768	2.013
(20) Relativity to Underlying Present Rate:	1.501	1.508	.
(21) Credibility to Underlying Relativity:	0.260	0.140	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.555	1.630	.
(24) Balanced Formula Relativity:	1.545	1.629	1.575

Class(es):		Effective: 7/1/2018							Goods and Services		
8111 PLUMBERS SUPPLIES DEALERS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	682,615	7	85	669,445	194,304	120,551	238,186	1,222,487	1.265	0.526	1.791
2012	698,560	2	87	130,579	619,578	123,882	439,721	1,313,760	1.074	0.807	1.881
2013	742,338	7	86	846,226	352,876	373,554	233,438	1,806,094	1.615	0.818	2.433
2014	739,162	5	110	399,720	748,764	172,064	559,232	1,879,779	1.554	0.989	2.543
2015	812,411	6	118	700,568	719,684	412,188	620,499	2,452,938	1.748	1.271	3.019
MA Total:	3,675,086	27	486	2,746,538	2,635,205	1,202,240	2,091,076	8,675,059	1.464	0.896	2.361

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.751	1.884	.
(14) Massachusetts Credibility:	0.500	0.730	.
(15) Countrywide Pure Premium:	1.082	0.497	1.579
(16) Countrywide Indicated Relativity:	1.297	1.039	.
(17) Countrywide Credibility:	0.250	0.140	.
(18) Countrywide Lost-Time Claims:	1258.0	.	.
(19) Pure Premium Underlying Present Rate:	1.288	0.749	2.037
(20) Relativity to Underlying Present Rate:	1.553	1.470	.
(21) Credibility to Underlying Relativity:	0.250	0.130	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.588	1.712	.
(24) Balanced Formula Relativity:	1.577	1.711	1.626

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Calculation of Class Relativities

Class(es): 8203 ICE DEALER & DRIVERS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	38,315	1	7	48,257	43,254	44,959	16,565	153,034	2,388	1,606	3,994
2012	39,450	1	8	34,508	101,806	5,112	53,407	194,832	3,455	1,483	4,939
2013	39,043	1	12	3,154	77,238	2,021	41,431	123,844	2,059	1,113	3,172
2014	39,245	0	13	0	285,502	0	168,013	453,515	7,275	4,281	11,556
2015	42,651	1	10	65,044	105,382	17,204	45,125	232,755	3,996	1,461	5,457
MA Total:	198,704	4	50	150,962	613,181	69,296	324,541	1,157,980	3,846	1,982	5,828

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.597	4.166	.
(14) Massachusetts Credibility:	0.220	0.330	.
(15) Countrywide Pure Premium:	2.701	1.182	3.883
(16) Countrywide Indicated Relativity:	3.238	2.472	.
(17) Countrywide Credibility:	0.390	0.340	.
(18) Countrywide Lost-Time Claims:	342.00	.	.
(19) Pure Premium Underlying Present Rate:	2.954	1.960	4.913
(20) Relativity to Underlying Present Rate:	3.562	3.845	.
(21) Credibility to Underlying Relativity:	0.390	0.330	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	3.664	3.484	.
(24) Balanced Formula Relativity:	3.639	3.483	3.583

Class(es): 8204 BUILDING MATERIAL YARD & LOCAL MANAGERS, DRIVERS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	15,434	0	1	0	2,740	0	6,321	9,061	0.178	0.410	0.587
2012	19,705	0	2	0	1,754	0	3,994	5,748	0.089	0.203	0.292
2013	21,928	0	4	0	396	0	23,524	23,921	0.018	1.073	1.091
2014	28,215	0	2	0	827	0	17,273	18,101	0.029	0.612	0.642
2015	55,285	4	8	375,405	103,259	556,036	68,719	1,103,419	8,658	11,301	19,959
MA Total:	140,568	4	17	375,405	108,976	556,036	119,831	1,160,249	3,446	4,808	8,254

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.120	10.106	.
(14) Massachusetts Credibility:	0.150	0.220	.
(15) Countrywide Pure Premium:	1.723	1.142	2.865
(16) Countrywide Indicated Relativity:	2.065	2.390	.
(17) Countrywide Credibility:	0.430	0.390	.
(18) Countrywide Lost-Time Claims:	195.00	.	.
(19) Pure Premium Underlying Present Rate:	1.791	1.009	2.800
(20) Relativity to Underlying Present Rate:	2.159	1.980	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.413	3.928	.
(24) Balanced Formula Relativity:	2.397	3.926	2.951

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8215 HAY, GRAIN OR FEED DEALER & LOCAL MANAGERS, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	55,991	0	10	0	29,018	0	13,901	42,919	0.518	0.248	0.767
2012	55,113	0	9	0	23,676	0	68,760	92,436	0.430	1.248	1.677
2013	60,322	2	9	280,128	70,144	169,603	15,903	535,777	5.807	3.075	8.882
2014	71,516	0	11	0	15,333	0	30,784	46,118	0.214	0.430	0.645
2015	77,113	0	6	0	69,452	0	88,315	157,767	0.901	1.145	2.046
MA Total:	320,055	2	45	280,128	207,623	169,603	217,663	875,016	1.524	1.210	2.734

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.822	2.543	.
(14) Massachusetts Credibility:	0.220	0.350	.
(15) Countrywide Pure Premium:	1.673	0.905	2.578
(16) Countrywide Indicated Relativity:	2.005	1.894	.
(17) Countrywide Credibility:	0.390	0.330	.
(18) Countrywide Lost-Time Claims:	1797.0	.	.
(19) Pure Premium Underlying Present Rate:	1.946	1.323	3.268
(20) Relativity to Underlying Present Rate:	2.346	2.595	.
(21) Credibility to Underlying Relativity:	0.390	0.320	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.098	2.346	.
(24) Balanced Formula Relativity:	2.084	2.345	2.179

Class(es):		Effective: 7/1/2018							Construction		
8227 CONTRACTORS PERMANENT YARD											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	923,759	5	70	1,178,216	609,560	422,078	507,032	2,716,886	1.935	1.006	2.941
2012	937,187	5	74	1,156,074	2,318,373	308,442	1,156,620	4,939,509	3.707	1.563	5.271
2013	981,997	2	84	511,639	2,387,062	197,258	1,430,960	4,526,918	2.952	1.658	4.610
2014	1,080,149	6	94	1,563,435	749,867	662,714	580,643	3,556,660	2.142	1.151	3.293
2015	1,210,143	8	67	2,070,398	1,483,982	670,826	508,623	4,733,829	2.937	0.975	3.912
MA Total:	5,133,235	26	389	6,479,762	7,548,844	2,261,319	4,183,877	20,473,802	2.733	1.256	3.988

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.042	1.063	.
(14) Massachusetts Credibility:	0.730	1.000	.
(15) Countrywide Pure Premium:	2.138	0.929	3.067
(16) Countrywide Indicated Relativity:	0.835	0.821	.
(17) Countrywide Credibility:	0.140	0.000	.
(18) Countrywide Lost-Time Claims:	3125.0	.	.
(19) Pure Premium Underlying Present Rate:	2.394	1.450	3.844
(20) Relativity to Underlying Present Rate:	0.872	1.081	.
(21) Credibility to Underlying Relativity:	0.130	0.000	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	0.991	1.063	.
(24) Balanced Formula Relativity:	0.997	1.064	1.017

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Calculation of Class Relativities

Class(es): 8232 LUMBER YARD-NEW MATERIALS ONLY: A/O EMP INCL YRD & WHSE & DR												Effective: 7/1/2018			Goods and Services		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	975.041	10	210	1,910.872	1,051.135	805.297	762.050	4,529.354	3.038	1.607	4.645						
2012	1,019.854	14	203	1,741.964	2,413.134	829.751	1,228.263	6,213.111	4.074	2.018	6.092						
2013	1,179.878	13	248	2,936.054	2,163.989	1,190.770	1,276.935	7,567.748	4.323	2.091	6.414						
2014	1,292.996	13	221	1,651.025	2,183.038	595.039	1,422.315	5,851.417	2.965	1.560	4.525						
2015	1,350.638	17	225	1,669.451	1,670.857	1,153.017	1,094.156	5,587.481	2.473	1.664	4.137						
MA Total:	5,818.407	67	1,107	9,909.366	9,482.152	4,573.874	5,783.719	29,749.111	3.333	1.780	5.113						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.984	3.742	.
(14) Massachusetts Credibility:	0.850	1.000	.
(15) Countrywide Pure Premium:	2.123	1.122	3.245
(16) Countrywide Indicated Relativity:	2.545	2.347	.
(17) Countrywide Credibility:	0.080	0.000	.
(18) Countrywide Lost-Time Claims:	9286.0	.	.
(19) Pure Premium Underlying Present Rate:	3.091	1.987	5.078
(20) Relativity to Underlying Present Rate:	3.727	3.899	.
(21) Credibility to Underlying Relativity:	0.070	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	3.851	3.742	.
(24) Balanced Formula Relativity:	3.826	3.740	3.795

Class(es): 8233 COAL MERCHANT & LOCAL MANAGERS & DRIVERS												Effective: 7/1/2018			Goods and Services		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	292.826	2	44	595.430	396.000	121.298	240.912	1,353.639	3.386	1.237	4.623						
2012	266.384	1	40	408.450	1,368.340	45.412	565.306	2,387.508	6.670	2.293	8.963						
2013	274.051	2	36	11.048	545.924	15.841	456.541	1,029.354	2.032	1.724	3.756						
2014	275.466	2	18	885.535	24.589	257.996	39.620	1,207.740	3.304	1.080	4.384						
2015	273.834	5	24	663.328	704.654	577.665	315.374	2,261.021	4.996	3.261	8.257						
MA Total:	1,382.560	12	162	2,563.791	3,039.507	1,018.212	1,617.752	8,239.262	4.053	1.907	5.959						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.845	4.007	.
(14) Massachusetts Credibility:	0.460	0.710	.
(15) Countrywide Pure Premium:	2.730	1.422	4.152
(16) Countrywide Indicated Relativity:	3.273	2.975	.
(17) Countrywide Credibility:	0.270	0.150	.
(18) Countrywide Lost-Time Claims:	2352.0	.	.
(19) Pure Premium Underlying Present Rate:	2.872	1.854	4.726
(20) Relativity to Underlying Present Rate:	3.463	3.638	.
(21) Credibility to Underlying Relativity:	0.270	0.140	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	4.047	3.801	.
(24) Balanced Formula Relativity:	4.021	3.800	3.940

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8235 SASH, DOOR OR ASSEMBLED MILLWORK DEALER & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	138,881	2	35	249,010	316,411	24,332	238,814	828,567	4,071	1,895	5,966
2012	131,973	0	25	0	249,722	0	126,114	375,836	1,892	0,956	2,848
2013	133,917	0	21	0	18,935	0	26,746	45,680	0,141	0,200	0,341
2014	140,195	0	26	0	291,856	0	116,328	408,184	2,082	0,830	2,912
2015	115,249	0	29	0	220,097	0	163,222	383,319	1,910	1,416	3,326
MA Total:	660,215	2	136	249,010	1,097,021	24,332	671,224	2,041,586	2,039	1,054	3,092

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.437	2.214	.
(14) Massachusetts Credibility:	0.300	0.450	.
(15) Countrywide Pure Premium:	2.412	1.153	3.565
(16) Countrywide Indicated Relativity:	2.891	2.413	.
(17) Countrywide Credibility:	0.350	0.280	.
(18) Countrywide Lost-Time Claims:	604.00	.	.
(19) Pure Premium Underlying Present Rate:	2.063	1.268	3.331
(20) Relativity to Underlying Present Rate:	2.488	2.487	.
(21) Credibility to Underlying Relativity:	0.350	0.270	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.614	2.344	.
(24) Balanced Formula Relativity:	2.597	2.343	2.505

Class(es):		Effective: 7/1/2018							Goods and Services		
8263 JUNK DEALERS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	81,547	1	11	9,150	30,508	5,856	58,491	104,004	0,486	0,789	1,275
2012	81,201	0	10	0	35,714	0	33,138	68,852	0,440	0,408	0,848
2013	85,748	0	19	0	19,246	0	57,536	76,782	0,224	0,671	0,895
2014	93,772	1	23	59,494	233,984	12,711	136,748	442,937	3,130	1,594	4,724
2015	94,041	0	24	0	320,116	0	173,161	493,278	3,404	1,841	5,245
MA Total:	436,309	2	87	68,644	639,568	18,567	459,074	1,185,852	1,623	1,095	2,718

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.940	2.301	.
(14) Massachusetts Credibility:	0.250	0.400	.
(15) Countrywide Pure Premium:	1.821	1.675	3.496
(16) Countrywide Indicated Relativity:	2.183	3.505	.
(17) Countrywide Credibility:	0.380	0.300	.
(18) Countrywide Lost-Time Claims:	183.00	.	.
(19) Pure Premium Underlying Present Rate:	1.960	1.423	3.383
(20) Relativity to Underlying Present Rate:	2.364	2.793	.
(21) Credibility to Underlying Relativity:	0.370	0.300	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.189	2.810	.
(24) Balanced Formula Relativity:	2.175	2.809	2.404

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Calculation of Class Relativities

Class(es): 8264 BOTTLE DEALER-USED & DRIVERS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	273,838	5	60	357,662	204,365	81,449	229,419	872,895	2,052	1,135	3,188
2012	314,334	2	68	16,452	480,785	3,226	248,189	748,652	1,582	0,800	2,382
2013	285,175	2	52	165,918	996,079	16,574	647,052	1,825,624	4,075	2,327	6,402
2014	271,367	4	45	342,139	281,752	326,495	230,522	1,180,908	2,299	2,053	4,352
2015	317,688	3	51	242,183	476,686	81,602	301,631	1,102,103	2,263	1,206	3,469
MA Total:	1,462,382	16	276	1,124,355	2,439,668	509,345	1,656,814	5,730,181	2,437	1,481	3,918

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.914	3.113	.
(14) Massachusetts Credibility:	0.470	0.680	.
(15) Countrywide Pure Premium:	2.229	1.343	3.572
(16) Countrywide Indicated Relativity:	2.672	2.810	.
(17) Countrywide Credibility:	0.270	0.160	.
(18) Countrywide Lost-Time Claims:	1377.0	.	.
(19) Pure Premium Underlying Present Rate:	2.880	1.553	4.433
(20) Relativity to Underlying Present Rate:	3.473	3.047	.
(21) Credibility to Underlying Relativity:	0.260	0.160	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.994	3.054	.
(24) Balanced Formula Relativity:	2.974	3.053	3.003

Class(es): 8279 STABLE OR BREEDING FARM & DRIVERS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	159,264	0	31	0	274,076	0	167,240	441,317	1,721	1,050	2,771
2012	165,442	3	23	379,391	19,490	125,185	64,660	588,725	2,411	1,147	3,558
2013	166,624	1	21	41,551	77,067	2,881	223,498	344,996	0,712	1,359	2,071
2014	170,964	1	15	53,041	155,999	17,219	128,422	354,681	1,223	0,852	2,075
2015	167,476	3	22	242,443	79,799	44,753	82,530	449,525	1,924	0,760	2,684
MA Total:	829,771	8	112	716,426	606,431	190,039	666,349	2,179,245	1,594	1,032	2,626

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.906	2.169	.
(14) Massachusetts Credibility:	0.350	0.580	.
(15) Countrywide Pure Premium:	2.722	1.979	4.701
(16) Countrywide Indicated Relativity:	3.263	4.141	.
(17) Countrywide Credibility:	0.330	0.210	.
(18) Countrywide Lost-Time Claims:	990.00	.	.
(19) Pure Premium Underlying Present Rate:	2.365	1.887	4.253
(20) Relativity to Underlying Present Rate:	2.852	3.703	.
(21) Credibility to Underlying Relativity:	0.320	0.210	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.656	2.905	.
(24) Balanced Formula Relativity:	2.639	2.904	2.735

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Calculation of Class Relativities

Class(es): 8291 STORAGE WAREHOUSE-COLD		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	134,689	2	31	106,784	500,164	38,554	229,107	874,608	4,506	1,987	6,494
2012	119,643	0	20	0	30,317	0	24,389	54,706	0,253	0,204	0,457
2013	120,802	1	32	110,401	262,672	53,185	161,356	587,613	3,088	1,776	4,864
2014	156,632	0	27	0	34,731	0	67,756	102,488	0,222	0,433	0,654
2015	156,003	1	28	64,938	118,749	13,340	136,685	333,712	1,177	0,962	2,139
MA Total:	687,770	4	138	282,123	946,634	105,078	619,293	1,953,128	1,787	1,053	2,840

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.136	2.214	.
(14) Massachusetts Credibility:	0.300	0.450	.
(15) Countrywide Pure Premium:	1.621	0.921	2.541
(16) Countrywide Indicated Relativity:	1.943	1.926	.
(17) Countrywide Credibility:	0.350	0.280	.
(18) Countrywide Lost-Time Claims:	1084.0	.	.
(19) Pure Premium Underlying Present Rate:	2.010	1.189	3.199
(20) Relativity to Underlying Present Rate:	2.424	2.332	.
(21) Credibility to Underlying Relativity:	0.350	0.270	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.169	2.165	.
(24) Balanced Formula Relativity:	2.155	2.164	2.158

Class(es): 8292 STORAGE WAREHOUSE NOC		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	505,705	1	106	162,679	180,355	20,213	247,239	610,485	0,678	0,529	1,207
2012	544,164	4	103	243,317	505,898	130,015	281,760	1,160,989	1,377	0,757	2,134
2013	598,667	11	115	954,132	443,558	356,622	366,377	2,120,689	2,335	1,208	3,542
2014	694,220	4	106	177,788	1,289,762	89,104	859,659	2,416,314	2,114	1,367	3,481
2015	747,805	8	112	694,833	1,300,991	230,227	534,294	2,760,344	2,669	1,022	3,691
MA Total:	3,090,562	28	542	2,232,749	3,720,563	826,180	2,289,330	9,068,822	1,926	1,008	2,934

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.303	2.119	.
(14) Massachusetts Credibility:	0.470	0.670	.
(15) Countrywide Pure Premium:	1.605	0.879	2.484
(16) Countrywide Indicated Relativity:	1.924	1.839	.
(17) Countrywide Credibility:	0.270	0.170	.
(18) Countrywide Lost-Time Claims:	6875.0	.	.
(19) Pure Premium Underlying Present Rate:	1.359	0.704	2.063
(20) Relativity to Underlying Present Rate:	1.639	1.381	.
(21) Credibility to Underlying Relativity:	0.260	0.160	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.028	1.953	.
(24) Balanced Formula Relativity:	2.014	1.953	1.992

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Calculation of Class Relativities

Class(es): 8293 STORAGE WAREHOUSE-FURNITURE & DRIVERS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	394,336	10	112	791,885	638,656	192,895	611,631	2,235,068	3,628	2,040	5,668
2012	446,587	8	98	632,696	648,408	849,298	375,476	2,505,878	2,869	2,743	5,611
2013	495,658	6	102	768,076	1,374,213	349,990	666,776	3,159,054	4,322	2,051	6,373
2014	578,049	12	149	1,239,673	2,464,564	361,743	1,463,037	5,529,017	6,408	3,157	9,565
2015	596,472	12	118	772,430	1,359,638	373,473	679,995	3,185,536	3,574	1,766	5,341
MA Total:	2,511,101	48	579	4,204,761	6,485,479	2,127,399	3,796,915	16,614,554	4,257	2,359	6,616

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.089	4.959	.
(14) Massachusetts Credibility:	0.700	1.000	.
(15) Countrywide Pure Premium:	4.397	2.049	6.446
(16) Countrywide Indicated Relativity:	5.270	4.288	.
(17) Countrywide Credibility:	0.150	0.000	.
(18) Countrywide Lost-Time Claims:	4528.0	.	.
(19) Pure Premium Underlying Present Rate:	4.426	2.847	7.273
(20) Relativity to Underlying Present Rate:	5.338	5.587	.
(21) Credibility to Underlying Relativity:	0.150	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	5.154	4.959	.
(24) Balanced Formula Relativity:	5.120	4.957	5.061

Class(es): 8350 GASOLINE OR OIL DEALER & DRIVERS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,546,799	9	281	1,024,572	2,762,960	348,243	1,836,955	5,972,730	2,449	1,413	3,861
2012	1,562,999	17	233	2,974,903	1,444,608	1,380,742	1,180,628	6,980,880	2,828	1,639	4,466
2013	1,565,408	16	277	2,114,194	2,351,120	622,400	1,788,584	6,876,297	2,852	1,540	4,393
2014	1,606,604	18	272	1,801,545	4,079,732	783,414	1,980,786	8,645,477	3,661	1,721	5,381
2015	1,598,549	15	209	3,091,667	2,834,779	1,005,952	1,696,439	8,628,838	3,707	1,691	5,398
MA Total:	7,880,360	75	1,272	11,006,880	13,473,199	4,140,751	8,483,392	37,104,222	3,106	1,602	4,708

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.714	3.367	.
(14) Massachusetts Credibility:	0.920	1.000	.
(15) Countrywide Pure Premium:	2.921	1.234	4.156
(16) Countrywide Indicated Relativity:	3.502	2.583	.
(17) Countrywide Credibility:	0.040	0.000	.
(18) Countrywide Lost-Time Claims:	3906.0	.	.
(19) Pure Premium Underlying Present Rate:	2.786	1.606	4.392
(20) Relativity to Underlying Present Rate:	3.359	3.151	.
(21) Credibility to Underlying Relativity:	0.040	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	3.691	3.367	.
(24) Balanced Formula Relativity:	3.667	3.366	3.558

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
8380 AUTOMOBILE SERVICE OR REPAIR CENTER & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	7,517,802	39	1,015	2,521,478	7,196,361	1,390,502	4,263,081	15,371,422	1,293	0,752	2,045	
2012	7,720,727	37	1,067	4,194,120	5,645,062	1,673,456	3,802,903	15,315,541	1,274	0,709	1,984	
2013	7,896,738	38	1,081	4,134,862	7,439,058	1,618,160	4,788,447	17,980,527	1,466	0,811	2,277	
2014	8,092,070	37	999	4,130,649	6,659,261	1,647,157	4,333,521	16,770,588	1,333	0,739	2,072	
2015	8,511,153	42	982	6,122,748	7,113,995	2,344,764	3,900,788	19,482,296	1,555	0,734	2,289	
MA Total:	39,738,490	193	5,144	21,103,856	34,053,738	8,674,039	21,088,741	84,920,375	1,388	0,749	2,137	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.659	1.574	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.238	0.631	1.869
(16) Countrywide Indicated Relativity:	1.484	1.320	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	27208	.	.
(19) Pure Premium Underlying Present Rate:	1.491	0.881	2.371
(20) Relativity to Underlying Present Rate:	1.798	1.728	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.659	1.574	.
(24) Balanced Formula Relativity:	1.648	1.574	1.621

Class(es):		Effective: 7/1/2018							Goods and Services			
8381 GASOLINE STATION-RETAIL-SELF SERVICE												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	199,767	1	8	55,724	115,608	119,658	55,690	346,681	0,858	0,878	1,735	
2012	201,975	1	14	49,841	50,893	14,015	140,093	254,842	0,499	0,763	1,262	
2013	178,383	0	8	0	545,322	0	212,032	757,354	3,057	1,189	4,246	
2014	200,703	1	18	38,107	34,377	11,592	35,100	119,177	0,361	0,233	0,594	
2015	189,360	1	6	12,154	92,063	7,566	104,398	216,182	0,550	0,591	1,142	
MA Total:	970,188	4	54	155,827	838,264	152,832	547,313	1,694,235	1,025	0,722	1,746	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.225	1.517	.
(14) Massachusetts Credibility:	0.240	0.410	.
(15) Countrywide Pure Premium:	0.698	0.439	1.136
(16) Countrywide Indicated Relativity:	0.836	0.918	.
(17) Countrywide Credibility:	0.380	0.300	.
(18) Countrywide Lost-Time Claims:	634.00	.	.
(19) Pure Premium Underlying Present Rate:	0.822	0.670	1.492
(20) Relativity to Underlying Present Rate:	0.992	1.314	.
(21) Credibility to Underlying Relativity:	0.380	0.290	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.989	1.278	.
(24) Balanced Formula Relativity:	0.982	1.278	1.089

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8385 BUS CO: GARAGE EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	427,907	3	67	346,874	161,530	271,613	176,711	956,728	1,188	1,048	2,236
2012	435,207	7	80	651,320	356,571	199,229	298,301	1,505,422	2,316	1,143	3,459
2013	413,494	0	78	0	244,988	0	209,534	454,522	0,592	0,507	1,099
2014	420,527	3	78	118,313	1,026,459	112,874	487,548	1,745,194	2,722	1,428	4,150
2015	446,221	4	44	384,093	311,404	171,125	153,653	1,020,275	1,559	0,728	2,286
MA Total:	2,143,356	17	347	1,500,601	2,100,953	754,841	1,325,746	5,682,141	1,680	0,971	2,651

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.009	2.040	.
(14) Massachusetts Credibility:	0.400	0.590	.
(15) Countrywide Pure Premium:	1.035	0.531	1.566
(16) Countrywide Indicated Relativity:	1.240	1.112	.
(17) Countrywide Credibility:	0.300	0.210	.
(18) Countrywide Lost-Time Claims:	1278.0	.	.
(19) Pure Premium Underlying Present Rate:	1.310	0.740	2.051
(20) Relativity to Underlying Present Rate:	1.580	1.453	.
(21) Credibility to Underlying Relativity:	0.300	0.200	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.650	1.728	.
(24) Balanced Formula Relativity:	1.639	1.727	1.671

Class(es):		Effective: 7/1/2018							Goods and Services		
8392 AUTOMOBILE STORAGE GARAGE OR PARKING STATION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	517,949	4	54	313,167	110,043	62,958	64,739	550,907	0,817	0,247	1,064
2012	516,167	3	42	103,454	67,287	53,866	60,162	284,769	0,331	0,221	0,552
2013	509,864	2	48	44,887	126,406	7,345	107,234	285,872	0,336	0,225	0,561
2014	575,119	1	46	102,798	65,423	486,527	211,791	866,538	0,292	1,214	1,507
2015	612,069	3	46	89,024	112,929	51,260	122,660	375,873	0,330	0,284	0,614
MA Total:	2,731,169	13	236	653,329	482,088	661,957	566,585	2,363,959	0,416	0,450	0,866

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.497	0.945	.
(14) Massachusetts Credibility:	0.360	0.530	.
(15) Countrywide Pure Premium:	0.892	0.569	1.462
(16) Countrywide Indicated Relativity:	1.070	1.191	.
(17) Countrywide Credibility:	0.320	0.240	.
(18) Countrywide Lost-Time Claims:	1438.0	.	.
(19) Pure Premium Underlying Present Rate:	0.763	0.451	1.214
(20) Relativity to Underlying Present Rate:	0.920	0.885	.
(21) Credibility to Underlying Relativity:	0.320	0.230	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.816	0.991	.
(24) Balanced Formula Relativity:	0.810	0.990	0.875

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Calculation of Class Relativities

Class(es): 8393 AUTOMOBILE BODY REPAIR		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,017,835	7	191	484,245	1,081,652	255,876	568,958	2,390,731	0.776	0.409	1.185
2012	1,995,238	6	199	1,109,799	1,516,597	232,884	841,614	3,700,895	1.316	0.539	1.855
2013	2,044,361	7	159	1,350,107	1,617,470	330,804	710,754	4,009,136	1.452	0.509	1.961
2014	2,188,666	6	174	757,437	678,207	101,716	594,561	2,131,921	0.656	0.318	0.974
2015	2,008,432	2	124	378,391	713,678	63,602	361,959	1,517,629	0.544	0.212	0.756
MA Total:	10,254,534	28	847	4,079,980	5,607,603	984,883	3,077,846	13,750,312	0.945	0.396	1.341

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.129	0.833	.
(14) Massachusetts Credibility:	0.710	0.990	.
(15) Countrywide Pure Premium:	0.860	0.365	1.225
(16) Countrywide Indicated Relativity:	1.031	0.763	.
(17) Countrywide Credibility:	0.150	0.010	.
(18) Countrywide Lost-Time Claims:	2973.0	.	.
(19) Pure Premium Underlying Present Rate:	1.119	0.569	1.688
(20) Relativity to Underlying Present Rate:	1.350	1.116	.
(21) Credibility to Underlying Relativity:	0.140	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.145	0.832	.
(24) Balanced Formula Relativity:	1.138	0.832	1.027

Class(es): 8601 ARCHITECT OR ENGINEER-CONSULTING		Effective: 7/1/2018							Office and Clerical		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	12,617,011	4	197	499,144	712,260	107,829	533,589	1,852,823	0.096	0.051	0.147
2012	13,017,257	6	159	465,496	713,019	610,832	632,038	2,421,385	0.091	0.095	0.186
2013	13,414,370	1	151	301,817	606,529	35,012	489,385	1,432,743	0.068	0.039	0.107
2014	14,249,262	9	159	664,753	1,221,617	189,769	608,996	2,685,135	0.132	0.056	0.188
2015	15,155,372	5	153	809,888	827,153	263,204	1,027,606	2,927,851	0.108	0.085	0.193
MA Total:	68,453,272	25	819	2,741,098	4,080,578	1,206,646	3,291,615	11,319,936	0.100	0.066	0.165

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.398	1.509	.
(14) Massachusetts Credibility:	0.610	0.970	.
(15) Countrywide Pure Premium:	0.115	0.068	0.183
(16) Countrywide Indicated Relativity:	1.895	1.753	.
(17) Countrywide Credibility:	0.200	0.020	.
(18) Countrywide Lost-Time Claims:	2414.0	.	.
(19) Pure Premium Underlying Present Rate:	0.118	0.081	0.199
(20) Relativity to Underlying Present Rate:	1.616	1.683	.
(21) Credibility to Underlying Relativity:	0.190	0.010	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	1.539	1.515	.
(24) Balanced Formula Relativity:	1.549	1.519	1.538

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8710 FIELD BONDED WAREHOUSING - ALL EMP & CLERICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	7,206	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	6,724	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	8,440	0	1	0	15,104	0	3,401	18,505	1.790	0.403	2.193
2014	7,314	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	2,259	0	1	0	11,313	0	2,577	13,890	5.007	1.140	6.148
MA Total:	31,944	0	2	0	26,418	0	5,978	32,396	0.827	0.187	1.014

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.989	0.393	.
(14) Massachusetts Credibility:	0.100	0.150	.
(15) Countrywide Pure Premium:	0.819	0.475	1.294
(16) Countrywide Indicated Relativity:	0.982	0.994	.
(17) Countrywide Credibility:	0.230	0.250	.
(18) Countrywide Lost-Time Claims:	30.000	.	.
(19) Pure Premium Underlying Present Rate:	2.946	1.530	4.477
(20) Relativity to Underlying Present Rate:	3.553	3.003	.
(21) Credibility to Underlying Relativity:	0.670	0.600	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.705	2.109	.
(24) Balanced Formula Relativity:	2.687	2.108	2.477

Class(es):		Effective: 7/1/2018							Goods and Services		
8720 INSPECTION OF RISKS FOR INSURANCE OR VALUATION PURPOSES NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,503,178	3	60	16,628	693,705	19,066	240,897	970,296	0.473	0.173	0.645
2012	1,571,659	6	43	778,839	487,676	444,336	170,093	1,880,944	0.806	0.391	1.197
2013	1,705,211	7	56	118,182	76,285	56,240	174,738	425,444	0.114	0.135	0.249
2014	1,754,849	2	42	144,131	171,897	9,150	187,364	512,543	0.180	0.112	0.292
2015	1,792,771	5	48	877,683	654,823	306,784	394,364	2,233,654	0.855	0.391	1.246
MA Total:	8,327,668	23	249	1,935,463	2,084,385	835,577	1,167,456	6,022,880	0.483	0.241	0.723

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.577	0.506	.
(14) Massachusetts Credibility:	0.450	0.640	.
(15) Countrywide Pure Premium:	0.495	0.251	0.746
(16) Countrywide Indicated Relativity:	0.593	0.525	.
(17) Countrywide Credibility:	0.280	0.180	.
(18) Countrywide Lost-Time Claims:	1292.0	.	.
(19) Pure Premium Underlying Present Rate:	0.455	0.237	0.692
(20) Relativity to Underlying Present Rate:	0.548	0.466	.
(21) Credibility to Underlying Relativity:	0.270	0.180	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.574	0.502	.
(24) Balanced Formula Relativity:	0.570	0.502	0.545

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Office and Clerical		
8721 REAL ESTATE APPRAISAL CO - OUTSIDE EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	273,309	1	2	74,972	16,561	342,981	1,658	436,172	0.335	1.261	1.596
2012	288,802	0	3	0	241,819	0	42,900	284,720	0.837	0.149	0.986
2013	275,524	2	1	132,324	0	8,967	30	141,321	0.480	0.033	0.513
2014	328,957	0	2	0	0	0	791	791	0.000	0.002	0.002
2015	284,195	0	1	0	0	0	46	46	0.000	0.000	0.000
MA Total:	1,450,786	3	9	207,295	258,380	351,949	45,425	863,049	0.321	0.274	0.595

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.504	6.289	.
(14) Massachusetts Credibility:	0.140	0.310	.
(15) Countrywide Pure Premium:	0.112	0.049	0.162
(16) Countrywide Indicated Relativity:	1.848	1.280	.
(17) Countrywide Credibility:	0.380	0.350	.
(18) Countrywide Lost-Time Claims:	101.00	.	.
(19) Pure Premium Underlying Present Rate:	0.150	0.224	0.374
(20) Relativity to Underlying Present Rate:	2.061	4.629	.
(21) Credibility to Underlying Relativity:	0.480	0.340	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	2.322	3.972	.
(24) Balanced Formula Relativity:	2.338	3.982	2.961

Class(es):		Effective: 7/1/2018							Office and Clerical		
8742 SALESPERSONS, COLLECTORS OR MESSENGERS-OUTSIDE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	86,383,345	32	493	4,692,458	1,945,007	1,447,055	1,989,027	10,073,546	0.077	0.040	0.117
2012	89,730,553	29	534	2,024,528	2,559,404	1,643,620	1,605,257	7,832,809	0.051	0.036	0.087
2013	97,017,102	27	509	3,128,491	3,229,495	981,062	2,398,477	9,737,525	0.066	0.035	0.100
2014	101,992,142	33	520	2,531,637	2,873,883	1,647,126	2,308,749	9,361,395	0.053	0.039	0.092
2015	107,750,515	22	570	1,678,580	4,321,925	964,256	3,727,886	10,692,647	0.056	0.044	0.099
MA Total:	482,873,657	143	2,626	14,055,693	14,929,713	6,683,119	12,029,395	47,697,921	0.060	0.039	0.099

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.842	0.890	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.096	0.056	0.152
(16) Countrywide Indicated Relativity:	1.575	1.461	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	15876	.	.
(19) Pure Premium Underlying Present Rate:	0.071	0.048	0.119
(20) Relativity to Underlying Present Rate:	0.976	0.987	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	0.842	0.890	.
(24) Balanced Formula Relativity:	0.848	0.892	0.865

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
8745 NEWS AGENT OR DISTRIB OF MAGAZINE-NOT RETAIL & SALES,DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	153,392	3	37	98,310	321,306	82,366	203,862	705,844	2,736	1,866	4,602
2012	130,163	0	33	0	584,569	0	351,292	935,861	4,491	2,699	7,190
2013	123,877	2	34	353,947	92,063	411,278	132,744	990,032	3,600	4,392	7,992
2014	124,555	3	22	275,877	286,837	109,616	615,335	1,287,665	4,518	5,820	10,338
2015	129,116	0	29	0	810,067	0	259,346	1,069,413	6,274	2,009	8,283
MA Total:	661,103	8	155	728,134	2,094,842	603,259	1,562,578	4,988,815	4,270	3,276	7,546

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.105	6.886	.
(14) Massachusetts Credibility:	0.340	0.560	.
(15) Countrywide Pure Premium:	1.887	1.123	3.009
(16) Countrywide Indicated Relativity:	2.262	2.349	.
(17) Countrywide Credibility:	0.330	0.220	.
(18) Countrywide Lost-Time Claims:	390.00	.	.
(19) Pure Premium Underlying Present Rate:	2.748	2.090	4.838
(20) Relativity to Underlying Present Rate:	3.314	4.101	.
(21) Credibility to Underlying Relativity:	0.330	0.220	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	3.576	5.275	.
(24) Balanced Formula Relativity:	3.552	5.273	4.176

Class(es):		Effective: 7/1/2018							Goods and Services		
8747 DISPLAY SHOWROOMS - ALL TYPES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	73,931	0	3	0	0	0	2,018	2,018	0.000	0.027	0.027
2012	103,461	0	3	0	237	0	1,084	1,321	0.002	0.010	0.013
2013	137,333	1	1	299,899	1,269	17,534	491	319,193	2,193	0.131	2,324
2014	144,263	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	138,742	0	2	0	4,342	0	14,406	18,748	0.031	0.104	0.135
MA Total:	597,729	1	9	299,899	5,847	17,534	17,999	341,280	0.512	0.059	0.571

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.612	0.125	.
(14) Massachusetts Credibility:	0.160	0.230	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.567	0.503	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.474	0.259	0.732
(20) Relativity to Underlying Present Rate:	0.571	0.507	.
(21) Credibility to Underlying Relativity:	0.840	0.770	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.578	0.419	.
(24) Balanced Formula Relativity:	0.574	0.419	0.518

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Calculation of Class Relativities

Class(es): 8748 AUTOMOBILE SALESPERSONS		Effective: 7/1/2018							Office and Clerical		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,534,945	3	101	362,188	528,201	110,893	385,906	1,387,188	0.351	0.196	0.547
2012	2,598,647	4	86	554,749	373,084	246,484	388,662	1,562,978	0.357	0.244	0.601
2013	2,766,046	7	96	700,677	448,110	356,272	267,918	1,772,977	0.415	0.226	0.641
2014	3,098,549	10	93	705,339	1,112,281	226,112	517,264	2,560,996	0.587	0.240	0.827
2015	3,096,150	2	64	291,752	913,348	40,269	308,440	1,553,808	0.389	0.113	0.502
MA Total:	14,094,337	26	440	2,614,704	3,375,025	980,030	1,868,189	8,837,948	0.425	0.202	0.627

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.963	4.640	.
(14) Massachusetts Credibility:	0.470	0.710	.
(15) Countrywide Pure Premium:	0.199	0.108	0.307
(16) Countrywide Indicated Relativity:	3.278	2.807	.
(17) Countrywide Credibility:	0.270	0.150	.
(18) Countrywide Lost-Time Claims:	1867.0	.	.
(19) Pure Premium Underlying Present Rate:	0.292	0.184	0.476
(20) Relativity to Underlying Present Rate:	4.015	3.808	.
(21) Credibility to Underlying Relativity:	0.260	0.140	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	4.732	4.248	.
(24) Balanced Formula Relativity:	4.763	4.260	4.572

Class(es): 8800 MAILING OR ADDRESSING CO & CLERICAL		Effective: 7/1/2018							Office and Clerical		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	425,555	3	19	231,402	166,858	23,896	70,108	492,264	0.936	0.221	1.157
2012	412,929	2	21	124,655	43,198	72,853	61,982	302,688	0.406	0.327	0.733
2013	412,553	2	14	140,083	64,744	35,012	51,501	291,341	0.496	0.210	0.706
2014	370,892	0	14	0	79,269	0	37,083	116,352	0.214	0.100	0.314
2015	404,358	1	13	52,180	40,178	38,104	33,275	163,738	0.228	0.177	0.405
MA Total:	2,026,286	8	81	548,320	394,248	169,866	253,951	1,366,384	0.465	0.209	0.674

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.528	4.802	.
(14) Massachusetts Credibility:	0.280	0.430	.
(15) Countrywide Pure Premium:	0.538	0.335	0.873
(16) Countrywide Indicated Relativity:	8.868	8.672	.
(17) Countrywide Credibility:	0.360	0.290	.
(18) Countrywide Lost-Time Claims:	901.00	.	.
(19) Pure Premium Underlying Present Rate:	0.580	0.350	0.930
(20) Relativity to Underlying Present Rate:	7.970	7.244	.
(21) Credibility to Underlying Relativity:	0.360	0.280	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	7.889	6.608	.
(24) Balanced Formula Relativity:	7.942	6.626	7.443

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Calculation of Class Relativities

Class(es): 8803 AUDITORS, ACCOUNTANT OR FACTORY COST OR OFF SYSTEMZR-TRAV												Effective: 7/1/2018			Office and Clerical		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	29,094,926	2	50	13,012	54,472	28,900	261,659	358,042	0.002	0.010	0.012						
2012	31,654,984	5	63	398,582	63,027	192,489	169,295	823,392	0.015	0.011	0.026						
2013	29,052,084	3	48	154,032	343,289	112,612	190,284	800,216	0.017	0.010	0.028						
2014	30,906,559	4	47	1,365,708	342,606	432,676	258,454	2,399,444	0.055	0.022	0.078						
2015	32,361,411	0	40	0	467,400	0	260,374	727,774	0.014	0.008	0.022						
MA Total:	153,069,965	14	248	1,931,333	1,270,793	766,676	1,140,066	5,108,868	0.021	0.012	0.033						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.294	0.286	.
(14) Massachusetts Credibility:	0.390	0.620	.
(15) Countrywide Pure Premium:	0.022	0.012	0.034
(16) Countrywide Indicated Relativity:	0.360	0.316	.
(17) Countrywide Credibility:	0.310	0.190	.
(18) Countrywide Lost-Time Claims:	887.00	.	.
(19) Pure Premium Underlying Present Rate:	0.016	0.012	0.028
(20) Relativity to Underlying Present Rate:	0.225	0.244	.
(21) Credibility to Underlying Relativity:	0.300	0.190	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	0.293	0.284	.
(24) Balanced Formula Relativity:	0.295	0.284	0.291

Class(es): 8810 CLERICAL OFFICE EMPLOYEES NOC												Effective: 7/1/2018			Office and Clerical		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums							
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	433,442,847	87	1,731	6,120,619	6,217,785	2,516,357	5,691,437	20,546,198	0.028	0.019	0.047						
2012	440,790,864	88	1,764	7,186,289	9,028,701	2,324,733	6,534,135	25,073,857	0.037	0.020	0.057						
2013	461,936,498	71	1,816	5,274,197	9,271,691	2,771,213	6,789,218	24,106,319	0.031	0.021	0.052						
2014	487,310,127	84	1,963	8,441,317	11,469,626	2,573,884	8,451,129	30,935,957	0.041	0.023	0.063						
2015	530,213,073	73	1,672	7,545,511	10,041,885	3,267,090	7,376,427	28,230,913	0.033	0.020	0.053						
MA Total:	2,353,693,408	403	8,946	34,567,933	46,029,688	13,453,276	34,842,347	128,893,244	0.034	0.021	0.055						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.481	0.471	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.042	0.027	0.069
(16) Countrywide Indicated Relativity:	0.685	0.703	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	42785	.	.
(19) Pure Premium Underlying Present Rate:	0.031	0.022	0.053
(20) Relativity to Underlying Present Rate:	0.430	0.458	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	0.481	0.471	.
(24) Balanced Formula Relativity:	0.484	0.472	0.479

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018						Office and Clerical			
8820 ATTORNEY-ALL EMP & CLERICAL, MESSENGERS, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	23,065,464	0	84	0	441,114	0	213,907	655,021	0.019	0.009	0.028
2012	24,761,604	4	69	107,472	809,088	36,889	620,480	1,573,929	0.037	0.027	0.064
2013	24,555,121	2	73	366,952	857,442	46,957	457,415	1,728,767	0.050	0.021	0.070
2014	24,325,225	2	67	390,943	837,439	261,455	528,501	2,018,338	0.050	0.032	0.083
2015	24,416,087	5	62	717,140	244,018	181,386	444,745	1,587,289	0.039	0.026	0.065
MA Total:	121,123,501	13	355	1,582,508	3,189,101	526,688	2,265,047	7,563,343	0.039	0.023	0.062

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.553	0.529	.
(14) Massachusetts Credibility:	0.510	0.760	.
(15) Countrywide Pure Premium:	0.041	0.025	0.066
(16) Countrywide Indicated Relativity:	0.682	0.648	.
(17) Countrywide Credibility:	0.250	0.120	.
(18) Countrywide Lost-Time Claims:	1771.0	.	.
(19) Pure Premium Underlying Present Rate:	0.042	0.025	0.066
(20) Relativity to Underlying Present Rate:	0.571	0.515	.
(21) Credibility to Underlying Relativity:	0.240	0.120	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	0.589	0.542	.
(24) Balanced Formula Relativity:	0.593	0.543	0.574

Class(es):		Effective: 7/1/2018						Goods and Services			
8829 CONVALESCENT OR NURSING HOME-ALL EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	10,254,311	51	2,265	4,656,506	8,244,179	1,338,353	4,772,521	19,011,558	1.258	0.596	1.854
2012	9,491,933	47	1,926	2,846,405	5,753,217	1,052,952	3,613,084	13,265,658	0.906	0.492	1.398
2013	9,893,555	48	1,816	3,861,045	6,283,098	1,248,873	3,749,723	15,142,739	1.025	0.505	1.531
2014	10,758,757	62	2,022	5,510,695	6,772,063	1,479,387	4,585,205	18,347,350	1.142	0.564	1.705
2015	9,502,033	42	1,643	4,173,135	7,784,709	1,554,019	4,449,709	17,961,572	1.258	0.632	1.890
MA Total:	49,900,589	250	9,672	21,047,786	34,837,267	6,673,583	21,170,241	83,728,878	1.120	0.558	1.678

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.339	1.173	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.973	0.567	1.540
(16) Countrywide Indicated Relativity:	1.166	1.187	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	23984	.	.
(19) Pure Premium Underlying Present Rate:	1.040	0.556	1.596
(20) Relativity to Underlying Present Rate:	1.254	1.090	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.339	1.173	.
(24) Balanced Formula Relativity:	1.330	1.172	1.273

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Calculation of Class Relativities

Class(es): 8831 PET GROOMING & DRIVERS		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,456,219	2	555	634	516,349	38,361	879,874	1,435,219	0.210	0.374	0.584
2012	2,574,448	5	515	292,116	262,566	271,319	605,327	1,431,327	0.215	0.341	0.556
2013	2,741,235	6	621	633,449	634,886	117,207	898,582	2,284,124	0.463	0.371	0.833
2014	2,861,655	2	602	91,186	539,838	100,370	1,144,254	1,875,647	0.221	0.435	0.655
2015	3,128,077	13	611	884,374	457,309	437,207	1,108,162	2,887,053	0.429	0.494	0.923
MA Total:	13,761,634	28	2,904	1,901,760	2,410,947	964,464	4,636,199	9,913,370	0.313	0.407	0.720

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.375	0.855	.
(14) Massachusetts Credibility:	0.500	0.950	.
(15) Countrywide Pure Premium:	0.441	0.390	0.831
(16) Countrywide Indicated Relativity:	0.529	0.815	.
(17) Countrywide Credibility:	0.250	0.030	.
(18) Countrywide Lost-Time Claims:	4444.0	.	.
(19) Pure Premium Underlying Present Rate:	0.356	0.388	0.744
(20) Relativity to Underlying Present Rate:	0.429	0.762	.
(21) Credibility to Underlying Relativity:	0.250	0.020	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.427	0.852	.
(24) Balanced Formula Relativity:	0.424	0.852	0.579

Class(es): 8832 PHYSICIAN & CLERICAL		Effective: 7/1/2018							Office and Clerical		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	49,031,893	43	1,136	4,700,878	4,657,915	2,113,560	3,032,414	14,504,768	0.191	0.105	0.296
2012	49,385,558	32	1,286	3,519,589	5,010,233	1,043,237	2,962,387	12,535,446	0.173	0.081	0.254
2013	53,360,566	39	1,338	3,343,806	2,970,893	1,232,939	3,077,629	10,625,266	0.118	0.081	0.199
2014	54,408,794	30	1,186	2,984,962	3,659,897	1,197,922	2,559,439	10,402,220	0.122	0.069	0.191
2015	55,225,726	21	1,136	1,707,608	4,332,880	800,866	2,888,825	9,730,180	0.109	0.067	0.176
MA Total:	261,412,536	165	6,082	16,256,843	20,631,817	6,388,525	14,520,695	57,797,880	0.141	0.080	0.221

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.980	1.836	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.100	0.057	0.156
(16) Countrywide Indicated Relativity:	1.640	1.475	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	14376	.	.
(19) Pure Premium Underlying Present Rate:	0.156	0.085	0.241
(20) Relativity to Underlying Present Rate:	2.136	1.761	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	1.980	1.836	.
(24) Balanced Formula Relativity:	1.993	1.841	1.936

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Calculation of Class Relativities

Class(es): 8833 HOSPITAL: PROFESSIONAL EMPLOYEES		Effective: 7/1/2018						Office and Clerical			
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	7,831,497	28	851	1,429,834	2,449,318	684,569	1,980,289	6,544,010	0.495	0.340	0.836
2012	7,931,908	17	927	1,560,879	2,679,418	394,769	2,179,571	6,814,638	0.535	0.325	0.859
2013	7,789,989	25	787	2,102,869	4,412,319	733,220	1,994,936	9,243,345	0.836	0.350	1.187
2014	8,554,231	19	890	1,476,207	3,744,189	394,195	1,721,241	7,335,833	0.610	0.247	0.858
2015	8,861,619	17	820	1,696,919	3,707,965	531,373	1,979,903	7,916,160	0.610	0.283	0.893
MA Total:	40,969,244	106	4,275	8,266,709	16,993,209	2,738,126	9,855,942	37,853,986	0.617	0.307	0.924

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	8.652	7.058	.
(14) Massachusetts Credibility:	0.970	1.000	.
(15) Countrywide Pure Premium:	0.297	0.182	0.478
(16) Countrywide Indicated Relativity:	4.891	4.701	.
(17) Countrywide Credibility:	0.020	0.000	.
(18) Countrywide Lost-Time Claims:	19540	.	.
(19) Pure Premium Underlying Present Rate:	0.616	0.345	0.961
(20) Relativity to Underlying Present Rate:	8.464	7.136	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	8.575	7.058	.
(24) Balanced Formula Relativity:	8.632	7.077	8.042

Class(es): 8835 NURSING-HOME HEALTH, PUBLIC & TRAVELING-ALL EMPLOYEES		Effective: 7/1/2018						Goods and Services			
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	5,908,562	38	695	3,173,630	2,312,677	1,591,990	1,561,352	8,639,649	0.929	0.534	1.462
2012	6,759,166	40	776	2,460,826	3,523,749	729,427	1,817,832	8,531,834	0.885	0.377	1.262
2013	7,554,902	53	845	3,309,337	3,274,912	1,402,599	1,959,427	9,946,274	0.872	0.445	1.317
2014	9,041,601	63	933	4,646,985	5,567,980	1,187,385	2,999,899	14,402,250	1.130	0.463	1.593
2015	10,615,190	64	939	8,506,727	8,126,852	2,798,510	3,589,059	23,021,148	1.567	0.602	2.169
MA Total:	39,879,422	258	4,188	22,097,505	22,806,170	7,709,911	11,927,569	64,541,155	1.126	0.492	1.618

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.346	1.035	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.028	0.502	1.530
(16) Countrywide Indicated Relativity:	1.232	1.051	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	18119	.	.
(19) Pure Premium Underlying Present Rate:	1.053	0.514	1.567
(20) Relativity to Underlying Present Rate:	1.270	1.009	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.346	1.035	.
(24) Balanced Formula Relativity:	1.337	1.035	1.227

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Office and Clerical			
8868 COLLEGE: PROFESSIONAL EMPLOYEES & CLERICAL												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	35,543,011	90	3,434	5,556,674	7,133,175	3,369,274	6,395,426	22,454,548	0.357	0.275	0.632	
2012	35,485,319	78	3,094	4,209,965	7,589,264	2,075,408	6,615,549	20,490,187	0.333	0.245	0.577	
2013	36,973,085	76	3,176	3,842,533	6,779,010	1,413,023	7,010,947	19,045,513	0.287	0.228	0.515	
2014	39,556,217	95	3,220	5,480,924	8,287,755	2,173,315	6,801,820	22,743,814	0.348	0.227	0.575	
2015	42,017,813	72	3,283	4,404,847	8,092,562	1,572,279	6,756,199	20,825,887	0.297	0.198	0.496	
MA Total:	189,575,445	411	16,207	23,494,942	37,881,765	10,603,300	33,579,942	105,559,949	0.324	0.233	0.557	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.543	5.351	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.093	0.079	0.172
(16) Countrywide Indicated Relativity:	1.536	2.049	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	17089	.	.
(19) Pure Premium Underlying Present Rate:	0.361	0.264	0.624
(20) Relativity to Underlying Present Rate:	4.950	5.466	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	4.543	5.351	.
(24) Balanced Formula Relativity:	4.573	5.366	4.874

Class(es):		Effective: 7/1/2018							Goods and Services			
9014 BUILDINGS - OPERATION BY CONTRACTORS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	5,148,044	53	535	4,663,348	5,159,082	1,587,312	2,656,688	14,066,429	1.908	0.824	2.732	
2012	5,225,880	40	521	3,033,541	3,404,708	995,173	2,365,001	9,798,423	1.232	0.643	1.875	
2013	5,558,652	30	473	2,456,146	5,062,576	848,539	2,736,618	11,103,880	1.353	0.645	1.998	
2014	6,084,003	27	454	2,613,245	4,395,848	1,413,726	1,759,737	10,182,556	1.152	0.522	1.674	
2015	6,766,448	32	515	1,963,529	4,013,481	873,978	2,495,247	9,346,235	0.883	0.498	1.381	
MA Total:	28,783,028	182	2,498	14,729,809	22,035,695	5,718,728	12,013,291	54,497,523	1.277	0.616	1.893	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.527	1.295	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.322	0.748	2.070
(16) Countrywide Indicated Relativity:	1.585	1.564	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	18757	.	.
(19) Pure Premium Underlying Present Rate:	1.458	0.765	2.222
(20) Relativity to Underlying Present Rate:	1.758	1.500	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.527	1.295	.
(24) Balanced Formula Relativity:	1.517	1.294	1.436

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
9015 BUILDINGS-OPERATION BY OWNER OR LESSEE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	5,289,270	30	824	3,292,049	5,597,578	1,186,420	2,962,943	13,038,989	1,681	0,784	2,465
2012	5,349,451	37	842	3,696,163	4,820,809	1,286,873	2,914,707	12,718,552	1,592	0,785	2,378
2013	5,566,603	27	795	3,044,306	6,396,310	1,182,143	3,706,367	14,329,126	1,696	0,878	2,574
2014	5,888,123	37	827	3,855,215	5,982,791	2,574,238	3,546,776	15,959,021	1,671	1,040	2,710
2015	6,111,789	21	761	2,574,586	6,096,096	974,833	4,420,293	14,065,808	1,419	0,883	2,301
MA Total:	28,205,237	152	4,049	16,462,319	28,893,583	7,204,507	17,551,087	70,111,496	1,608	0,878	2,486

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.922	1.845	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.475	0.762	2.236
(16) Countrywide Indicated Relativity:	1.768	1.593	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	15988	.	.
(19) Pure Premium Underlying Present Rate:	1.623	0.826	2.449
(20) Relativity to Underlying Present Rate:	1.957	1.621	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.922	1.845	.
(24) Balanced Formula Relativity:	1.910	1.844	1.886

Class(es):		Effective: 7/1/2018							Goods and Services		
9016 AMUSEMENT PARK OR EXHIBITION OPERATION & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	539,494	3	103	115,969	578,154	493,729	337,351	1,525,203	1,287	1,540	2,827
2012	558,122	1	98	4,430	354,367	5,012	324,024	687,832	0,643	0,590	1,232
2013	595,855	5	102	301,191	430,396	167,840	189,408	1,088,836	1,228	0,600	1,827
2014	610,875	0	97	0	352,882	0	422,948	775,831	0,578	0,692	1,270
2015	629,921	2	88	49,832	732,430	28,355	488,733	1,299,350	1,242	0,821	2,063
MA Total:	2,934,266	11	488	471,422	2,448,230	694,936	1,762,465	5,377,052	0,995	0,837	1,833

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.190	1.760	.
(14) Massachusetts Credibility:	0.380	0.720	.
(15) Countrywide Pure Premium:	0.828	0.661	1.488
(16) Countrywide Indicated Relativity:	0.992	1.382	.
(17) Countrywide Credibility:	0.310	0.140	.
(18) Countrywide Lost-Time Claims:	1944.0	.	.
(19) Pure Premium Underlying Present Rate:	0.820	0.887	1.707
(20) Relativity to Underlying Present Rate:	0.989	1.740	.
(21) Credibility to Underlying Relativity:	0.310	0.140	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.066	1.705	.
(24) Balanced Formula Relativity:	1.059	1.704	1.293

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Miscellaneous		
9019 BRIDGE OR VEHICULAR TUNNEL OPERATION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	18,613	0	0	0	0	0	0	0	0.000	0.000	0.000
2012	25,615	0	0	0	0	0	0	0	0.000	0.000	0.000
2013	37,338	1	0	529,271	0	201,863	0	731,134	14,175	5,406	19,581
2014	28,412	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	32,438	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	142,415	1	0	529,271	0	201,863	0	731,134	3,716	1,417	5,134

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.550	1.188	.
(14) Massachusetts Credibility:	0.140	0.170	.
(15) Countrywide Pure Premium:	0.613	0.401	1.014
(16) Countrywide Indicated Relativity:	0.284	0.377	.
(17) Countrywide Credibility:	0.250	0.260	.
(18) Countrywide Lost-Time Claims:	35.000	.	.
(19) Pure Premium Underlying Present Rate:	1.433	0.474	1.906
(20) Relativity to Underlying Present Rate:	0.588	0.359	.
(21) Credibility to Underlying Relativity:	0.610	0.570	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.647	0.505	.
(24) Balanced Formula Relativity:	0.644	0.508	0.599

Class(es):		Effective: 7/1/2018							Goods and Services		
9033 HOUSING AUTHORITY & CLERICAL, SALES, DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	212,743	2	40	323,307	233,209	190,935	109,275	856,726	2,616	1,411	4,027
2012	206,506	1	39	38,882	92,022	78,633	87,948	297,485	0,634	0,807	1,441
2013	213,437	1	41	280	291,841	13,975	181,553	487,650	1,369	0,916	2,285
2014	217,562	0	35	0	39,203	0	65,594	104,797	0,180	0,301	0,482
2015	217,398	2	24	458,873	546,963	49,129	187,815	1,242,779	4,627	1,090	5,717
MA Total:	1,067,646	6	179	821,342	1,203,238	332,672	632,185	2,989,437	1,896	0,904	2,800

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.267	1.900	.
(14) Massachusetts Credibility:	0.340	0.480	.
(15) Countrywide Pure Premium:	1.100	0.529	1.630
(16) Countrywide Indicated Relativity:	1.319	1.108	.
(17) Countrywide Credibility:	0.330	0.260	.
(18) Countrywide Lost-Time Claims:	788.00	.	.
(19) Pure Premium Underlying Present Rate:	1.756	0.916	2.672
(20) Relativity to Underlying Present Rate:	2.118	1.798	.
(21) Credibility to Underlying Relativity:	0.330	0.260	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.905	1.667	.
(24) Balanced Formula Relativity:	1.892	1.667	1.810

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
9040 HOSPITAL: ALL OTHER EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	737,191	4	233	188,384	589,877	216,666	421,701	1,416,627	1,056	0,866	1,922
2012	652,793	8	185	746,680	833,987	201,801	408,345	2,190,813	2,421	0,935	3,356
2013	621,328	6	190	325,619	648,411	236,449	579,032	1,789,511	1,568	1,312	2,880
2014	673,405	5	171	467,966	323,231	245,006	334,509	1,370,712	1,175	0,861	2,035
2015	755,965	4	231	477,083	726,389	145,400	456,656	1,805,527	1,592	0,796	2,388
MA Total:	3,440,682	27	1,010	2,205,731	3,121,895	1,045,321	2,200,243	8,573,190	1,548	0,943	2,492

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.851	1.983	.
(14) Massachusetts Credibility:	0.510	0.760	.
(15) Countrywide Pure Premium:	1.346	0.841	2.187
(16) Countrywide Indicated Relativity:	1.614	1.759	.
(17) Countrywide Credibility:	0.250	0.120	.
(18) Countrywide Lost-Time Claims:	6911.0	.	.
(19) Pure Premium Underlying Present Rate:	1.461	0.884	2.344
(20) Relativity to Underlying Present Rate:	1.761	1.734	.
(21) Credibility to Underlying Relativity:	0.240	0.120	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.770	1.926	.
(24) Balanced Formula Relativity:	1.758	1.925	1.819

Class(es):		Effective: 7/1/2018							Goods and Services		
9052 HOTEL: ALL OTHER EMPLOYEES & SALES, DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	6,369,096	33	856	2,723,328	2,860,355	1,093,092	2,110,161	8,786,935	0,877	0,503	1,380
2012	6,240,679	23	830	1,350,719	4,440,238	560,166	2,506,222	8,857,345	0,928	0,491	1,419
2013	6,171,810	29	689	2,191,217	2,995,276	595,692	1,882,203	7,664,389	0,840	0,401	1,242
2014	6,297,626	26	644	1,686,338	3,835,996	509,322	2,039,888	8,071,543	0,877	0,405	1,282
2015	6,707,252	24	675	1,894,075	2,874,028	540,964	1,884,991	7,194,058	0,711	0,362	1,073
MA Total:	31,786,463	135	3,694	9,845,677	17,005,893	3,299,235	10,423,465	40,574,270	0,845	0,432	1,276

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.010	0.907	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.877	0.539	1.416
(16) Countrywide Indicated Relativity:	1.051	1.127	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	20227	.	.
(19) Pure Premium Underlying Present Rate:	0.860	0.525	1.386
(20) Relativity to Underlying Present Rate:	1.038	1.031	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.010	0.907	.
(24) Balanced Formula Relativity:	1.003	0.907	0.968

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
9058 HOTEL: RESTAURANT EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,463,936	7	428	696,310	676,086	269,830	596,690	2,238,917	0.557	0.352	0.909
2012	2,415,769	10	449	657,648	2,173,366	135,914	1,141,986	4,108,914	1.172	0.529	1.701
2013	2,307,702	7	431	710,952	1,471,463	162,660	879,060	3,224,136	0.946	0.451	1.397
2014	2,507,873	5	357	559,635	1,453,186	130,107	983,657	3,126,584	0.803	0.444	1.247
2015	2,550,066	9	354	602,155	1,276,396	163,711	734,527	2,776,788	0.737	0.352	1.089
MA Total:	12,245,347	38	2,019	3,226,699	7,050,497	862,223	4,335,920	15,475,339	0.839	0.424	1.264

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.003	0.892	.
(14) Massachusetts Credibility:	0.630	0.970	.
(15) Countrywide Pure Premium:	0.557	0.359	0.916
(16) Countrywide Indicated Relativity:	0.667	0.751	.
(17) Countrywide Credibility:	0.190	0.020	.
(18) Countrywide Lost-Time Claims:	6926.0	.	.
(19) Pure Premium Underlying Present Rate:	0.706	0.449	1.154
(20) Relativity to Underlying Present Rate:	0.851	0.880	.
(21) Credibility to Underlying Relativity:	0.180	0.010	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.912	0.889	.
(24) Balanced Formula Relativity:	0.906	0.889	0.900

Class(es):		Effective: 7/1/2018							Goods and Services		
9060 CLUB-COUNTRY, GOLF, FISHING OR YACHT & CLERICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	2,799,388	4	329	211,623	908,375	113,954	687,220	1,921,172	0.400	0.286	0.686
2012	2,919,095	1	329	492,285	741,127	123,616	522,691	1,879,719	0.423	0.221	0.644
2013	2,992,386	4	330	217,738	858,065	208,910	944,263	2,228,975	0.360	0.385	0.745
2014	3,120,144	3	302	333,257	993,035	460,676	743,731	2,530,699	0.425	0.386	0.811
2015	3,283,279	5	278	355,765	1,133,055	296,589	1,022,302	2,807,711	0.453	0.402	0.855
MA Total:	15,114,292	17	1,568	1,610,667	4,633,657	1,203,745	3,920,207	11,368,276	0.413	0.339	0.752

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.494	0.713	.
(14) Massachusetts Credibility:	0.560	0.920	.
(15) Countrywide Pure Premium:	0.579	0.391	0.970
(16) Countrywide Indicated Relativity:	0.695	0.817	.
(17) Countrywide Credibility:	0.220	0.040	.
(18) Countrywide Lost-Time Claims:	5126.0	.	.
(19) Pure Premium Underlying Present Rate:	0.414	0.326	0.741
(20) Relativity to Underlying Present Rate:	0.500	0.641	.
(21) Credibility to Underlying Relativity:	0.220	0.040	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.539	0.714	.
(24) Balanced Formula Relativity:	0.536	0.714	0.600

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
9061 CLUB NOC & CLERICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	711,019	2	46	74,912	134,012	20,229	132,866	362,020	0.294	0.215	0.509
2012	725,506	4	41	231,816	26,696	145,041	86,832	490,385	0.356	0.320	0.676
2013	740,312	1	40	169,020	134,666	119,199	146,181	569,066	0.410	0.358	0.769
2014	745,114	0	48	0	452,984	0	443,922	896,906	0.608	0.596	1.204
2015	738,525	1	26	173,993	24,448	16,146	40,811	255,398	0.269	0.077	0.346
MA Total:	3,660,477	8	201	649,742	772,807	300,614	850,611	2,573,774	0.389	0.315	0.703

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.465	0.661	.
(14) Massachusetts Credibility:	0.320	0.500	.
(15) Countrywide Pure Premium:	0.571	0.332	0.903
(16) Countrywide Indicated Relativity:	0.685	0.694	.
(17) Countrywide Credibility:	0.340	0.250	.
(18) Countrywide Lost-Time Claims:	788.00	.	.
(19) Pure Premium Underlying Present Rate:	0.425	0.294	0.719
(20) Relativity to Underlying Present Rate:	0.513	0.576	.
(21) Credibility to Underlying Relativity:	0.340	0.250	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.556	0.648	.
(24) Balanced Formula Relativity:	0.552	0.648	0.587

Class(es):		Effective: 7/1/2018							Goods and Services		
9063 YMCA, YWCA, YMHA OR YWHA, INSTITUTION-ALL EMPLOYEES & CLERICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,595,960	11	307	785,688	791,652	247,075	792,555	2,616,971	0.343	0.226	0.569
2012	4,799,202	10	291	771,962	1,152,199	463,082	780,737	3,167,980	0.401	0.259	0.660
2013	5,098,237	7	328	301,786	921,950	388,617	937,405	2,549,758	0.240	0.260	0.500
2014	5,703,741	8	330	499,015	1,106,405	214,117	951,662	2,771,198	0.281	0.204	0.486
2015	6,278,993	4	380	195,817	965,948	165,992	1,262,552	2,590,309	0.185	0.228	0.413
MA Total:	26,476,133	40	1,636	2,554,268	4,938,154	1,478,882	4,724,911	13,696,215	0.283	0.234	0.517

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.338	0.493	.
(14) Massachusetts Credibility:	0.640	1.000	.
(15) Countrywide Pure Premium:	0.326	0.262	0.588
(16) Countrywide Indicated Relativity:	0.391	0.549	.
(17) Countrywide Credibility:	0.180	0.000	.
(18) Countrywide Lost-Time Claims:	3572.0	.	.
(19) Pure Premium Underlying Present Rate:	0.335	0.274	0.609
(20) Relativity to Underlying Present Rate:	0.404	0.538	.
(21) Credibility to Underlying Relativity:	0.180	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.360	0.493	.
(24) Balanced Formula Relativity:	0.357	0.492	0.406

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
9079 RESTAURANT NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	22,084,275	62	3,271	4,291,745	7,038,448	2,200,094	6,495,659	20,025,947	0.513	0.394	0.907
2012	23,145,520	74	3,178	4,589,054	6,162,590	1,839,364	5,486,942	18,077,949	0.465	0.317	0.781
2013	25,532,017	74	3,340	3,499,314	9,224,634	1,462,628	6,831,552	21,018,128	0.498	0.325	0.823
2014	26,315,866	77	3,094	6,133,384	8,409,630	2,128,127	6,649,828	23,320,969	0.553	0.334	0.886
2015	28,527,463	71	2,951	5,619,275	11,991,898	2,835,717	8,701,552	29,148,442	0.617	0.404	1.022
MA Total:	125,605,140	358	15,834	24,132,772	42,827,201	10,465,929	34,165,534	111,591,436	0.533	0.355	0.888

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.637	0.747	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.487	0.353	0.840
(16) Countrywide Indicated Relativity:	0.583	0.739	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	3013.0	.	.
(19) Pure Premium Underlying Present Rate:	0.473	0.366	0.840
(20) Relativity to Underlying Present Rate:	0.571	0.719	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.637	0.747	.
(24) Balanced Formula Relativity:	0.633	0.747	0.674

Class(es):		Effective: 7/1/2018							Goods and Services		
9089 BILLIARD HALL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	4,592	0	1	0	0	0	478	478	0.000	0.104	0.104
2012	4,286	0	1	0	0	0	481	481	0.000	0.112	0.112
2013	5,382	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	3,744	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	5,885	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	23,889	0	2	0	0	0	959	959	0.000	0.040	0.040

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.084	.
(14) Massachusetts Credibility:	0.040	0.070	.
(15) Countrywide Pure Premium:	0.225	0.324	0.549
(16) Countrywide Indicated Relativity:	0.270	0.679	.
(17) Countrywide Credibility:	0.160	0.160	.
(18) Countrywide Lost-Time Claims:	11.000	.	.
(19) Pure Premium Underlying Present Rate:	0.473	0.352	0.824
(20) Relativity to Underlying Present Rate:	0.570	0.691	.
(21) Credibility to Underlying Relativity:	0.800	0.770	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.499	0.646	.
(24) Balanced Formula Relativity:	0.496	0.646	0.550

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Calculation of Class Relativities

Class(es): 9093 BOWLING LANE		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	150,913	1	22	2,271	70,722	6,796	210,485	290,274	0.484	1,440	1,923
2012	154,528	0	19	0	10,117	0	25,634	35,751	0.065	0.166	0.231
2013	167,733	1	20	1,848	17,170	23,400	16,363	58,781	0.113	0.237	0.350
2014	195,554	0	18	0	242,062	0	113,448	355,510	1.238	0.580	1.818
2015	241,530	2	22	37,143	30,250	16,925	39,719	124,037	0.279	0.235	0.514
MA Total:	910,258	4	101	41,262	370,321	47,121	405,649	864,353	0.452	0.497	0.950

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.541	1.045	.
(14) Massachusetts Credibility:	0.190	0.350	.
(15) Countrywide Pure Premium:	0.482	0.386	0.868
(16) Countrywide Indicated Relativity:	0.578	0.808	.
(17) Countrywide Credibility:	0.410	0.330	.
(18) Countrywide Lost-Time Claims:	445.00	.	.
(19) Pure Premium Underlying Present Rate:	0.470	0.469	0.938
(20) Relativity to Underlying Present Rate:	0.567	0.920	.
(21) Credibility to Underlying Relativity:	0.400	0.320	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.566	0.927	.
(24) Balanced Formula Relativity:	0.562	0.927	0.694

Class(es): 9101 COLLEGE: ALL OTHER EMPLOYEES		Effective: 7/1/2018							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	1,476,231	15	565	802,362	1,311,645	462,403	1,150,091	3,726,500	1.432	1.092	2,524
2012	1,420,675	15	588	995,215	1,402,606	708,050	1,260,732	4,366,603	1.688	1.386	3,074
2013	1,486,072	10	503	948,227	903,326	173,194	805,305	2,830,052	1.246	0.658	1,904
2014	1,516,187	7	630	511,951	1,161,696	193,297	1,163,729	3,030,674	1.104	0.895	1,999
2015	1,538,806	11	626	505,516	2,083,055	217,649	1,738,490	4,544,709	1.682	1.271	2,953
MA Total:	7,437,972	58	2,912	3,763,272	6,862,328	1,754,592	6,118,346	18,498,538	1.429	1.058	2,487

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.708	2.225	.
(14) Massachusetts Credibility:	0.660	1.000	.
(15) Countrywide Pure Premium:	1.325	0.892	2.217
(16) Countrywide Indicated Relativity:	1.588	1.866	.
(17) Countrywide Credibility:	0.170	0.000	.
(18) Countrywide Lost-Time Claims:	14511	.	.
(19) Pure Premium Underlying Present Rate:	1.275	0.957	2.232
(20) Relativity to Underlying Present Rate:	1.538	1.878	.
(21) Credibility to Underlying Relativity:	0.170	0.000	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.659	2.225	.
(24) Balanced Formula Relativity:	1.648	2.224	1.857

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Calculation of Class Relativities

Class(es): 9102 PARK NOC- ALL EMPLOYEES & DRIVERS		Effective: 7/1/2018							Miscellaneous		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	172,769	0	23	0	417,072	0	298,195	715,267	2,414	1,726	4,140
2012	188,030	0	24	0	29,174	0	39,693	68,867	0,155	0,211	0,366
2013	190,940	2	29	337,113	144,240	157,103	55,902	694,358	2,521	1,116	3,637
2014	244,451	0	48	0	219,581	0	156,955	376,536	0,898	0,642	1,540
2015	271,167	1	28	168	121,940	2,628	74,092	198,827	0,450	0,283	0,733
MA Total:	1,067,358	3	152	337,281	932,007	159,731	624,837	2,053,856	1,189	0,735	1,924

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.496	0.616	.
(14) Massachusetts Credibility:	0.300	0.460	.
(15) Countrywide Pure Premium:	1.331	0.835	2.165
(16) Countrywide Indicated Relativity:	0.617	0.786	.
(17) Countrywide Credibility:	0.350	0.270	.
(18) Countrywide Lost-Time Claims:	7359.0	.	.
(19) Pure Premium Underlying Present Rate:	1.220	0.819	2.039
(20) Relativity to Underlying Present Rate:	0.500	0.621	.
(21) Credibility to Underlying Relativity:	0.350	0.270	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.540	0.663	.
(24) Balanced Formula Relativity:	0.538	0.668	0.581

Class(es): 9154 THEATER NOC: ALL OTHER EMPLOYEES		Effective: 7/1/2018							Miscellaneous		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	661,207	1	100	110,167	966,596	315,970	412,236	1,804,969	1,628	1,101	2,730
2012	623,367	2	83	196,671	368,621	56,250	272,482	894,025	0,907	0,527	1,434
2013	682,375	0	91	0	204,026	0	224,686	428,713	0,299	0,329	0,628
2014	662,366	1	63	3,449	739,024	2,955	250,655	996,084	1,121	0,383	1,504
2015	658,543	1	60	11,495	251,304	2,668	338,930	604,398	0,399	0,519	0,918
MA Total:	3,287,858	5	397	321,783	2,529,570	377,844	1,498,990	4,728,187	0,867	0,571	1,438

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.362	0.478	.
(14) Massachusetts Credibility:	0.420	0.660	.
(15) Countrywide Pure Premium:	0.610	0.451	1.060
(16) Countrywide Indicated Relativity:	0.283	0.424	.
(17) Countrywide Credibility:	0.290	0.170	.
(18) Countrywide Lost-Time Claims:	1480.0	.	.
(19) Pure Premium Underlying Present Rate:	0.921	0.654	1.576
(20) Relativity to Underlying Present Rate:	0.378	0.496	.
(21) Credibility to Underlying Relativity:	0.290	0.170	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.344	0.472	.
(24) Balanced Formula Relativity:	0.342	0.475	0.386

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Office and Clerical			
9156 THEATER NOC: PLAYERS, ENTERTAINERS OR MUSICIANS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	496,728	0	102	0	477,693	0	254,698	732,391	0.962	0.513	1.474	
2012	300,754	0	77	0	160,063	0	253,898	413,961	0.532	0.844	1.376	
2013	332,188	1	77	5,708	166,096	8,782	202,714	383,300	0.517	0.637	1.154	
2014	349,427	1	78	6,636	146,748	3,174	178,136	334,695	0.439	0.519	0.958	
2015	340,295	0	83	0	239,133	0	232,273	471,406	0.703	0.683	1.385	
MA Total:	1,819,392	2	417	12,344	1,189,734	11,956	1,121,719	2,335,753	0.661	0.623	1.284	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	9.271	14.307	.
(14) Massachusetts Credibility:	0.280	0.480	.
(15) Countrywide Pure Premium:	0.552	0.402	0.954
(16) Countrywide Indicated Relativity:	9.096	10.422	.
(17) Countrywide Credibility:	0.360	0.260	.
(18) Countrywide Lost-Time Claims:	769.00	.	.
(19) Pure Premium Underlying Present Rate:	0.636	0.522	1.158
(20) Relativity to Underlying Present Rate:	8.730	10.815	.
(21) Credibility to Underlying Relativity:	0.360	0.260	.
(22) Industry Group Converted Pure Premium:	0.071	0.044	0.115
(23) Formula Relativity:	9.013	12.389	.
(24) Balanced Formula Relativity:	9.073	12.422	10.344

Class(es):		Effective: 7/1/2018							Miscellaneous			
9178 ATHLETIC TEAM OR PARK: NON-CONTACT SPORTS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	12,877	1	36	56,939	220,567	49,367	174,283	501,155	21,551	17,369	38,920	
2012	16,194	0	36	0	248,385	0	122,578	370,964	15,338	7,569	22,908	
2013	17,177	0	51	0	572,335	0	359,359	931,694	33,321	20,921	54,242	
2014	37,959	0	66	0	0	0	230,431	230,431	0.000	6.071	6.071	
2015	37,411	0	59	0	774	0	161,648	162,422	0.021	4.321	4.342	
MA Total:	121,616	1	248	56,939	1,042,061	49,367	1,048,299	2,196,666	9.037	9.026	18.062	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.768	7.563	.
(14) Massachusetts Credibility:	0.200	0.440	.
(15) Countrywide Pure Premium:	1.412	2.059	3.470
(16) Countrywide Indicated Relativity:	0.655	1.938	.
(17) Countrywide Credibility:	0.400	0.280	.
(18) Countrywide Lost-Time Claims:	629.00	.	.
(19) Pure Premium Underlying Present Rate:	3.849	6.312	10.162
(20) Relativity to Underlying Present Rate:	1.579	4.783	.
(21) Credibility to Underlying Relativity:	0.400	0.280	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	1.647	5.210	.
(24) Balanced Formula Relativity:	1.640	5.246	2.838

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Miscellaneous			
9179 ATHLETIC TEAM OR PARK: CONTACT SPORTS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	28,259	2	56	161,922	1,110,099	5,322	254,797	1,532,140	45,012	9,205	54,217	
2012	28,133	4	62	1,014,709	856,389	83,066	167,436	2,121,601	66,510	8,904	75,415	
2013	29,955	3	104	156,155	372,059	120,699	492,392	1,141,305	17,634	20,467	38,101	
2014	30,667	0	107	0	606,404	0	720,055	1,326,459	19,774	23,480	43,254	
2015	26,083	2	99	146,799	830,774	556,963	792,800	2,327,336	37,479	51,749	89,228	
MA Total:	143,097	11	428	1,479,585	3,775,727	766,049	2,427,479	8,448,841	36,726	22,317	59,043	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	15.314	18.702	.
(14) Massachusetts Credibility:	0.350	0.500	.
(15) Countrywide Pure Premium:	2.312	1.853	4.165
(16) Countrywide Indicated Relativity:	1.073	1.745	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	1259.0	.	.
(19) Pure Premium Underlying Present Rate:	13.568	7.230	20.798
(20) Relativity to Underlying Present Rate:	5.567	5.478	.
(21) Credibility to Underlying Relativity:	0.320	0.250	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	7.495	11.157	.
(24) Balanced Formula Relativity:	7.464	11.233	8.716

Class(es):		Effective: 7/1/2018							Miscellaneous			
9180 AMUSEMENT DEVICE OPERATION NOC-NOT TRAV & DR												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	143,095	0	30	0	30,524	0	117,248	147,772	0.213	0.819	1.033	
2012	156,421	1	41	192,562	62,406	86,410	223,543	564,921	1.630	1.982	3.612	
2013	185,482	0	41	0	145,150	0	255,398	400,548	0.783	1.377	2.159	
2014	175,481	0	34	0	145,948	0	282,641	428,589	0.832	1.611	2.442	
2015	198,348	0	39	0	328,765	0	985,735	1,314,500	1.658	4.970	6.627	
MA Total:	858,826	1	185	192,562	712,793	86,410	1,864,565	2,856,329	1.054	2.272	3.326	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.440	1.904	.
(14) Massachusetts Credibility:	0.300	0.550	.
(15) Countrywide Pure Premium:	2.145	2.250	4.396
(16) Countrywide Indicated Relativity:	0.995	2.119	.
(17) Countrywide Credibility:	0.350	0.230	.
(18) Countrywide Lost-Time Claims:	2060.0	.	.
(19) Pure Premium Underlying Present Rate:	1.593	1.547	3.140
(20) Relativity to Underlying Present Rate:	0.654	1.172	.
(21) Credibility to Underlying Relativity:	0.350	0.220	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.709	1.792	.
(24) Balanced Formula Relativity:	0.706	1.804	1.071

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Miscellaneous		
9182 ATHLETIC TEAM OR PARK: OPERATIONS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	206,857	2	52	25,501	301,934	19,501	78,023	424,959	1,583	0,471	2,054
2012	190,867	3	65	154,133	404,910	36,885	244,650	840,578	2,929	1,475	4,404
2013	247,268	3	83	299,693	734,652	113,640	283,730	1,431,715	4,183	1,607	5,790
2014	297,302	2	54	226,089	305,106	164,822	188,489	884,506	1,787	1,188	2,975
2015	306,206	1	39	15,792	183,973	15,357	179,407	394,529	0,652	0,636	1,288
MA Total:	1,248,501	11	293	721,207	1,930,576	350,205	974,299	3,976,287	2,124	1,061	3,185

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.886	0.889	.
(14) Massachusetts Credibility:	0.320	0.600	.
(15) Countrywide Pure Premium:	0.680	0.553	1.233
(16) Countrywide Indicated Relativity:	0.316	0.520	.
(17) Countrywide Credibility:	0.340	0.200	.
(18) Countrywide Lost-Time Claims:	403.00	.	.
(19) Pure Premium Underlying Present Rate:	1.293	1.336	2.629
(20) Relativity to Underlying Present Rate:	0.530	1.012	.
(21) Credibility to Underlying Relativity:	0.340	0.200	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.571	0.840	.
(24) Balanced Formula Relativity:	0.569	0.846	0.661

Class(es):		Effective: 7/1/2018							Goods and Services		
9220 CEMETERY OPERATION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	186,692	1	32	4,858	12,429	1,802	56,592	75,682	0,093	0,313	0,405
2012	191,140	1	32	159,721	195,928	14,080	150,864	520,592	1,861	0,863	2,724
2013	197,407	0	32	0	48,085	0	60,593	108,678	0,244	0,307	0,551
2014	198,182	1	33	53,120	84,210	35,703	109,609	282,642	0,693	0,733	1,426
2015	192,924	1	28	23,446	314,100	15,086	137,567	490,198	1,750	0,791	2,541
MA Total:	966,345	4	157	241,145	654,751	66,671	515,225	1,477,792	0,927	0,602	1,529

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.108	1.266	.
(14) Massachusetts Credibility:	0.310	0.460	.
(15) Countrywide Pure Premium:	1.977	1.164	3.141
(16) Countrywide Indicated Relativity:	2.369	2.436	.
(17) Countrywide Credibility:	0.350	0.270	.
(18) Countrywide Lost-Time Claims:	656.00	.	.
(19) Pure Premium Underlying Present Rate:	1.551	0.892	2.443
(20) Relativity to Underlying Present Rate:	1.870	1.751	.
(21) Credibility to Underlying Relativity:	0.340	0.270	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.809	1.713	.
(24) Balanced Formula Relativity:	1.797	1.712	1.766

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Calculation of Class Relativities

Class(es): 9402 STREET CLEANING & DRIVERS												Effective: 7/1/2018			Miscellaneous		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	595,841	5	81	421,262	908,463	208,004	408,620	1,946,349	2,232	1,035	3,267						
2012	653,585	6	81	452,039	772,648	157,234	449,246	1,831,167	1,874	0,928	2,802						
2013	757,125	5	65	649,641	712,649	295,187	401,635	2,059,113	1,799	0,920	2,720						
2014	967,331	7	69	180,323	1,674,521	151,488	610,278	2,616,610	1,917	0,787	2,705						
2015	905,865	2	68	188,158	2,142,242	100,004	956,876	3,387,279	2,573	1,167	3,739						
MA Total:	3,879,748	25	364	1,891,424	6,210,523	911,917	2,826,655	11,840,519	2,088	0,964	3,052						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.871	0.808	.
(14) Massachusetts Credibility:	0.660	0.910	.
(15) Countrywide Pure Premium:	2.674	1.276	3.950
(16) Countrywide Indicated Relativity:	1.240	1.201	.
(17) Countrywide Credibility:	0.170	0.050	.
(18) Countrywide Lost-Time Claims:	2169.0	.	.
(19) Pure Premium Underlying Present Rate:	2.450	1.236	3.687
(20) Relativity to Underlying Present Rate:	1.005	0.937	.
(21) Credibility to Underlying Relativity:	0.170	0.040	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	0.956	0.832	.
(24) Balanced Formula Relativity:	0.952	0.838	0.914

Class(es): 9403 GARBAGE, ASHES OR REFUSE COLLECTION & DRIVERS												Effective: 7/1/2018			Miscellaneous		
Converted Unlimited Losses																	
Amount																	
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums									
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)						
2011	1,042,398	14	271	1,598,827	2,939,596	839,448	1,653,280	7,031,151	4,354	2,391	6,745						
2012	970,964	17	209	4,174,720	1,891,037	1,165,466	1,292,598	8,523,821	6,247	2,532	8,779						
2013	1,057,111	17	272	2,508,885	2,879,455	1,080,636	1,397,360	7,866,336	5,097	2,344	7,441						
2014	1,081,497	9	234	1,017,530	3,277,309	204,350	1,588,516	6,087,705	3,971	1,658	5,629						
2015	1,146,854	10	259	1,056,078	5,087,040	593,228	2,458,109	9,194,455	5,356	2,661	8,017						
MA Total:	5,298,825	67	1,245	10,356,040	16,074,437	3,883,129	8,389,863	38,703,468	4,988	2,316	7,304						

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.080	1.941	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.686	1.703	5.389
(16) Countrywide Indicated Relativity:	1.710	1.603	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7860.0	.	.
(19) Pure Premium Underlying Present Rate:	5.099	2.434	7.533
(20) Relativity to Underlying Present Rate:	2.092	1.844	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.398	1.193	3.592
(23) Formula Relativity:	2.080	1.941	.
(24) Balanced Formula Relativity:	2.071	1.954	2.032

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services		
9410 MUNICIPAL, TOWN, COUNTY OR STATE EMP NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	66,918	0	24	0	21,370	0	35,594	56,964	0.319	0.532	0.851
2012	50,749	0	26	0	6,909	0	23,747	30,656	0.136	0.468	0.604
2013	51,775	1	9	218,901	3,323	144,384	3,445	370,052	4.292	2.855	7.147
2014	51,706	1	16	80,000	204,222	7,341	56,457	348,019	5.497	1.234	6.731
2015	50,835	0	24	0	166,699	0	95,410	262,108	3.279	1.877	5.156
MA Total:	271,983	2	99	298,900	402,522	151,724	214,652	1,067,799	2.579	1.347	3.926

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.083	2.831	.
(14) Massachusetts Credibility:	0.170	0.290	.
(15) Countrywide Pure Premium:	1.042	0.510	1.552
(16) Countrywide Indicated Relativity:	1.249	1.067	.
(17) Countrywide Credibility:	0.420	0.360	.
(18) Countrywide Lost-Time Claims:	950.00	.	.
(19) Pure Premium Underlying Present Rate:	1.127	0.992	2.118
(20) Relativity to Underlying Present Rate:	1.359	1.945	.
(21) Credibility to Underlying Relativity:	0.410	0.350	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	1.606	1.886	.
(24) Balanced Formula Relativity:	1.595	1.885	1.700

Class(es):		Effective: 7/1/2018							Manufacturing		
9501 SIGN PAINTING OR LETTERING-INSIDE & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	298,839	3	44	283,073	108,959	198,487	99,495	690,014	1.312	0.997	2.309
2012	301,368	2	29	97,206	114,771	33,728	63,937	309,642	0.703	0.324	1.027
2013	303,750	1	25	58,153	298,011	3,320	258,967	618,451	1.173	0.863	2.036
2014	304,415	0	37	0	63,830	0	89,200	153,030	0.210	0.293	0.503
2015	329,772	1	29	9,847	28,705	14,345	70,292	123,189	0.117	0.257	0.374
MA Total:	1,538,144	7	164	448,279	614,276	249,880	581,891	1,894,326	0.691	0.541	1.232

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.707	1.053	.
(14) Massachusetts Credibility:	0.330	0.510	.
(15) Countrywide Pure Premium:	1.210	0.648	1.858
(16) Countrywide Indicated Relativity:	1.351	1.407	.
(17) Countrywide Credibility:	0.340	0.250	.
(18) Countrywide Lost-Time Claims:	1408.0	.	.
(19) Pure Premium Underlying Present Rate:	1.083	0.710	1.794
(20) Relativity to Underlying Present Rate:	1.149	1.296	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.071	1.200	.
(24) Balanced Formula Relativity:	1.062	1.194	1.108

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Goods and Services			
9519 HOUSEHOLD APPLIANCES-ELECTRICAL-INSTALL, SERV OR REPAIR & DR												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	779,943	14	144	2,055,150	334,749	656,123	379,586	3,425,608	3,064	1,328	4,392	
2012	778,298	5	115	1,143,762	569,255	614,466	445,589	2,773,071	2,201	1,362	3,563	
2013	851,336	9	107	628,913	1,146,163	178,881	537,797	2,491,753	2,085	0,842	2,927	
2014	791,727	4	75	396,761	287,508	162,070	263,795	1,110,134	0,864	0,538	1,402	
2015	924,209	6	74	261,989	667,696	167,116	405,264	1,502,065	1,006	0,619	1,625	
MA Total:	4,125,514	38	515	4,486,574	3,005,371	1,778,656	2,032,032	11,302,632	1,816	0,924	2,740	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.171	1.941	.
(14) Massachusetts Credibility:	0.600	0.900	.
(15) Countrywide Pure Premium:	2.326	0.965	3.291
(16) Countrywide Indicated Relativity:	2.788	2.019	.
(17) Countrywide Credibility:	0.200	0.050	.
(18) Countrywide Lost-Time Claims:	2383.0	.	.
(19) Pure Premium Underlying Present Rate:	1.824	1.109	2.932
(20) Relativity to Underlying Present Rate:	2.199	2.175	.
(21) Credibility to Underlying Relativity:	0.200	0.050	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	2.300	1.957	.
(24) Balanced Formula Relativity:	2.285	1.956	2.166

Class(es):		Effective: 7/1/2018							Manufacturing			
9521 HOUSE FURNISHINGS INSTALLATION-NOC												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2011	236,350	0	16	0	20,196	0	59,134	79,331	0.085	0.250	0.336	
2012	181,933	1	14	5,253	43,719	10,241	219,442	278,655	0.269	1.262	1.532	
2013	208,169	1	14	384,744	30,461	56,352	24,150	495,707	1.995	0.387	2.381	
2014	216,443	1	23	9,597	136,809	6,876	111,834	265,116	0.676	0.548	1.225	
2015	277,420	1	20	193,615	351,647	16,748	179,383	741,393	1.965	0.707	2.672	
MA Total:	1,120,314	4	87	593,209	582,832	90,218	593,942	1,860,202	1.050	0.611	1.660	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.074	1.189	.
(14) Massachusetts Credibility:	0.350	0.480	.
(15) Countrywide Pure Premium:	1.711	0.839	2.550
(16) Countrywide Indicated Relativity:	1.910	1.824	.
(17) Countrywide Credibility:	0.330	0.260	.
(18) Countrywide Lost-Time Claims:	595.00	.	.
(19) Pure Premium Underlying Present Rate:	1.725	0.856	2.581
(20) Relativity to Underlying Present Rate:	1.829	1.561	.
(21) Credibility to Underlying Relativity:	0.320	0.260	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	1.591	1.451	.
(24) Balanced Formula Relativity:	1.578	1.444	1.531

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Calculation of Class Relativities

Class(es): 9522 UPHOLSTERING		Effective: 7/1/2018							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	140,205	0	10	0	33,099	0	26,766	59,865	0.236	0.191	0.427
2012	149,857	0	11	0	200,407	0	53,353	253,760	1.337	0.356	1.693
2013	139,128	0	16	0	142,407	0	81,302	223,709	1.024	0.584	1.608
2014	131,340	2	18	104,455	39,481	9,656	51,677	205,270	1.096	0.467	1.563
2015	145,716	0	13	0	1,761	0	3,785	5,546	0.012	0.026	0.038
MA Total:	706,246	2	68	104,455	417,155	9,656	216,883	748,148	0.739	0.321	1.059

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.755	0.625	.
(14) Massachusetts Credibility:	0.220	0.310	.
(15) Countrywide Pure Premium:	1.016	0.531	1.546
(16) Countrywide Indicated Relativity:	1.134	1.153	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	1691.0	.	.
(19) Pure Premium Underlying Present Rate:	0.905	0.467	1.372
(20) Relativity to Underlying Present Rate:	0.960	0.852	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	0.978	0.514	1.491
(23) Formula Relativity:	0.983	0.887	.
(24) Balanced Formula Relativity:	0.974	0.882	0.943

Class(es): 9533 SCAFFOLDING: SCAFFOLD INST, RPR OR REMOVAL- BUILT UP FROM GROUN		Effective: 7/1/2018							Construction		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	82,523	1	13	1,133	691,826	1,751	265,895	960,605	8.397	3.243	11.640
2012	60,263	0	6	0	354,510	0	225,839	580,349	5.883	3.748	9.630
2013	63,697	1	6	155,756	252,134	364,047	59,484	831,421	6.404	6.649	13.053
2014	56,426	1	4	31,521	178,655	11,894	85,708	307,779	3.725	1.730	5.455
2015	59,667	0	10	0	408,159	0	134,447	542,606	6.841	2.253	9.094
MA Total:	322,577	3	39	188,410	1,885,285	377,692	771,373	3,222,760	6.429	3.562	9.991

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.451	3.015	.
(14) Massachusetts Credibility:	0.400	0.510	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.964	2.447	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	8.514	3.469	11.983
(20) Relativity to Underlying Present Rate:	3.102	2.588	.
(21) Credibility to Underlying Relativity:	0.600	0.490	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	2.842	2.806	.
(24) Balanced Formula Relativity:	2.858	2.809	2.843

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
9534 MOBILE CRANE & HOIST SERV CONTR-NOC-ALL OP -INCL YRD EMP &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	215,120	2	11	572,417	209,983	117,079	158,274	1,057,753	3,637	1,280	4,917
2012	234,662	2	13	688,318	474,797	183,852	197,510	1,544,477	4,957	1,625	6,582
2013	246,747	0	14	0	66,304	0	244,387	310,691	0,269	0,990	1,259
2014	272,846	4	15	1,170,953	423,335	408,843	205,185	2,208,316	5,843	2,250	8,094
2015	319,548	0	5	0	212,234	0	268,744	480,979	0,664	0,841	1,505
MA Total:	1,288,923	8	58	2,431,688	1,386,653	709,775	1,074,100	5,602,216	2,962	1,384	4,346

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.129	1.171	.
(14) Massachusetts Credibility:	0.490	0.720	.
(15) Countrywide Pure Premium:	2.167	0.751	2.919
(16) Countrywide Indicated Relativity:	0.846	0.664	.
(17) Countrywide Credibility:	0.260	0.140	.
(18) Countrywide Lost-Time Claims:	421.00	.	.
(19) Pure Premium Underlying Present Rate:	3.624	2.026	5.650
(20) Relativity to Underlying Present Rate:	1.321	1.511	.
(21) Credibility to Underlying Relativity:	0.250	0.140	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.103	1.148	.
(24) Balanced Formula Relativity:	1.110	1.149	1.122

Class(es):		Effective: 7/1/2018							Construction		
9549 ADVERTISING CO & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	28,307	1	7	345,319	5,092	56,767	14,233	421,410	12,379	2,508	14,887
2012	30,629	2	5	363,557	18,128	37,241	17,763	436,688	12,461	1,796	14,257
2013	30,660	0	8	0	11,951	0	6,436	18,387	0,390	0,210	0,600
2014	14,630	0	1	0	4,278	0	5,144	9,421	0,292	0,352	0,644
2015	15,820	0	2	0	0	0	1,366	1,366	0,000	0,086	0,086
MA Total:	120,046	3	23	708,875	39,449	94,007	44,941	887,272	6,234	1,157	7,391

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.376	0.980	.
(14) Massachusetts Credibility:	0.170	0.220	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.873	0.812	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.507	1.151	3.658
(20) Relativity to Underlying Present Rate:	0.913	0.859	.
(21) Credibility to Underlying Relativity:	0.830	0.780	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.162	0.885	.
(24) Balanced Formula Relativity:	1.169	0.887	1.081

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Section IX - Classification Pricing
 Subsection G - Class Relativities
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Calculation of Class Relativities

Class(es):		Effective: 7/1/2018							Construction		
9552 SIGN MFG-ERECTION, REPAIR OR MAINT & SHOP, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	120,889	0	19	0	287,274	0	140,648	427,922	2,376	1,163	3,540
2012	121,174	2	21	72,846	106,838	168,417	105,232	453,333	1,483	2,258	3,741
2013	129,658	0	23	0	592,618	0	213,920	806,537	4,571	1,650	6,221
2014	165,766	4	26	944,358	67,957	414,849	67,516	1,494,680	6,107	2,910	9,017
2015	170,617	2	23	420,690	301,728	360,149	150,012	1,232,579	4,234	2,990	7,224
MA Total:	708,105	8	112	1,437,894	1,356,414	943,415	677,328	4,415,051	3,946	2,289	6,235

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.504	1.937	.
(14) Massachusetts Credibility:	0.390	0.520	.
(15) Countrywide Pure Premium:	4.818	2.233	7.051
(16) Countrywide Indicated Relativity:	1.881	1.973	.
(17) Countrywide Credibility:	0.140	0.140	.
(18) Countrywide Lost-Time Claims:	8.000	.	.
(19) Pure Premium Underlying Present Rate:	3.725	1.647	5.372
(20) Relativity to Underlying Present Rate:	1.357	1.228	.
(21) Credibility to Underlying Relativity:	0.470	0.340	.
(22) Industry Group Converted Pure Premium:	2.623	1.182	3.805
(23) Formula Relativity:	1.488	1.701	.
(24) Balanced Formula Relativity:	1.497	1.703	1.561

Class(es):		Effective: 7/1/2018							Goods and Services		
9586 BARBER SHOP, BEAUTY PARLOR, HAIR STYLING SALON											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	3,982,126	4	80	113,820	436,933	37,756	198,992	787,501	0.138	0.059	0.198
2012	4,209,145	1	75	164,448	279,165	40,510	120,366	604,489	0.105	0.038	0.144
2013	4,389,682	5	73	53,335	117,906	33,648	130,108	334,997	0.039	0.037	0.076
2014	4,606,937	2	65	517,565	591,928	112,041	257,941	1,479,475	0.241	0.080	0.321
2015	4,843,148	1	82	17,565	732,489	13,130	338,648	1,101,832	0.155	0.073	0.228
MA Total:	22,031,038	13	375	866,733	2,158,421	237,086	1,046,055	4,308,293	0.137	0.058	0.196

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.164	0.122	.
(14) Massachusetts Credibility:	0.470	0.660	.
(15) Countrywide Pure Premium:	0.232	0.130	0.362
(16) Countrywide Indicated Relativity:	0.278	0.273	.
(17) Countrywide Credibility:	0.270	0.170	.
(18) Countrywide Lost-Time Claims:	1953.0	.	.
(19) Pure Premium Underlying Present Rate:	0.184	0.097	0.282
(20) Relativity to Underlying Present Rate:	0.222	0.191	.
(21) Credibility to Underlying Relativity:	0.260	0.170	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.210	0.160	.
(24) Balanced Formula Relativity:	0.209	0.160	0.191

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Section IX - Classification Pricing
 Subsection G - Class Relativities
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Calculation of Class Relativities

Class(es): 9620 FUNERAL DIRECTOR & DRIVERS		Effective: 7/1/2018						Goods and Services			
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2011	615,274	2	16	220,084	43,158	131,278	59,155	453,675	0.428	0.310	0.737
2012	601,352	2	9	102,287	18,401	17,541	41,009	179,238	0.201	0.097	0.298
2013	664,230	2	10	3,533	39,263	13,310	112,000	168,106	0.064	0.189	0.253
2014	673,427	0	16	0	269,039	0	103,869	372,908	0.400	0.154	0.554
2015	673,527	1	12	6,633	106,371	19,694	141,969	274,667	0.168	0.240	0.408
MA Total:	3,227,810	7	63	332,537	476,231	181,823	458,003	1,448,594	0.251	0.198	0.449

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.300	0.417	.
(14) Massachusetts Credibility:	0.280	0.430	.
(15) Countrywide Pure Premium:	0.440	0.259	0.699
(16) Countrywide Indicated Relativity:	0.528	0.542	.
(17) Countrywide Credibility:	0.360	0.290	.
(18) Countrywide Lost-Time Claims:	518.00	.	.
(19) Pure Premium Underlying Present Rate:	0.337	0.223	0.560
(20) Relativity to Underlying Present Rate:	0.406	0.438	.
(21) Credibility to Underlying Relativity:	0.360	0.280	.
(22) Industry Group Converted Pure Premium:	0.836	0.476	1.312
(23) Formula Relativity:	0.420	0.459	.
(24) Balanced Formula Relativity:	0.417	0.459	0.432

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Section IX - Classification Pricing
Subsection H - Industry Group Rate Change and Rate Level Factors
7/1/2018

Section IX - H
Exhibit 1

Calculation of Industry Group Rate Change and Limits

	Industry Group				
	Manufacturing	Construction	Office & Clerical	Goods & Services	Miscellaneous
(1) Industry Group Differential	1.039	0.971	0.988	1.021	0.997
(2) Experience and Benefit Level Change - Overall	-11.1%	-11.1%	-11.1%	-11.1%	-11.1%
(3) Target Rate Change = (1) x [1.000 + (2)] - 1.000	-7.7%	-13.7%	-12.1%	-9.2%	-11.4%
(4) Maximum Rate Change = (3) + 20.0%	12.3%	6.3%	7.9%	10.8%	8.6%
(5) Minimum Rate Change = (3) - 20.0%	-27.7%	-33.7%	-32.1%	-29.2%	-31.4%
(6) Present Average Rate	2.029	5.542	0.165	1.817	5.097
(7) Uncapped Rate Level Factor = [1.000 + (3)] x (6)	1.873	4.782	0.145	1.650	4.516
(8) Capped Rate Level Factor	1.936	4.786	0.147	1.653	4.562

In addition, the WCRIBMA is limiting the increase in average rates for any class to \$15.00 and no average rate shall exceed \$90.00 per \$100.00 of payroll.

Notes:

- (1): Exhibit 2.
- (2): Indicated Rate Change, from Section I-A, Exhibit 1.
- (6): Rates by class consistent with the 07/01/16 stipulation, weighted by five years of exposure.
- (8): Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved.

Calculation of Massachusetts Industry Group Differentials
 Excluding Large Deductibles

Industry Group (1)	Expected Losses (2)	Converted Unlimited Losses (3)	Industry Group Differential = (3) / (2) (4)	Lost-Time Cases (5)	Full Standard for Credibility Lost-Time Cases (6)	Credibility (7)	Credibility Weighted (8)	Balanced Industry Group Differential = (8) / 0.960 (9)
Manufacturing	457,346,341	457,273,768	1.000	10,139	12,000	0.919	0.997	1.039
Construction	1,179,381,704	1,098,463,859	0.931	12,723	12,000	1.000	0.931	0.971
Office & Clerical	449,945,547	426,578,696	0.948	11,071	12,000	0.961	0.949	0.988
Goods & Services	1,123,601,254	1,101,260,450	0.980	30,038	12,000	1.000	0.980	1.021
Miscellaneous	517,231,162	494,437,191	0.956	9,652	12,000	0.897	0.956	0.997
All	3,727,506,008	3,578,013,964	0.960			1.000	0.960	1.000

Notes:

(2): Five Years of Exposure x Pure Premium Underlying Present Rate from Section IX - F.

(3): Section IX - C. Goods and Services includes Per Capita classes.

(7) = $\text{Min} (1.0 , [(5)/(6)]^{0.5})$

(8) = $[(7) \times (4)] + [(1.0 - (7)) \times (4) \text{ Total}]$

(8) Total = $\text{sum} [(2) \times (8)] / (2) \text{ Total}$

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Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
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 Exhibit 1

Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
0005	1.345	1.291	1.326	1.650	2.19
0008	1.314	1.548	1.399	1.650	2.31
0016	2.372	2.224	2.318	1.650	3.83
0034	2.064	2.656	2.278	1.650	3.76
0035	1.180	1.369	1.248	1.650	2.06
0036	2.064	2.656	2.278	1.650	3.76
0042	2.231	2.462	2.315	1.650	3.82
0046	1.070	1.178	1.109	1.650	1.83
0050	0.990	0.884	0.957	4.782	4.58
0079	1.668	2.676	2.033	1.650	3.36
0083	2.024	2.130	2.062	1.650	3.40
0106	2.047	2.943	2.345	4.516	10.59
0113	2.064	2.656	2.278	1.650	3.76
0170	2.064	2.656	2.278	1.650	3.76
0908	105.743	81.318	96.888	1.650	79.94
0909	159.310	280.731	203.332	1.650	167.77
0912	159.310	280.731	203.332	1.650	335.55
0913	105.743	81.318	96.888	1.650	159.89
0917	1.761	1.843	1.791	1.650	2.96
0918	0.389	0.224	0.329	1.650	0.54
1430	2.772	2.177	2.567	1.873	4.81
1438	1.683	1.610	1.658	1.873	3.11
1463	4.666	5.404	4.920	1.873	9.22
1624	0.805	0.906	0.839	4.516	3.79
1655	0.676	0.677	0.676	4.516	3.05
1701	1.477	1.212	1.386	1.873	2.60
1710	0.805	0.906	0.839	4.516	3.79
1747	1.710	1.498	1.637	1.873	3.07
1748	1.367	1.840	1.530	1.873	2.87
1853	0.878	0.520	0.755	1.873	1.41
1924	1.138	1.083	1.119	1.873	2.10
1925	1.867	14.927	6.365	1.873	11.92
2003	1.957	1.861	1.924	1.873	3.60
2014	1.815	1.596	1.740	1.873	3.26
2021	1.230	1.224	1.228	1.873	2.30
2039	1.813	2.076	1.904	1.873	3.57
2041	1.497	1.331	1.440	1.873	2.70
2070	2.121	1.965	2.067	1.873	3.87
2081	1.450	2.124	1.682	1.873	3.15
2089	1.705	1.379	1.592	1.873	2.98
2095	1.903	1.561	1.785	1.873	3.34
2101	1.705	1.379	1.592	1.873	2.98

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Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
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 Exhibit 1

Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
2111	1.092	1.052	1.078	1.873	2.02
2114	1.705	1.379	1.592	1.873	2.98
2115	2.656	2.340	2.547	1.873	4.77
2121	0.619	0.671	0.637	1.873	1.19
2130	0.957	0.814	0.908	1.873	1.70
2131	1.312	1.396	1.341	1.873	2.51
2143	0.968	1.014	0.984	1.873	1.84
2150	2.299	2.317	2.305	1.873	4.32
2156	2.474	2.320	2.421	1.873	4.54
2157	2.065	1.741	1.953	1.873	3.66
2172	1.134	0.727	0.994	1.873	1.86
2211	3.274	3.445	3.333	1.873	6.24
2220	1.226	1.359	1.271	1.873	2.38
2260	3.242	2.670	3.045	1.873	5.70
2288	1.621	1.469	1.569	1.873	2.94
2305	2.270	2.057	2.197	1.873	4.12
2362	0.754	0.975	0.830	1.873	1.56
2380	1.240	1.277	1.253	1.873	2.35
2402	1.166	1.221	1.185	1.873	2.22
2413	1.675	1.902	1.753	1.873	3.28
2416	1.442	1.232	1.370	1.873	2.57
2417	1.574	1.187	1.441	1.873	2.70
2501	1.023	0.942	0.995	1.873	1.86
2503	0.757	0.612	0.707	1.873	1.32
2570	3.326	2.694	3.108	1.873	5.82
2576	0.864	0.957	0.896	1.873	1.68
2585	1.527	1.564	1.540	1.873	2.88
2586	0.900	0.895	0.898	1.873	1.68
2587	2.270	1.898	2.135	1.650	3.52
2623	2.629	2.438	2.563	1.873	4.80
2651	0.791	0.715	0.765	1.873	1.43
2660	0.925	1.081	0.979	1.873	1.83
2683	0.854	1.088	0.934	1.873	1.75
2688	1.190	1.126	1.168	1.873	2.19
2702	2.946	3.073	2.988	4.516	13.49
2710	3.321	4.050	3.572	1.873	6.69
2731	1.554	1.806	1.640	1.873	3.07
2747	3.071	2.822	2.985	1.873	5.59
2790	0.874	0.823	0.856	1.873	1.60
2802	2.069	2.026	2.054	1.873	3.85
2835	0.922	0.990	0.945	1.873	1.77
2836	1.008	0.966	0.993	1.873	1.86

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Section IX - Classification Pricing
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Exhibit 1

Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
2841	1.872	1.610	1.782	1.873	3.34
2883	1.683	1.505	1.622	1.873	3.04
2923	0.875	0.870	0.873	1.873	1.64
2942	0.969	1.013	0.984	1.873	1.84
3018	1.470	1.226	1.386	1.873	2.60
3022	1.830	1.938	1.867	1.873	3.50
3027	2.278	3.583	2.728	1.873	5.11
3028	1.412	1.546	1.458	1.873	2.73
3030	3.185	2.847	3.068	1.873	5.75
3040	2.764	2.091	2.532	1.873	4.74
3041	1.696	2.199	1.869	1.873	3.50
3042	3.265	2.500	3.001	1.873	5.62
3066	1.172	1.289	1.212	1.873	2.27
3076	1.156	1.161	1.158	1.873	2.17
3081	2.428	2.828	2.566	1.873	4.81
3082	2.428	2.828	2.566	1.873	4.81
3085	2.506	2.492	2.501	1.873	4.69
3110	4.573	4.851	4.669	1.873	8.75
3111	0.989	1.059	1.013	1.873	1.90
3113	0.766	0.779	0.771	1.873	1.44
3114	1.295	1.504	1.367	1.873	2.56
3118	1.113	0.641	0.950	1.873	1.78
3119	0.346	0.486	0.394	1.873	0.74
3120	0.819	0.620	0.750	1.873	1.41
3122	1.008	1.208	1.077	1.873	2.02
3127	0.658	0.805	0.709	1.873	1.33
3131	0.754	0.815	0.775	1.873	1.45
3132	1.516	1.731	1.590	1.873	2.98
3145	0.816	0.814	0.815	1.873	1.53
3146	1.082	1.240	1.136	1.873	2.13
3169	1.225	1.616	1.360	1.873	2.55
3179	0.654	0.511	0.605	1.873	1.13
3180	1.460	1.359	1.425	1.873	2.67
3188	1.044	1.023	1.037	1.873	1.94
3200	1.031	1.059	1.040	1.873	1.95
3220	2.250	1.697	2.060	1.873	3.86
3255	1.151	1.105	1.135	1.873	2.13
3257	1.324	1.380	1.343	1.873	2.52
3270	1.044	1.031	1.040	1.873	1.95
3300	1.729	2.129	1.867	1.873	3.50
3315	1.660	1.469	1.594	1.873	2.99
3336	2.009	1.447	1.816	1.873	3.40

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Section IX - Classification Pricing
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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
3365	1.220	1.203	1.214	4.782	5.81
3372	1.075	1.314	1.157	1.873	2.17
3373	2.143	1.620	1.963	1.873	3.68
3381	1.205	1.141	1.183	1.873	2.22
3383	0.880	1.032	0.932	1.873	1.75
3385	0.356	0.363	0.358	1.873	0.67
3400	1.225	1.616	1.360	1.873	2.55
3507	1.413	1.252	1.357	1.873	2.54
3515	1.438	1.634	1.506	1.873	2.82
3558	0.363	0.606	0.446	1.873	0.84
3571	0.437	0.401	0.425	1.873	0.80
3574	0.865	0.822	0.850	1.873	1.59
3612	0.846	0.972	0.890	1.873	1.67
3620	2.044	3.169	2.432	1.873	4.56
3629	0.865	0.822	0.850	1.873	1.59
3632	0.865	0.822	0.850	1.873	1.59
3634	0.771	0.709	0.749	1.873	1.40
3635	1.402	1.441	1.416	1.873	2.65
3638	0.865	0.822	0.850	1.873	1.59
3642	0.617	0.531	0.587	1.873	1.10
3643	0.808	0.751	0.789	1.873	1.48
3647	1.047	0.935	1.009	1.873	1.89
3648	0.640	0.723	0.668	1.873	1.25
3681	0.377	0.328	0.360	1.873	0.67
3685	0.341	0.295	0.325	1.873	0.61
3724	1.084	1.064	1.078	4.782	5.15
3726	1.110	0.748	0.998	4.782	4.77
3807	1.225	1.616	1.360	1.873	2.55
3808	1.393	1.513	1.434	1.873	2.69
3821	2.627	2.739	2.668	1.650	4.40
3826	2.605	3.446	2.895	1.873	5.42
3830	0.865	0.822	0.850	1.873	1.59
3841	0.661	0.728	0.684	1.873	1.28
4000	1.086	0.971	1.048	4.516	4.73
4021	1.904	2.011	1.941	1.873	3.64
4024	1.576	1.466	1.538	1.873	2.88
4034	3.029	3.709	3.263	1.873	6.11
4036	1.288	1.106	1.225	1.873	2.30
4038	1.564	1.314	1.478	1.873	2.77
4053	1.104	1.296	1.170	1.873	2.19
4062	0.860	0.910	0.877	1.873	1.64
4112	0.252	0.233	0.246	1.873	0.46

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
4113	1.104	1.296	1.170	1.873	2.19
4114	1.263	0.952	1.155	1.873	2.16
4130	1.569	1.541	1.560	1.873	2.92
4133	0.873	0.757	0.833	1.873	1.56
4150	0.341	0.301	0.327	1.873	0.61
4239	1.198	1.190	1.195	1.873	2.24
4243	1.709	1.544	1.652	1.873	3.10
4244	1.280	1.089	1.214	1.873	2.27
4250	0.927	1.020	0.959	1.873	1.80
4251	1.288	0.925	1.163	1.873	2.18
4273	1.361	1.308	1.343	1.873	2.52
4279	1.003	1.002	1.003	1.873	1.88
4283	1.063	1.031	1.052	1.873	1.97
4299	0.941	0.983	0.955	1.873	1.79
4304	2.429	2.921	2.599	1.873	4.87
4307	0.792	0.880	0.822	1.873	1.54
4308	1.610	0.396	1.192	1.873	2.23
4351	0.483	0.444	0.470	1.873	0.88
4352	0.807	0.588	0.732	1.873	1.37
4360	0.327	0.290	0.314	1.873	0.59
4361	4.698	5.125	4.860	0.145	0.71
4362	0.338	0.313	0.329	1.650	0.54
4410	1.328	1.403	1.354	1.873	2.54
4432	0.428	0.513	0.457	1.873	0.86
4439	2.206	2.847	2.427	1.873	4.55
4452	1.588	1.449	1.540	1.873	2.89
4459	1.339	1.348	1.342	1.873	2.51
4470	1.133	0.903	1.054	1.873	1.97
4484	0.981	1.097	1.021	1.873	1.91
4493	1.102	1.061	1.088	1.873	2.04
4511	0.186	0.172	0.181	1.650	0.30
4512	0.055	0.063	0.058	1.650	0.10
4557	0.863	0.949	0.893	1.873	1.67
4558	0.663	0.759	0.696	1.873	1.30
4583	1.784	1.398	1.651	1.873	3.09
4611	0.307	0.266	0.293	1.873	0.55
4635	2.434	2.813	2.564	1.873	4.80
4653	0.896	0.757	0.849	1.873	1.59
4665	4.202	4.189	4.197	1.873	7.86
4692	0.318	0.294	0.310	1.873	0.58
4693	0.468	0.459	0.465	1.873	0.87
4720	0.961	1.015	0.979	1.873	1.83

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
4740	0.607	0.594	0.603	1.873	1.13
4741	1.307	0.938	1.180	1.873	2.21
4771	2.745	1.113	2.183	1.873	4.09
4777	1.784	1.398	1.651	1.873	3.09
4825	0.298	0.238	0.277	1.873	0.52
4828	0.567	0.532	0.555	1.873	1.04
4829	0.567	0.532	0.555	1.873	1.04
4902	0.969	1.013	0.984	1.873	1.84
4923	0.327	0.290	0.314	1.873	0.59
5020	0.959	0.754	0.895	4.782	4.28
5022	2.089	1.928	2.039	4.782	9.75
5037	3.821	3.034	3.577	4.782	17.10
5040	5.503	4.186	5.094	4.782	24.36
5057	4.243	5.390	4.599	4.782	21.99
5059	3.398	3.854	3.540	4.782	16.93
5102	1.410	1.052	1.299	4.782	6.21
5146	1.488	1.389	1.457	4.782	6.97
5160	0.600	0.546	0.584	4.782	2.79
5183	0.634	0.594	0.622	4.782	2.97
5188	0.962	0.818	0.917	4.782	4.39
5190	0.440	0.505	0.460	4.782	2.20
5191	0.501	0.437	0.478	1.650	0.79
5192	1.759	1.651	1.720	1.650	2.84
5213	2.685	2.232	2.544	4.782	12.17
5215	0.979	0.782	0.918	4.782	4.39
5221	1.564	1.304	1.484	4.782	7.09
5222	1.979	1.478	1.823	4.782	8.72
5223	0.857	0.956	0.888	4.782	4.25
5348	0.959	0.706	0.881	4.782	4.21
5402	1.059	1.338	1.146	4.782	5.48
5403	1.705	1.434	1.621	4.782	7.75
5437	0.984	0.882	0.952	4.782	4.55
5443	0.679	0.705	0.687	4.782	3.28
5445	1.383	1.086	1.291	4.782	6.17
5462	1.397	1.122	1.312	4.782	6.27
5472	1.965	1.620	1.858	4.782	8.88
5473	2.344	2.730	2.464	4.782	11.78
5474	0.874	0.965	0.902	4.782	4.31
5478	0.963	0.714	0.886	4.782	4.24
5479	1.481	1.443	1.469	4.782	7.02
5480	0.903	0.752	0.856	4.782	4.09
5506	1.122	1.066	1.105	4.782	5.28

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
5507	1.174	1.217	1.188	4.782	5.68
5508	0.990	0.884	0.957	4.782	4.58
5509	0.777	1.069	0.868	4.782	4.15
5538	0.805	0.819	0.810	4.782	3.87
5545	6.641	9.649	7.575	4.782	36.22
5547	2.120	3.111	2.428	4.782	11.61
5606	0.301	0.335	0.312	4.782	1.49
5610	1.341	0.893	1.202	4.782	5.75
5645	1.405	1.733	1.507	4.782	7.21
5701	4.002	6.152	4.669	4.782	22.33
5703	2.455	2.198	2.375	4.782	11.36
5705	2.730	2.770	2.743	4.782	13.12
6003	2.043	1.710	1.940	4.782	9.28
6005	0.990	0.884	0.957	4.782	4.58
6204	1.295	1.119	1.241	4.782	5.93
6217	0.853	0.861	0.855	4.782	4.09
6229	0.825	0.747	0.801	4.782	3.83
6233	0.588	0.436	0.541	4.782	2.58
6251	1.283	0.721	1.108	4.782	5.30
6252	1.821	1.633	1.762	4.782	8.43
6306	1.780	1.589	1.721	4.782	8.23
6319	0.732	0.804	0.754	4.782	3.61
6325	0.748	0.670	0.724	4.782	3.46
6400	0.986	1.031	1.000	4.782	4.78
6504	1.705	1.379	1.592	1.873	2.98
6834	0.467	0.558	0.497	4.516	2.25
6836	0.790	1.090	0.890	4.516	4.02
7219	2.070	1.738	1.960	4.516	8.85
7230	2.161	2.134	2.152	4.516	9.72
7231	2.415	2.324	2.384	4.516	10.77
7360	0.988	1.070	1.015	4.516	4.58
7370	0.654	0.886	0.731	4.516	3.30
7380	1.405	1.357	1.389	4.516	6.27
7382	0.756	0.847	0.786	4.516	3.55
7403	1.017	1.187	1.073	4.516	4.85
7405	0.265	0.242	0.257	4.516	1.16
7420	1.801	0.842	1.482	4.516	6.69
7421	0.305	0.227	0.279	4.516	1.26
7422	0.305	0.227	0.279	4.516	1.26
7425	0.645	0.343	0.544	4.516	2.46
7431	0.305	0.227	0.279	4.516	1.26
7502	0.365	0.367	0.366	4.516	1.65

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
7515	0.457	1.128	0.680	4.516	3.07
7520	0.649	0.637	0.645	4.516	2.91
7538	1.286	1.305	1.292	4.782	6.18
7539	0.265	0.259	0.263	4.516	1.19
7580	0.735	0.702	0.724	4.516	3.27
7590	0.825	0.792	0.814	4.516	3.68
7600	0.739	0.594	0.691	4.516	3.12
7601	1.316	1.675	1.428	4.782	6.83
7610	3.916	2.453	3.361	0.145	0.49
7704	0.868	1.104	0.946	4.516	4.27
7720	0.307	0.326	0.313	4.516	1.41
7855	0.936	0.820	0.900	4.782	4.30
8001	0.996	1.285	1.101	1.650	1.82
8002	0.789	1.039	0.880	1.650	1.45
8006	0.697	0.883	0.764	1.650	1.26
8008	0.451	0.480	0.462	1.650	0.76
8010	0.899	1.102	0.973	1.650	1.61
8013	0.206	0.207	0.206	1.650	0.34
8017	0.548	0.625	0.576	1.650	0.95
8018	2.010	1.796	1.933	1.650	3.19
8021	2.028	1.706	1.911	1.650	3.15
8031	1.159	1.042	1.116	1.650	1.84
8032	0.851	0.757	0.817	1.650	1.35
8033	0.984	1.128	1.036	1.650	1.71
8034	2.215	1.847	2.081	1.650	3.43
8039	0.638	0.863	0.720	1.650	1.19
8044	1.799	1.802	1.800	1.650	2.97
8046	1.061	1.177	1.103	1.650	1.82
8048	1.769	1.435	1.648	1.650	2.72
8058	1.300	1.641	1.424	1.650	2.35
8103	1.755	1.678	1.727	1.650	2.85
8105	7.906	5.959	7.200	1.650	11.88
8106	3.528	3.600	3.554	1.650	5.87
8107	1.545	1.629	1.575	1.650	2.60
8111	1.577	1.711	1.626	1.650	2.68
8203	3.639	3.483	3.583	1.650	5.91
8204	2.397	3.926	2.951	1.650	4.87
8215	2.084	2.345	2.179	1.650	3.60
8227	0.997	1.064	1.017	4.782	4.87
8232	3.826	3.740	3.795	1.650	6.26
8233	4.021	3.800	3.940	1.650	6.50
8235	2.597	2.343	2.505	1.650	4.13

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
8263	2.175	2.809	2.404	1.650	3.97
8264	2.974	3.053	3.003	1.650	4.96
8265	4.021	3.800	3.940	1.650	6.50
8279	2.639	2.904	2.735	1.650	4.51
8291	2.155	2.164	2.158	1.650	3.56
8292	2.014	1.953	1.992	1.650	3.29
8293	5.120	4.957	5.061	1.650	8.35
8350	3.667	3.366	3.558	1.650	5.87
8380	1.648	1.574	1.621	1.650	2.68
8381	0.982	1.278	1.089	1.650	1.80
8385	1.639	1.727	1.671	1.650	2.76
8392	0.810	0.990	0.875	1.650	1.44
8393	1.138	0.832	1.027	1.650	1.69
8500	4.021	3.800	3.940	1.650	6.50
8601	1.549	1.519	1.538	0.145	0.22
8710	2.687	2.108	2.477	1.650	4.09
8719	2.687	2.108	2.477	1.650	4.09
8720	0.570	0.502	0.545	1.650	0.90
8721	2.338	3.982	2.961	0.145	0.43
8742	0.848	0.892	0.865	0.145	0.13
8745	3.552	5.273	4.176	1.650	6.89
8747	0.574	0.419	0.518	1.650	0.85
8748	4.763	4.260	4.572	0.145	0.66
8800	7.942	6.626	7.443	0.145	1.08
8803	0.295	0.284	0.291	0.145	0.04
8810	0.484	0.472	0.479	0.145	0.07
8820	0.593	0.543	0.574	0.145	0.08
8829	1.330	1.172	1.273	1.650	2.10
8831	0.424	0.852	0.579	1.650	0.96
8832	1.993	1.841	1.936	0.145	0.28
8833	8.632	7.077	8.042	0.145	1.17
8835	1.337	1.035	1.227	1.650	2.03
8868	4.573	5.366	4.874	0.145	0.71
8901	0.484	0.472	0.479	0.145	0.07
9014	1.517	1.294	1.436	1.650	2.37
9015	1.910	1.844	1.886	1.650	3.11
9016	1.059	1.704	1.293	1.650	2.13
9019	0.644	0.508	0.599	4.516	2.70
9033	1.892	1.667	1.810	1.650	2.99
9040	1.758	1.925	1.819	1.650	3.00
9052	1.003	0.907	0.968	1.650	1.60
9058	0.906	0.889	0.900	1.650	1.48

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Section IX - I
Exhibit 1

Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
9060	0.536	0.714	0.600	1.650	0.99
9061	0.552	0.648	0.587	1.650	0.97
9063	0.357	0.492	0.406	1.650	0.67
9079	0.633	0.747	0.674	1.650	1.11
9089	0.496	0.646	0.550	1.650	0.91
9093	0.562	0.927	0.694	1.650	1.15
9101	1.648	2.224	1.857	1.650	3.06
9102	0.538	0.668	0.581	4.516	2.62
9154	0.342	0.475	0.386	4.516	1.74
9156	9.073	12.422	10.344	0.145	1.50
9178	1.640	5.246	2.838	4.516	12.82
9179	7.464	11.233	8.716	4.516	39.36
9180	0.706	1.804	1.071	4.516	4.84
9182	0.569	0.846	0.661	4.516	2.98
9186	0.706	1.804	1.071	4.516	4.84
9220	1.797	1.712	1.766	1.650	2.91
9402	0.952	0.838	0.914	4.516	4.13
9403	2.071	1.954	2.032	4.516	9.18
9410	1.595	1.885	1.700	1.650	2.81
9501	1.062	1.194	1.108	1.873	2.07
9505	1.062	1.194	1.108	1.873	2.07
9519	2.285	1.956	2.166	1.650	3.57
9521	1.578	1.444	1.531	1.873	2.87
9522	0.974	0.882	0.943	1.873	1.77
9533	2.858	2.809	2.843	4.782	13.59
9534	1.110	1.149	1.122	4.782	5.37
9549	1.169	0.887	1.081	4.782	5.17
9552	1.497	1.703	1.561	4.782	7.46
9586	0.209	0.160	0.191	1.650	0.31
9620	0.417	0.459	0.432	1.650	0.71

Notes:

(2), (3), (4): Section IX - G.

(5): Section IX - H, Exhibit 1.

(6) = (4) x (5)

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Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2018

Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
0005	2.56	2.19	2.19
0008	2.54	2.31	2.31
0016	4.54	3.83	3.83
0034	4.53	3.76	3.77
0035	2.41	2.06	2.06
0036	4.53	3.76	3.77
0042	4.30	3.82	3.83
0046	2.32	1.83	1.83
0050	6.57	4.58	4.58
0079	3.16	3.36	3.36
0083	4.61	3.40	3.41
0106	14.33	10.59	10.70
0113	4.53	3.76	3.77
0170	4.53	3.76	3.77
0908	90.06	79.94	80.07
0909	166.70	167.77	168.04
0912	333.39	335.55	336.08
0913	180.12	159.89	160.14
0917	3.42	2.96	2.96
0918	0.61	0.54	0.54
1430	9.15	4.81	6.62
1438	3.39	3.11	3.21
1463	9.45	9.22	9.53
1624	4.87	3.79	3.83
1655	4.96	3.05	3.40
1701	3.78	2.60	2.74
1710	4.87	3.79	3.83
1747	3.17	3.07	3.17
1748	3.36	2.87	2.96
1853	1.67	1.41	1.46
1924	2.05	2.10	2.17
1925	4.61	11.92	5.18
2003	3.60	3.60	3.73
2014	3.66	3.26	3.37
2021	2.92	2.30	2.38
2039	2.96	3.57	3.32
2041	2.71	2.70	2.79
2070	4.28	3.87	4.00
2081	4.13	3.15	3.26
2089	2.65	2.98	2.98
2095	3.62	3.34	3.46
2101	2.65	2.98	2.98
2111	2.27	2.02	2.09
2114	2.65	2.98	2.98
2115	4.04	4.77	4.54
2121	1.68	1.19	1.23
2130	2.10	1.70	1.76
2131	2.46	2.51	2.60

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Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
2143	2.41	1.84	1.90
2150	5.31	4.32	4.46
2156	6.16	4.54	4.69
2157	4.46	3.66	3.78
2172	2.19	1.86	1.92
2211	6.68	6.24	6.45
2220	2.92	2.38	2.46
2260	7.10	5.70	5.90
2288	2.83	2.94	3.04
2305	2.63	4.12	2.96
2362	1.85	1.56	1.61
2380	2.53	2.35	2.42
2402	2.39	2.22	2.29
2413	3.71	3.28	3.39
2416	2.66	2.57	2.65
2417	3.75	2.70	2.79
2501	2.13	1.86	1.93
2503	1.15	1.32	1.30
2570	5.19	5.82	5.83
2576	2.52	1.68	1.82
2585	3.40	2.88	2.98
2586	1.73	1.68	1.74
2587	3.33	3.52	3.53
2623	4.57	4.80	4.96
2651	1.91	1.43	1.48
2660	1.82	1.83	1.90
2683	1.74	1.75	1.81
2688	2.51	2.19	2.26
2702	16.34	13.49	13.63
2710	7.24	6.69	6.91
2731	3.66	3.07	3.18
2747	6.04	5.59	5.78
2790	1.80	1.60	1.66
2802	4.65	3.85	3.98
2835	1.99	1.77	1.83
2836	2.50	1.86	1.92
2841	3.90	3.34	3.45
2883	3.25	3.04	3.14
2923	1.62	1.64	1.69
2942	1.85	1.84	1.91
3018	3.58	2.60	2.68
3022	3.64	3.50	3.62
3027	4.92	5.11	5.28
3028	3.38	2.73	2.82
3030	6.48	5.75	5.94
3040	6.29	4.74	4.90
3041	4.98	3.50	3.62
3042	6.12	5.62	5.81

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Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
3066	2.99	2.27	2.35
3076	2.42	2.17	2.24
3081	6.42	4.81	4.97
3082	6.42	4.81	4.97
3085	4.62	4.69	4.84
3110	8.63	8.75	9.04
3111	2.25	1.90	1.96
3113	1.71	1.44	1.49
3114	2.82	2.56	2.65
3118	1.71	1.78	1.84
3119	0.86	0.74	0.76
3120	1.55	1.41	1.45
3122	2.04	2.02	2.09
3127	0.94	1.33	1.06
3131	1.67	1.45	1.50
3132	3.54	2.98	3.08
3145	1.64	1.53	1.58
3146	1.85	2.13	2.08
3169	3.38	2.55	2.63
3179	1.32	1.13	1.17
3180	2.78	2.67	2.76
3188	2.67	1.94	2.01
3200	2.49	1.95	2.01
3220	2.66	3.86	2.99
3255	2.71	2.13	2.20
3257	2.72	2.52	2.60
3270	2.15	1.95	2.01
3300	5.55	3.50	4.01
3315	3.50	2.99	3.09
3336	3.81	3.40	3.52
3365	7.81	5.81	5.81
3372	2.51	2.17	2.24
3373	3.72	3.68	3.80
3381	2.68	2.22	2.29
3383	1.48	1.75	1.66
3385	0.80	0.67	0.69
3400	3.38	2.55	2.63
3507	2.91	2.54	2.63
3515	2.72	2.82	2.91
3558	0.83	0.84	0.86
3571	0.97	0.80	0.82
3574	1.73	1.59	1.65
3612	1.99	1.67	1.72
3620	5.63	4.56	4.71
3629	1.73	1.59	1.65
3632	1.73	1.59	1.65
3634	1.70	1.40	1.45
3635	3.05	2.65	2.74

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Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
3638	1.73	1.59	1.65
3642	1.13	1.10	1.14
3643	1.67	1.48	1.53
3647	2.20	1.89	1.95
3648	1.40	1.25	1.29
3681	0.86	0.67	0.70
3685	0.67	0.61	0.63
3724	5.02	5.15	5.16
3726	12.45	4.77	8.25
3807	3.38	2.55	2.63
3808	3.07	2.69	2.78
3821	4.23	4.40	4.41
3826	3.24	5.42	3.63
3830	1.73	1.59	1.65
3841	1.43	1.28	1.32
4000	4.52	4.73	4.78
4021	4.06	3.64	3.76
4024	3.07	2.88	2.98
4034	6.24	6.11	6.32
4036	2.36	2.30	2.37
4038	2.58	2.77	2.86
4053	1.88	2.19	2.11
4062	2.37	1.64	1.71
4112	0.67	0.46	0.49
4113	1.88	2.19	2.11
4114	2.21	2.16	2.24
4130	3.99	2.92	3.02
4133	1.79	1.56	1.61
4150	0.80	0.61	0.63
4239	2.70	2.24	2.31
4243	3.71	3.10	3.20
4244	3.03	2.27	2.35
4250	2.28	1.80	1.86
4251	2.09	2.18	2.25
4273	2.45	2.52	2.60
4279	2.89	1.88	2.09
4283	2.34	1.97	2.04
4299	1.96	1.79	1.85
4304	4.20	4.87	4.71
4307	1.72	1.54	1.59
4308	1.27	2.23	1.43
4351	0.86	0.88	0.91
4352	1.20	1.37	1.35
4360	1.04	0.59	0.75
4361	0.65	0.71	0.70
4362	0.63	0.54	0.54
4410	3.61	2.54	2.62
4432	1.09	0.86	0.89

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Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
4439	3.27	4.55	3.67
4452	3.53	2.89	2.98
4459	2.87	2.51	2.60
4470	2.28	1.97	2.04
4484	2.20	1.91	1.98
4493	2.64	2.04	2.11
4511	0.29	0.30	0.30
4512	0.12	0.10	0.10
4557	1.98	1.67	1.73
4558	1.42	1.30	1.35
4583	3.53	3.09	3.20
4611	1.26	0.55	0.91
4635	4.03	4.80	4.53
4653	2.49	1.59	1.80
4665	6.79	7.86	7.63
4692	0.65	0.58	0.60
4693	0.97	0.87	0.90
4720	1.95	1.83	1.90
4740	1.21	1.13	1.17
4741	2.65	2.21	2.28
4771	9.08	4.09	6.57
4777	3.53	3.09	3.20
4825	0.71	0.52	0.54
4828	1.01	1.04	1.07
4829	1.01	1.04	1.07
4902	1.85	1.84	1.91
4923	1.04	0.59	0.75
5020	5.04	4.28	4.28
5022	9.77	9.75	9.76
5037	22.83	17.10	17.12
5040	33.63	24.36	24.38
5057	26.64	21.99	22.01
5059	16.98	16.93	16.94
5102	6.17	6.21	6.21
5146	6.43	6.97	6.83
5160	3.40	2.79	2.79
5183	3.47	2.97	2.98
5188	4.98	4.39	4.39
5190	2.63	2.20	2.20
5191	0.96	0.79	0.79
5192	3.30	2.84	2.84
5213	15.57	12.17	12.18
5215	5.69	4.39	4.39
5221	6.82	7.09	7.10
5222	10.48	8.72	8.73
5223	4.33	4.25	4.25
5348	5.16	4.21	4.22
5402	9.28	5.48	6.15

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Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
5403	11.08	7.75	7.76
5437	5.56	4.55	4.56
5443	4.25	3.28	3.29
5445	6.95	6.17	6.18
5462	7.75	6.27	6.28
5472	9.33	8.88	8.89
5473	10.32	11.78	10.97
5474	5.70	4.31	4.32
5478	5.63	4.24	4.24
5479	8.96	7.02	7.03
5480	4.67	4.09	4.10
5506	6.90	5.28	5.29
5507	7.70	5.68	5.68
5508	6.57	4.58	4.58
5509	3.74	4.15	3.97
5538	4.61	3.87	3.88
5545	37.31	36.22	36.25
5547	13.78	11.61	11.62
5606	1.88	1.49	1.49
5610	6.53	5.75	5.75
5645	8.17	7.21	7.21
5701	25.57	22.33	22.35
5703	21.57	11.36	14.30
5705	12.15	13.12	12.92
6003	10.53	9.28	9.28
6005	6.57	4.58	4.58
6204	7.84	5.93	5.94
6217	4.56	4.09	4.09
6229	4.59	3.83	3.83
6233	4.26	2.58	2.82
6251	6.39	5.30	5.30
6252	9.42	8.43	8.44
6306	9.16	8.23	8.24
6319	4.51	3.61	3.61
6325	4.82	3.46	3.46
6400	6.04	4.78	4.79
6504	2.65	2.98	2.98
6834	2.61	2.25	2.27
6836	3.26	4.02	3.54
7219	10.27	8.85	8.94
7230	8.37	9.72	9.09
7231	8.49	10.77	9.23
7360	5.87	4.58	4.63
7370	4.26	3.30	3.34
7380	6.39	6.27	6.34
7382	3.91	3.55	3.59
7403	5.52	4.85	4.90
7405	1.58	1.16	1.17

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Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
7420	7.87	6.69	6.76
7421	1.87	1.26	1.28
7422	1.87	1.26	1.28
7425	3.20	2.46	2.48
7431	1.87	1.26	1.28
7502	3.12	1.65	2.14
7515	2.28	3.07	2.48
7520	3.32	2.91	2.94
7538	6.04	6.18	6.18
7539	1.35	1.19	1.20
7580	3.31	3.27	3.30
7590	5.16	3.68	3.71
7600	4.17	3.12	3.15
7601	5.42	6.83	5.76
7610	0.25	0.49	0.26
7704	2.42	4.27	2.63
7720	1.80	1.41	1.43
7855	5.21	4.30	4.31
8001	1.95	1.82	1.82
8002	1.85	1.45	1.45
8006	1.50	1.26	1.26
8008	0.85	0.76	0.76
8010	1.49	1.61	1.61
8013	0.43	0.34	0.34
8017	1.12	0.95	0.95
8018	3.17	3.19	3.19
8021	3.11	3.15	3.16
8031	2.23	1.84	1.85
8032	1.62	1.35	1.35
8033	2.03	1.71	1.71
8034	3.40	3.43	3.44
8039	1.32	1.19	1.19
8044	4.16	2.97	2.97
8046	2.15	1.82	1.82
8048	2.84	2.72	2.72
8058	2.56	2.35	2.35
8103	2.83	2.85	2.85
8105	5.45	11.88	6.04
8106	6.60	5.87	5.87
8107	3.25	2.60	2.60
8111	2.78	2.68	2.69
8203	6.71	5.91	5.92
8204	4.44	4.87	4.88
8215	3.95	3.60	3.60
8227	4.73	4.87	4.87
8232	5.81	6.26	6.27
8233	7.17	6.50	6.51
8235	4.54	4.13	4.14

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Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
8263	5.69	3.97	4.03
8264	6.04	4.96	4.96
8265	7.17	6.50	6.51
8279	5.81	4.51	4.52
8291	4.36	3.56	3.57
8292	3.15	3.29	3.29
8293	9.92	8.35	8.36
8350	5.99	5.87	5.88
8380	3.23	2.68	2.68
8381	2.04	1.80	1.80
8385	2.80	2.76	2.76
8392	1.66	1.44	1.45
8393	2.30	1.69	1.70
8500	7.17	6.50	6.51
8601	0.29	0.22	0.23
8710	2.93	4.09	3.24
8719	2.93	4.09	3.24
8720	0.94	0.90	0.90
8721	0.23	0.43	0.24
8742	0.17	0.13	0.13
8745	4.41	6.89	4.88
8747	1.00	0.85	0.86
8748	0.61	0.66	0.65
8800	1.02	1.08	1.09
8803	0.04	0.04	0.04
8810	0.08	0.07	0.07
8820	0.10	0.08	0.08
8829	2.17	2.10	2.10
8831	1.02	0.96	0.96
8832	0.29	0.28	0.28
8833	1.39	1.17	1.18
8835	2.13	2.03	2.03
8868	0.83	0.71	0.72
8901	0.08	0.07	0.07
9014	3.03	2.37	2.37
9015	3.34	3.11	3.12
9016	2.12	2.13	2.14
9019	2.96	2.70	2.73
9033	3.81	2.99	2.99
9040	3.20	3.00	3.01
9052	1.89	1.60	1.60
9058	1.58	1.48	1.49
9060	1.01	0.99	0.99
9061	0.98	0.97	0.97
9063	0.83	0.67	0.67
9079	1.15	1.11	1.11
9089	1.13	0.91	0.91
9093	1.28	1.15	1.15

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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
9101	3.05	3.06	3.07
9102	2.79	2.62	2.65
9154	1.61	1.74	1.75
9156	1.48	1.50	1.52
9178	14.43	12.82	12.95
9179	28.46	39.36	30.91
9180	4.31	4.84	4.68
9182	3.61	2.98	3.01
9186	4.31	4.84	4.68
9220	3.33	2.91	2.92
9402	5.04	4.13	4.17
9403	10.30	9.18	9.27
9410	2.61	2.81	2.81
9501	2.49	2.07	2.14
9505	2.49	2.07	2.14
9519	3.39	3.57	3.58
9521	3.58	2.87	2.96
9522	1.90	1.77	1.82
9533	16.89	13.59	13.61
9534	6.75	5.37	5.37
9549	4.97	5.17	5.17
9552	7.30	7.46	7.47
9586	0.39	0.31	0.32
9620	0.76	0.71	0.71

Notes:

(2) = (4) from Section IX - J, Exhibit 1 of the 07/01/2016 stipulation.

(3): Section IX - I.

(4): Total Balanced Formula Relativity (from Section IX - I, Exhibit 1) x Capped Rate Level Factors and subject to maximum and minimum caps (from Section IX - H, Exhibit 1.)

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Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2018

Section IX - J
Exhibit 2

Summary of Proposed Premium Change All Industry Groups

Industry Group (1)	Present Premium (2)	Proposed Premium (3)	Proposed Change (4)	Target Change (5)	Capped Rate Level Factor (6)
Manufacturing	622,202,559	574,462,004	-7.7%	-7.7%	1.936
Construction	1,599,999,112	1,380,556,150	-13.7%	-13.7%	4.786
Office & Clerical	614,575,666	540,046,518	-12.1%	-12.1%	0.147
Goods & Services	1,535,250,460	1,393,991,588	-9.2%	-9.2%	1.653
Miscellaneous	701,745,124	621,719,968	-11.4%	-11.4%	4.562
All Groups	5,073,772,921	4,510,776,228	-11.1%		

Notes:

(2) = Exposure x Present Average Rates from Exhibit 1.

(3) = Exposure x Proposed Average Capped Rates from Exhibit 1.

(4) = [(3) - (2)] / (2)

(5): Section IX - H, Exhibit 1.

(6): Section IX - H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved.

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Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
7/1/2018

Section IX - K
Exhibit 1

Calculation of Proposed Manual Rates

The proposed manual rates in Section IX - A, Exhibit 1 are derived from the proposed average capped rates in Section IX - J, Exhibit 1 as follows:

Proposed Manual Rate = [Proposed Average Rate / (Factor 1 x Factor 2 x Factor 3)] x [1.000 / (1.000 - Factor 4)]

(1)	Factor 1 =	0.997	The offset for Merit Rating and Average Experience Modification
(2)	Factor 2 =	1.051	The offset for ARAP
(3)	Factor 3 =	0.967	For eligible classes, the offset for the Construction Classification Premium Adjustment Program
(4)	Factor 4 =	0.0026	The loading from the filing of recoupment of amounts paid to the Insolvency Fund

Notes:

- (1): Exhibit 2.
- (2): Exhibit 3.
- (3): Exhibit 4.
- (4): Exhibit 5, Page 1.

Offset for Experience & Merit Rating

Policy Year (1)	Age (2)	Rating Category (3)	Number of Policies (4)	% of Policies = (4) / Total (4) (5)	Manual Premium (6)	% of Manual = (6) / Total (6) (7)	Standard Premium (8)	Historical Average Mod = (8) / (6) (9)	Selected Average Mod (10)
2011	66	Non Rated	78,335	41%	18,891,236	2%	18,889,669	1.000	
		Merit Rated	75,668	40%	139,448,780	15%	136,679,175	0.980	
		Intrastate Rated	18,304	10%	406,497,233	44%	423,653,133	1.042	
		Interstate Rated	17,200	9%	352,945,157	38%	338,854,742	0.960	
		Total	189,507	100%	917,782,406	100%	918,076,719	1.000	
2012	54	Non Rated	85,059	43%	20,271,268	2%	20,269,341	1.000	
		Merit Rated	76,929	39%	142,893,092	15%	139,931,353	0.979	
		Intrastate Rated	18,667	9%	414,314,281	44%	427,747,711	1.032	
		Interstate Rated	18,051	9%	369,046,123	39%	350,009,695	0.948	
		Total	198,706	100%	946,524,764	100%	937,958,100	0.991	
2013	42	Non Rated	88,376	43%	21,040,727	2%	21,038,717	1.000	
		Merit Rated	78,749	38%	147,049,718	15%	143,930,935	0.979	
		Intrastate Rated	19,619	10%	435,291,294	43%	447,448,304	1.028	
		Interstate Rated	19,008	9%	401,989,880	40%	373,179,338	0.928	
		Total	205,752	100%	1,005,371,619	100%	985,597,294	0.980	
2014	30	Non Rated	93,282	44%	22,202,167	2%	22,196,243	1.000	
		Merit Rated	79,860	37%	150,997,827	14%	147,589,899	0.977	
		Intrastate Rated	20,625	10%	466,559,867	43%	470,582,834	1.009	
		Interstate Rated	20,316	9%	439,421,335	41%	402,888,301	0.917	
		Total	214,083	100%	1,079,181,196	100%	1,043,257,277	0.967	
2015	18	Non Rated	97,395	44%	23,286,534	2%	23,278,507	1.000	
		Merit Rated	80,344	36%	155,146,815	13%	151,653,905	0.977	
		Intrastate Rated	22,331	10%	500,135,203	43%	499,608,387	0.999	
		Interstate Rated	21,634	10%	476,527,776	41%	437,257,779	0.918	
		Total	221,704	100%	1,155,096,328	100%	1,111,798,578	0.963	
Total		Non Rated	442,447	43%	105,691,932	2%	105,672,477	1.000	1.000
		Merit Rated	391,550	38%	735,536,232	14%	719,785,267	0.979	0.979
		Intrastate Rated	99,546	10%	2,222,797,878	44%	2,269,040,369	1.021	1.000
		Interstate Rated	96,209	9%	2,039,930,271	40%	1,902,189,855	0.932	1.000
		Total	1,029,752	100%	5,103,956,313	100%	4,996,687,968	0.979	0.997

Notes:

Unit Statistical Plan data, excluding Large Deductibles and SIGs.

Non Rated, Merit Rated and Intrastate Rated categories are estimated based on manual premium.

(10): Set to 1.000 for Non Rated and Interstate Rated and Intrastate Rated.

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Section IX - Classification Pricing
 Subsection K - Adjustments to Derive Final Manual Rates
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Section IX - K
 Exhibit 3

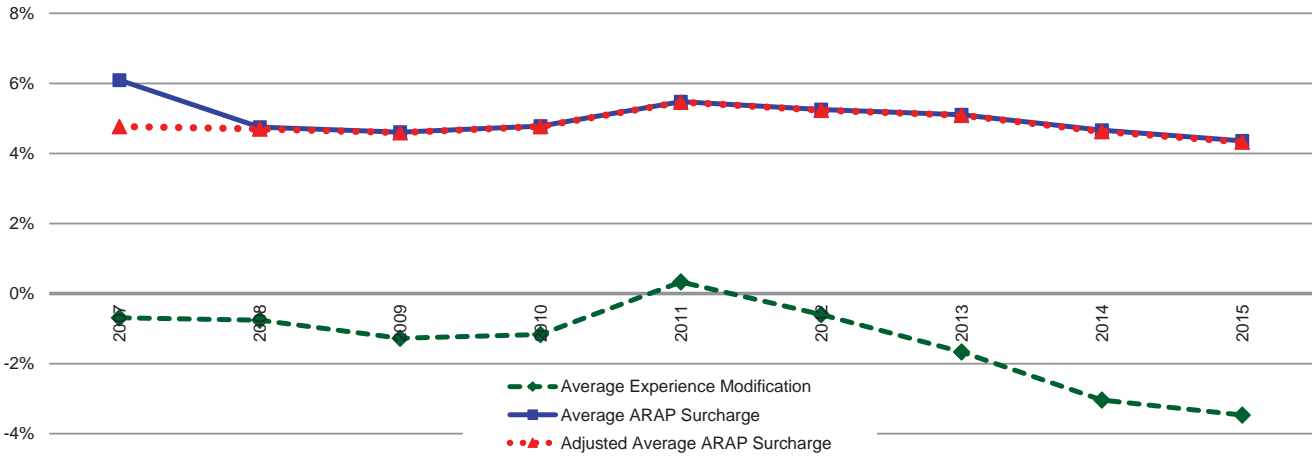
Offset for ARAP Estimate of Average ARAP Surcharge for Prospective Effective Period

Historical Average Experience Modification and ARAP Surcharge

Policy Year (1)	Manual Premium (2)	Standard Premium (3)	ARAP Premium (4)	Adjusted ARAP Premium (5)	Average ARAP Surcharge =(4) / (3) (6)	Average Experience Modification =(3) / (2) - 1.000 (7)	Adjusted Average ARAP Surcharge =(5) / [(3)+(4)-(5)] (8)
2007	996,526,290	989,596,286	60,296,346	47,769,380	6.1%	-0.7%	4.8%
2008	831,911,040	825,571,365	39,208,730	38,814,225	4.7%	-0.8%	4.7%
2009	802,126,746	791,883,094	36,467,853	36,389,208	4.6%	-1.3%	4.6%
2010	870,460,835	860,253,960	41,112,225	41,025,277	4.8%	-1.2%	4.8%
2011	915,060,483	918,076,719	50,277,522	50,181,538	5.5%	0.3%	5.5%
2012	943,637,428	937,958,100	49,236,332	49,114,361	5.2%	-0.6%	5.2%
2013	1,002,292,947	985,597,294	50,272,250	50,163,987	5.1%	-1.7%	5.1%
2014	1,075,947,404	1,043,257,277	48,638,523	48,259,973	4.7%	-3.0%	4.6%
2015	1,151,755,819	1,111,798,578	48,450,846	48,109,803	4.4%	-3.5%	4.3%

Regression of Average ARAP Surcharge on Average Experience Modification

(9) R-Squared	0.558
(10) Slope	0.220
(11) Intercept	0.051
(12) Projected Average ARAP Surcharge = (11)	0.051



Notes:

- (2)-(4): Unit Statistical Plan data, excluding Large Deductibles and SIGs. ARAP adjusted from company level to DSR level.
- (5): (4) adjusted to maximum ARAP surcharge factor of 1.25.

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Section IX - Classification Pricing
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Exhibit 4

Construction Class Premium Adjustment Program

Policy Year (1)	Manual Premium for Eligible Class Codes (2)	Construction Credit (3)	Percent (4)
2014	361,670,345	14,880,487	4.1%
2015	399,967,834	13,391,847	3.3%
(5) Selected Average Credit for Eligible Class Codes in Prospective Effective Period			3.3%

Note:

(2),(3): Unit Statistical Plan data, excluding Large Deductibles and SIGs.

(4): (3) / (2)

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Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
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Exhibit 5
Page 1

Loading for Recoupment of Insolvency Fund Assessments

Unanticipated Insolvency Assessment Recoupments

(1)	Estimated Written Premium for the Policy Period beginning 7/1/17 and ending 6/30/18, absent Insolvency loads	1,471,980,951
(2)	Unanticipated Insolvency Assessment Recoupment Rate (As a % of premium absent insolvency loads)	-0.23%
(3)	Unanticipated Insolvency Assessment Recoupments	(3,385,556)
(4)	Interest Adjustment Factor	1.016
(5)	Adjusted Unanticipated Insolvency Assessment Recoupments	(3,440,201)

Net Assessments

(6)	Amount Sufficient to Recoup Assessment	0
(7)	Net Assessments	3,440,201

Loading for Recoupment

(8)	Estimated Written Premium in the Prospective Effective Period, absent insolvency loads	1,336,480,415
(9)	Indicated Loading for Recoupment of Insolvency Fund Assessments	0.26%

Notes:

(1): consistent with Page 2.

(2): loading for insolvency fund in 07/01/2016 effective rates.

(3) = (1) x (2)

(4): 1.6% is the risk-free rate of interest, shown in Section VII-J, Exhibit 1, Page 1 compounded from the expected collection date of the unanticipated insolvency assessment recoupments to the average date the assessment will be recouped or returned.

(5) = (3) x (4)

(6): No Assessments in 2016 or 2017.

(7) = (6) - (5)

(8): Page 2.

(9) = (7) / [(7) + (8)]

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Exhibit 5
Page 2

Expected Workers' Compensation Written Premium in Prospective Effective Period

(1)	2016 Calendar Year Written Premium, absent insolvency loads	1,414,836,086
(2)	Estimated Exposure Growth Factor from Calendar Year 2016 to Policy Period ending 6/30/18	1.032
(3)	Rate Change from Calendar Year 2016 Written to the Policy Period ending 6/30/18	0.8%
(4)	Estimated Written Premium for the Policy Period ending 6/30/18, absent Insolvency Loads = (1) x (2) x [1.0 + (3)]	1,471,980,951
(5)	Estimated Exposure Growth Factor from the Policy Period ending 6/30/18 to the Prospective Effective Period	1.021
(6)	Average Indicated Rate Change	-11.1%
(7)	Estimated Written Premium in Prospective Effective Period, absent insolvency loads = (4) x (5) x [1.0 + (6)]	1,336,480,415

Notes:

(1): Adjusted to remove any loading for recoupment of insolvency fund assessments.

(2): Assumes a 2.1% (from Section V-H, Exhibit 3).

(3): The 7/1/16 rate change was 1.5%.

(5): Assumes a 2.1% annual change (from Section V-H, Exhibit 3) compounded for 1 year.

(6): Section I-A, Exhibit 1.

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Section IX - Classification Pricing
 Subsection L - Pricing Example
 7/1/2018

Section IX - L
 Exhibit 1
 Page 1

Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of MA Indicated Relativity:

		(A). Limited Losses (Unit Statistical Plan data, excluding Large Deductibles)							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	7,119	0	7,997	0
	2012	0	0	0	0	0	0	10,044	0
	2013	0	0	0	0	0	0	1,519	0
	2014	0	0	0	0	0	3,528	0	0
	2015	0	0	0	0	98,589	0	337	0
Medical	2011	0	0	0	0	1,538	0	39,536	2,537
	2012	0	0	0	0	0	0	3,114	1,153
	2013	0	0	0	0	0	0	7,158	0
	2014	0	0	0	0	0	1,781	0	326
	2015	0	0	0	0	60,488	0	989	113

		(B). Primary Conversion Factors (Section IX - B, Exhibit 1, Page 1)							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0.878	0.881	0.878	0.902	0.906	0.864	0.867	0.000
	2012	0.921	0.928	0.919	0.940	0.947	0.907	0.914	0.000
	2013	1.010	1.004	1.008	1.029	1.023	0.995	0.990	0.000
	2014	1.071	1.060	1.070	1.089	1.078	1.059	1.047	0.000
	2015	1.674	1.494	1.681	1.703	1.521	1.667	1.488	0.000
Medical	2011	0.778	0.789	0.778	0.778	0.789	0.778	0.789	0.641
	2012	0.765	0.779	0.765	0.765	0.779	0.765	0.779	0.673
	2013	0.835	0.847	0.835	0.835	0.847	0.835	0.847	0.702
	2014	0.796	0.798	0.796	0.796	0.798	0.796	0.798	0.774
	2015	0.931	0.927	0.931	0.931	0.927	0.931	0.927	0.828

		(C). Converted Limited Losses [(A) x (B)]							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	6,447	0	6,933	0
	2012	0	0	0	0	0	0	9,176	0
	2013	0	0	0	0	0	0	1,503	0
	2014	0	0	0	0	0	3,735	0	0
	2015	0	0	0	0	149,923	0	502	0
Medical	2011	0	0	0	0	1,213	0	31,190	1,627
	2012	0	0	0	0	0	0	2,425	776
	2013	0	0	0	0	0	0	6,064	0
	2014	0	0	0	0	0	1,418	0	252
	2015	0	0	0	0	56,063	0	917	94

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Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of MA Indicated Relativity:

(D). Unadjusted Excess Losses [(Excess Factor -1.0) x (C)]									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	764	0	822	0
	2012	0	0	0	0	0	0	1,088	0
	2013	0	0	0	0	0	0	178	0
	2014	0	0	0	0	0	443	0	0
	2015	0	0	0	0	17,776	0	59	0
Medical	2011	0	0	0	0	144	0	3,698	193
	2012	0	0	0	0	0	0	288	92
	2013	0	0	0	0	0	0	719	0
	2014	0	0	0	0	0	168	0	30
	2015	0	0	0	0	6,647	0	109	11

(E). Adjusted Excess Losses									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	535	0	575	0
	2012	0	0	0	0	0	0	762	0
	2013	0	0	0	0	0	0	125	0
	2014	0	0	0	0	0	310	0	0
	2015	0	0	0	0	12,443	0	42	0
Medical	2011	0	0	0	0	373	0	3,945	193
	2012	0	0	0	0	0	0	614	92
	2013	0	0	0	0	0	0	772	0
	2014	0	0	0	0	0	301	0	30
	2015	0	0	0	0	11,980	0	127	11

(F). Secondary Conversion Factors					
	Fatal	Permanent	Permanent Partial	Temporary Total	Medical
Indemnity	0.978	0.922	1.218	1.228	0.000
Medical	1.185	0.923	1.219	1.229	1.185

(G). Converted Unlimited Losses									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	8,505	0	9,219	0
	2012	0	0	0	0	0	0	12,202	0
	2013	0	0	0	0	0	0	1,999	0
	2014	0	0	0	0	0	4,967	0	0
	2015	0	0	0	0	197,781	0	667	0
Medical	2011	0	0	0	0	1,934	0	43,171	2,156
	2012	0	0	0	0	0	0	3,734	1,028
	2013	0	0	0	0	0	0	8,400	0
	2014	0	0	0	0	0	2,112	0	334
	2015	0	0	0	0	82,942	0	1,282	124

(H). Total					
Policy Year	Exposure	Indemnity		Medical	
		LD	NLD	LD	NLD
2011	43,694	0	17,724	0	47,261
2012	48,173	0	12,202	0	4,762
2013	44,048	0	1,999	0	8,400
2014	46,156	4,967	0	2,112	334
2015	44,779	0	198,448	0	84,348
Total	226,850	4,967	230,374	2,112	145,104

	Indemnity	Medical
(I). Indicated Pure Premium	1.037	0.649
(J). Manufacturing Industry Group Pure Premium	0.978	0.514
(K). MA Indicated Relativity	1.061	1.263

Notes:

- (E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7
 Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses
- (F): Section IX-B, Exhibit 1, Page 3.
- (G) = [(C) + (E)] x (F)
- (I) = Total Losses / Total Exposure
- (J): Industry Group Pure Premium from Section IX - C, Exhibit 1, Page 2.
- (K) = (I) / (J)

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Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of Countrywide Relativity

State (1)	State Code (2)	Losses				Lost-Time Claims		Payroll (9)
		Indemnity		Medical		Likely (7)	Not-Likely (8)	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			
Alabama	1	0	0	0	0	0	0	0
Arizona	2	0	0	0	8,316	0	0	5,843,139
Arkansas	3	0	33,410	0	143,750	0	14	45,853,201
Colorado	5	0	0	0	3,874	0	0	3,404,823
Connecticut	6	0	0	0	0	0	0	45,695
D.C.	8	0	0	0	0	0	0	0
Florida	9	0	12,135	0	50,932	0	3	4,980,438
Georgia	10	0	23,233	0	11,710	0	2	1,958,404
Idaho	11	0	0	0	0	0	0	986,623
Illinois	12	120,045	94,629	47,344	86,940	6	8	14,054,430
Indiana	13	0	8,182	0	43,994	0	1	2,464,503
Iowa	14	0	0	0	0	0	0	623,414
Kansas	15	0	0	0	0	0	0	0
Kentucky	16	0	3,491	0	6,629	0	2	2,103,760
Louisiana	17	0	0	0	0	0	0	0
Maine	18	21,390	1,008,642	95,252	1,229,988	2	51	126,081,699
Maryland	19	0	0	0	0	0	0	24,962
Michigan	21	40,459	51,218	17,544	401,185	2	13	72,189,882
Minnesota	22	0	7,044	0	40,048	0	2	6,588,983
Mississippi	23	0	0	0	0	0	0	0
Missouri	24	61,449	616,466	64,173	913,383	4	65	73,316,886
Montana	25	0	0	0	0	0	0	731,252
Nebraska	26	0	0	0	111	0	0	820,261
Nevada	27	0	0	0	0	0	0	418,686
New Hampshire	28	0	20,046	0	95,322	0	2	1,264,121
New Mexico	30	0	0	0	0	0	0	0
North Carolina	32	34,701	43,907	34,249	64,537	1	7	13,445,023
Oklahoma	35	0	0	0	0	0	0	0
Oregon	36	0	124,922	0	171,532	0	8	38,950,433
Rhode Island	38	0	0	0	0	0	0	61,912
South Carolina	39	0	0	0	0	0	0	38,602
South Dakota	40	0	0	0	0	0	0	0
Tennessee	41	1,777	110,507	8,017	282,195	1	18	20,277,616
Utah	43	0	0	0	2,602	0	0	1,734,177
Vermont	44	0	0	0	0	0	0	14,695
Virginia	45	0	0	0	1,594	0	0	8,505,709
West Virginia	47	0	0	0	0	0	0	0
Wisconsin	48	856,149	217,353	604,358	936,814	5	36	63,248,150
Hawaii	52	0	23,794	0	15,860	0	1	2,402,382
Alaska	54	0	0	0	0	0	0	0
Total		1,135,970	2,398,979	870,937	4,511,316	21	233	512,433,861

Note:
 (3) - (9): Data are total for latest three policy years. See Section IX-D, Exhibit 3.

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Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of Countrywide Relativity

State (1)	State Code (2)	Manufacturing Pitch Factors		Pure Premiums, on MA Level		Total (7)
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)	
Alabama	1	2.310	0.443	0.000	0.000	
Arizona	2	3.317	0.482	0.000	0.069	
Arkansas	3	3.559	0.889	0.259	0.279	
Colorado	5	1.437	0.455	0.000	0.052	
Connecticut	6	0.649	0.299	0.000	0.000	
D.C.	8	0.273	0.124	0.000	0.000	
Florida	9	1.655	0.370	0.403	0.378	
Georgia	10	1.309	0.694	1.553	0.415	
Idaho	11	1.554	0.379	0.000	0.000	
Illinois	12	0.842	0.356	1.287	0.340	
Indiana	13	3.824	0.636	1.270	1.135	
Iowa	14	0.914	0.301	0.000	0.000	
Kansas	15	1.783	0.504	0.000	0.000	
Kentucky	16	1.907	0.605	0.316	0.191	
Louisiana	17	1.367	0.439	0.000	0.000	
Maine	18	1.019	0.439	0.832	0.462	
Maryland	19	1.289	0.575	0.000	0.000	
Michigan	21	1.869	0.686	0.237	0.398	
Minnesota	22	1.525	0.576	0.163	0.350	
Mississippi	23	1.674	0.512	0.000	0.000	
Missouri	24	1.232	0.447	1.140	0.597	
Montana	25	0.618	0.175	0.000	0.000	
Nebraska	26	1.046	0.229	0.000	0.003	
Nevada	27	1.280	0.030	0.000	0.000	
New Hampshire	28	2.044	0.358	3.241	2.699	
New Mexico	30	1.448	0.359	0.000	0.000	
North Carolina	32	1.384	0.705	0.809	0.518	
Oklahoma	35	0.895	0.434	0.000	0.000	
Oregon	36	1.695	0.668	0.543	0.294	
Rhode Island	38	0.637	0.512	0.000	0.000	
South Carolina	39	0.867	0.546	0.000	0.000	
South Dakota	40	2.345	0.409	0.000	0.000	
Tennessee	41	2.164	0.493	1.198	0.706	
Utah	43	3.926	0.574	0.000	0.086	
Vermont	44	0.888	0.372	0.000	0.000	
Virginia	45	2.345	0.612	0.000	0.011	
West Virginia	47	2.188	0.515	0.000	0.000	
Wisconsin	48	1.532	0.353	2.600	0.860	
Hawaii	52	0.911	0.467	0.902	0.308	
Alaska	54	1.640	0.257	0.000	0.000	
(8)	Average of (5), (6) weighted by Payroll from Page 1, respectively			0.922	0.485	1.407
(9)	CW Manufacturing Pure Premium			0.884	0.454	1.338
(10)	CW Relativity = (8) / (9)			1.043	1.069	1.052
(11)	CW Relativity, balanced to unity			1.029	1.054	

Notes:

- (3), (4) = (MA Total Unlimited Losses) / [(State Pure Premium) x (MA Total Exposure)] for Industry Code 1. See Section IX - D, Exhibit 2.
- (5) = 100 x [State Indemnity Losses / State Payroll] x (3), where State Indemnity Losses and State Payroll from page 1.
- (6) = 100 x [State Medical Losses / State Payroll] x (4), where State Medical Losses and State Payroll from page 1.
- (9) = (8) weighted by MA five year Manufacturing Exposure
- (11): Relativities balanced to unity (weighted by MA exposure) over Manufacturing Industry Group.

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Section IX - Classification Pricing
 Subsection L - Pricing Example
 7/1/2018

Section IX - L
 Exhibit 3

Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of Credibility and Balanced Formula Relativity:

- (1) MA Indicated Relativity
- (2) Countrywide Indicated Relativity
- (3) Relativity to Underlying Present Rate

Injury Type	
Indemnity	Medical
1.061	1.263
1.029	1.054
0.796	1.025

Calculation of MA Credibility:

The MA Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are expected losses for that injury type.

- (4) Adopted Relativity
- (5) Industry Group Pure Premium Underlying Present Rate Factor
- (6) Pure Premium Underlying Present Rate
 = (4) x (5)
- (7) Expected Losses
 = (6) x [(Total Exposure from Exhibit 1)]
- (8) Full Credibility Standards
- (9) MA Credibility
 = Minimum of {100%, [(7) / (8)]^{0.4}}

Injury Type	
Indemnity	Medical
0.791	1.018
0.949	0.552
0.751	0.562
170,318	127,413
27,200,000	6,000,000
13%	21%

Calculation of Countrywide Credibility

The Countrywide Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are the countrywide claim counts for that injury type. The countrywide credibility is limited to no more than half of the complement of the credibility assigned to the Massachusetts data.

- (10) Countrywide Lost-Time Claims
- (11) Countrywide Claim Count Standard
- (12) Countrywide Credibility
 = Minimum of {[(10) / (11)]^{0.4}, 0.5 x [100% - (9)]}
- (13) Credibility to Underlying Present Rate
 = 100% - (9) - (12)
- (14) Formula Relativity
 = [(1) x (9)] + [(2) x (12)] + [(3) x (13)]
- (15) Off Balance Factor

Injury Type	
Indemnity	Medical
254	254
1,150	1,000
44%	40%
43%	39%
0.933	1.086
1.009	1.005

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
0.925	1.081	0.979

Notes:

- (1): Exhibit 1, Page 2.
- (2): Exhibit 2, Page 2.
- (3): Relativity of (6) to Industry Group average, using 5 year Schedule Z exposure as weights.
- (4): Section IX-F, Exhibit 1.
- (5): Section IX-E, Exhibit 1.
- (8), (11): Section IX-D, Exhibit 1, Page 1.
- (10): Exhibit 2, Page 1.
- (15): Factor to balance Formula relativities across industry group to unity using 5 year Schedule Z exposure by injury type.
- (16) = (14) / (15) , Total Balanced Formula Relativity is the weighted average of Partial Relativities using the MA Industry Group Pure Premium as weights.

IX 000299

Section IX - Classification Pricing
Subsection L - Pricing Example
7/1/2018

Section IX - L
Exhibit 4

Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of Proposed Average Rate and Proposed Manual Rate:

(1) Total Balanced Formula Relativity	0.979
(2) Capped Rate Level Factor	1.936
(3) Proposed Average Capped Rate = (1) x (2)	1.90
(4) Offset for Merit Rating	0.997
(5) Offset for ARAP	1.051
(6) Offset for Construction Classification Premium Adjustment Program	1.000
(7) Provision for Insolvency Fund Assessment Recoupment	0.0026
(8) Proposed Manual Rate = {(3) / [(4) x (5) x (6)]} x {1.000 / [1.000 - (7)]}	1.81
(9) Minimum Premium	222
(10) Loss Constant	0
(11) Expected Loss Rate	0.93
(12) D-Ratio	0.16

Notes:

(1): Exhibit 3.

(2): Section IX-H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved. Class 2660 is in the Manufacturing Industry Group.

(4), (5), (6), (7): Section IX-K, Exhibit 1. Class 2660 is not eligible for the Construction Credit program.

(9) = {[(8) x 35.0] + (10) + Expense Constant} subject to a maximum of \$500

Where Expense Constant = 159 if (8) x 35 + (10) < 200

= 250 if (8) x 35 + (10) >= 200 and < 1000.

= 338 if (8) x 35 + (10) >= 1000.

(10): No loss constant for Manufacturing classes, \$50 for Construction classes, \$20 for all other classes.

(11) = (3) x Ratio of Experience Rating ELR to Average Rate, from Section X - A, Exhibit 1. Class 2660 is in Hazard Group B.

(12): See text of Section X for an explanation of the calculation of D-Ratios.

IX 000300

Section IX - Classification Pricing
Subsection M - Steel Erection
7/1/2018

Section IX - M
Exhibit 1

Underlying Values

(1) Class	(2) Exposure (\$100 Payroll)	(3) Weight	(4)	(5)	(6) Present Average Rate
			Adopted Relativity		
			Indemnity	Medical	
5040	553,319.99	53%	11.923	8.675	59.49
Reassigned 5538	493,204.04	47%	0.781	0.767	4.61
Adjusted 5040	1,046,524.03	100%	6.672	4.948	33.63
5059	211,412.78	56%	3.252	3.107	26.64
Reassigned 5538	165,025.47	44%	0.781	0.767	4.61
Adjusted 5059	376,438.25	100%	2.168	2.081	16.98

Notes:

(2): Based on Unit Statistical Data

(4),(5),(6): 5040, 5059, 5538 from 7/1/2016 Stipulation. Adjusted values are weighted averages using (3) as weight.

IX 000301

Section IX - Classification Pricing
 Subsection M - Steel Erection
 7/1/2018

Section IX - M
 Exhibit 2
 Page 1

Pricing Example for Class 5040 Iron Or Steel: Erection: Erection-Frame Structures

Calculation of MA Indicated Relativity

		(A). Limited Losses (Unit Statistical Plan data, excluding Large Deductibles)							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	224,927	0	1,396,478	0	81,783	
	2012	0	0	399,085	211,929	820,221	150,000	218,677	
	2013	0	0	468,515	496,244	1,148,642	47,500	48,662	
	2014	0	0	0	723,582	848,190	224,988	333,797	
	2015	0	0	0	201,853	304,103	433,150	203,325	
Medical	2011	0	0	275,073	0	361,975	0	35,356	23,260
	2012	0	0	100,915	30,320	78,838	25,000	62,970	26,691
	2013	0	0	31,485	75,541	191,940	0	25,232	28,357
	2014	0	0	0	166,361	231,789	177,707	148,467	65,033
	2015	0	0	0	23,818	45,235	88,322	143,170	22,486

		(B). Primary Conversion Factors (Section IX - B, Exhibit 1, Page 1)							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0.878	0.881	0.878	0.902	0.906	0.864	0.867	0.000
	2012	0.921	0.928	0.919	0.940	0.947	0.907	0.914	0.000
	2013	1.010	1.004	1.008	1.029	1.023	0.995	0.990	0.000
	2014	1.071	1.060	1.070	1.089	1.078	1.059	1.047	0.000
	2015	1.674	1.494	1.681	1.703	1.521	1.667	1.488	0.000
Medical	2011	0.778	0.789	0.778	0.778	0.789	0.778	0.789	0.641
	2012	0.765	0.779	0.765	0.765	0.779	0.765	0.779	0.673
	2013	0.835	0.847	0.835	0.835	0.847	0.835	0.847	0.702
	2014	0.796	0.798	0.796	0.796	0.798	0.796	0.798	0.774
	2015	0.931	0.927	0.931	0.931	0.927	0.931	0.927	0.828

		(C). Converted Limited Losses							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	199,257	0	1,256,392	0	70,573	0
	2012	0	0	366,825	199,189	776,824	136,009	199,780	0
	2013	0	0	472,253	510,419	1,172,479	47,282	48,154	0
	2014	0	0	0	816,341	929,177	238,190	349,600	0
	2015	0	0	0	343,853	480,965	883,394	312,775	0
Medical	2011	0	0	194,871	0	282,018	0	27,803	14,815
	2012	0	0	77,224	23,202	60,002	19,131	48,885	17,709
	2013	0	0	26,279	63,052	160,699	0	21,374	19,726
	2014	0	0	0	129,756	184,775	141,476	118,531	50,078
	2015	0	0	0	22,164	42,950	86,054	134,213	19,193

Notes:

(A) : The combined total of Remainder of Industry and AIG losses.

(B): Separate Primary Conversion Factors are applied to AIG data (factors also from Section IX-B, Exhibit 1, Page 1). The Remainder of Industry factors are displayed here.

(C): = (A) x (B) with Primary Conversion Factors for AIG (Section IX-B, Exhibit 1, Page 1) applied to AIG's losses instead of the factors displayed in (B).

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Section IX - Classification Pricing
Subsection M - Steel Erection
7/1/2018

Section IX - M
Exhibit 2
Page 2

Pricing Example for Class 5040 Iron Or Steel: Erection: Erection-Frame Structures

Calculation of MA Indicated Relativity:

(D). Unadjusted Excess Losses [(Excess Factor -1.0) x (C)]									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	96,816	0	610,461	0	34,290	0
	2012	0	0	178,234	96,783	377,446	66,085	97,070	0
	2013	0	0	229,460	248,005	569,689	22,973	23,397	0
	2014	0	0	0	396,647	451,472	115,733	169,865	0
	2015	0	0	0	167,073	233,693	429,227	151,972	0
Medical	2011	0	0	94,685	0	137,028	0	13,509	7,198
	2012	0	0	37,522	11,274	29,154	9,295	23,752	8,605
	2013	0	0	12,769	30,636	78,081	0	10,386	9,584
	2014	0	0	0	63,047	89,779	68,741	57,592	24,332
	2015	0	0	0	10,769	20,869	41,812	65,212	9,325

(E). Adjusted Excess Losses									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	67,771	0	427,322	0	24,003	0
	2012	0	0	124,764	67,748	264,212	46,259	67,949	0
	2013	0	0	160,622	173,603	398,782	16,081	16,378	0
	2014	0	0	0	277,653	316,030	81,013	118,906	0
	2015	0	0	0	116,951	163,585	300,459	106,381	0
Medical	2011	0	0	123,730	0	320,166	0	23,796	7,198
	2012	0	0	90,992	40,308	142,388	29,121	52,873	8,605
	2013	0	0	81,607	105,037	248,988	6,892	17,405	9,584
	2014	0	0	0	182,041	225,221	103,461	108,552	24,332
	2015	0	0	0	60,891	90,977	170,580	110,804	9,325

(F). Secondary Conversion Factors					
	Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical
Indemnity	0.978	0.922	1.218	1.228	0.000
Medical	1.185	0.923	1.219	1.229	1.185

(G). Converted Unlimited Losses									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	246,261	0	2,050,958	0	116,129	0
	2012	0	0	453,358	325,160	1,268,102	223,805	328,741	0
	2013	0	0	583,656	833,219	1,913,978	77,803	79,238	0
	2014	0	0	0	1,332,612	1,516,806	391,945	575,272	0
	2015	0	0	0	561,313	785,137	1,453,636	514,675	0
Medical	2011	0	0	294,026	0	734,034	0	63,402	26,086
	2012	0	0	155,241	77,416	246,703	59,289	125,034	31,182
	2013	0	0	99,564	204,893	499,389	8,468	47,649	34,733
	2014	0	0	0	380,066	499,766	300,961	279,025	88,176
	2015	0	0	0	101,240	163,250	315,335	301,060	33,794

(H). Total					
Policy Year	Exposure	Indemnity		Medical	
		LD	NLD	LD	NLD
2011	142,586	246,261	2,167,088	294,026	823,522
2012	142,332	1,002,323	1,596,844	291,946	402,919
2013	220,982	1,494,678	1,993,215	312,925	581,771
2014	282,222	1,724,557	2,092,078	681,027	866,967
2015	258,402	2,014,949	1,299,812	416,574	498,103
Total	1,046,524	6,482,767	9,149,037	1,996,499	3,173,282

	Indemnity	Medical
(I). Indicated Pure Premium	14.937	4.940
(J). Construction Industry Group Pure Premium	2.623	1.182
(K). MA Indicated Relativity	5.694	4.181

Notes:

(E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7

Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses

(F): Section IX-B, Exhibit 1, Page 3.

(G) = [(C) + (E)] x (F)

(I) = Total Losses / Total Exposure

(J): Industry Group Pure Premium from Section IX - C, Exhibit 1, Page 2.

(K) = (I) / (J)

IX 000303

Section IX - Classification Pricing
 Subsection M - Steel Erection
 7/1/2018

Section IX - M
 Exhibit 2
 Page 3

Pricing Example for Class 5040
 Iron Or Steel: Erection: Erection-Frame Structures

Calculation of Countrywide Relativity

State (1)	State Code (2)	Losses				Lost-Time Claims		Payroll (9)
		Indemnity		Medical		Likely (7)	Not-Likely (8)	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			
Alabama	1	0	640,876	0	839,177	0	13	50,516,359
Arizona	2	486,600	276,243	630,480	726,235	3	14	47,687,051
Arkansas	3	211,523	216,252	951,697	701,339	4	9	39,591,254
Colorado	5	1,016,867	716,677	1,725,023	1,310,852	8	29	40,110,023
Connecticut	6	1,662,260	465,084	2,007,155	485,458	7	13	12,760,041
D.C.	8	9,969	0	16,923	1,307	1	0	3,052,390
Florida	9	1,161,725	1,420,194	2,077,261	4,092,215	15	61	123,198,571
Georgia	10	1,000,118	2,274,252	764,420	1,600,512	10	27	102,322,451
Idaho	11	424,275	376,840	592,935	690,707	2	12	12,314,953
Illinois	12	2,135,484	4,231,454	1,601,903	2,790,938	17	64	107,478,411
Indiana	13	495,246	369,241	839,568	1,269,566	8	20	84,006,044
Iowa	14	1,121,370	1,125,766	1,034,214	579,737	10	16	30,950,797
Kansas	15	390,336	153,201	182,771	213,772	5	5	33,642,693
Kentucky	16	27,706	399,548	137,663	448,808	2	9	34,757,772
Louisiana	17	840,296	1,427,803	843,456	1,855,688	16	65	232,812,412
Maine	18	245,999	0	1,554,354	157,397	2	0	3,342,029
Maryland	19	456,817	936,008	948,568	416,860	3	12	16,617,673
Michigan	21	1,450,215	1,320,215	1,213,947	860,228	7	26	42,853,126
Minnesota	22	173	556,072	729	772,243	1	14	17,352,589
Mississippi	23	103,971	342,699	41,765	370,315	2	13	53,047,343
Missouri	24	1,646,668	1,440,391	1,459,456	1,798,294	10	41	35,868,523
Montana	25	0	320,142	0	403,931	0	6	6,215,247
Nebraska	26	144,451	166,284	269,195	409,482	3	10	18,721,142
Nevada	27	344,797	332,122	609,662	397,341	2	10	18,750,656
New Hampshire	28	281,885	265,007	241,748	400,745	2	5	5,346,741
New Mexico	30	40,728	232,576	1,039,940	184,336	1	5	9,736,413
North Carolina	32	424,737	3,064,658	253,494	2,663,462	5	43	126,845,762
Oklahoma	35	363,929	642,567	907,311	1,029,896	5	13	17,195,345
Oregon	36	196,113	394,382	72,782	504,507	2	16	30,106,762
Rhode Island	38	507,317	35,117	139,097	36,511	3	3	2,355,075
South Carolina	39	554,808	1,537,797	393,214	1,179,921	4	34	135,663,038
South Dakota	40	34,218	136,206	280,969	460,311	1	4	7,671,503
Tennessee	41	536,867	695,551	1,127,069	618,034	8	22	40,051,309
Utah	43	349,019	363,421	936,241	594,911	2	12	30,632,314
Vermont	44	0	152,158	0	202,125	0	5	4,107,205
Virginia	45	650,969	902,677	462,763	1,142,292	6	8	63,766,212
West Virginia	47	12,997	144,823	20,860	210,870	1	10	26,612,314
Wisconsin	48	759,899	1,280,084	1,132,389	2,207,410	7	31	38,598,328
Hawaii	52	125,611	24,600	59,281	25,194	1	5	7,344,208
Alaska	54	93,256	57,255	86,910	237,194	2	2	24,099,714
Total		20,309,219	29,436,243	26,657,213	34,890,121	188	707	1,738,101,793

Note:
 Data are total for latest three policy years. See Section IX - D, Exhibit 3 for years used.

IX 000304

Pricing Example for Class 5040
 Iron Or Steel: Erection: Erection-Frame Structures

Calculation of Countrywide Relativity

State (1)	State Code (2)	Construction Pitch Factors		Pure Premiums, on MA Level		Total (7)
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)	
Alabama	1	2.386	0.366	3.027	0.609	
Arizona	2	2.387	0.402	3.818	1.142	
Arkansas	3	3.605	0.853	3.895	3.562	
Colorado	5	1.323	0.451	5.718	3.411	
Connecticut	6	0.723	0.290	12.062	5.668	
D.C.	8	1.074	0.656	0.351	0.392	
Florida	9	1.601	0.303	3.355	1.516	
Georgia	10	0.673	0.327	2.152	0.755	
Idaho	11	1.490	0.352	9.694	3.665	
Illinois	12	0.832	0.419	4.926	1.711	
Indiana	13	4.310	0.719	4.435	1.805	
Iowa	14	1.239	0.405	8.997	2.113	
Kansas	15	2.567	0.615	4.147	0.724	
Kentucky	16	1.833	0.613	2.253	1.034	
Louisiana	17	1.654	0.502	1.611	0.582	
Maine	18	1.037	0.436	7.633	22.344	
Maryland	19	1.386	0.514	11.621	4.226	
Michigan	21	2.071	0.834	13.386	4.038	
Minnesota	22	2.058	0.749	6.596	3.334	
Mississippi	23	1.702	0.523	1.433	0.406	
Missouri	24	1.454	0.509	12.514	4.624	
Montana	25	1.291	0.307	6.648	1.995	
Nebraska	26	1.901	0.428	3.155	1.553	
Nevada	27	1.369	0.539	4.942	2.897	
New Hampshire	28	1.326	0.312	13.567	3.748	
New Mexico	30	1.714	0.419	4.811	5.266	
North Carolina	32	1.133	0.452	3.116	1.040	
Oklahoma	35	1.394	0.570	8.158	6.423	
Oregon	36	1.552	0.611	3.043	1.171	
Rhode Island	38	0.845	0.698	19.466	5.204	
South Carolina	39	0.736	0.349	1.135	0.404	
South Dakota	40	2.075	0.392	4.609	3.787	
Tennessee	41	1.989	0.423	6.120	1.845	
Utah	43	3.171	0.478	7.374	2.390	
Vermont	44	1.018	0.416	3.770	2.048	
Virginia	45	2.041	0.414	4.972	1.041	
West Virginia	47	2.990	0.839	1.773	0.730	
Wisconsin	48	1.399	0.348	7.392	3.012	
Hawaii	52	1.613	0.786	3.298	0.904	
Alaska	54	2.228	0.309	1.392	0.415	
(8)	Average of (5), (6) weighted by Payroll from Page 1, respectively			4.142	1.623	5.765
(9)	CW Construction Pure Premium			2.447	1.070	3.517
(10)	CW Relativity = (8) / (9)			1.693	1.517	1.639
(11)	CW Relativity, balanced to unity			1.617	1.434	

Notes:

- (3), (4) = (MA Total Unlimited Losses) / [(State Pure Premium) x (MA Total Exposure)] for Industry Code 2. See Section IX - D, Exhibit 2.
- (5) = 100 x [State Indemnity Losses / State Payroll] x (3), where State Indemnity Losses and State Payroll from page 3.
- (6) = 100 x [State Medical Losses / State Payroll] x (4), where State Medical Losses and State Payroll from page 3.
- (9) = (8) weighted by MA five year Construction Exposure
- (11): Relativities balanced to unity (weighted by MA exposure) over Construction Industry Group.

IX 000305

Section IX - Classification Pricing
 Subsection M - Steel Erection
 7/1/2018

Section IX - M
 Exhibit 2
 Page 5

Pricing Example for Class 5040 Iron Or Steel: Erection: Erection-Frame Structures

Calculation of Credibility and Balanced Formula Relativity:

- (1) MA Indicated Relativity
- (2) Countrywide Indicated Relativity
- (3) Relativity to Underlying Present Rate

Injury Type	
Indemnity	Medical
5.694	4.181
1.617	1.434
6.586	4.905

Calculation of MA Credibility:

The MA Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are expected losses for that injury type.

- (4) Adopted Relativity
- (5) Industry Group Pure Premium Underlying Present Rate Factor
- (6) Pure Premium Underlying Present Rate
 = (4) x (5)
- (7) Expected Losses
 = (6) x [(Total Exposure from Exhibit 1)]
- (8) Full Credibility Standards
- (9) MA Credibility
 = Minimum of {100%, [(7) / (8)]^{0.4}}

Injury Type	
Indemnity	Medical
6.672	4.948
2.709	1.329
18.074	6.576
18,915,110	6,882,121
27,200,000	6,000,000
86.0%	100.0%

Calculation of Countrywide Credibility

The Countrywide Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are the countrywide claim counts for that injury type. The countrywide credibility is limited to no more than half of the complement of the credibility assigned to the Massachusetts data.

- (10) Countrywide Lost-Time Claims
- (11) Countrywide Claim Count Standard
- (12) Countrywide Credibility
 = Minimum of {[(10) / (11)]^{0.4}, 0.5 x [100% - (9)]}
- (13) Credibility to Underlying Present Rate
 = 100% - (9) - (12)
- (14) Formula Relativity
 = [(1) x (9)] + [(2) x (12)] + [(3) x (13)]
- (15) Off Balance Factor

Injury Type	
Indemnity	Medical
895	895
1,150	1,000
7%	0%
7%	0%
5.471	4.181
0.994	0.999

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
5.503	4.186	5.094

Notes:

- (1): Page 2.
- (2): Page 4.
- (3): Relativity of (5) to Industry Group average, using 5 year Schedule Z exposure as weights.
- (4): Exhibit 1.
- (5): Section IX - E, Exhibit 1.
- (8), (11): Section IX - D, Exhibit 1, Page 1.
- (10): Page 3.
- (15): Factor to balance Formula relativities across industry group to unity using 5 year Schedule Z exposure by injury type.
- (16) = (14) / (15) , Total Balanced Formula Relativity is the weighted average of Partial Relativities using the MA Industry Group Pure Premium as weights.

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Section IX - Classification Pricing
Subsection M - Steel Erection
7/1/2018

Section IX - M
Exhibit 2
Page 6

Pricing Example for Class 5040 Iron Or Steel: Erection: Erection-Frame Structures

Calculation of Proposed Average Rate and Proposed Manual Rate:

(1) Total Balanced Formula Relativity	5.094
(2) Capped Rate Level Factor	4.786
(3) Proposed Average Capped Rate = (1) x (2)	24.38
(4) Offset for Merit Rating	0.997
(5) Offset for ARAP	1.051
(6) Offset for Construction Classification Premium Adjustment Program	0.967
(7) Provision for Insolvency Fund Assessment Recoupment	0.0026
(8) Proposed Manual Rate = {(3) / [(4) x (5) x (6)]} x {1.000 / [1.000 - (7)]}	24.12
(9) Minimum Premium	500
(10) Loss Constant	50.00
(11) Expected Loss Rate	7.51
(12) D-Ratio	0.14

Notes:

(1): Page 5.

(2): Section IX - H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved. Class 5040 is in the Construction Industry Group.

(4), (5), (6), (7): Section IX - K. Class 5040 is eligible for the Construction Credit program.

(9) = {[(8) x 35.0] + (10) + Expense Constant} subject to a maximum of \$500

Where Expense Constant = 159 if (8) x 35 + (10) < 200

= 250 if (8) x 35 + (10) >= 200 and < 1000.

= 338 if (8) x 35 + (10) >= 1000.

(10): No loss constant for Manufacturing classes, \$50 for Construction classes, \$20 for all other classes.

(11) = (3) x Ratio of Experience Rating ELR to Average Rate, from Section X - A, Exhibit 1. Class 5040 is in Hazard Group G.

(12): Section X. See text of this section for an explanation of the calculation of D-Ratios.

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Section IX - Classification Pricing
 Subsection M - Steel Erection
 7/1/2018

Section IX - M
 Exhibit 3
 Page 1

Pricing Example for Class 5059 Iron Or Steel: Erection: Frame Struct Not Over 2 Strs In Hgt

Calculation of MA Indicated Relativity

		(A). Limited Losses (Unit Statistical Plan data, excluding Large Deductibles)							
	Policy Year	Fatal		Permanent	Permanent Partial		Temporary Total		Medical Only
		LD	NLD	Total	LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	27,169	72,614	56,140	0
	2012	0	0	0	6,918	175,127	0	17,461	0
	2013	0	0	0	0	441,006	0	116,708	0
	2014	0	0	0	238,976	0	0	80,628	0
	2015	0	0	0	504,720	167,372	0	146,417	0
Medical	2011	0	0	0	0	9,717	25,447	16,671	5,848
	2012	0	0	0	166,531	64,040	0	12,948	6,464
	2013	0	0	0	0	150,781	0	30,249	706
	2014	0	0	0	28,714	0	0	32,431	11,875
	2015	0	0	0	209,058	247,231	0	24,801	8,056

		(B). Primary Conversion Factors (Section IX - B, Exhibit 1, Page 1)							
	Policy Year	Fatal		Permanent	Permanent Partial		Temporary Total		Medical Only
		LD	NLD	Total	LD	NLD	LD	NLD	
Indemnity	2011	0.878	0.881	0.878	0.902	0.906	0.864	0.867	0.000
	2012	0.921	0.928	0.919	0.940	0.947	0.907	0.914	0.000
	2013	1.010	1.004	1.008	1.029	1.023	0.995	0.990	0.000
	2014	1.071	1.060	1.070	1.089	1.078	1.059	1.047	0.000
	2015	1.674	1.494	1.681	1.703	1.521	1.667	1.488	0.000
Medical	2011	0.778	0.789	0.778	0.778	0.789	0.778	0.789	0.641
	2012	0.765	0.779	0.765	0.765	0.779	0.765	0.779	0.673
	2013	0.835	0.847	0.835	0.835	0.847	0.835	0.847	0.702
	2014	0.796	0.798	0.796	0.796	0.798	0.796	0.798	0.774
	2015	0.931	0.927	0.931	0.931	0.927	0.931	0.927	0.828

		(C). Converted Limited Losses							
	Policy Year	Fatal		Permanent	Permanent Partial		Temporary Total		Medical Only
		LD	NLD	Total	LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	24,542	62,708	48,118	0
	2012	0	0	0	6,502	165,843	0	15,952	0
	2013	0	0	0	0	450,937	0	115,489	0
	2014	0	0	0	260,296	0	0	84,445	0
	2015	0	0	0	859,782	254,521	0	217,893	0
Medical	2011	0	0	0	0	7,620	19,798	12,996	3,707
	2012	0	0	0	127,436	49,867	0	10,082	4,348
	2013	0	0	0	0	127,729	0	25,624	496
	2014	0	0	0	22,860	0	0	25,892	9,186
	2015	0	0	0	194,538	229,146	0	22,987	6,672

Notes:

- (A) : The combined total of Remainder of Industry and AIG losses.
- (B): Separate Primary Conversion Factors are applied to AIG data (factors also from Section IX-B, Exhibit 1, Page 1). The Remainder of Industry factors are displayed here.
- (C): = (A) x (B) with Primary Conversion Factors for AIG (Section IX-B, Exhibit 1, Page 1) applied to AIG's losses instead of the factors displayed in (B).

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Section IX - Classification Pricing
 Subsection M - Steel Erection
 7/1/2018

Section IX - M
 Exhibit 3
 Page 2

Pricing Example for Class 5059
 Iron Or Steel: Erection: Frame Struct Not Over 2 Strs In Hgt

Calculation of MA Indicated Relativity:

(D). Unadjusted Excess Losses [(Excess Factor -1.0) x (C)]									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	11,924	30,469	23,380	0
	2012	0	0	0	3,159	80,580	0	7,751	0
	2013	0	0	0	0	219,103	0	56,114	0
	2014	0	0	0	126,473	0	0	41,031	0
	2015	0	0	0	417,754	123,668	0	105,871	0
Medical	2011	0	0	0	0	3,703	9,619	6,314	1,801
	2012	0	0	0	61,919	24,230	0	4,899	2,113
	2013	0	0	0	0	62,062	0	12,451	241
	2014	0	0	0	11,107	0	0	12,580	4,463
	2015	0	0	0	94,523	111,338	0	11,169	3,242

(E). Adjusted Excess Losses									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	8,347	21,328	16,366	0
	2012	0	0	0	2,211	56,406	0	5,426	0
	2013	0	0	0	0	153,372	0	39,280	0
	2014	0	0	0	88,531	0	0	28,721	0
	2015	0	0	0	292,428	86,567	0	74,109	0
Medical	2011	0	0	0	0	7,280	18,760	13,328	1,801
	2012	0	0	0	62,867	48,404	0	7,224	2,113
	2013	0	0	0	0	127,793	0	29,285	241
	2014	0	0	0	49,049	0	0	24,890	4,463
	2015	0	0	0	219,849	148,439	0	42,930	3,242

(F). Secondary Conversion Factors					
	Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical
Indemnity	0.978	0.922	1.218	1.228	0.000
Medical	1.185	0.923	1.219	1.229	1.185

(G). Converted Unlimited Losses									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	0	0	40,063	103,187	79,179	0
	2012	0	0	0	10,614	270,725	0	26,249	0
	2013	0	0	0	0	736,119	0	190,039	0
	2014	0	0	0	424,912	0	0	138,956	0
	2015	0	0	0	1,403,525	415,485	0	358,546	0
Medical	2011	0	0	0	0	18,163	47,377	32,345	6,527
	2012	0	0	0	231,971	119,788	0	21,265	7,656
	2013	0	0	0	0	311,470	0	67,469	873
	2014	0	0	0	87,654	0	0	62,397	16,174
	2015	0	0	0	505,120	460,258	0	80,994	11,748

(H). Total						
Policy Year	Exposure	Indemnity			Medical	
		LD	NLD	LD	NLD	
2011	73,350	103,187	119,242	47,377	57,035	
2012	66,671	10,614	296,974	231,971	148,709	
2013	65,252	0	926,158	0	379,811	
2014	67,619	424,912	138,956	87,654	78,571	
2015	103,546	1,403,525	774,031	505,120	553,000	
Total	376,438	1,942,237	2,255,360	872,122	1,217,126	

	Indemnity	Medical
(I). Indicated Pure Premium	11.151	5.550
(J). Construction Industry Group Pure Premium	2.623	1.182
(K). MA Indicated Relativity	4.251	4.697

Notes:

(E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7

Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses

(F): Section IX-B, Exhibit 1, Page 3.

(G) = [(C) + (E)] x (F)

(I) = Total Losses / Total Exposure

(J): Industry Group Pure Premium from Section IX - C, Exhibit 1, Page 2.

(K) = (I) / (J)

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 7/1/2018

Section IX - M
 Exhibit 3
 Page 3

Pricing Example for Class 5059
 Iron Or Steel: Erection: Frame Struct Not Over 2 Strs In Hgt

Calculation of Countrywide Relativity

State (1)	State Code (2)	Losses				Lost-Time Claims		Payroll (9)
		Indemnity		Medical		Likely (7)	Not-Likely (8)	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			
Alabama	1	181,580	98,354	995,929	479,697	1	7	8,704,202
Arizona	2	203,748	93,996	2,137,288	544,552	4	9	11,594,465
Arkansas	3	596,677	432,588	637,318	172,808	4	9	29,531,213
Colorado	5	233,225	1,626,291	309,383	350,032	3	11	7,886,523
Connecticut	6	776,249	231,988	837,909	206,594	3	8	6,710,645
D.C.	8	10,384	412,655	14,078	215,214	1	1	3,803,079
Florida	9	20,535	381,241	53,407	1,171,523	1	15	4,497,097
Georgia	10	47,534	914,628	48,566	739,164	1	8	8,728,807
Idaho	11	0	128,519	0	604,058	0	10	5,117,457
Illinois	12	1,684,076	1,501,535	863,363	1,285,135	6	18	17,835,903
Indiana	13	27,948	195,099	150,621	548,966	1	7	18,681,345
Iowa	14	33,132	470,648	33,960	592,255	1	17	10,587,431
Kansas	15	5,628	53,981	21,844	190,512	1	9	4,656,171
Kentucky	16	0	146,933	0	176,135	0	3	13,500,805
Louisiana	17	667,764	332,390	2,279,442	489,935	6	12	33,314,691
Maine	18	0	1,193	0	24,452	0	1	1,007,002
Maryland	19	817,236	76,328	965,243	65,296	2	5	4,271,027
Michigan	21	57,732	591,746	44,053	765,844	2	14	9,971,948
Minnesota	22	0	29,039	0	138,603	0	10	3,805,378
Mississippi	23	437,964	261,429	1,635,052	430,640	3	8	11,740,448
Missouri	24	384,195	652,743	1,109,001	901,854	5	25	5,962,568
Montana	25	15,063	21,754	14,719	222,499	1	2	2,322,824
Nebraska	26	286,693	527,166	590,885	972,551	1	9	5,332,051
Nevada	27	0	922	0	18,999	0	1	2,648,547
New Hampshire	28	0	87,831	0	49,385	0	2	1,354,601
New Mexico	30	227,418	12,039	136,621	16,333	3	1	2,354,095
North Carolina	32	92,439	1,046,099	73,249	1,057,152	3	14	16,046,325
Oklahoma	35	112,213	47,976	124,548	60,841	3	5	2,755,208
Oregon	36	0	220,370	0	351,201	0	14	12,726,215
Rhode Island	38	0	398	0	1,002	0	1	561,578
South Carolina	39	385,234	368,301	497,133	299,682	2	10	11,753,540
South Dakota	40	122,677	66,345	186,009	261,990	2	8	4,134,587
Tennessee	41	285,232	83,391	461,142	184,973	3	6	9,890,950
Utah	43	31,719	274,655	38,840	843,270	1	11	9,042,549
Vermont	44	126,199	0	123,655	0	1	0	832,320
Virginia	45	606,929	213,413	1,460,876	1,034,127	2	7	12,912,061
West Virginia	47	0	0	0	13,040	0	0	2,971,224
Wisconsin	48	0	287,499	0	622,236	0	10	12,316,695
Hawaii	52	279,861	542	501,556	11,251	2	2	9,119,246
Alaska	54	80,885	23,327	448,500	57,194	1	2	2,272,150
Total		8,838,169	11,915,352	16,794,190	16,170,995	70	312	343,254,971

Note:
 Data are total for latest three policy years. See Section IX - D, Exhibit 3 for years used.

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Section IX - Classification Pricing
 Subsection M - Steel Erection
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 Exhibit 3
 Page 4

Pricing Example for Class 5059
 Iron Or Steel: Erection: Frame Struct Not Over 2 Strs In Hgt

Calculation of Countrywide Relativity

State (1)	State Code (2)	Construction Pitch Factors		Pure Premiums, on MA Level		Total (7)
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)	
Alabama	1	2.386	0.366	7.674	6.210	
Arizona	2	2.387	0.402	6.129	9.287	
Arkansas	3	3.605	0.853	12.565	2.340	
Colorado	5	1.323	0.451	31.197	3.768	
Connecticut	6	0.723	0.290	10.870	4.516	
D.C.	8	1.074	0.656	11.948	3.955	
Florida	9	1.601	0.303	14.303	8.244	
Georgia	10	0.673	0.327	7.414	2.947	
Idaho	11	1.490	0.352	3.743	4.150	
Illinois	12	0.832	0.419	14.852	5.042	
Indiana	13	4.310	0.719	5.145	2.692	
Iowa	14	1.239	0.405	5.896	2.397	
Kansas	15	2.567	0.615	3.286	2.803	
Kentucky	16	1.833	0.613	1.994	0.799	
Louisiana	17	1.654	0.502	4.965	4.170	
Maine	18	1.037	0.436	0.123	1.059	
Maryland	19	1.386	0.514	29.007	12.410	
Michigan	21	2.071	0.834	13.486	6.775	
Minnesota	22	2.058	0.749	1.570	2.726	
Mississippi	23	1.702	0.523	10.138	9.199	
Missouri	24	1.454	0.509	25.286	17.168	
Montana	25	1.291	0.307	2.046	3.135	
Nebraska	26	1.901	0.428	29.013	12.561	
Nevada	27	1.369	0.539	0.048	0.387	
New Hampshire	28	1.326	0.312	8.600	1.137	
New Mexico	30	1.714	0.419	17.435	2.721	
North Carolina	32	1.133	0.452	8.036	3.187	
Oklahoma	35	1.394	0.570	8.104	3.836	
Oregon	36	1.552	0.611	2.687	1.685	
Rhode Island	38	0.845	0.698	0.060	0.125	
South Carolina	39	0.736	0.349	4.718	2.365	
South Dakota	40	2.075	0.392	9.484	4.246	
Tennessee	41	1.989	0.423	7.413	2.766	
Utah	43	3.171	0.478	10.743	4.665	
Vermont	44	1.018	0.416	15.431	6.181	
Virginia	45	2.041	0.414	12.966	7.994	
West Virginia	47	2.990	0.839	0.000	0.368	
Wisconsin	48	1.399	0.348	3.265	1.759	
Hawaii	52	1.613	0.786	4.959	4.421	
Alaska	54	2.228	0.309	10.220	6.876	
(8)	Average of (5), (6) weighted by Payroll from Page 1, respectively			9.144	4.455	13.599
(9)	CW Construction Pure Premium			2.447	1.070	3.517
(10)	CW Relativity = (8) / (9)			3.737	4.164	3.866
(11)	CW Relativity, balanced to unity			3.570	3.937	

Notes:

- (3), (4) = (MA Total Unlimited Losses) / [(State Pure Premium) x (MA Total Exposure)] for Industry Code 2. See Section IX - D, Exhibit 2.
- (5) = 100 x [State Indemnity Losses / State Payroll] x (3), where State Indemnity Losses and State Payroll from page 3.
- (6) = 100 x [State Medical Losses / State Payroll] x (4), where State Medical Losses and State Payroll from page 3.
- (9) = (8) weighted by MA five year Construction Exposure
- (11): Relativities balanced to unity (weighted by MA exposure) over Construction Industry Group.

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 Exhibit 3
 Page 5

Pricing Example for Class 5059 Iron Or Steel: Erection: Frame Struct Not Over 2 Strs In Hgt

Calculation of Credibility and Balanced Formula Relativity:

- (1) MA Indicated Relativity
- (2) Countrywide Indicated Relativity
- (3) Relativity to Underlying Present Rate

Injury Type	
Indemnity	Medical
4.251	4.697
3.570	3.937
2.141	2.063

Calculation of MA Credibility:

The MA Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are expected losses for that injury type.

- (4) Adopted Relativity
- (5) Industry Group Pure Premium Underlying Present Rate Factor
- (6) Pure Premium Underlying Present Rate
= (4) x (5)
- (7) Expected Losses
= (6) x [(Total Exposure from Exhibit 1)]
- (8) Full Credibility Standards
- (9) MA Credibility
= Minimum of {100%, [(7) / (8)]^{0.4}}

Injury Type	
Indemnity	Medical
2.168	2.081
2.709	1.329
5.874	2.766
2,211,351	1,041,152
27,200,000	6,000,000
37.0%	50.0%

Calculation of Countrywide Credibility

The Countrywide Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are the countrywide claim counts for that injury type. The countrywide credibility is limited to no more than half of the complement of the credibility assigned to the Massachusetts data.

- (10) Countrywide Lost-Time Claims
- (11) Countrywide Claim Count Standard
- (12) Countrywide Credibility
= Minimum of {[(10) / (11)]^{0.4}, 0.5 x [100% - (9)]}
- (13) Credibility to Underlying Present Rate
= 100% - (9) - (12)
- (14) Formula Relativity
= [(1) x (9)] + [(2) x (12)] + [(3) x (13)]
- (15) Off Balance Factor

Injury Type	
Indemnity	Medical
382	382
1,150	1,000
32%	25%
31%	25%
3.379	3.849
0.994	0.999

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
3.398	3.854	3.540

Notes:

- (1): Page 2.
- (2): Page 4.
- (3): Relativity of (5) to Industry Group average, using 5 year Schedule Z exposure as weights.
- (4): Exhibit 1.
- (5): Section IX - E, Exhibit 1.
- (8), (11): Section IX - D, Exhibit 1, Page 1.
- (10): Page 3.
- (15): Factor to balance Formula relativities across industry group to unity using 5 year Schedule Z exposure by injury type.
- (16) = (14) / (15) , Total Balanced Formula Relativity is the weighted average of Partial Relativities using the MA Industry Group Pure Premium as weights.

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Page 6

Pricing Example for Class 5059 Iron Or Steel: Erection: Frame Struct Not Over 2 Strs In Hgt

Calculation of Proposed Average Rate and Proposed Manual Rate:

(1) Total Balanced Formula Relativity	3.540
(2) Capped Rate Level Factor	4.786
(3) Proposed Average Capped Rate = (1) x (2)	16.94
(4) Offset for Merit Rating	0.997
(5) Offset for ARAP	1.051
(6) Offset for Construction Classification Premium Adjustment Program	0.967
(7) Provision for Insolvency Fund Assessment Recoupment	0.0026
(8) Proposed Manual Rate = {(3) / [(4) x (5) x (6)]} x {1.000 / [1.000 - (7)]}	16.76
(9) Minimum Premium	500
(10) Loss Constant	50.00
(11) Expected Loss Rate	5.22
(12) D-Ratio	0.16

Notes:

(1): Page 5.

(2): Section IX - H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved. Class 5059 is in the Construction Industry Group.

(4), (5), (6), (7): Section IX - K. Class 5059 is eligible for the Construction Credit program.

(9) = {[(8) x 35.0] + (10) + Expense Constant} subject to a maximum of \$500

Where Expense Constant = 159 if (8) x 35 + (10) < 200

= 250 if (8) x 35 + (10) >= 200 and < 1000.

= 338 if (8) x 35 + (10) >= 1000.

(10): No loss constant for Manufacturing classes, \$50 for Construction classes, \$20 for all other classes.

(11) = (3) x Ratio of Experience Rating ELR to Average Rate, from Section X - A, Exhibit 1. Class 5059 is in Hazard Group G.

(12): Section X. See text of this section for an explanation of the calculation of D-Ratios.

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 Subsection M - Steel Erection
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Section IX - M
 Exhibit 4
 Page 1

Pricing Example for Class 5538 Sheet Metal Work-Shop & Outside-Noc & Drivers

Calculation of MA Indicated Relativity

		(A). Limited Losses (Unit Statistical Plan data, excluding Large Deductibles)							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	71,253	565,580	673,063	199,858	848,246	
	2012	0	499,636	383,779	33,410	1,720,361	149,720	293,406	
	2013	0	0	352,565	840,527	512,176	270,886	536,667	
	2014	414,411	0	0	721,677	1,281,321	1,023,661	747,621	
	2015	0	0	0	257,970	532,845	266,257	889,675	
Medical	2011	0	0	20,396	113,384	173,008	77,478	652,630	131,854
	2012	0	364	116,221	13,105	485,065	41,804	227,896	185,784
	2013	0	0	147,435	253,854	260,206	110,170	315,081	140,575
	2014	0	0	0	346,880	617,806	469,201	664,727	163,893
	2015	0	0	0	28,145	258,147	86,247	722,687	186,911

		(B). Primary Conversion Factors (Section IX - B, Exhibit 1, Page 1)							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0.878	0.881	0.878	0.902	0.906	0.864	0.867	0.000
	2012	0.921	0.928	0.919	0.940	0.947	0.907	0.914	0.000
	2013	1.010	1.004	1.008	1.029	1.023	0.995	0.990	0.000
	2014	1.071	1.060	1.070	1.089	1.078	1.059	1.047	0.000
	2015	1.674	1.494	1.681	1.703	1.521	1.667	1.488	0.000
Medical	2011	0.778	0.789	0.778	0.778	0.789	0.778	0.789	0.641
	2012	0.765	0.779	0.765	0.765	0.779	0.765	0.779	0.673
	2013	0.835	0.847	0.835	0.835	0.847	0.835	0.847	0.702
	2014	0.796	0.798	0.796	0.796	0.798	0.796	0.798	0.774
	2015	0.931	0.927	0.931	0.931	0.927	0.931	0.927	0.828

		(C). Converted Limited Losses							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	62,580	510,401	609,553	172,593	735,096	0
	2012	0	463,417	359,684	31,402	1,629,184	135,755	268,051	0
	2013	0	0	355,377	864,537	523,099	269,641	531,021	0
	2014	443,973	0	0	817,803	1,396,778	1,083,728	783,941	0
	2015	0	0	0	439,447	810,292	443,864	1,332,727	0
Medical	2011	0	0	15,868	87,198	136,425	60,278	514,388	84,407
	2012	0	283	78,833	10,028	377,100	31,990	177,157	124,830
	2013	0	0	123,059	211,884	219,629	91,956	266,771	98,506
	2014	0	0	0	275,053	490,836	373,539	530,514	126,519
	2015	0	0	0	26,190	239,263	80,257	670,585	154,961

Notes:

(A) : The combined total of Remainder of Industry and AIG losses.

(B): Separate Primary Conversion Factors are applied to AIG data (factors also from Section IX-B, Exhibit 1, Page 1). The Remainder of Industry factors are displayed here.

(C): = (A) x (B) with Primary Conversion Factors for AIG (Section IX-B, Exhibit 1, Page 1) applied to AIG's losses instead of the factors displayed in (B).

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 Page 2

Pricing Example for Class 5538 Sheet Metal Work-Shop & Outside-Noc & Drivers

Calculation of MA Indicated Relativity:

(D). Unadjusted Excess Losses [(Excess Factor -1.0) x (C)]									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	14,394	117,399	140,205	39,699	169,081	0
	2012	0	106,592	82,732	7,223	374,732	31,225	61,655	0
	2013	0	0	81,741	198,854	120,319	62,021	122,141	0
	2014	102,119	0	0	188,105	321,276	249,271	180,316	0
	2015	0	0	0	101,078	186,377	102,094	306,544	0
Medical	2011	0	0	3,650	20,057	31,379	13,865	118,316	19,415
	2012	0	65	18,132	2,307	86,738	7,358	40,748	28,712
	2013	0	0	28,305	48,736	50,517	21,151	61,361	22,658
	2014	0	0	0	63,266	112,898	85,919	122,025	29,101
	2015	0	0	0	6,024	55,033	18,460	154,243	35,643

(E). Adjusted Excess Losses									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	10,076	82,179	98,143	27,789	118,357	0
	2012	0	74,614	57,912	5,056	262,313	21,858	43,159	0
	2013	0	0	57,219	139,198	84,223	43,415	85,499	0
	2014	71,483	0	0	131,673	224,893	174,490	126,221	0
	2015	0	0	0	70,755	130,464	71,466	214,581	0
Medical	2011	0	0	7,968	55,276	73,441	25,774	169,040	19,415
	2012	0	32,043	42,952	4,473	199,157	16,726	59,245	28,712
	2013	0	0	52,828	108,392	86,613	39,757	98,003	22,658
	2014	30,636	0	0	119,697	209,281	160,700	176,120	29,101
	2015	0	0	0	36,348	110,947	49,088	246,206	35,643

(F). Secondary Conversion Factors					
	Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical
Indemnity	0.978	0.922	1.218	1.228	0.000
Medical	1.185	0.923	1.219	1.229	1.185

(G). Converted Unlimited Losses									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2011	0	0	67,005	721,831	862,056	246,046	1,047,943	0
	2012	0	526,114	385,120	44,409	2,304,061	193,531	382,130	0
	2013	0	0	380,509	1,222,665	739,789	384,397	757,016	0
	2014	504,039	0	0	1,156,572	1,975,384	1,544,949	1,117,576	0
	2015	0	0	0	621,485	1,145,950	632,766	1,899,918	0
Medical	2011	0	0	21,998	173,670	255,816	105,735	839,750	123,029
	2012	0	38,306	112,391	17,677	702,431	59,859	290,475	181,948
	2013	0	0	162,320	390,402	373,296	161,840	448,209	143,579
	2014	36,303	0	0	481,182	853,411	656,437	868,263	184,410
	2015	0	0	0	76,231	426,890	158,931	1,126,490	225,865

(H). Total (Remainder of Industry + Company A)					
Policy Year	Exposure	Indemnity		Medical	
		LD	NLD	LD	NLD
2011	1,519,463	1,034,883	1,909,999	301,402	1,218,595
2012	1,797,265	623,060	3,212,306	189,927	1,213,160
2013	1,969,517	1,987,571	1,496,805	714,562	965,084
2014	2,229,874	3,205,560	3,092,960	1,173,922	1,906,084
2015	2,512,692	1,254,251	3,045,868	235,161	1,779,245
Total	10,028,811	8,105,326	12,757,937	2,614,974	7,082,167

	Indemnity	Medical
(I). Indicated Pure Premium	2.080	0.967
(J). Construction Industry Group Pure Premium	2.623	1.182
(K). MA Indicated Relativity	0.793	0.818

Notes:

(E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7

Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses

(F): Section IX-B, Exhibit 1, Page 3.

(G) = [(C) + (E)] x (F)

(I) = Total Losses / Total Exposure

(J): Industry Group Pure Premium from Section IX - C, Exhibit 1, Page 2.

(K) = (I) / (J)

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Section IX - M
 Exhibit 4
 Page 3

Pricing Example for Class 5538
 Sheet Metal Work-Shop & Outside-Noc & Drivers

Calculation of Countrywide Relativity

State (1)	State Code (2)	Losses				Lost-Time Claims		Payroll (9)
		Indemnity		Medical		Likely (7)	Not-Likely (8)	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			
Alabama	1	0	0	0	0	0	0	0
Arizona	2	0	0	0	0	0	0	0
Arkansas	3	0	0	0	0	0	0	0
Colorado	5	0	0	0	0	0	0	0
Connecticut	6	0	0	0	0	0	0	0
D.C.	8	0	0	0	0	0	0	0
Florida	9	0	0	0	0	0	0	0
Georgia	10	0	0	0	0	0	0	0
Idaho	11	0	0	0	0	0	0	0
Illinois	12	0	0	0	0	0	0	0
Indiana	13	0	0	0	0	0	0	0
Iowa	14	0	0	0	0	0	0	0
Kansas	15	0	0	0	0	0	0	0
Kentucky	16	0	0	0	0	0	0	0
Louisiana	17	0	0	0	0	0	0	0
Maine	18	0	0	0	0	0	0	0
Maryland	19	0	0	0	0	0	0	0
Michigan	21	1,147,958	2,819,706	1,332,976	3,301,226	19	119	397,062,692
Minnesota	22	2,152,380	1,669,811	1,723,923	2,389,713	29	125	253,526,165
Mississippi	23	0	0	0	0	0	0	0
Missouri	24	0	0	0	0	0	0	0
Montana	25	0	0	0	0	0	0	0
Nebraska	26	0	0	0	0	0	0	0
Nevada	27	0	0	0	0	0	0	0
New Hampshire	28	0	0	0	0	0	0	0
New Mexico	30	0	0	0	0	0	0	0
North Carolina	32	0	0	0	0	0	0	0
Oklahoma	35	0	0	0	0	0	0	0
Oregon	36	0	0	0	0	0	0	0
Rhode Island	38	0	0	0	0	0	0	0
South Carolina	39	0	0	0	0	0	0	0
South Dakota	40	0	0	0	0	0	0	0
Tennessee	41	0	0	0	0	0	0	0
Utah	43	0	0	0	0	0	0	0
Vermont	44	0	0	0	0	0	0	0
Virginia	45	0	0	0	0	0	0	0
West Virginia	47	0	0	0	0	0	0	0
Wisconsin	48	0	0	0	0	0	0	0
Hawaii	52	0	0	0	0	0	0	0
Alaska	54	0	0	0	0	0	0	0
Total		3,300,338	4,489,517	3,056,899	5,690,939	48	244	650,588,857

Note:
 Data are total for latest three policy years. See Section IX - D, Exhibit 3 for years used.

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Pricing Example for Class 5538
 Sheet Metal Work-Shop & Outside-Noc & Drivers

Calculation of Countrywide Relativity

State (1)	State Code (2)	Construction Pitch Factors		Pure Premiums, on MA Level		Total (7)
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)	
Alabama	1	2.386	0.366	0.000	0.000	
Arizona	2	2.387	0.402	0.000	0.000	
Arkansas	3	3.605	0.853	0.000	0.000	
Colorado	5	1.323	0.451	0.000	0.000	
Connecticut	6	0.723	0.290	0.000	0.000	
D.C.	8	1.074	0.656	0.000	0.000	
Florida	9	1.601	0.303	0.000	0.000	
Georgia	10	0.673	0.327	0.000	0.000	
Idaho	11	1.490	0.352	0.000	0.000	
Illinois	12	0.832	0.419	0.000	0.000	
Indiana	13	4.310	0.719	0.000	0.000	
Iowa	14	1.239	0.405	0.000	0.000	
Kansas	15	2.567	0.615	0.000	0.000	
Kentucky	16	1.833	0.613	0.000	0.000	
Louisiana	17	1.654	0.502	0.000	0.000	
Maine	18	1.037	0.436	0.000	0.000	
Maryland	19	1.386	0.514	0.000	0.000	
Michigan	21	2.071	0.834	2.069	0.974	
Minnesota	22	2.058	0.749	3.102	1.215	
Mississippi	23	1.702	0.523	0.000	0.000	
Missouri	24	1.454	0.509	0.000	0.000	
Montana	25	1.291	0.307	0.000	0.000	
Nebraska	26	1.901	0.428	0.000	0.000	
Nevada	27	1.369	0.539	0.000	0.000	
New Hampshire	28	1.326	0.312	0.000	0.000	
New Mexico	30	1.714	0.419	0.000	0.000	
North Carolina	32	1.133	0.452	0.000	0.000	
Oklahoma	35	1.394	0.570	0.000	0.000	
Oregon	36	1.552	0.611	0.000	0.000	
Rhode Island	38	0.845	0.698	0.000	0.000	
South Carolina	39	0.736	0.349	0.000	0.000	
South Dakota	40	2.075	0.392	0.000	0.000	
Tennessee	41	1.989	0.423	0.000	0.000	
Utah	43	3.171	0.478	0.000	0.000	
Vermont	44	1.018	0.416	0.000	0.000	
Virginia	45	2.041	0.414	0.000	0.000	
West Virginia	47	2.990	0.839	0.000	0.000	
Wisconsin	48	1.399	0.348	0.000	0.000	
Hawaii	52	1.613	0.786	0.000	0.000	
Alaska	54	2.228	0.309	0.000	0.000	
(8)	Average of (5), (6) weighted by Payroll from Page 1, respectively			2.472	1.067	3.539
(9)	CW Construction Pure Premium			2.447	1.070	3.517
(10)	CW Relativity = (8) / (9)			1.010	0.998	1.006
(11)	CW Relativity, balanced to unity			0.965	0.943	

Notes:

- (3), (4) = (MA Total Unlimited Losses) / [(State Pure Premium) x (MA Total Exposure)] for Industry Code 2. See Section IX - D, Exhibit 2.
- (5) = 100 x [State Indemnity Losses / State Payroll] x (3), where State Indemnity Losses and State Payroll from page 3.
- (6) = 100 x [State Medical Losses / State Payroll] x (4), where State Medical Losses and State Payroll from page 3.
- (9) = (8) weighted by MA five year Construction Exposure
- (11): Relativities balanced to unity (weighted by MA exposure) over Construction Industry Group.

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Section IX - Classification Pricing
 Subsection M - Steel Erection
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Section IX - M
 Exhibit 4
 Page 5

Pricing Example for Class 5538 Sheet Metal Work-Shop & Outside-Noc & Drivers

Calculation of Credibility and Balanced Formula Relativity:

- (1) MA Indicated Relativity
- (2) Countrywide Indicated Relativity
- (3) Relativity to Underlying Present Rate

Injury Type	
Indemnity	Medical
0.793	0.818
0.965	0.943
0.771	0.760

Calculation of MA Credibility:

The MA Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are expected losses for that injury type.

- (4) Adopted Relativity
- (5) Industry Group Pure Premium Underlying Present Rate Factor
- (6) Pure Premium Underlying Present Rate
 = (4) x (5)
- (7) Expected Losses
 = (6) x [(Total Exposure from Exhibit 1)]
- (8) Full Credibility Standards
- (9) MA Credibility
 = Minimum of {100%, [(7) / (8)]^{0.4}}

Injury Type	
Indemnity	Medical
0.781	0.767
2.709	1.329
2.115	1.019
21,214,895	10,223,311
27,200,000	6,000,000
91.0%	100.0%

Calculation of Countrywide Credibility

The Countrywide Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are the countrywide claim counts for that injury type. The countrywide credibility is limited to no more than half of the complement of the credibility assigned to the Massachusetts data.

- (10) Countrywide Lost-Time Claims
- (11) Countrywide Claim Count Standard
- (12) Countrywide Credibility
 = Minimum of {[(10) / (11)]^{0.4}, 0.5 x [100% - (9)]}
- (13) Credibility to Underlying Present Rate
 = 100% - (9) - (12)
- (14) Formula Relativity
 = [(1) x (9)] + [(2) x (12)] + [(3) x (13)]
- (15) Off Balance Factor

Injury Type	
Indemnity	Medical
292	292
1,150	1,000
5%	0%
4%	0%
0.801	0.818
0.994	0.999

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
0.805	0.819	0.810

Notes:

- (1): Page 2.
- (2): Page 4.
- (3): Relativity of (5) to Industry Group average, using 5 year Schedule Z exposure as weights.
- (4): Section IX - F, Exhibit 4.
- (5): Section IX - E, Exhibit 1.
- (8), (11): Section IX - D, Exhibit 1, Page 1.
- (10): Page 5.
- (15): Factor to balance Formula relativities across industry group to unity using 5 year Schedule Z exposure by injury type.
- (16) = (14) / (15) , Total Balanced Formula Relativity is the weighted average of Partial Relativities using the MA Industry Group Pure Premium as weights.

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Section IX - M
Exhibit 4
Page 6

Pricing Example for Class 5538 Sheet Metal Work-Shop & Outside-Noc & Drivers

Calculation of Proposed Average Rate and Proposed Manual Rate:

(1) Total Balanced Formula Relativity	0.810
(2) Capped Rate Level Factor	4.786
(3) Proposed Average Capped Rate = (1) x (2)	3.88
(4) Offset for Merit Rating	0.997
(5) Offset for ARAP	1.051
(6) Offset for Construction Classification Premium Adjustment Program	0.967
(7) Provision for Insolvency Fund Assessment Recoupment	0.0026
(8) Proposed Manual Rate = {(3) / [(4) x (5) x (6)]} x {1.000 / [1.000 - (7)]}	3.83
(9) Minimum Premium	343
(10) Loss Constant	50.00
(11) Expected Loss Rate	1.62
(12) D-Ratio	0.15

Notes:

- (1): Page 5.
- (2): Section IX - H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved. Class 5538 is in the Construction Industry Group.
- (4), (5), (6), (7): Section IX - K. Class 5538 is eligible for the Construction Credit program.
- (9) = {[(8) x 35.0] + (10) + Expense Constant} subject to a maximum of \$500
Where Expense Constant = 159 if (8) x 35 + (10) < 200
= 250 if (8) x 35 + (10) >= 200 and < 1000.
= 338 if (8) x 35 + (10) >= 1000.
- (10): No loss constant for Manufacturing classes, \$50 for Construction classes, \$20 for all other classes.
- (11) = (3) x Ratio of Experience Rating ELR to Average Rate, from Section X - A, Exhibit 1. Class 5538 is in Hazard Group E.
- (12): Section X. See text of this section for an explanation of the calculation of D-Ratios.

EXPERIENCE RATING

Experience rating is a procedure that uses past insurance experience for individual policyholders to predict their future losses. In this procedure, the manual rate for the risk is adjusted by an experience rating modification that serves to increase or decrease the rate for individual policyholders depending on whether that policyholder's past experience has been worse or better than expected.

The experience rating modification for an insured is determined by comparing actual past losses to expected losses. This section of the filing develops elements used in the derivation of Expected Loss Rates (ELRs) and D-Ratios, which are needed for the calculation of experience rating modifications.

Section X-A - Expected Loss Rates

Generally, an insured's experience rating modification is based on its exposure and loss experience for the last three completed policies for which the WCRIBMA has received data. For the purpose of experience rating, we must derive expected losses on a comparable basis for each of those three policy periods. These calculations are detailed in Section X-A and Section X-E.

Expected Losses for an insured are derived by multiplying the ELR for each applicable class by the reported exposure (typically payroll in hundreds) for each class. The proposed ELRs are displayed in Section X-E. The ELR for each class is the product of the proposed average capped rate for that class (as shown in Section IX-J) and the

Ratio of Experience Rating ELR to Average Rate (as calculated in Section X-A) for the hazard group containing the classification. We use the Ratio of Experience Rating ELR to Average Rate to remove the allowances for underwriting profit and expenses (including loss adjustment expenses) from the capped rate, and then adjust the remaining pure premiums to a level comparable to that of the losses entering the experience rating calculation itself. The Ratio of Experience Rating ELR to Average Rate is a composite factor that incorporates elements relating to expenses (Exhibit 1), trend (Exhibit 1), loss limitations (Exhibit 2 & 3), benefit level differences (Exhibit 1), loss development (Exhibits 4 & 5) and investment income (Exhibit 6).

Section X-B - Calculation of D-Ratios

The second task of Section X is to determine the portion of the expected loss that is considered primary. Primary losses are defined as the first \$5,000 of loss per claim. The experience rating formula splits losses into primary losses and excess losses (the loss amount above the primary loss subject to a maximum). In calculating the experience rating modification, primary losses are given more weight than excess losses because primary losses are more predictive than excess losses for purposes of estimating an insured's prospective loss experience.

The D-Ratio is defined as the portion of expected losses that is expected to be primary. In experience rating, multiplication of a risk's expected losses by the appropriate D-Ratio gives the expected primary losses to which the risk's actual primary losses are compared. The proposed D-Ratios are displayed in Section X-E.

The procedure used here for the calculation of D-Ratios is the same general methodology as used in all of the WCRIBMA's filings since 2001. The general methodology is as follows. First, the WCRIBMA calculates partial D-Ratios for indemnity and medical losses from detailed loss data (Section X-B). The loss data is taken from Unit Statistical Plan Data for the three most recent policy years, and is adjusted for law amendment changes and severity trend to the level corresponding with the losses that will be used in experience rating. Indemnity and medical partial D-Ratios are calculated separately.

We calculate final D-Ratios by class as a weighted average of the partial D-Ratios using the formula:

$$\text{"D" Ratio} = \frac{[(P_i)(D_i) + (P_m)(D_m)]}{[P_i + P_m]}$$

where P_i and P_m are the proposed partial pure premiums for indemnity and medical. D_i and D_m represent the associated partial D-Ratios. The resulting D-Ratios by classification are shown in Section X-E.

Section X-C – Expected Loss Rates for F-Class

The calculations for F-Class rates differ from the state classifications because F-Classes are subject to different benefit provisions than the state classifications. Changes in F-Class rates include a separate calculation for the Ratio of Experience

X 000004

Rating ELR to Average Rate, shown in Section-X-C, by excluding the loss based assessment from the federal indemnity losses. Additionally, the law factors and loss development factors are weighted by losses to reflect that F-Class benefits can be paid either under state or federal laws. The remaining calculations mirror the calculations for the state classifications from Section X-A.

Section X-D – State Reference Point

The experience rating plan recognizes that the loss experience of large insureds is more predictive than the loss experience of small insureds for purposes of predicting future loss experience. Large insureds are expected to have a larger number of claims than small insureds, and a larger number of expected claims effectively provides a larger sample size from which to estimate future loss experience. Consistent with the law of large numbers, as the number of expected claims increases the predictive value of the loss experience increases. When calculating an experience modification in accordance with the rules in the experience rating plan, the predictive value assigned to actual loss experience is based on expected loss dollars instead of expected claim counts. Consequently, increases in claims severity result in higher predictive value being assigned to actual loss experience, all else being equal. In other words, despite no change in sample size (the expected number of claims), the predictive value is deemed to have increased if claims severity increases. To account for this, certain parameters used within the experience rating plan, including the G-Value used to derive the Weighting and Ballast tables, need periodic updates to adjust for changes in claims severity.

X 000005

In this filing, the WCRIBMA continues with the estimation of the state average cost per claim (SACC) expected during the prospective effective period for the proposed new rates. The WCRIBMA used the most recent three years of Unit Statistical Plan data and the estimated severity trend factors found in Section V to estimate the SACC. The SACC is then used to derive the State Reference Point, which in turn is used to derive the G-Value needed for updating the Weighting and Ballast tables.¹ The State Reference Point is also used to calculate the State Accident Limitation. The SACC, the selected State Reference Point, and the resulting G-Value are all updated in Section X-D. The WCRIBMA tempered its selection of the State Reference Point to limit the proposed increase in the G-Value to 20%. The current G-Value of 8.4 would be replaced with a value of 10.0. The proposed new Weighting and Ballast tables are shown in Section X-E.

Section X-E – Manual Page

The proposed revised manual pages are shown in Section X-E.

¹ An explanation of the derivation of the various parameters used in experience rating can be found in a paper authored by Gillam, William R. "Workers Compensation Experience Rating: What Every Actuary Should Know" PCAS LXXIX, 1992, P.215-239.

Calculation of ELR Factors

Unit Report / Policy Effective Dates (1)	Hazard Group (2)	Permissible Loss Ratio (3)	Exp Rating LER by Hazard Group (4)	Law Factor (5)	Loss Trend / Payroll Trend (6)	Loss Development to 10th Report (7)	Loss Development from 10th Report to Ult (8)	Investment Income Offset (9)	Ratio of Exp Rating ELR to Average Rate (10)
1st Report 7/1/2016 to 6/30/2017	A	0.633	0.025	1.011	0.946	1.405	1.051	1.025	0.427
	B	0.633	0.060	1.011	0.946	1.406	1.054	1.020	0.412
	C	0.633	0.079	1.011	0.946	1.418	1.059	1.022	0.397
	D	0.633	0.077	1.011	0.946	1.436	1.057	1.024	0.393
	E	0.633	0.173	1.011	0.946	1.429	1.063	0.992	0.363
	F	0.633	0.189	1.011	0.946	1.441	1.064	0.993	0.352
	G	0.633	0.357	1.011	0.946	1.400	1.067	0.976	0.292
2nd Report 7/1/2015 to 6/30/2016	A	0.633	0.033	1.017	0.920	1.156	1.051	1.025	0.526
	B	0.633	0.079	1.017	0.920	1.156	1.054	1.020	0.502
	C	0.633	0.104	1.017	0.920	1.167	1.059	1.022	0.480
	D	0.633	0.102	1.017	0.920	1.181	1.057	1.024	0.475
	E	0.633	0.228	1.017	0.920	1.176	1.063	0.992	0.422
	F	0.633	0.248	1.017	0.920	1.186	1.064	0.993	0.406
	G	0.633	0.468	1.017	0.920	1.152	1.067	0.976	0.300
3rd Report 7/1/2014 to 6/30/2015	A	0.633	0.033	1.023	0.895	1.062	1.051	1.025	0.585
	B	0.633	0.079	1.023	0.895	1.062	1.054	1.020	0.558
	C	0.633	0.105	1.023	0.895	1.072	1.059	1.022	0.534
	D	0.633	0.102	1.023	0.895	1.085	1.057	1.024	0.529
	E	0.633	0.229	1.023	0.895	1.080	1.063	0.992	0.469
	F	0.633	0.250	1.023	0.895	1.089	1.064	0.993	0.451
	G	0.633	0.471	1.023	0.895	1.059	1.067	0.976	0.332
1st - 3rd Report Average	A								0.513
	B								0.491
	C								0.471
	D								0.466
	E								0.418
	F								0.403
	G								0.308

Notes:

- (1): Unit Stat Reports used to experience rate a policy taking effect during the prospective effective period.
- (3): Section VI-J, Exhibit 1, (10).
- (4): Exhibit 2, (10) - (12).
- (5): Section IV-A, Exhibit 1.
- (6): Section V-A, Exhibit 1. Net Trend applied from USR policy effective period to prospective effective period.
- (7): Exhibit 4, Page 1, (6).
- (8): Exhibit 5, Page 1, (7).
- (9): Exhibit 6, (7).
- (10) = { (3) x [1.0 - (4)] } / [(5) x (6) x (7) x (8) x (9)]

900000 X

Loss Elimination Ratios for Losses in Excess of Experience Rating Caps
 By Hazard Group

Hazard Group	Adjusted Total Losses	Adjusted Excess Losses	Implied Loss Elimination Ratio = (3) / (2)	Expected Losses	Expected Losses Wgtd LER	Balanced LER Differential	Selected LER Differential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A	68,933,812	2,124,445	0.031	87,632,574	0.031	0.19	0.19
B	217,129,050	16,026,151	0.074	295,970,337	0.074	0.46	0.46
C	431,707,501	42,137,209	0.098	590,170,889	0.098	0.61	0.61
D	198,901,159	18,962,120	0.095	286,150,947	0.095	0.59	0.59
E	307,159,035	65,584,408	0.214	440,491,927	0.214	1.33	1.33
F	383,132,570	89,246,227	0.233	563,665,207	0.233	1.45	1.45
G	79,663,234	34,990,270	0.439	101,234,342	0.439	2.74	2.74
Total	1,686,626,361	269,070,830	0.160	2,365,316,224	0.160	1.00	1.00

Loss Elimination Ratio by Hazard Group

Hazard Group	First Report	Second Report	Third Report
(9)	(10)	(11)	(12)
A	0.025	0.033	0.033
B	0.060	0.079	0.079
C	0.079	0.104	0.105
D	0.077	0.102	0.102
E	0.173	0.228	0.229
F	0.189	0.248	0.250
G	0.357	0.468	0.471
Total	0.130	0.171	0.172

Notes:

- (2): Unit Statistical Plan losses, PYs 2013 - 2015. Adjusted by factors from Section X - B, Exhibit 1, Page 2.
- (3): Adjusted losses above per claim limit of \$250,000
- (5): PYs 2013 - 2015, exposure times pure premium underlying present rates.
- (6): Total = (6) Weighted by (5)
- (7) = (6) / [Total for (6)]
- (10) - (12) = [Exhibit 3, (5)] x (8)

X 000007

Loss Elimination Ratio
 Factor to Reflect the State Accident Limitation of \$250,000

Report (1)	Injury Type (2)	Adjusted Total Losses (3)	Adjusted Excess Losses (4)	Loss Elimination Ratio = (4) / (3) (5)
1st	Fatal	17,472,560	11,043,529	0.632
1st	Permanent Total	17,083,842	14,095,575	0.825
1st	Permanent Partial	170,841,182	16,026,498	0.094
1st	Temporary Total	256,827,969	22,500,497	0.088
1st	Medical Only	26,758,176	0	0.000
1st	Total	488,983,729	63,666,099	0.130
2nd	Fatal	5,669,412	2,486,621	0.439
2nd	Permanent Total	48,280,460	33,751,329	0.699
2nd	Permanent Partial	301,803,853	46,045,089	0.153
2nd	Temporary Total	228,803,330	22,057,267	0.096
2nd	Medical Only	25,778,913	0	0.000
2nd	Total	610,335,967	104,340,306	0.171
3rd	Fatal	11,218,091	5,091,675	0.454
3rd	Permanent Total	63,711,364	42,146,619	0.662
3rd	Permanent Partial	294,700,526	46,834,235	0.159
3rd	Temporary Total	191,234,631	6,991,895	0.037
3rd	Medical Only	26,442,051	0	0.000
3rd	Total	587,306,664	101,064,425	0.172

Notes:

Unit Statistical Plan losses have been adjusted by multiplying by law amendment changes and severity trend factors from Section X - B, Exhibit 1, Page 2.

(4): Adjusted losses above per claim limit of \$250,000

800000 X

X 000009

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2018

Section X - A
 Exhibit 4
 Page 1

Hazard Group Development Factors to Tenth Report

Development to 10th Report (1)	Hazard Group (2)	Losses at Latest Report (3)	Selected Relativity (4)	Balanced Relativity = (4) / TT(4) (5)	Selected Dev. Factor to 10th Report (6)
1st to 10th	A	20,830,786	0.987	0.987	1.405
1st to 10th	B	59,532,207	0.987	0.987	1.406
1st to 10th	C	117,081,517	0.996	0.996	1.418
1st to 10th	D	55,334,657	1.009	1.009	1.436
1st to 10th	E	83,487,225	1.004	1.004	1.429
1st to 10th	F	103,478,179	1.012	1.012	1.441
1st to 10th	G	31,439,386	0.984	0.984	1.400
1st to 10th	Total	471,183,957	1.000	1.000	1.424
2nd to 10th	A	23,525,148	0.987	0.986	1.156
2nd to 10th	B	75,993,179	0.987	0.987	1.156
2nd to 10th	C	158,125,373	0.996	0.996	1.167
2nd to 10th	D	67,771,660	1.009	1.008	1.181
2nd to 10th	E	100,786,541	1.004	1.003	1.176
2nd to 10th	F	132,642,164	1.012	1.012	1.186
2nd to 10th	G	28,699,286	0.984	0.983	1.152
2nd to 10th	Total	587,543,351	1.000	1.000	1.172
3rd to 10th	A	22,102,116	0.987	0.986	1.062
3rd to 10th	B	73,752,362	0.987	0.986	1.062
3rd to 10th	C	140,724,174	0.996	0.995	1.072
3rd to 10th	D	68,465,361	1.009	1.008	1.085
3rd to 10th	E	110,793,693	1.004	1.003	1.080
3rd to 10th	F	132,822,152	1.012	1.011	1.089
3rd to 10th	G	17,422,031	0.984	0.983	1.059
3rd to 10th	Total	566,081,889	1.001	1.000	1.077

Notes:

(3): See Exhibit 4 Pages 3-5.

(4): See Page 2 for State Classifications for selection. The entry in the "Total" row is the weighted average using incurred losses at latest report in column (3) as the weights.

(6) = (5) x (Total LDF from page (3) - (5))

Hazard Group Reported Loss Development Relativities to Tenth Report

Relativities for State Classification Rates

Hazard Group (1)	Development			Average Relativity (5)	Selected (6)
	3rd Report to 10th Report (2)	2nd Report to 10th Report (3)	1st Report to 10th Report (4)		
A	0.994	0.992	0.975	0.987	0.987
B	0.997	0.991	0.974	0.987	0.987
C	1.000	0.995	0.993	0.996	0.996
D	0.998	1.004	1.023	1.009	1.009
E	1.000	1.009	1.002	1.004	1.004
F	1.003	1.005	1.029	1.012	1.012
G	1.007	0.994	0.950	0.984	0.984

Relativities for F-Class Rates

Hazard Group (7)	Development			Average Relativity (11)	Selected (12)
	3rd Report to 10th Report (8)	2nd Report to 10th Report (9)	1st Report to 10th Report (10)		
C	0.999	0.994	0.991	0.994	0.994
E	0.999	1.007	1.000	1.002	1.002
F	1.001	1.003	1.027	1.011	1.011
G	1.006	0.993	0.948	0.982	0.982

Notes:

(2) - (4): Pages 3 through 5. = [(12) for Hazard Group] / [(12) for Hazard Groups A-G Total]

(5): Average of (2) - (4)

(8) - (10): Pages 3 through 5. = [(12) for Hazard Group] / [(12) for Hazard Groups C,E,F,G Total]

(11): Average of (8) - (10)

X 000010

Loss Development of Schedule Z to Tenth Report by Hazard Group

Policy Year 2015 at 18 Months
 First Report to Tenth Report

Hazard Group	Indemnity Losses Likely To Develop		Indemnity Losses Not Likely To Develop		Medical Losses Likely To Develop		Medical Losses Not Likely To Develop		Total Losses		
	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Total Reported Losses =(2)+(4)+(6)+(8)	Total Developed Losses =(3)+(5)+(7)+(9)	Develop. Factor = (11) / (10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	3,098,317	5,685,191	7,299,197	12,161,733	2,372,698	2,608,021	8,060,574	8,451,904	20,830,786	28,906,849	1.388
B	8,736,065	16,240,805	19,790,051	32,854,117	9,243,815	10,656,632	21,762,276	22,807,978	59,532,207	82,559,533	1.387
C	21,403,499	38,783,498	42,080,652	70,036,367	12,013,653	13,146,273	41,583,713	43,583,778	117,081,517	165,549,916	1.414
D	10,013,898	18,627,756	21,743,017	36,741,004	6,179,495	6,989,779	17,398,247	18,251,947	55,334,657	80,610,487	1.457
E	15,294,176	28,368,736	29,025,941	48,790,363	17,158,692	18,829,997	22,008,416	23,116,452	83,487,225	119,105,549	1.427
F	20,736,748	38,204,990	41,514,523	69,356,110	13,491,774	15,041,433	27,735,134	29,026,632	103,478,179	151,629,165	1.465
G	6,410,174	11,759,999	6,714,964	11,136,155	15,038,857	16,200,767	3,275,391	3,430,728	31,439,386	42,527,650	1.353
A, B, C, D, E, F, G	85,692,877	157,670,975	168,168,345	281,075,851	75,498,984	83,472,902	141,823,751	148,669,420	471,183,957	670,889,148	1.424
C, E, F, G	63,844,597	117,117,223	119,336,080	199,318,996	57,702,976	63,218,470	94,602,654	99,157,591	335,486,307	478,812,279	1.427

Notes:
 (2), (4), (6), (8): Unit Statistical Plan Data.
 (3), (5), (7), (9): Unit Statistical Plan Data x Loss Development Factors to 10th report from Exhibit 5, Pages 5 and 6.

X 000011

Loss Development of Schedule Z to Tenth Report by Hazard Group

Policy Year 2014 at 30 Months
 Second Report to Tenth Report

Hazard Group	Indemnity Losses Likely To Develop		Indemnity Losses Not Likely To Develop		Medical Losses Likely To Develop		Medical Losses Not Likely To Develop		Total Losses		
	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Total Reported Losses =(2)+(4)+(6)+(8)	Total Developed Losses =(3)+(5)+(7)+(9)	Develop. Factor = (11) / (10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	5,267,971	6,707,653	8,121,479	10,162,443	2,089,621	2,239,625	8,046,077	8,227,089	23,525,148	27,336,809	1.162
B	16,244,926	20,586,254	26,999,432	33,763,216	9,361,769	9,987,512	23,387,052	23,921,897	75,993,179	88,258,879	1.161
C	35,615,648	45,338,210	55,623,965	69,480,506	24,644,276	26,360,198	42,241,484	43,209,536	158,125,373	184,388,450	1.166
D	15,405,189	19,797,923	26,289,572	32,935,714	6,790,723	7,285,809	19,286,176	19,722,730	67,771,660	79,742,176	1.177
E	26,893,905	34,252,176	36,922,281	46,305,684	16,016,408	17,142,595	20,953,947	21,400,825	100,786,541	119,101,280	1.182
F	35,368,082	44,868,360	47,124,003	58,962,089	24,477,246	26,080,337	25,672,833	26,249,081	132,642,164	156,159,866	1.177
G	9,661,368	12,212,155	5,638,421	7,064,436	10,487,618	11,168,080	2,911,879	2,977,000	28,699,286	33,421,672	1.165
A, B, C, D, E, F, G	144,457,089	183,762,731	206,719,153	258,674,088	93,867,661	100,264,156	142,499,448	145,708,157	587,543,351	688,409,132	1.172
C, E, F, G	107,539,003	136,670,901	145,308,670	181,812,715	75,625,548	80,751,211	91,780,143	93,836,441	420,253,364	493,071,268	1.173

Notes:

(2), (4), (6), (8): Unit Statistical Plan Data.

(3), (5), (7), (9): Unit Statistical Plan Data x Loss Development Factors to 10th report from Exhibit 5, Pages 5 and 6.

X 000012

Loss Development of Schedule Z to Tenth Report by Hazard Group

Policy Year 2013 at 42 Months
 Third Report to Tenth Report

Hazard Group	Indemnity Losses Likely To Develop		Indemnity Losses Not Likely To Develop		Medical Losses Likely To Develop		Medical Losses Not Likely To Develop		Total Losses		
	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Total Reported Losses =(2)+(4)+(6)+(8)	Total Developed Losses =(3)+(5)+(7)+(9)	Develop. Factor = (11) / (10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	3,446,468	3,835,018	9,316,403	10,337,755	1,522,254	1,583,621	7,816,991	7,908,077	22,102,116	23,664,471	1.071
B	17,508,246	19,472,087	26,327,659	29,219,576	7,310,534	7,609,245	22,605,923	22,873,358	73,752,362	79,174,265	1.074
C	35,945,559	39,972,991	51,880,191	57,577,657	15,865,752	16,519,745	37,032,672	37,485,782	140,724,174	151,556,176	1.077
D	15,007,645	16,695,341	27,324,539	30,311,028	6,538,672	6,786,993	19,594,505	19,838,538	68,465,361	73,631,900	1.075
E	30,300,881	33,785,723	36,238,695	40,163,516	23,638,659	24,623,730	20,615,458	20,824,110	110,793,693	119,397,080	1.078
F	36,158,560	40,196,668	48,985,696	54,326,440	22,155,127	23,104,798	25,522,769	25,822,705	132,822,152	143,450,612	1.080
G	3,775,989	4,196,295	8,965,448	9,945,666	804,237	838,596	3,876,357	3,914,693	17,422,031	18,895,251	1.085
A, B, C, D, E, F, G	142,143,348	158,154,124	209,038,631	231,881,638	77,835,235	81,066,729	137,064,675	138,667,265	566,081,889	609,769,755	1.077
C, E, F, G	106,180,989	118,151,678	146,070,030	162,013,279	62,463,775	65,086,869	87,047,256	88,047,291	401,762,050	433,299,118	1.078

Notes:

(2), (4), (6), (8): Unit Statistical Plan Data.

(3), (5), (7), (9): Unit Statistical Plan Data x Loss Development Factors to 10th report from Exhibit 5, Pages 5 and 6.

X 000013

Loss Development Factors From 10th to Ultimate

Hazard Group	Losses Developed to 10th Report				Indicated Development Factor to Ultimate	Balanced Selected Factor
	Indemnity		Medical			
	Likely to Develop	Not Likely to Develop	Likely to Develop	Not Likely to Develop		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A	16,227,862	32,661,931	6,431,267	24,587,070	1.051	1.051
B	56,299,146	95,836,908	28,253,390	69,603,233	1.054	1.054
C	124,094,699	197,094,530	56,026,216	124,279,096	1.059	1.059
D	55,121,020	99,987,747	21,062,581	57,813,215	1.057	1.057
E	96,406,635	135,259,563	60,596,323	65,341,387	1.063	1.063
F	123,270,018	182,644,639	64,226,568	81,098,418	1.064	1.064
G	28,168,449	28,146,257	28,207,444	10,322,422	1.067	1.067
TOTAL	499,587,830	771,631,576	264,803,787	433,044,842	1.060	1.060

Notes:

(2) - (5): Exhibit 4, Pages 3-5.

(6): Weighted Average of Development Factors from Page 2.

(Likely to Dev. Ind. 1.182, Not Likely to Dev. Ind.1.030, Likely to Dev. Med. 1.013, Not Likely to Dev. Med. 1.002)

(7): Factors are balanced to the total development factor from Page 2.

X 000014

X 000015

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2018

Section X - A
 Exhibit 5
 Page 2

Calculation of Development Category Development Factors from 10th to Ultimate

Policy Year (1)	Unit Stat Plan Losses Developed to 10th Rept. (2)	Aggregate Financial Develop. Factor 10th to Ult. (3)	Differential in Loss Development (4)	Unit Stat Plan Losses Adjusted to Financial Agg. Ult. Loss Level = (2) x (3) x (4) (5)	Development Factor 10th to Ult. = (5) / (2) (6)
Indemnity					
2015	438,746,826	1.064	1.024	478,046,554	1.090
2014	442,436,819	1.064	1.024	482,067,070	1.090
2013	390,035,762	1.064	1.024	424,972,310	1.090
Total	1,271,219,406			1,385,085,934	1.090
Medical					
2015	232,142,323	1.006	1.000	233,533,812	1.006
2014	245,972,313	1.006	1.000	247,446,701	1.006
2013	219,733,994	1.006	1.000	221,051,106	1.006
Total	697,848,629			702,031,620	1.006
Ind.+ Med.					
2015	670,889,148			711,580,367	1.061
2014	688,409,132			729,513,771	1.060
2013	609,769,755			646,023,416	1.059
Total	1,969,068,035			2,087,117,554	1.060

(7)	Unit Stat Plan Indem. Losses Developed to 10th Report (8)	Development Factor 10th to Ult. (9)	(10)	Unit Stat Plan Med. Losses Developed to 10th Report (11)	Development Factor 10th to Ult. (12)
a. Likely to Develop	499,587,830	1.182	a. Likely to Develop	264,803,787	1.013
b. Not Likely to Develop	771,631,576	1.030	b. Not Likely to Develop	433,044,842	1.002
c. Total	1,271,219,406	1.090	c. Total	697,848,629	1.006

Notes:

(2): Page 4.

(3): Page 3.

(4): Page 11.

(8),(11): Page 4.

(9), (12): Likely to Develop Factor = $1 + (\text{Total Losses/Likely to Develop Losses}) \times (\text{"Appropriate Column 6 Factor"} - 1) \times 0.8$

(9), (12): Not Likely to Develop Factor = $1 + (\text{Total Losses/Not Likely to Develop Losses}) \times (\text{"Appropriate Column 6 Factor"} - 1) \times (1 - 0.8)$

X 000016

Section X - Experience Rating
Subsection A - Expected Loss Rates
7/1/2018

Section X - A
Exhibit 5
Page 3

Calculation of Development Factor from USR at 10th report to Aggregate Financial Ultimate Level

	<u>Indemnity</u>	<u>Medical</u>
(1) PY2015 Paid + Case Losses Developed to 10th report		
(a) Remainder of Industry	381,412,371	206,022,269
(b) AIG	57,334,455	26,120,054
(c) Total	438,746,826	232,142,323
(2) Development Factor based on Paid + Case 132 Months to Ult.		
(a) Remainder of Industry	1.033	1.018
(b) AIG	1.049	1.065
(c) Weighted Average	1.035	1.023
(3) Est. Ultimate Losses (Prior to Escalation Adj.) based on Paid + Case Develop. Method		
(a) PY2014	444,738,707	247,021,225
(b) PY2015	440,205,264	226,992,687
(c) Average	442,471,985	237,006,956
(4) Est. Ultimate Losses (Prior to Escalation Adj.) based on Paid Develop. Method		
(a) PY2014	459,921,788	231,165,614
(b) PY2015	475,317,332	226,662,866
(c) Average	467,619,560	228,914,240
(5) Ratio of Est. Ultimate Losses based on average of Paid and Paid + Case indications to Est. Ultimate Losses based on Paid + Case = { [(3c) + (4c)] / 2.000 } / (3c)	1.028	0.983
(6) Development Factor to bring Unit Statistical Plan Data 10th report to Aggregate Financial Ultimate Level = (2c) x (5)	1.064	1.006

Notes:

- (1): Unit Statistical Plan Losses and LDFs from Pages 5 and 6.
- (2): 132 Months to 252 Months LDF from Section II-B, Exhibit 1, Pages 1 and 2.
 x 252 Months to Ult LDF from Section II-C, Exhibit 2, Page 1.
- (3),(4): Section II-A, Exhibit 1.

Losses Developed to 10th Report

Policy Year (1)	Loss Development Category (2)	Paid + Case			
		Reported Schedule Z Losses		Losses Developed to 10th Report	
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)
2015	Likely	85,692,877	75,498,984	157,670,975	83,472,902
2015	Not Likely	168,168,345	141,823,751	281,075,851	148,669,420
2015	TOTALS	253,861,222	217,322,735	438,746,826	232,142,323
2014	Likely	144,457,089	93,867,661	183,762,731	100,264,156
2014	Not Likely	206,719,153	142,499,448	258,674,088	145,708,157
2014	TOTALS	351,176,242	236,367,109	442,436,819	245,972,313
2013	Likely	142,143,348	77,835,235	158,154,124	81,066,729
2013	Not Likely	209,038,631	137,064,675	231,881,638	138,667,265
2013	TOTALS	351,181,979	214,899,910	390,035,762	219,733,994

Notes:

(3),(4): Sum of Unit Statistical Plan Data.

(5),(6): Unit Statistical Plan Data x Loss Development Factors to 10th report from Exhibit 5, Pages 5 and 6.

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X 000018

Section X - Experience Rating
 Subsection A - Expected Loss Rates
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 Page 5

Summary of Development Factors Remainder of Industry

		Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		(1) Indemnity Paid + Case Losses								
2Yr Weighted Average		1.428	1.134	1.085	1.012	1.004	0.997	0.999	1.006	1.005
Cumulative		1.797	1.258	1.110	1.023	1.011	1.007	1.011	1.011	1.005
		(2) Medical Paid + Case Losses								
2Yr Weighted Average		1.010	1.018	1.035	1.010	1.004	0.998	0.995	1.009	0.993
Cumulative		1.074	1.063	1.044	1.009	0.999	0.995	0.997	1.002	0.993
		Not-Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		(3) Indemnity Paid + Case Losses								
2Yr Weighted Average		1.311	1.121	1.058	1.025	1.015	1.002	1.003	1.001	1.003
Cumulative		1.633	1.246	1.112	1.050	1.025	1.009	1.007	1.003	1.003
		(4) Medical Paid + Case Losses								
2Yr Weighted Average		1.019	1.009	1.007	1.005	1.002	1.002	0.999	1.000	1.000
Cumulative		1.044	1.024	1.015	1.008	1.003	1.002	1.000	1.001	1.000

Notes:

(1),(2): Page 7.

(3),(4): Page 9.

X 000019

Section X - Experience Rating
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 Page 6

Summary of Development Factors AIG

		Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		<u>(1) Indemnity Paid + Case Losses</u>								
5Yr Weighted Average		1.595	1.238	1.072	1.029	1.016	0.998	1.006	1.004	1.002
Cumulative		2.236	1.402	1.132	1.056	1.026	1.010	1.012	1.006	1.002
		<u>(2) Medical Paid + Case Losses</u>								
5Yr Weighted Average		1.255	1.130	1.015	0.997	0.995	0.963	1.066	0.990	0.995
Cumulative		1.445	1.152	1.019	1.003	1.006	1.011	1.050	0.985	0.995
		Not-Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		<u>(3) Indemnity Paid + Case Losses</u>								
5Yr Weighted Average		1.524	1.177	1.050	1.035	1.006	0.998	1.004	0.998	1.001
Cumulative		1.964	1.289	1.095	1.042	1.007	1.002	1.004	1.000	1.001
		<u>(4) Medical Paid + Case Losses</u>								
5Yr Weighted Average		1.078	1.023	1.002	0.992	0.995	0.999	0.997	1.002	0.999
Cumulative		1.086	1.008	0.986	0.984	0.992	0.997	0.998	1.001	0.999

Notes:
 (1),(2): Page 8.
 (3),(4): Page 10.

X 000020

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2018

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 Exhibit 5
 Page 7

Calculation of Likely to Develop Development Factors Remainder of Industry

Policy Year	Likely to Develop					
	Unlimited Indemnity Paid + Case Losses			Unlimited Medical Paid + Case Losses		
	Evaluated at month		Link Ratio	Evaluated at month		Link Ratio
	18	30		18	30	
2014	84,188,062	121,938,123	1.448	84,149,606	85,094,610	1.011
2013	68,555,672	96,254,571	1.404	64,331,054	64,932,001	1.009
Weighted Average			1.428			1.010
2013	103,098,024	115,997,950	1.125	67,332,208	68,956,838	1.024
2012	102,982,037	117,630,725	1.142	76,550,773	77,531,264	1.013
Weighted Average			1.134			1.018
2012	125,014,971	133,874,098	1.071	80,164,934	83,183,523	1.038
2011	105,103,602	115,753,471	1.101	59,757,055	61,572,237	1.030
Weighted Average			1.085			1.035
2011	121,978,662	123,761,119	1.015	64,124,429	63,621,854	0.992
2010	109,049,300	109,936,249	1.008	63,138,943	64,854,949	1.027
Weighted Average			1.012			1.010
2010	112,910,893	112,295,332	0.995	66,074,078	67,671,811	1.024
2009	115,357,728	116,858,291	1.013	56,815,189	55,753,123	0.981
Weighted Average			1.004			1.004
2009	118,074,519	117,831,725	0.998	56,084,911	55,954,145	0.998
2008	107,283,435	106,760,975	0.995	47,015,371	46,960,465	0.999
Weighted Average			0.997			0.998
2008	107,451,873	107,942,364	1.005	47,357,255	47,136,891	0.995
2007	110,616,839	109,968,798	0.994	63,652,032	63,285,157	0.994
Weighted Average			0.999			0.995
2007	109,968,798	110,324,703	1.003	63,265,924	62,669,470	0.991
2006	107,531,322	108,567,373	1.010	54,680,528	56,333,830	1.030
Weighted Average			1.006			1.009
2006	107,837,189	108,342,253	1.005	56,118,160	55,239,712	0.984
2005	98,565,003	99,086,874	1.005	51,905,660	52,056,536	1.003
Weighted Average			1.005			0.993

Note:
 Unit Statistical Plan Data, Excluding Large Deductible Policies.

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Section X - Experience Rating
 Subsection A - Expected Loss Rates
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Calculation of Likely to Develop Development Factors AIG

Likely to Develop						
Policy Year	Unlimited Indemnity Paid + Case Losses			Unlimited Medical Paid + Case Losses		
	Evaluated at month		Link Ratio	Evaluated at month		Link Ratio
	18	30		18	30	
2014	9,174,120	13,663,846	1.489	5,186,006	5,561,224	1.072
2013	9,565,297	14,608,144	1.527	5,363,899	6,361,015	1.186
2012	7,622,437	12,480,476	1.637	4,626,187	5,851,489	1.265
2011	14,714,154	23,356,039	1.587	11,025,014	15,898,278	1.442
2010	13,997,983	23,752,420	1.697	7,724,637	8,896,159	1.152
Weighted Average			1.595			1.255
	30	42		30	42	
2013	16,125,667	19,274,213	1.195	6,682,322	7,012,191	1.049
2012	13,665,638	16,602,300	1.215	6,109,640	6,407,442	1.049
2011	23,673,086	29,258,257	1.236	16,011,973	20,979,853	1.310
2010	24,324,864	31,534,574	1.296	9,123,191	9,988,184	1.095
2009	19,927,584	24,350,328	1.222	12,482,745	12,590,133	1.009
Weighted Average			1.238			1.130
	42	54		42	54	
2012	17,244,294	18,596,239	1.078	6,863,653	6,966,900	1.015
2011	30,068,933	32,550,259	1.083	21,144,761	21,523,904	1.018
2010	31,258,709	32,730,677	1.047	9,908,805	10,117,585	1.021
2009	25,079,167	26,755,455	1.067	12,882,618	12,778,754	0.992
2008	34,688,511	37,671,065	1.086	13,949,519	14,365,826	1.030
Weighted Average			1.072			1.015
	54	66		54	66	
2011	32,600,224	33,674,455	1.033	21,715,458	21,312,246	0.981
2010	32,469,444	33,977,936	1.046	10,089,936	9,423,068	0.934
2009	28,317,683	28,099,837	0.992	13,476,753	14,566,424	1.081
2008	38,272,318	39,536,682	1.033	14,775,737	14,442,869	0.977
2007	53,661,859	55,399,946	1.032	18,071,407	18,147,565	1.004
Weighted Average			1.029			0.997
	66	78		66	78	
2010	33,475,188	33,564,808	1.003	9,370,024	8,971,775	0.957
2009	27,927,829	28,278,318	1.013	14,510,391	14,220,022	0.980
2008	40,706,821	41,171,296	1.011	14,598,533	14,637,395	1.003
2007	56,375,444	57,709,075	1.024	18,513,393	18,645,515	1.007
2006	68,833,771	70,136,112	1.019	34,355,604	34,456,279	1.003
Weighted Average			1.016			0.995
	78	90		78	90	
2009	28,458,038	28,215,176	0.991	14,268,595	12,874,217	0.902
2008	41,524,883	41,615,816	1.002	14,756,690	13,230,098	0.897
2007	57,838,599	57,957,308	1.002	18,683,148	17,889,554	0.958
2006	71,405,891	71,113,790	0.996	35,042,814	34,802,541	0.993
2005	78,978,185	78,719,088	0.997	37,981,702	37,459,421	0.986
Weighted Average			0.998			0.963
	90	102		90	102	
2008	41,615,816	41,124,487	0.988	13,230,098	12,789,604	0.967
2007	57,957,308	57,527,031	0.993	17,859,773	17,485,556	0.979
2006	71,129,197	71,659,532	1.007	34,825,645	42,163,310	1.211
2005	79,522,627	80,533,258	1.013	37,963,400	38,790,790	1.022
2004	73,705,769	75,161,243	1.020	35,426,519	37,204,331	1.050
Weighted Average			1.006			1.066
	102	114		102	114	
2007	57,864,693	57,896,464	1.001	17,525,696	17,968,328	1.025
2006	71,659,532	72,493,213	1.012	42,163,310	42,484,439	1.008
2005	81,853,852	81,932,856	1.001	39,360,617	37,187,447	0.945
2004	77,999,342	78,512,434	1.007	38,293,202	38,019,290	0.993
2003	63,137,675	63,032,039	0.998	23,577,444	23,679,737	1.004
Weighted Average			1.004			0.990
	114	126		114	126	
2006	72,493,213	72,181,925	0.996	42,468,293	41,804,346	0.984
2005	81,932,856	81,707,067	0.997	37,187,447	37,417,352	1.006
2004	78,512,434	79,613,128	1.014	38,019,290	37,931,577	0.998
2003	63,613,511	63,738,773	1.002	23,863,252	24,036,357	1.007
2002	43,693,717	43,746,989	1.001	18,147,059	17,703,010	0.976
Weighted Average			1.002			0.995

Note:
 Unit Statistical Plan Data, Excluding Large Deductible Policies.

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Section X - Experience Rating
 Subsection A - Expected Loss Rates
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 Page 9

Calculation of Not-Likely to Develop Development Factors Remainder of Industry

Not-Likely to Develop						
Policy Year	Unlimited Indemnity Paid + Case Losses			Unlimited Medical Paid + Case Losses		
	Evaluated at month		Link Ratio	Evaluated at month		Link Ratio
	18	30		18	30	
2014	140,431,242	188,663,212	1.343	126,255,920	129,011,971	1.022
2013	134,452,499	171,586,883	1.276	122,928,578	124,850,080	1.016
Weighted Average			1.311			1.019
	30	42		30	42	
2013	164,743,430	184,705,792	1.121	122,449,873	123,001,259	1.005
2012	159,464,120	178,601,625	1.120	117,353,787	119,004,475	1.014
Weighted Average			1.121			1.009
	42	54		42	54	
2012	171,217,379	181,896,878	1.062	116,370,805	116,969,489	1.005
2011	166,638,473	175,683,845	1.054	111,012,506	111,996,171	1.009
Weighted Average			1.058			1.007
	54	66		54	66	
2011	169,458,654	173,392,372	1.023	109,443,979	109,424,090	1.000
2010	150,573,911	154,621,342	1.027	101,694,068	102,690,480	1.010
Weighted Average			1.025			1.005
	66	78		66	78	
2010	151,600,648	153,297,030	1.011	101,412,818	101,075,637	0.997
2009	144,729,558	147,615,946	1.020	99,729,955	100,381,815	1.007
Weighted Average			1.015			1.002
	78	90		78	90	
2009	146,399,718	146,755,950	1.002	100,050,027	99,961,230	0.999
2008	136,001,666	136,347,010	1.003	89,574,000	90,071,715	1.006
Weighted Average			1.002			1.002
	90	102		90	102	
2008	135,656,112	136,004,808	1.003	89,674,925	89,460,902	0.998
2007	130,216,671	130,760,782	1.004	94,103,213	94,148,677	1.000
Weighted Average			1.003			0.999
	102	114		102	114	
2007	130,760,782	130,793,668	1.000	94,167,910	93,607,759	0.994
2006	121,092,400	121,198,301	1.001	82,532,087	83,125,723	1.007
Weighted Average			1.001			1.000
	114	126		114	126	
2006	121,928,485	122,786,409	1.007	83,341,393	83,450,301	1.001
2005	124,161,309	124,002,523	0.999	82,690,385	82,656,183	1.000
Weighted Average			1.003			1.000

Note:
 Unit Statistical Plan Data, Excluding Large Deductible Policies.

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Section X - Experience Rating
 Subsection A - Expected Loss Rates
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Calculation of Not-Likely to Develop Development Factors AIG

Not-Likely to Develop						
Policy Year	Unlimited Indemnity Paid + Case Losses			Unlimited Medical Paid + Case Losses		
	Evaluated at month		Link Ratio	Evaluated at month		Link Ratio
	18	30		18	30	
2014	17,302,800	26,911,061	1.555	15,262,146	16,699,304	1.094
2013	18,039,922	28,181,595	1.562	15,017,602	16,330,510	1.087
2012	15,596,069	23,041,013	1.477	13,740,393	14,557,090	1.059
2011	21,700,096	32,191,965	1.483	19,627,323	21,064,950	1.073
2010	24,143,989	37,141,106	1.538	22,154,888	23,801,481	1.074
Weighted Average			1.524			1.078
	30	42		30	42	
2013	26,664,072	31,204,024	1.170	16,009,203	15,929,622	0.995
2012	21,855,851	27,186,623	1.244	14,298,939	14,995,683	1.049
2011	31,874,918	36,798,879	1.154	20,951,255	21,256,770	1.015
2010	36,568,662	41,504,074	1.135	23,574,449	24,456,738	1.037
2009	30,434,028	36,837,638	1.210	21,320,307	21,690,743	1.017
Weighted Average			1.177			1.023
	42	54		42	54	
2012	26,544,629	28,425,294	1.071	14,539,472	14,454,028	0.994
2011	35,988,203	37,642,426	1.046	21,091,862	21,277,847	1.009
2010	41,779,939	44,142,114	1.057	24,536,117	24,575,733	1.002
2009	36,108,799	36,896,428	1.022	21,398,258	22,024,251	1.029
2008	48,695,120	51,543,621	1.058	28,331,947	27,760,357	0.980
Weighted Average			1.050			1.002
	54	66		54	66	
2011	37,592,461	39,092,642	1.040	21,086,293	21,074,697	0.999
2010	44,403,347	45,716,327	1.030	24,603,382	24,527,604	0.997
2009	35,334,200	36,577,100	1.035	21,326,252	20,792,373	0.975
2008	50,942,368	52,138,602	1.023	27,350,446	27,194,978	0.994
2007	48,121,538	50,401,813	1.047	30,331,812	30,126,586	0.993
Weighted Average			1.035			0.992
	66	78		66	78	
2010	46,219,075	47,067,995	1.018	24,580,648	24,698,886	1.005
2009	36,749,108	36,891,535	1.004	20,848,406	20,766,193	0.996
2008	50,968,463	51,323,517	1.007	27,039,314	26,966,870	0.997
2007	49,426,315	49,251,613	0.996	29,760,758	29,524,200	0.992
2006	47,110,020	47,261,121	1.003	30,747,161	30,338,431	0.987
Weighted Average			1.006			0.995
	78	90		78	90	
2009	36,711,815	37,164,658	1.012	20,717,620	20,741,933	1.001
2008	50,969,930	50,501,119	0.991	26,847,575	26,648,652	0.993
2007	49,122,089	49,065,303	0.999	29,486,567	29,346,699	0.995
2006	45,991,342	45,973,773	1.000	29,751,896	29,646,865	0.996
2005	55,131,327	54,716,045	0.992	32,803,975	33,076,995	1.008
Weighted Average			0.998			0.999
	90	102		90	102	
2008	50,501,119	50,460,912	0.999	26,648,652	26,428,046	0.992
2007	49,065,303	49,208,839	1.003	29,376,480	29,414,639	1.001
2006	45,958,366	46,144,371	1.004	29,623,761	29,367,738	0.991
2005	53,912,506	53,928,233	1.000	32,573,016	32,405,416	0.995
2004	49,347,187	50,065,661	1.015	29,521,302	29,722,208	1.007
Weighted Average			1.004			0.997
	102	114		102	114	
2007	48,871,177	48,936,610	1.001	29,374,499	29,420,311	1.002
2006	46,144,371	46,124,585	1.000	29,367,738	29,245,085	0.996
2005	52,607,639	52,500,976	0.998	31,835,589	31,898,461	1.002
2004	47,227,562	47,442,232	1.005	28,633,337	28,820,474	1.007
2003	38,273,755	37,703,446	0.985	21,481,129	21,564,692	1.004
Weighted Average			0.998			1.002
	114	126		114	126	
2006	46,124,585	46,127,911	1.000	29,261,231	29,216,271	0.998
2005	52,500,976	52,792,780	1.006	31,898,461	31,909,447	1.000
2004	47,442,232	47,628,451	1.004	28,820,474	28,702,755	0.996
2003	37,121,974	37,191,827	1.002	21,381,177	21,285,684	0.996
2002	32,500,748	32,240,915	0.992	16,975,043	17,069,364	1.006
Weighted Average			1.001			0.999

Note:
 Unit Statistical Plan Data, Excluding Large Deductible Policies.

Escalation Adjustment for Indemnity Losses Only

Loss Development Method (1)	Policy Year (2)	Differential in Loss Development (3)
Paid Plus Case	2015	1.006
	2014	1.006
	2013	1.006
Paid	2015	1.042
	2014	1.042
	2013	1.042
Average of Paid and Paid Plus Case	2015	1.024
	2014	1.024
	2013	1.024

Notes:

(3): Section II-D, Exhibit 1, Page 1 and Exhibit 2, Page 1.

X 000024

X 000025

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2018

Section X - A
 Exhibit 6

Investment Income Offset

Hazard Code (1)	Injury Type (2)	Indemnity		Medical		Total Investment Income Offset (7)
		Developed Losses at Ultimate (3)	Investment Income Offset (4)	Developed Losses at Ultimate (5)	Investment Income Offset (6)	
A	Fatal	1,464,277	0.825	66,968	1.000	
A	Permanent Total	549,453	0.778	56,524	0.779	
A	Permanent Partial	23,232,848	1.028	9,480,905	1.029	
A	Temporary Total	27,576,544	1.036	14,890,875	1.037	
A	Medical Only	0		6,655,846	1.000	
A	TOTAL	52,823,122	1.024	31,151,118	1.026	1.025
B	Fatal	1,961,102	0.825	48,242	1.000	
B	Permanent Total	7,075,332	0.778	2,364,152	0.779	
B	Permanent Partial	80,358,915	1.028	33,064,577	1.029	
B	Temporary Total	75,862,257	1.036	44,554,723	1.037	
B	Medical Only	0		18,331,429	1.000	
B	TOTAL	165,257,606	1.019	98,363,124	1.021	1.020
C	Fatal	5,393,114	0.825	156,515	1.000	
C	Permanent Total	11,176,418	0.778	2,962,396	0.779	
C	Permanent Partial	178,879,560	1.028	65,521,420	1.029	
C	Temporary Total	154,238,209	1.036	85,356,706	1.037	
C	Medical Only	0		27,285,175	1.000	
C	TOTAL	349,687,301	1.020	181,282,211	1.024	1.022
D	Fatal	3,686,735	0.825	552,250	1.000	
D	Permanent Total	3,059,709	0.778	388,235	0.779	
D	Permanent Partial	90,858,547	1.028	35,816,765	1.029	
D	Temporary Total	70,535,434	1.036	34,351,900	1.037	
D	Medical Only	0		8,156,086	1.000	
D	TOTAL	168,140,425	1.022	79,265,237	1.028	1.024
E	Fatal	6,938,641	0.825	212,233	1.000	
E	Permanent Total	20,257,089	0.778	33,197,027	0.779	
E	Permanent Partial	126,377,802	1.028	39,754,799	1.029	
E	Temporary Total	99,696,460	1.036	43,929,676	1.037	
E	Medical Only	0		9,762,409	1.000	
E	TOTAL	253,269,993	1.006	126,856,145	0.964	0.992
F	Fatal	19,027,160	0.825	2,162,746	1.000	
F	Permanent Total	31,901,726	0.778	23,802,745	0.779	
F	Permanent Partial	167,799,121	1.028	60,372,032	1.029	
F	Temporary Total	115,101,132	1.036	52,272,633	1.037	
F	Medical Only	0		7,711,973	1.000	
F	TOTAL	333,829,140	0.995	146,322,128	0.989	0.993
G	Fatal	4,992,347	0.825	420,015	1.000	
G	Permanent Total	9,002,892	0.778	9,001,120	0.779	
G	Permanent Partial	32,545,504	1.028	10,940,476	1.029	
G	Temporary Total	15,745,010	1.036	17,675,463	1.037	
G	Medical Only	0		880,133	1.000	
G	TOTAL	62,285,752	0.978	38,917,207	0.974	0.976

Notes:

(3),(5): From Exhibit 4, Pages 3-5, Developed to Ultimate.

(4),(6): Section IX-B, Exhibit 4.

(7) = Average of (4) and (6) weighted by (3) and (5).

Calculation of Statewide Partial "D" Ratios by Benefit Type

Benefit Type (1)	Adjusted Primary Losses (2)	Adjusted Total Losses (3)	Partial D-Ratio = (2) / (3) (4)
Indemnity	91,659,458	871,092,669	0.105
Medical	142,574,937	546,462,862	0.261

Notes:

Data at the individual claim level for PYs 2013 - 2015 have been adjusted by the factors shown on Page 2. The Adjusted Primary Losses are capped at \$5,000 per claim. The Adjusted Total Losses are capped at \$250,000 per claim. If losses are capped, the proportions for capped indemnity and capped medical losses are consistent with the proportions for unlimited indemnity and unlimited medical.

X 000026

Severity Trend and State Benefit Level Adjustment Factors

Policy Year	Indemnity By Injury Type				Medical by Injury Type				
	Fatal	Permanent Total	Permanent Partial	Temporary Total	Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical Only

(1) Severity Trend Factors

2013	1.031	1.031	1.031	1.031	1.032	1.032	1.032	1.032	1.032
2014	1.031	1.031	1.031	1.031	1.032	1.032	1.032	1.032	1.032
2015	1.031	1.031	1.031	1.031	1.032	1.032	1.032	1.032	1.032

(2) State Benefit Level Adjustment Factors

2013	1.012	1.007	1.012	1.004	1.000	1.000	1.000	1.000	1.000
2014	1.014	1.010	1.016	1.005	1.000	1.000	1.000	1.000	1.000
2015	1.009	1.011	1.017	1.007	1.000	1.000	1.000	1.000	1.000

(3) Combined Severity Trend and State Benefit Level Adjustment Factors

2013	1.044	1.038	1.044	1.035	1.032	1.032	1.032	1.032	1.032
2014	1.046	1.041	1.048	1.037	1.032	1.032	1.032	1.032	1.032
2015	1.040	1.042	1.048	1.038	1.032	1.032	1.032	1.032	1.032

Notes:

(1): Exhibit 2.

(2): Section IV-A, Exhibit 1. PY 2013 to CPY 2014_07. PY 2014 to CPY 2015_07. PY 2015 to CPY 2016_07.

(3) = (1) x (2)

X 000027

Severity Trend Factors

Schedule Z Policy Year (1)			Policy Effective Period (2)		
01/01/2015	-	12/31/2015	07/01/2016	-	06/30/2017
01/01/2014	-	12/31/2014	07/01/2015	-	06/30/2016
01/01/2013	-	12/31/2013	07/01/2014	-	06/30/2015

Avg Acc Date	Avg Acc Date
12/31/2014	06/29/2016

(3) Indemnity Severity Trend	2.1%
(4) Medical Severity Trend	2.2%
(5) Trend Period Length = Years between (1) and (2)	1.495
(6) Indemnity Trend Factor = [1.000 + (3)] ^ (5)	1.031
(7) Medical Trend Factor = [1.000 + (4)] ^ (5)	1.032

Notes:

(3),(4): Section V-A Exhibit 1.

Medical Severity Trend is a weighted average using Injury Type Weights at Ultimate from Section IV.

X 000028

Calculation of ELR Factors

Unit Report / Policy Effective Dates (1)	Hazard Group (2)	Permissible Loss and LBA Ratio (3)	Weighted LBA (4)	Exp Rating LER by Hazard Group (5)	Law Factor (6)	Loss Trend / Payroll Trend (7)	Loss Development to Ultimate Report (8)	Investment Income Offset (9)	Ratio of Exp Rating ELR to Average Rate (10)
1st Report	C	0.633	0.070	0.079	1.002	0.946	1.678	1.022	0.335
7/1/2016	E	0.633	0.070	0.173	1.002	0.946	1.683	0.992	0.309
to	F	0.633	0.070	0.189	1.002	0.946	1.689	0.993	0.302
6/30/2017	G	0.633	0.070	0.357	1.002	0.946	1.670	0.976	0.247
2nd Report	C	0.633	0.070	0.104	1.003	0.920	1.250	1.022	0.450
7/1/2015	E	0.633	0.070	0.228	1.003	0.920	1.252	0.992	0.399
to	F	0.633	0.070	0.248	1.003	0.920	1.254	0.993	0.387
6/30/2016	G	0.633	0.070	0.468	1.003	0.920	1.247	0.976	0.280
3rd Report	C	0.633	0.070	0.105	1.004	0.895	1.149	1.022	0.503
7/1/2014	E	0.633	0.070	0.229	1.004	0.895	1.150	0.992	0.445
to	F	0.633	0.070	0.250	1.004	0.895	1.151	0.993	0.432
6/30/2015	G	0.633	0.070	0.471	1.004	0.895	1.147	0.976	0.311
1st - 3rd Report Average	C E F G								0.429 0.385 0.374 0.279

Notes:

- (1): Unit Stat Reports used to experience rate a policy taking effect during the prospective effective period.
- (3), (5), (7), (9): Section X-A, Exhibit 1.
- (4): Loss Based Assessment weighted by federal indemnity losses as a % of losses.
- (6): State Factors from Section IV-A, Exhibit 1 and Federal Factors from Section IV-F, Exhibit 1 weighted by Adjusted Reported Losses from Section VIII-C, Exhibit 1, Pages 2 and 4.
- (8): Exhibit 2.
- (10) = $[(3) / \{ 1.0 + (4) \}] \times [1.0 - (5)] / [(6) \times (7) \times (8) \times (9)]$

X 000029

X 000030

Section X - Experience Rating
 Subsection C - Expected Loss Rates for F-Class
 7/1/2018

Section X - C
 Exhibit 2

Hazard Group Development Factors to Ultimate

Development to Ultimate (1)	Hazard Group (2)	Losses at Latest Report (3)	Selected Relativity (4)	Balanced Relativity = (4) / TT(4) (5)	Selected Dev. Factor to Ultimate (6)
1st	C	117,081,517	0.994	0.994	1.678
1st	E	83,487,225	1.002	1.002	1.683
1st	F	103,478,179	1.011	1.010	1.689
1st	G	31,439,386	0.982	0.982	1.670
1st	Total	335,486,307	1.000	1.000	1.682
2nd	C	158,125,373	0.994	0.994	1.250
2nd	E	100,786,541	1.002	1.002	1.252
2nd	F	132,642,164	1.011	1.010	1.254
2nd	G	28,699,286	0.982	0.982	1.247
2nd	Total	420,253,364	1.000	1.000	1.251
3rd	C	140,724,174	0.994	0.993	1.149
3rd	E	110,793,693	1.002	1.001	1.150
3rd	F	132,822,152	1.011	1.009	1.151
3rd	G	17,422,031	0.982	0.981	1.147
3rd	Total	401,762,050	1.001	1.000	1.150

Notes:

(3): See Section X-A, Exhibit 4, Page 1.

(4): See Section X-A, Exhibit 4, Page 2 for F-Classes for selection. The entry in the "Total" row is the weighted average using incurred losses at latest report in column (3) as the weights.

(6) = 1.00 + (5) x (Total LDF from Exhibit 3 - 1.00)

Loss Development Factors For Use in Calculation of Reciprocals

Report (1)	Benefit Type (2)	Injury Type (3)	State Loss Development Factor to Ultimate (4)	Federal Loss Development Factor to Ultimate (5)	Average Loss Development Factor to Ultimate (6)	Distribution of Ultimate Losses (7)	Adjusted Distribution = (7) / (6) (8)	LDF to Ultimate to Derive ELR = TT(7) / TT(8) (9)
1st	Indemnity	Likely to Develop	2.124	2.500	2.500	29.7%	11.9%	
1st	Indemnity	Not Likely to Develop	1.681	1.747	1.747	35.6%	20.4%	
1st	Medical	Likely to Develop	1.087	1.680	1.680	13.2%	7.8%	
1st	Medical	Not Likely to Develop	1.046	1.113	1.113	21.6%	19.4%	
1st	Total					100.0%	59.4%	1.682
2nd	Indemnity	Likely to Develop	1.487	1.455	1.455	29.7%	20.4%	
2nd	Indemnity	Not Likely to Develop	1.283	1.214	1.214	35.6%	29.3%	
2nd	Medical	Likely to Develop	1.076	1.365	1.365	13.2%	9.6%	
2nd	Medical	Not Likely to Develop	1.026	1.049	1.049	21.6%	20.6%	
2nd	Total					100.0%	79.9%	1.251
3rd	Indemnity	Likely to Develop	1.312	1.260	1.260	29.7%	23.6%	
3rd	Indemnity	Not Likely to Develop	1.145	1.097	1.097	35.6%	32.4%	
3rd	Medical	Likely to Develop	1.057	1.277	1.277	13.2%	10.3%	
3rd	Medical	Not Likely to Develop	1.017	1.044	1.044	21.6%	20.6%	
3rd	Total					100.0%	87.0%	1.150

Notes:

(4): Section X-A, Exhibit 5, Page 5 and Section X-A, Exhibit 5, Page 2.

(5): Section VIII-E, Exhibit 1, Page 1.

(6): Average of (4) and (5) weighted by % of Total Reported Losses from Section VIII-C, Exhibit 1 Page 2 and Page 4.

Federal losses are 100.0% of total reported indemnity losses and 100.0% of total reported medical losses.

(7): Section IV-E, Exhibit 2, Page 1.

X 000031

X 000032

Section X - Experience Rating
Subsection D - State Reference Point
7/1/2018

Section X - D
Exhibit 1

State Reference Point

Report (1)	Policy Year (2)	Reported Claims (3)	Reported Losses (4)	Average Claim Cost = (4) / (3) (5)
1st	2015	42,679	471,183,957	11,040
2nd	2014	44,018	587,543,351	13,348
3rd	2013	44,057	566,081,889	12,849
Total		130,754	1,624,809,197	12,426
(6)	Indicated State Reference Point = [Total (5)] x 250			3,106,615
(7)	Average Annual Severity Trend			2.10%
(8)	Length of Trending Period in Years			1.495
(9)	Trend Factor = [1.000 + (7)] ^ (8)			1.032
(10)	Trended State Reference Point = (6) x (9)			3,204,671
(11)	Selected State Reference Point			2,500,000
(12)	G = (11) / 250,000			10.00
(13)	State Per Claim Accident Limitation = (11) x 0.1			250,000
(14)	Multiple State Claim Accident Limitation = (13) x 2			500,000

Notes:

(3), (4): Unit Statistical Plan Data, Excluding Large Deductible Policies.

(7): Credibility Weighted Severity Trends from Section V-A, Exhibit 1 weighted by Injury Type Weights at Ultimate from Section IV-E, Exhibit 2.

(8): Section X-B, Exhibit 2.

EXPERIENCE RATING PLAN MANUAL

MASSACHUSETTS

Proposed Effective July 1, 2018

TABLE OF EXPECTED LOSS RATES AND DISCOUNT RATIOS

CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO
0005	1.03	.16	2115	1.90	.15	3041	1.70	.17	3634	0.71	.16	4439	1.54	.17
0008	1.08	.17	2121	0.58	.16	3042	2.71	.15	3635	1.29	.16	4452	1.40	.16
0016	1.60	.16	2130	0.83	.15	3066	1.11	.16	3638	0.81	.16	4459	1.22	.16
0034	1.77	.17	2131	1.22	.16	3076	1.10	.16	3642	0.54	.15	4470	0.96	.15
0035	1.01	.17	2143	0.94	.16	3081D	2.08	.16	3643	0.72	.16	4484	0.93	.16
0036	1.77	.17	2150	2.10	.16	3082D	2.08	.16	3647	0.91	.15	4493	0.99	.16
0042	1.78	.17	2156	2.21	.16	3085D	2.02	.16	3648	0.64	.16	4511	0.14	.16
0046	0.86	.17	2157	1.78	.15	3110	4.26	.16	3681	0.34	.15	4512	0.05	.17
0050	2.16	.15	2172	0.90	.14	3111	0.92	.16	3685	0.31	.15	4557	0.85	.16
0059D	.	.	2211	2.70	.16	3113	0.70	.16	3724	2.08	.15	4558	0.63	.16
0065D	.	.	2220	1.16	.16	3114	1.25	.16	3726	2.54	.14	4583	1.29	.15
0066D	.	.	2260	2.46	.15	3118	0.90	.14	3807	1.29	.17	4611	0.45	.15
0067D	.	.	2288	1.49	.16	3119	0.39	.17	3808	1.29	.16	4635	1.39	.16
0079	1.40	.18	2305	1.38	.16	3120	0.75	.15	3821	2.05	.16	4653	0.88	.15
0083	1.61	.16	2362	0.76	.17	3122	1.02	.17	3826	1.71	.17	4665	3.19	.16
0106	4.31	.17	2380	1.14	.16	3127	0.50	.17	3830	0.77	.16	4692	0.29	.16
0113	1.77	.17	2402	0.96	.16	3131	0.71	.16	3841	0.62	.16	4693	0.42	.16
0170	1.77	.17	2413	1.60	.16	3132	1.45	.16	4000	1.93	.15	4720	0.89	.16
0771	.	.	2416	1.25	.15	3145	0.74	.16	4021	1.57	.16	4740	0.49	.16
0908	37.71	.15	2417	1.31	.15	3146	0.98	.16	4024	1.24	.16	4741	1.08	.15
0909	82.51	.18	2501	0.91	.16	3169	1.24	.17	4034	2.64	.17	4771	2.02	.13
0912	165.02	.18	2503	0.64	.15	3179	0.57	.15	4036	0.99	.15	4777	0.98	.15
0913	75.43	.15	2570	2.86	.15	3180	1.35	.16	4038	1.47	.15	4825	0.22	.15
0917	1.45	.16	2576	0.90	.16	3188	0.99	.16	4053	0.99	.16	4828	0.50	.16
0918	0.26	.14	2585	1.46	.16	3200	0.95	.16	4062	0.81	.16	4829	0.43	.16
1430	2.77	.15	2586	0.82	.16	3220	1.41	.15	4112	0.23	.16	4902	0.94	.16
1438	1.29	.16	2587	1.73	.16	3223	(a)	(a)	4113	0.99	.16	4923	0.35	.15
1463	3.84	.16	2623	2.31	.16	3255	1.13	.16	4114	1.05	.15	5020	1.79	.15
1624D	1.54	.16	2651	0.73	.16	3257	1.22	.16	4130	1.42	.16	5022	3.93	.15
1655	1.42	.16	2660	0.93	.16	3270	0.95	.16	4133	0.79	.15	5037	5.27	.15
1701	1.14	.15	2683	0.89	.17	3300	1.89	.17	4150	0.32	.15	5040	7.51	.14
1710D	1.60	.16	2688	1.11	.16	3305	(a)	(a)	4239	0.97	.16	5057	6.78	.16
1747	1.32	.15	2702	4.20	.16	3315	1.52	.15	4243	1.51	.16	5059	5.22	.16
1748	1.24	.17	2710	2.79	.17	3336	1.47	.15	4244	1.11	.15	5102	2.50	.14
1853	0.68	.14	2731	1.33	.16	3365	2.43	.15	4250	0.87	.16	5146	2.86	.15
1924	1.06	.16	2747	2.96	.16	3372	1.04	.17	4251	1.06	.15	5160	1.13	.15
1925	2.41	.23	2790	0.81	.16	3373	1.79	.15	4273	1.22	.16	5183	1.24	.15
2003	1.75	.16	2802	1.85	.16	3381	1.08	.16	4279	0.98	.16	5188	1.83	.15
2014	1.41	.15	2835	0.94	.16	3383	0.81	.16	4283	0.96	.16	5190	0.92	.16
2021	1.11	.16	2836	0.99	.16	3385	0.34	.16	4299	0.91	.16	5191	0.37	.16
2039	1.63	.16	2841	1.69	.15	3400	1.23	.17	4304	2.20	.17	5192	1.34	.16
2041	1.37	.15	2883	1.48	.15	3507	1.24	.15	4307	0.82	.16	5213	4.91	.15
2070	1.88	.16	2923	0.83	.16	3515	1.37	.16	4308	0.70	.12	5215	2.05	.15
2081	1.53	.17	2942	0.98	.16	3558	0.41	.18	4351	0.43	.16	5221	2.97	.15
2089	1.40	.15	3018	1.12	.15	3571	0.40	.16	4352	0.66	.15	5222	3.52	.14
2095	1.63	.15	3022	1.78	.16	3574	0.81	.16	4360	0.37	.15	5223	1.78	.16
2101	1.46	.15	3027	2.21	.18	3612	0.80	.16	4361	0.35	.17	5348	1.76	.14
2105	(a)	(a)	3028	1.33	.16	3620	1.97	.18	4362	0.26	.16	5402	3.02	.16
2111	1.02	.16	3030	2.48	.15	3629	0.81	.16	4410	1.23	.16	5403	3.13	.15
2114	1.46	.15	3040	2.05	.15	3632	0.77	.16	4432	0.45	.17	5437	1.90	.15

(a) Expected Loss Rates and Discount Ratios for each individual risk must be obtained by Home Office from the WCRIBMA
 D Supplement Disease Loading

Proposed Effective July 1, 2018

TABLE OF EXPECTED LOSS RATES AND DISCOUNT RATIOS

CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO
5443	1.55	.15	7016M	1.12	.79	7704	1.06	.17	8719	1.00	.15	9179	15.18	.17
5445	2.49	.15	7024M	1.40	.79	7720	0.60	.16	8720	0.38	.16	9180	1.96	.19
5462	2.62	.15	7038M	2.12	.76	7855	1.80	.15	8721	0.10	.18	9182	1.42	.17
5472	2.74	.15	7046M	3.02	.58	8001	0.89	.17	8726F	2.17	.17	9186	1.89	.19
5473	3.38	.16	7047M	1.76	.69	8002	0.68	.17	8734M	0.21	.54	9220	1.36	.16
5474	1.74	.16	7050M	3.32	.67	8006	0.59	.17	8737M	0.17	.54	9402	1.74	.15
5478	1.77	.14	7090M	2.65	.76	8008	0.37	.16	8738M	0.26	.53	9403	3.74	.15
5479	3.28	.15	7098M	3.55	.58	8010	0.79	.17	8742	0.05	.17	9410	1.32	.17
5480	1.65	.15	7099M	4.45	.51	8013	0.16	.16	8745	2.28	.18	9501	1.00	.16
5506	1.63	.15	7133	(a)	(a)	8017	0.47	.17	8747	0.42	.15	9505	1.00	.16
5507	2.29	.15	7151M	3.96	.52	8018	1.57	.16	8748	0.30	.16	9519	1.50	.16
5508D	1.91	.15	7152M	6.22	.52	8021	1.49	.16	8800	0.56	.16	9521	1.24	.16
5509	1.60	.16	7153M	4.96	.52	8031	0.87	.16	8803	0.02	.16	9522	0.86	.16
5538	1.62	.15	7219	3.60	.15	8032	0.66	.16	8805M	0.09	.60	9533	5.48	.15
5545	11.17	.17	7230	4.24	.16	8033	0.81	.17	8810	0.03	.16	9534	2.16	.15
5547	3.58	.17	7231	4.30	.16	8034	1.62	.16	8814M	0.07	.60	9549	2.16	.14
5606	0.60	.16	7309F	4.24	.16	8039	0.58	.17	8815M	0.11	.59	9552	3.12	.16
5610	2.71	.14	7313F	4.62	.13	8044	1.39	.16	8820	0.04	.16	9586	0.16	.15
5645	2.91	.16	7317F	4.65	.15	8046	0.86	.17	8824	0.79	.16	9620	0.33	.17
5701	6.88	.17	7327F	8.25	.16	8048	1.34	.15	8826	0.79	.16			
5703	5.98	.15	7333M	4.51	.70	8058	1.11	.17	8829	0.99	.16			
5705	5.40	.15	7335M	5.30	.70	8103	1.33	.16	8831	0.45	.19			
6003	3.88	.15	7337M	6.65	.61	8105	2.97	.15	8832	0.13	.16			
6005	1.91	.15	7350F	7.38	.15	8106	2.46	.16	8833	0.56	.16			
6204	2.39	.15	7360	1.94	.16	8107	1.09	.16	8835	0.96	.15			
6217	1.65	.15	7370	1.57	.17	8111	1.27	.16	8837	(a)	(a)			
6229	1.55	.15	7380	2.95	.16	8203	2.79	.16	8868	0.35	.17			
6233	1.14	.14	7382	1.69	.16	8204	2.04	.18	8901	0.03	.16			
6251D	2.14	.14	7394M	5.80	.84	8215	1.51	.17	9014	1.12	.16			
6252D	2.60	.15	7395M	7.41	.84	8227	1.50	.16	9015	1.47	.16			
6306	3.32	.15	7398M	9.29	.74	8232	2.62	.16	9016	1.01	.18			
6319	1.45	.16	7403	2.05	.16	8233	2.72	.16	9019	1.14	.15			
6325	1.40	.15	7405	0.49	.15	8235	1.95	.16	9033	1.41	.16			
6400	2.23	.15	7420	2.08	.13	8263	1.88	.17	9040	1.48	.16			
6504	1.46	.15	7421	0.52	.15	8264	2.07	.16	9044	0.71	.14			
6702M	(a)	(a)	7422	0.40	.15	8265	2.62	.16	9052	0.79	.16			
6703M	(a)	(a)	7425	0.76	.14	8279	1.82	.17	9058	0.76	.16			
6704M	(a)	(a)	7431	0.40	.15	8291	1.66	.16	9060	0.49	.17			
6801F	2.49	.17	7445	.	.	8292	1.55	.16	9061	0.50	.17			
6811	2.14	.17	7453	.	.	8293	3.50	.16	9062	0.50	.17			
6824F	3.88	.17	7502	0.90	.16	8350	2.37	.16	9063	0.33	.17			
6826F	3.08	.16	7515	0.76	.19	8380	1.25	.16	9077F	2.33	.20			
6834	1.06	.16	7520	1.39	.16	8381	0.84	.17	9079	0.57	.17			
6836	1.48	.17	7538	1.90	.15	8385	1.15	.16	9089	0.45	.17			
6843F	3.72	.15	7539	0.48	.16	8392	0.68	.17	9093	0.56	.18			
6854	3.20	.15	7580	1.38	.16	8393	0.80	.15	9101	1.51	.17			
6872F	4.89	.17	7590	1.73	.16	8500	2.72	.16	9102	1.25	.16			
6874F	4.48	.15	7600	1.32	.15	8601	0.11	.16	9154	0.82	.17			
6882	4.21	.17	7601	2.32	.16	8709F	1.47	.16	9156	0.71	.18			
6884	3.86	.15	7610	0.12	.15	8710	1.36	.15	9178	6.64	.20			

(a) Expected Loss Rates and Discount Ratios for each individual risk must be obtained by Home Office from the WCRIBMA
 D Supplement Disease Loading
 F Expected Loss Rates and Discount Ratios for risks covered under the United States Longshore and Harbor Workers' Compensation Act.
 M Expected Loss Rates and Discount Ratios for risks subject to Admiralty Law or Federal Employers Liability Act (FELA).

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EXPERIENCE RATING PLAN MANUAL

Proposed Effective July 1, 2018

TABLE OF WEIGHTING VALUES					
Expected Losses	Weighting Values	Expected Losses	Weighting Values	Expected Losses	Weighting Values
0 - 2,094	0.04	592,434 - 639,201	0.24	2,442,140 - 2,640,313	0.44
2,095 - 8,465	0.05	639,202 - 688,454	0.25	2,640,314 - 2,861,317	0.45
8,466 - 14,973	0.06	688,455 - 740,399	0.26	2,861,318 - 3,109,338	0.46
14,974 - 61,441	0.07	740,400 - 795,268	0.27	3,109,339 - 3,389,655	0.47
61,442 - 89,440	0.08	795,269 - 853,318	0.28	3,389,656 - 3,709,015	0.48
89,441 - 116,140	0.09	853,319 - 914,835	0.29	3,709,016 - 4,076,189	0.49
116,141 - 142,901	0.10	914,836 - 980,144	0.30	4,076,190 - 4,502,786	0.50
142,902 - 170,187	0.11	980,145 - 1,049,608	0.31	4,502,787 - 5,004,499	0.51
170,188 - 198,237	0.12	1,049,609 - 1,123,639	0.32	5,004,500 - 5,603,090	0.52
198,238 - 227,209	0.13	1,123,640 - 1,202,704	0.33	5,603,091 - 6,329,619	0.53
227,210 - 257,226	0.14	1,202,705 - 1,287,337	0.34	6,329,620 - 7,230,011	0.54
257,227 - 288,398	0.15	1,287,338 - 1,378,150	0.35	7,230,012 - 8,375,165	0.55
288,399 - 320,826	0.16	1,378,151 - 1,475,847	0.36	8,375,166 - 9,880,584	0.56
320,827 - 354,616	0.17	1,475,848 - 1,581,242	0.37	9,880,585 - 11,948,018	0.57
354,617 - 389,873	0.18	1,581,243 - 1,695,284	0.38	11,948,019 - 14,964,429	0.58
389,874 - 426,711	0.19	1,695,285 - 1,819,085	0.39	14,964,430 - 19,777,840	0.59
426,712 - 465,250	0.20	1,819,086 - 1,953,956	0.40	19,777,841 - 28,675,343	0.60
465,251 - 505,620	0.21	1,953,957 - 2,101,450	0.41	28,675,344 - 50,684,928	0.61
505,621 - 547,963	0.22	2,101,451 - 2,263,429	0.42	50,684,929 - 99,999,999	0.62
547,964 - 592,433	0.23	2,263,430 - 2,442,139	0.43		

- | | |
|---|-----------|
| (a) State Per Claim Accident Limitation | \$250,000 |
| (b) State Multiple Claim Accident Limitation | \$500,000 |
| (c) U.S. Longshore and Harbor Workers' Act Per Claim Accident Limitation | \$130,000 |
| (d) U.S. Longshore and Harbor Workers' Act Multiple Claim Accident Limitation | \$260,000 |
| (e) Employers Liability Accident Limitation | \$55,000 |
| (f) USL&HW Act-Expected Loss Factor-Non-F Classes | 16.2% |
| (g) Cap on Modifications = $1 + (0.00005) [(Expected Losses) + (2) (Expected Losses) / (10)]$ | |

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Proposed Effective July 1, 2018

TABLE OF BALLAST VALUES

Expected Losses	Ballast Values	Expected Losses	Ballast Values	Expected Losses	Ballast Values
0 - 53,788	25,000	1,726,010 - 1,775,981	200,000	3,475,503 - 3,525,495	375,000
53,789 - 92,574	30,000	1,775,982 - 1,825,954	205,000	3,525,496 - 3,575,488	380,000
92,575 - 137,140	35,000	1,825,955 - 1,875,929	210,000	3,575,489 - 3,625,481	385,000
137,141 - 184,154	40,000	1,875,930 - 1,925,905	215,000	3,625,482 - 3,675,475	390,000
184,155 - 232,312	45,000	1,925,906 - 1,975,882	220,000	3,675,476 - 3,725,468	395,000
232,313 - 281,074	50,000	1,975,883 - 2,025,860	225,000	3,725,469 - 3,775,462	400,000
281,075 - 330,189	55,000	2,025,861 - 2,075,840	230,000	3,775,463 - 3,825,456	405,000
330,190 - 379,527	60,000	2,075,841 - 2,125,820	235,000	3,825,457 - 3,875,450	410,000
379,528 - 429,013	65,000	2,125,821 - 2,175,801	240,000	3,875,451 - 3,925,445	415,000
429,014 - 478,603	70,000	2,175,802 - 2,225,783	245,000	3,925,446 - 3,975,439	420,000
478,604 - 528,269	75,000	2,225,784 - 2,275,766	250,000	3,975,440 - 4,025,433	425,000
528,270 - 577,991	80,000	2,275,767 - 2,325,750	255,000	4,025,434 - 4,075,428	430,000
577,992 - 627,756	85,000	2,325,751 - 2,375,734	260,000	4,075,429 - 4,125,423	435,000
627,757 - 677,556	90,000	2,375,735 - 2,425,719	265,000	4,125,424 - 4,175,418	440,000
677,557 - 727,382	95,000	2,425,720 - 2,475,704	270,000	4,175,419 - 4,225,413	445,000
727,383 - 777,231	100,000	2,475,705 - 2,525,690	275,000	4,225,414 - 4,275,408	450,000
777,232 - 827,098	105,000	2,525,691 - 2,575,677	280,000	4,275,409 - 4,325,403	455,000
827,099 - 876,979	110,000	2,575,678 - 2,625,664	285,000	4,325,404 - 4,375,399	460,000
876,980 - 926,873	115,000	2,625,665 - 2,675,652	290,000	4,375,405 - 4,425,394	465,000
926,874 - 976,778	120,000	2,675,653 - 2,725,640	295,000	4,425,395 - 4,475,390	470,000
976,779 - 1,026,692	125,000	2,725,641 - 2,775,628	300,000	4,475,391 - 4,525,386	475,000
1,026,693 - 1,076,614	130,000	2,775,629 - 2,825,617	305,000	4,525,387 - 4,575,381	480,000
1,076,615 - 1,126,543	135,000	2,825,618 - 2,875,607	310,000	4,575,382 - 4,625,377	485,000
1,126,544 - 1,176,478	140,000	2,875,608 - 2,925,596	315,000	4,625,378 - 4,675,373	490,000
1,176,479 - 1,226,418	145,000	2,925,597 - 2,975,586	320,000	4,675,374 - 4,725,369	495,000
1,226,419 - 1,276,363	150,000	2,975,587 - 3,025,577	325,000	4,725,370 - 4,775,365	500,000
1,276,364 - 1,326,312	155,000	3,025,578 - 3,075,567	330,000		
1,326,313 - 1,376,265	160,000	3,075,568 - 3,125,558	335,000		
1,376,266 - 1,426,221	165,000	3,125,559 - 3,175,549	340,000		
1,426,222 - 1,476,179	170,000	3,175,550 - 3,225,541	345,000		
1,476,180 - 1,526,141	175,000	3,225,542 - 3,275,533	350,000		
1,526,142 - 1,576,105	180,000	3,275,534 - 3,325,525	355,000		
1,576,106 - 1,626,071	185,000	3,325,526 - 3,375,517	360,000		
1,626,072 - 1,676,039	190,000	3,375,518 - 3,425,509	365,000		
1,676,040 - 1,726,009	195,000	3,425,510 - 3,475,502	370,000		

For Expected Losses (E) greater than \$4,775,365, the Ballast Value is calculated using the following formula (rounded to the nearest 1):

$$\text{Ballast} = (0.1E + 2,500GE / (E + 700G))$$

G = 10

XI 000001

Miscellaneous Rating Values

In this section, we discuss recommended modifications to various miscellaneous rating values, including the following:

- Massachusetts Benefits Deductible Program Credits
- Massachusetts Benefits Claim and Aggregate Deductible Program Credits

XI 000002

Section XI-B – Massachusetts Benefits Deductible Program Credits

The Massachusetts Benefits Deductible Program allows insureds to elect a per claim deductible applicable to the sum of medical and indemnity losses. Deductible levels of \$500, \$1,000, \$2,000, \$2,500 and \$5,000 are offered to every employer. Insureds that elect a deductible obtain a premium reduction reflective of the percentage of losses expected to be retained by the insured as a consequence of the deductible. Higher deductibles should be associated with larger premium credits because an insured's expected retained losses increase as the deductible level increases.

Section XI-B, Exhibit 1 displays Loss Elimination Ratios and Premium Credits for the available deductible levels. The premium credits have been calculated with the following considerations:

- The deductible will apply to the sum of indemnity and medical losses.
- The database used is Unit Statistical Report data from policy years 2011, 2010, 2009, 2008, and 2007 at fifth report. Each loss is multiplied by appropriate trend, law amendment and development factors. Claim costs are trended to 7/1/2019, the average accident date (assuming the proposed small deductible credits will be in effect for one year starting 7/1/2018). These factors are shown in Section XI-D, Exhibit 1 and they are taken directly from other sections of the filing.
- Each claim is then layered by size of loss to calculate loss elimination ratios (LER).
- The WCRIBMA used the same formula as in the last Massachusetts Benefits Deductible Program filing to calculate the premium credit. This is formula (8) in

XI 000003

“Fundamentals of Individual Risk Rating”, 1992, Part III by William R. Gillam and Richard H. Snader:

$$\frac{\text{Premium Credit}}{\text{Credit}} = \frac{\text{LER} \times \text{SF} \times \text{ELR}}{1.0 - \text{VEL}}$$

LER - Loss Elimination Ratio (Section XI-B, Exhibit 1)

ELR - Expected Loss Ratio (Section VI-A, Exhibit 1)

VEL - Variable Expense Load (sum of the variable expense ratio from Section VI-A, Exhibit 1 and the IRR Profit Provision from Section VII-A, Exhibit 1)

SF - Safety Factor (based on the 2007 Stipulation)

The safety factor is warranted for a number of reasons. First, insureds that elect a small deductible are more likely to benefit from having the deductible than an insured chosen at random. This is referred to as adverse selection and is exacerbated by the requirement in Massachusetts (211 CMR 115.04) mandating that all risks be offered a policy with a deductible. Second, unlike personal auto or health insurance where the insurance company pays claims net of any applicable deductible, workers' compensation insurers must pay the entire amount of the claim and then seek reimbursement of the deductible from the insured. This creates credit risk and some insureds default on their obligation to reimburse their insurance carrier. Additionally, the exposure insured by the insurance carrier is more risky if the policyholder has opted for a deductible because the policyholder retains the less risky portion of the total losses.

XI 000004

Section XI - Miscellaneous Rating Values
Subsection B - Massachusetts Benefits Deductible Program Credits
7/1/2018

Section XI-B
Exhibit 1

Massachusetts Benefits Deductible Program Premium Credits

Deductible Level (1)	Loss Elimination Ratio (2)	Expected Loss Ratio (3)	Safety Factor (4)	Variable Expense Ratio (5)	Underwriting Profit Provision (6)	Premium Credit (7)
500	2.8%	0.633	0.90	0.199	0.003	2.0%
1,000	4.6%	0.633	0.90	0.199	0.003	3.2%
2,000	6.9%	0.633	0.90	0.199	0.003	4.9%
2,500	7.9%	0.633	0.90	0.199	0.003	5.6%
5,000	11.6%	0.633	0.90	0.199	0.003	8.3%

Notes:

(2): Based on Unit Statistical Data

(3): Section VI-J, Exhibit 1.

(4) = 0.9 from 9/1/2007 Stipulation.

(5): Section VI-A, Exhibit 1.

(6): Section VII-A, Exhibit 1.

(7) = [(2) x (3) x (4)] / [1.0 - (5) - (6)]

XI 000005

Section XI-C – Massachusetts Benefits Claim and Aggregate Deductible Program

Credits

The Massachusetts Benefits Claim and Aggregate Deductible Program allows insureds to elect a per claim deductible applicable to the sum of medical and indemnity losses. However, unlike the Massachusetts Benefits Deductible Program, the losses retained by the insured are subject to a maximum, the aggregate limit. Only one deductible option is available with the Massachusetts Benefits Claim and Aggregate Deductible Program. Insureds may elect a \$2,500 deductible with an aggregate limit equal to the greater of \$10,000 or 5% of the “Basis for the Aggregate Limit at Policy Inception” which is defined in the Massachusetts Workers Compensation and Employers Liability Insurance Manual (“Massachusetts Manual”) as manual premium subject to any applicable merit or experience rating.

Section XI-C, Exhibit 1 shows the pricing of the \$2,500 per claim deductible subject to an aggregate limit. In the exhibit, the WCRIBMA estimates how much less of a credit is appropriate given the limitation on the insured’s retained losses. For the Massachusetts Benefits Deductible Program, a credit of 5.6% is estimated for a \$2,500 per claim deductible (not subject to an aggregate limit). The 5.6% will serve as the basis for the calculation of the credit factors applicable to the Massachusetts Benefits Claim and Aggregate Deductible Program.

The impact of the aggregate limit on retained losses will vary with the premium size for an insured. Consistent with the law of large numbers, the loss experience for smaller policies is more volatile than for larger policies. Hence, proportionately “smaller insureds”

XI 000006

have either very low or very high loss ratios when compared to “larger insureds.” Consequently, smaller insureds are less apt to benefit from an aggregate limit. In this section, factors are derived to modify the credit proposed for a \$2,500 deductible without an applicable aggregate limit. These vary by premium size to reflect the differential benefits of the aggregate limit for different size insureds. As in the prior Massachusetts Benefits Claim and Aggregate Deductible Program filing, the selection of the adjustment factor is based on the results of a simulation model shown in Section XI-C, Exhibit 2.

The simulation model does the following for each simulated insured:

- Assumes the insured has an expected claim frequency of N.
- Simulates the number of claims for the insured by generating a random number from a Poisson distribution with mean N.
- For each simulated claim, selects at random an actual loss amount from those reported in policy years 2011, 2010, 2009, 2008, and 2007 at 5th report. Loss amounts are adjusted for trend, development and law changes.
- Applies the per claim deductible to each claim to estimate the retained losses prior to application of the aggregate limit.
- Summarizes the simulated retained losses.
- Applies the aggregate limit to the sum of the simulated retained losses.

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Section XI - Miscellaneous Rating Values
 Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
 7/1/2018

Section XI-C
 Exhibit 1

Massachusetts Benefits Claim and Aggregate Deductible Program Premium Credit for \$2,500 Per Claim Deductible with Aggregate Limit

Estimated Annual Standard Premium (1)	Expected Number of Claims Per Year = Midpoint of (1) / \$22,965 (2)	Aggregate Limit (3)	Selected Adjustment Factor for Aggregate Limit (4)	Premium Credit = (4) x 5.6% (5)
0 - 75,000	1.6	\$10,000	0.98	5.5%
75,000 - 100,000	3.8	\$10,000	0.96	5.4%
100,000 - 125,000	4.9	\$10,000	0.94	5.3%
125,000 - 150,000	6.0	\$10,000	0.92	5.2%
150,000 - 200,000	7.6	\$10,000	0.88	5.0%
Over 200,000	9 or more	5% of the 'Basis for the Aggregate Limit at Policy Inception'	0.83	4.7%

Notes:

(2): Based on \$22,965 in standard premium (no ARAP) per expected claim.

(4): Selected based on the simulation results shown in Exhibit 2.

(5): The 5.6% is based on the \$2,500 per claim deductible without any aggregate limit, from Section XI-B, Exhibit 1.

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Section XI - Miscellaneous Rating Values
 Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
 7/1/2018

Section XI-C
 Exhibit 2

Results of Simulation Model

Expected Number of Claims Per Year (1)	Number of Simulated Risks (2)	LER with No Aggregate Limit (3)	LER with \$10,000 Aggregate Limit (4)	LER with 5% of the Basis for Aggregate Limit (5)	Ratio of LERs (\$10,000 limit) = (4) / (3) (6)	Ratio of LERs (5% limit) = (5) / (3) (7)
1	1,000,000	7.80%	7.79%	3.65%	1.00	0.47
2	1,000,000	7.82%	7.80%	4.86%	1.00	0.62
3	1,000,000	7.89%	7.82%	5.43%	0.99	0.69
4	1,000,000	7.86%	7.67%	5.70%	0.98	0.73
5	1,000,000	7.86%	7.49%	5.91%	0.95	0.75
6	1,000,000	7.88%	7.25%	6.07%	0.92	0.77
7	1,000,000	7.88%	6.96%	6.20%	0.88	0.79
8	1,000,000	7.89%	6.62%	6.30%	0.84	0.80
9	1,000,000	7.87%	6.24%	6.36%	0.79	0.81
10	1,000,000	7.88%	5.89%	6.44%	0.75	0.82
12	1,000,000	7.86%	5.17%	6.53%	0.66	0.83
14	1,000,000	7.89%	4.58%	6.64%	0.58	0.84
16	1,000,000	7.88%	4.05%	6.70%	0.51	0.85
18	1,000,000	7.87%	3.61%	6.74%	0.46	0.86
20	1,000,000	7.88%	3.27%	6.80%	0.41	0.86
25	1,000,000	7.88%	2.62%	6.89%	0.33	0.87
30	1,000,000	7.86%	2.18%	6.94%	0.28	0.88
40	1,000,000	7.88%	1.64%	7.05%	0.21	0.89
50	1,000,000	7.87%	1.31%	7.11%	0.17	0.90
75	1,000,000	7.88%	0.87%	7.21%	0.11	0.91
100	1,000,000	7.87%	0.65%	7.26%	0.08	0.92
150	1,000,000	7.87%	0.44%	7.33%	0.06	0.93
200	1,000,000	7.88%	0.33%	7.37%	0.04	0.94
300	1,000,000	7.88%	0.22%	7.41%	0.03	0.94
400	1,000,000	7.88%	0.16%	7.43%	0.02	0.94
500	1,000,000	7.88%	0.13%	7.45%	0.02	0.95

Notes:

(5): The Aggregate Limit is based on the average claim severity of the simulated losses, \$15,291 and the permissible loss ratio of 0.633. One claim is assumed to be expected for each \$22,965 of standard premium.

XI 000009

Section XI - Miscellaneous Rating Values
 Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
 7/1/2018

Section XI-C
 Exhibit 3

Law Amendments, Loss Development Factors, and Severity Trend

(1) Law Amendment Factors to Prospective Effective Period

Policy Year	Indemnity Losses				Medical Losses
	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types
PY 2007	1.056	1.061	1.102	1.036	1.032
PY 2008	1.050	1.052	1.087	1.031	1.024
PY 2009	1.047	1.049	1.081	1.029	1.002
PY 2010	1.048	1.050	1.082	1.029	1.000
PY 2011	1.044	1.045	1.073	1.027	1.000

(2) Loss Development Factors - Fifth Report to Ultimate

Loss Development Category	Indemnity	Medical
Likely to Develop	1.073	1.024
Not Likely to Develop	1.014	1.004

(3) Severity Trend Factors

We apply three distinct trend factors.

Trend to PY 2011 is based on empirical USR data at 5th report.

Trend from PY 2011 to PY 2015 is based on severities from Section V-A.

Trend from PY 2015 to the Prospective Effective Period is based on the projected severity trends from Section V-A.

Trend Period		Indemnity	Lost Time	
From	To		Medical	Medical Only
PY 2007	PY 2011	1.127	1.146	1.014
PY 2008	PY 2011	1.057	1.169	0.999
PY 2009	PY 2011	1.014	1.013	1.025
PY 2010	PY 2011	1.063	1.079	1.020
PY 2011	PY 2015	1.109	1.063	1.102
PY 2015	Prosp. Eff. Period	1.074	1.079	1.068

Notes:

(1): Section IV-A, Exhibit 1.

(2): Section IV-E, Exhibit 1, Pages 1 and 2.

(3): Section V-A, Exhibits 1 and 2.

XI 000010

MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL	RATES
<i>Proposed Effective July 1, 2018</i>	Page RA-5

MISCELLANEOUS VALUES

Basis of Premium applicable in accordance with the footnote instructions for Code 7370 - "Taxicab Co.":	
Employee operated vehicles.....	\$104,400.00
Leased or rented vehicles.....	\$69,600.00
Basis of Premium for Sole Proprietors, Partners of Legal Partnerships, Members of Limited Liability Companies or Partners of Limited Liability Partnerships in accordance with Rule IX-B-3-a.....	
	\$48,700.00
Payroll Limitations:	
For Executive Officers - in accordance with Rule IX-A-3-a and b	
Minimum individual payroll for an executive officer per week.....	\$210.00
Maximum individual payroll for an executive officer per week.....	\$1,060.00
For Spouses of Individuals, Co-Partners or Corporate Officers - in accordance with Rule IX-A-4	
Minimum individual payroll for a spouse per week.....	\$210.00
For Elected or Appointed Officers of a City or Town - in accordance with Rule IX-A-5	
Minimum individual payroll for an elected or appointed officer per week.....	\$210.00
Maximum individual payroll for an elected or appointed officer per week.....	\$1,060.00
Applicable with footnote instructions detailing the maximum average weekly wage per employee for the following three classification codes:	
Code 9186 - Amusement Device Operator, Carnival or Circus Traveling - All Employees & Drivers.....	\$320.00
Code 9179 - Athletic Sports Or Park: Contact Sports.....	\$320.00
Code 9178 - Athletic Sports Or Park: Non-Contact Sports.....	\$320.00
Terrorism Insurance Program —Certified Loss.....	0.03

BENEFITS DEDUCTIBLE COVERAGE PROGRAM

Medical and Indemnity Deductible Amount	Premium Reduction Percentage
\$500	2.0%
\$1,000	3.2%
\$2,000	4.9%
\$2,500	5.6%
\$5,000	8.3%

BENEFITS CLAIM AND AGGREGATE DEDUCTIBLE PROGRAM

Basis for the Aggregate Limit	Claim Deductible Amount	Aggregate Deductible Amount	Premium Reduction Percentage
\$ 0 to \$75,000	\$2,500	\$10,000	5.5%
\$75,001 to \$100,000	\$2,500	\$10,000	5.4%
\$100,001 to \$125,000	\$2,500	\$10,000	5.3%
\$125,001 to \$150,000	\$2,500	\$10,000	5.2%
\$150,001 to \$200,000	\$2,500	\$10,000	5.0%
over \$200,000	\$2,500	5% of Basis for the Aggregate Limit	4.7%

Expense Constant applicable in accordance with Basic Manual Rule VI-E-2:	
Policies which develop earned Standard Premium of less than \$200.....	\$159.00
Policies which develop earned Standard Premium of at least \$200 and less than \$1,000.....	\$250.00
Policies which develop earned Standard Premium of \$1,000 or more.....	\$338.00

The expense constant for private residence per capita classifications is \$64, up to a maximum of 4.

Notes:

- Benefit Deductible Coverage Program - Section XI-B, Exhibit 1.
- Benefit Claim and Aggregate Deductible Program - Section XI-C, Exhibit 1.
- Expense Constant - Section VI-D, Exhibit 1.
- Expense Constant for private residences - Section I-A, Exhibit 1.

XI 000011

RATES		MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL	
Page RA-6		Proposed Effective July 1, 2018	
Premium Discount Percentages —(See Basic Manual Rule VII). The following premium discounts are applicable to Standard Premiums. Note: Premium Discount is not applicable to Assigned Risk policies.			
		Type A Discount	Type B Discount
First	\$ 10,000.....	0.0%	0.0%
Next	190,000.....	9.1%	5.1%
Next	1,550,000.....	11.3%	6.5%
Over	1,750,000.....	12.3%	7.5%
United States Longshore and Harbor Workers' Compensation Coverage Percentage applicable only in connection with Rule XII-D-3-b "U.S. Longshore and Harbor Workers' Compensation Act" of the MA Manual.....			22.6%
(Multiply an eligible Non-F classification rate by a factor of 1.226)			
EXPERIENCE RATING ELIGIBILITY			
A risk is eligible for intrastate experience rating when the payrolls or other exposures developed in the last year or last two years of the experience period produced a subject premium of at least \$11,000. If more than two years, an average annual premium of at least \$5,500 is required. The Experience Rating Plan Manual should be referenced for the latest eligibility amounts by state.			

Notes:

USL&H factor - Section VIII-J, Exhibit 1.

XII 000001

RETROSPECTIVE RATING PLANS

The NCCI's Retrospective Rating Plan has been adopted for use in Massachusetts since 1936. Retrospective rating plans adjust the premium of a policy to reflect an insured's loss experience during the effective period of the policy. At the simplest level, an insured's retrospective premium is determined by the formula

$R = [B + (c \times L)] \times t$, where:

R = Retrospective Premium, subject to minimum and maximum amounts

B = Basic Premium

c = Loss Conversion Factor, generally reflecting loss adjustment expense

L = Actual Incurred Loss during the effective policy period

t = Tax Multiplier

The basic premium provides for the expenses of carriers. It also includes a net insurance charge, which is intended to compensate for the possibility that the otherwise-indicated retrospective premium will exceed the maximum permissible premium amount. Similarly, there is a savings resulting from the possibility that the otherwise-indicated retrospective premium will be less than the permissible minimum premium amount. The net insurance charge is the difference between the charge for the maximum and the savings from the minimum.

XII 000002

The calculations in this section appear in Sections XII-A, XII-B and XII-C and are similar to those used by the Commissioner in her 2003 decision. This year, consistent with the 2011, 2012, 2014 and 2016 filing, the WCRIBMA includes miscellaneous taxes in the Tax Multiplier.

Section XII-A displays the calculation of the parameters needed for retrospective rating. Insureds electing to purchase a retrospectively rated policy may choose one of two options that differ as to their treatment of allocated loss adjustment expenses (“ALAE”). Option one, the traditional approach, is designed so that expected ALAE is primarily recovered through the application of the loss conversion factor to losses (Exhibit 3). Option two uses the sum of losses and ALAE, as opposed to only losses, in its calculation of retrospective premium and therefore, the loss conversion factor is smaller (Exhibit 4).

Section XII-B calculates the revised provision for the residual market subsidy.

Section XII-C displays the tables of expense ratios corresponding to the parameters calculated in Section XII-A.

Section XII-D and E presents the calculation of hazard group differentials.

Section XII-F presents an update of the Excess Loss Factors.

Expected Loss Ranges and State and Hazard Groups

Retrospective premiums are calculated subject to a maximum and minimum premium. If an insured incurs losses high enough to cap its premium at the maximum, the insurer collects insufficient premium for that account. If an insured has unusually low losses, it pays the minimum premium. The net insurance charge is the difference between the charge for the maximum and the savings from the minimum.

XII 000003

The Table of Insurance Charges contains the excess ratios needed to quantify the insurance charge and savings described above. The ratio of actual losses to expected losses, the entry ratio, is used to look up the values in the Table of Insurance Charges. The charges depend not only on the maximum and minimum subject losses, but also on the size of the insured. The variation in the loss ratios, and in turn the charges, of the larger employers that expect many losses should be much lower than the variation for smaller employers. Insurance Charges are inversely proportional to risk size. Retrospectively rated risks are categorized into expected loss ranges which dictate which column to use from the Table of Insurance Charges when calculating a retrospectively rated risk's insurance charge.

XII 000004

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

**MASSACHUSETTS
 RR1**

Proposed Effective July 1, 2018

1. Hazard Group Differentials

A	B	C	D	E	F	G
1.93	1.60	1.38	1.17	0.95	0.76	0.59

2. Tax Multipliers

a. State (non-F Classes)	1.028*
b. Federal Classes, or non-F classes where rate is increased by the USL&HW Act Percentage	1.076*

* Includes -0.24% residual market subsidy provision and 0.26% insolvency fund assessment provision

3. Expected Loss Ratio

0.632

Expected Loss and Allocated Loss Adjustment Expense Ratio (ALAE Option)

0.892

4. Loss Conversion Factor

1.185

Loss Conversion Factor for Allocated Loss Adjustment Expense Option (ALAE Option)

1.083

5. Table of Expense Ratios Excluding Taxes and Including Profit

Type A Company

Massachusetts
 Effective July 1, 2018

Type B Company

Massachusetts
 Effective July 1, 2018

Table of Expense Ratios Excluding Allocated Loss Adjustment Expense and Taxes and Including Profit (ALAE Option)

Type A Company

Massachusetts
 Effective July 1, 2018

Type B Company

Massachusetts
 Effective July 1, 2018

6. 2013—Table of Expected Loss Ranges

April 1, 2014

7a.

Excess Loss Factors

(Applicable to New and Renewal Policies)

<u>Per Accident Limitation</u>	<u>Hazard Groups</u>						
	A	B	C	D	E	F	G
\$25,000	0.397	0.422	0.446	0.468	0.488	0.517	0.550
30,000	0.378	0.405	0.430	0.453	0.474	0.504	0.540
35,000	0.362	0.389	0.415	0.440	0.461	0.492	0.531
40,000	0.347	0.375	0.402	0.428	0.449	0.481	0.523
50,000	0.322	0.350	0.378	0.406	0.428	0.461	0.508
75,000	0.271	0.300	0.330	0.363	0.385	0.420	0.475
100,000	0.234	0.262	0.292	0.327	0.351	0.384	0.447
125,000	0.205	0.230	0.261	0.298	0.321	0.354	0.421
150,000	0.182	0.205	0.235	0.272	0.294	0.326	0.398
175,000	0.163	0.184	0.213	0.250	0.271	0.301	0.377
200,000	0.147	0.166	0.193	0.231	0.250	0.279	0.357
250,000	0.121	0.137	0.162	0.199	0.215	0.243	0.323
300,000	0.102	0.116	0.139	0.173	0.188	0.213	0.293
500,000	0.060	0.068	0.084	0.110	0.120	0.138	0.210
1,000,000	0.028	0.032	0.040	0.054	0.059	0.069	0.116
2,000,000	0.012	0.014	0.018	0.025	0.027	0.032	0.058
3,000,000	0.007	0.008	0.011	0.016	0.017	0.020	0.037
4,000,000	0.005	0.006	0.008	0.011	0.012	0.014	0.027
5,000,000	0.004	0.004	0.006	0.008	0.009	0.011	0.020

XII 000005

**MASSACHUSETTS
 RR2**

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

Proposed Effective July 1, 2018

**7b. ALAE Option Excess Loss and Allocated Loss Adjustment Expense Factors
 (Applicable to New and Renewal Policies)**

Per Accident Limitation	Hazard Groups						
	A	B	C	D	E	F	G
\$25,000	0.444	0.471	0.497	0.520	0.541	0.573	0.607
30,000	0.424	0.453	0.480	0.504	0.526	0.559	0.597
35,000	0.407	0.436	0.464	0.490	0.513	0.547	0.588
40,000	0.391	0.421	0.450	0.477	0.500	0.535	0.579
50,000	0.364	0.394	0.424	0.455	0.478	0.514	0.563
75,000	0.310	0.341	0.373	0.408	0.433	0.470	0.529
100,000	0.269	0.300	0.333	0.371	0.397	0.434	0.500
125,000	0.238	0.266	0.300	0.340	0.365	0.401	0.473
150,000	0.212	0.238	0.272	0.312	0.337	0.372	0.448
175,000	0.191	0.215	0.247	0.288	0.311	0.346	0.426
200,000	0.173	0.195	0.226	0.267	0.289	0.322	0.405
250,000	0.144	0.162	0.192	0.232	0.251	0.282	0.369
300,000	0.122	0.138	0.165	0.203	0.220	0.249	0.337
500,000	0.073	0.082	0.101	0.132	0.143	0.165	0.245
1,000,000	0.034	0.038	0.048	0.066	0.071	0.083	0.138
2,000,000	0.015	0.017	0.022	0.031	0.033	0.039	0.069
3,000,000	0.009	0.010	0.013	0.019	0.021	0.025	0.045
4,000,000	0.006	0.007	0.009	0.013	0.015	0.017	0.032
5,000,000	0.005	0.005	0.007	0.010	0.011	0.013	0.025

8. Retrospective Development Factors

With Loss Limit				Without Loss Limit			
1st	2nd	3rd	4th & Subsequent	1st	2nd	3rd	4th & Subsequent
<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>
0.11	0.07	0.05	0.00	0.14	0.09	0.06	0.00

9. State Special Classifications by Hazard Group

All Massachusetts Hazard Group assignments can be found in Appendix G of the 2008 Edition of the Massachusetts Workers' Compensation & Employers Liability Insurance Manual.

XII 000006

Section XII - Retrospective Rating
Subsection A - Expenses
7/1/2018

Section XII - A
Exhibit 3

Expense Provisions Underlying the Proposed Retrospective Rating Plans

Total Expenses:	
(1) Commission and Other Acquisition Expenses	12.6%
(2) Fixed Expenses	4.4%
(3) Premium Discount	5.2%
(4) Underwriting Profit Provision	<u>0.3%</u>
(5) Total Expenses Excluding Taxes and Assessments (= (1) + (2) + (3) + (4))	22.4%
(6) Current Premium Tax Rate	2.28%
(7) Miscellaneous Taxes	0.42%
(8) Retro Provision for the Residual Market Subsidy	-0.24%
(9) Insolvency Fund Assessment	<u>0.26%</u>
(10) Tax Multiplier (= $1.0 / \{ 1.0 - [(6) + (7) + (8) + (9)] \}$)	1.028
(11) Expected Loss and LAE Ratio (adjusted for Residual Market Subsidy) (= $[1.0 / (10)] - (5)$)	74.9%
(12) Loss Adjustment Expense (as percentage of losses)	18.5%
(13) Loss Conversion Factor (= $1.0 + (12)$)	1.185
(14) Expected Loss without LAE (= $(11) / (13)$)	63.2%
(15) Expenses excluding Premium Taxes but including LAE (= $(5) + [(12) \times (14)]$)	34.1%

Notes:

- (1): Section VI-J, Exhibit 1, line (1).
- (2): Section VI-J, Exhibit 1, line (7), less the provision for miscellaneous taxes, see line (7) below.
- (3): Section VI-A, Exhibit 1, line (2).
- (4): Section VII-A, Exhibit 1, line (14).
- (6): Section VI-J, Exhibit 1, Note (3).
- (7): Section VI-B, Exhibit 1, the average of the results of columns (13) x (15) / (17).
- (8): Section XII-B, Exhibit 1, line (3).
- (9): Section IX-K, Exhibit 5, page 1, line (9).
- (12): Section VI-J, Exhibit 1, line (9).

XII 000007

Section XII - Retrospective Rating
Subsection A - Expenses
7/1/2018

Section XII - A
Exhibit 4

Expense Provisions Underlying the ALAE Option of the Recommended Retrospective Rating Plans

(1) Expected Loss without Defense and Cost Containment Expense (as percentage of Standard Premium plus ARAP)	63.2%
(2) Provision for ALAE Expenses (as percentage of losses)	9.4%
(3) Expected Loss plus ALAE Ratio (= (1) x [1.0 + (2)])	69.2%
(4) Loss Adjustment Expense (as percentage of losses)	18.5%
(5) Loss Conversion Factor (= [1.0 + (4)] / [1.0 + (2)])	1.083
(6) Tax Multiplier	1.028
(7) Expenses excluding Premium Taxes but including LAE (as percentage of Standard Premium plus ARAP)	34.1%
(8) Expenses including all AO Expenses but excluding ALAE Expenses and Premium Taxes (= (7) - [(1) x (2)])	28.1%

Notes:

(1): Exhibit 3, line (14)

(2): Section VI-H, Exhibit 1, line (5), DCC assumed a proxy for ALAE.

(4), (6), (7): Exhibit 3, lines (12), (10) and (15) respectively.

XII 000008

Section XII - Retrospective Rating
Subsection B - Residual Market Subsidy
7/1/2018

Section XII - B
Exhibit 1

Calculation of the Provision for the Residual Market Subsidy

(1) Voluntary Market Implied Rate Factor Equivalent	1.003
(2) Factor to Take into Account Basic Premium	0.800
(3) Retro Provision for the Residual Market Subsidy	-0.24%

Notes:

(1): Section I-E, Exhibit 1, page 1.

(2): From the filing for the provision for the Residual Market Subsidy effective 1/1/89.

(3) = $[1.0 - (1)] \times (2)$

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

**MASSACHUSETTS
 RRS**

Proposed Effective July 1, 2018

TABLE OF EXPENSE RATIOS—EXCLUDING TAXES AND INCLUDING PROFIT

TYPE A COMPANY—MASSACHUSETTS

Standard Premium		Expense Ratio	Standard Premium		Expense Ratio	Standard Premium		Expense Ratio
From	To		From	To		From	To	
0	10,057	0.341	18,059	18,434	0.301	98,125	110,357	0.261
10,058	10,172	0.340	18,435	18,826	0.300	110,358	126,074	0.260
10,173	10,291	0.339	18,827	19,235	0.299	126,075	147,011	0.259
10,292	10,412	0.338	19,236	19,662	0.298	147,012	176,288	0.258
10,413	10,536	0.337	19,663	20,109	0.297	176,289	203,184	0.257
10,537	10,662	0.336	20,110	20,576	0.296	203,185	211,503	0.256
10,663	10,792	0.335	20,577	21,066	0.295	211,504	220,533	0.255
10,793	10,926	0.334	21,067	21,579	0.294	220,534	230,369	0.254
10,927	11,062	0.333	21,580	22,119	0.293	230,370	241,123	0.253
11,063	11,202	0.332	22,120	22,685	0.292	241,124	252,929	0.252
11,203	11,346	0.331	22,686	23,282	0.291	252,930	265,952	0.251
11,347	11,493	0.330	23,283	23,911	0.290	265,953	280,389	0.250
11,494	11,644	0.329	23,912	24,575	0.289	280,390	296,482	0.249
11,645	11,799	0.328	24,576	25,276	0.288	296,483	314,536	0.248
11,800	11,959	0.327	25,277	26,019	0.287	314,537	334,931	0.247
11,960	12,123	0.326	26,020	26,807	0.286	334,932	358,155	0.246
12,124	12,291	0.325	26,808	27,644	0.285	358,156	384,838	0.245
12,292	12,464	0.324	27,645	28,536	0.284	384,839	415,818	0.244
12,465	12,642	0.323	28,537	29,486	0.283	415,819	452,223	0.243
12,643	12,825	0.322	29,487	30,502	0.282	452,224	495,613	0.242
12,826	13,014	0.321	30,503	31,591	0.281	495,614	548,214	0.241
13,015	13,208	0.320	31,592	32,760	0.280	548,215	613,306	0.240
13,209	13,408	0.319	32,761	34,019	0.279	613,307	695,937	0.239
13,409	13,614	0.318	34,020	35,378	0.278	695,938	804,302	0.238
13,615	13,827	0.317	35,379	36,851	0.277	804,303	952,637	0.237
13,828	14,046	0.316	36,852	38,452	0.276	952,638	1,168,060	0.236
14,047	14,273	0.315	38,453	40,198	0.275	1,168,061	1,509,380	0.235
14,274	14,507	0.314	40,199	42,110	0.274	1,509,381	1,826,261	0.234
14,508	14,748	0.313	42,111	44,213	0.273	1,826,262	1,990,054	0.233
14,749	14,998	0.312	44,214	46,538	0.272	1,990,055	2,186,122	0.232
14,999	15,257	0.311	46,539	49,120	0.271	2,186,123	2,425,048	0.231
15,258	15,524	0.310	49,121	52,006	0.270	2,425,049	2,722,607	0.230
15,525	15,801	0.309	52,007	55,252	0.269	2,722,608	3,103,401	0.229
15,802	16,089	0.308	55,253	58,930	0.268	3,103,402	3,608,035	0.228
16,090	16,386	0.307	58,931	63,133	0.267	3,608,036	4,308,651	0.227
16,387	16,695	0.306	63,134	67,981	0.266	4,308,652	5,346,929	0.226
16,696	17,016	0.305	67,982	73,637	0.265	5,346,930	7,044,472	0.225
17,017	17,350	0.304	73,638	80,318	0.264	7,044,473	10,321,267	0.224
17,351	17,697	0.303	80,319	88,332	0.263	10,321,268	19,297,800	0.223
17,698	18,058	0.302	88,333	98,124	0.262	19,297,801	OVER	0.222

Table based on the following discounts:

Standard Premium	Discount	
First	10,000	0.0%
Next	190,000	9.1%
Next	1,550,000	11.3%
Over	1,750,000	12.3%

Expected Loss Ratio

0.632

Tax Multiplier

1.028

**MASSACHUSETTS
 RR6**

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

Proposed Effective July 1, 2018

TABLE OF EXPENSE RATIOS—EXCLUDING TAXES AND INCLUDING PROFIT

TYPE B COMPANY—MASSACHUSETTS

Standard Premium		Expense Ratio	Standard Premium		Expense Ratio	Standard Premium		Expense Ratio
From	To		From	To		From	To	
0	- 10,102	0.341	19,758	- 20,576	0.316	234,520	- 252,942	0.291
10,103	- 10,312	0.340	20,577	- 21,466	0.315	252,943	- 274,507	0.290
10,313	- 10,531	0.339	21,467	- 22,437	0.314	274,508	- 300,091	0.289
10,532	- 10,759	0.338	22,438	- 23,500	0.313	300,092	- 330,934	0.288
10,760	- 10,998	0.337	23,501	- 24,669	0.312	330,935	- 368,843	0.287
10,999	- 11,247	0.336	24,670	- 25,959	0.311	368,844	- 416,562	0.286
11,248	- 11,508	0.335	25,960	- 27,393	0.310	416,563	- 478,462	0.285
11,509	- 11,781	0.334	27,394	- 28,994	0.309	478,463	- 561,969	0.284
11,782	- 12,068	0.333	28,995	- 30,793	0.308	561,970	- 680,790	0.283
12,069	- 12,368	0.332	30,794	- 32,831	0.307	680,791	- 863,328	0.282
12,369	- 12,685	0.331	32,832	- 35,158	0.306	863,329	- 1,179,615	0.281
12,686	- 13,018	0.330	35,159	- 37,839	0.305	1,179,616	- 1,766,853	0.280
13,019	- 13,368	0.329	37,840	- 40,964	0.304	1,766,854	- 1,935,814	0.279
13,369	- 13,738	0.328	40,965	- 44,651	0.303	1,935,815	- 2,140,506	0.278
13,739	- 14,130	0.327	44,652	- 49,067	0.302	2,140,507	- 2,393,605	0.277
14,131	- 14,544	0.326	49,068	- 54,452	0.301	2,393,606	- 2,714,584	0.276
14,545	- 14,983	0.325	54,453	- 61,166	0.300	2,714,585	- 3,134,980	0.275
14,984	- 15,450	0.324	61,167	- 69,767	0.299	3,134,981	- 3,709,447	0.274
15,451	- 15,946	0.323	69,768	- 81,184	0.298	3,709,448	- 4,541,685	0.273
15,947	- 16,476	0.322	81,185	- 97,069	0.297	4,541,686	- 5,855,374	0.272
16,477	- 17,042	0.321	97,070	- 120,681	0.296	5,855,375	- 8,238,321	0.271
17,043	- 17,648	0.320	120,682	- 159,475	0.295	8,238,322	- 13,891,856	0.270
17,649	- 18,299	0.319	159,476	- 204,700	0.294	13,891,857	- OVER	0.269
18,300	- 19,000	0.318	204,701	- 218,597	0.293			
19,001	- 19,757	0.317	218,598	- 234,519	0.292			

Table based on the following discounts:

Standard Premium	Discount
First	10,000 0.0%
Next	190,000 5.1%
Next	1,550,000 6.5%
Over	1,750,000 7.5%

Expected Loss Ratio

0.632

Tax Multiplier

1.028

RETROSPECTIVE RATING PLAN MANUAL **MASSACHUSETTS**
STATE SPECIAL RATING VALUES **RR7**

Proposed Effective July 1, 2018

**TABLE OF EXPENSE RATIOS—EXCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE
 AND TAXES AND INCLUDING PROFIT**

TYPE A COMPANY—MASSACHUSETTS

Standard Premium		Expense Ratio	Standard Premium		Expense Ratio	Standard Premium		Expense Ratio
From	To		From	To		From	To	
0	10,057	0.281	18,059	18,434	0.241	98,125	110,357	0.201
10,058	10,172	0.280	18,435	18,826	0.240	110,358	126,074	0.200
10,173	10,291	0.279	18,827	19,235	0.239	126,075	147,011	0.199
10,292	10,412	0.278	19,236	19,662	0.238	147,012	176,288	0.198
10,413	10,536	0.277	19,663	20,109	0.237	176,289	203,184	0.197
10,537	10,662	0.276	20,110	20,576	0.236	203,185	211,503	0.196
10,663	10,792	0.275	20,577	21,066	0.235	211,504	220,533	0.195
10,793	10,926	0.274	21,067	21,579	0.234	220,534	230,369	0.194
10,927	11,062	0.273	21,580	22,119	0.233	230,370	241,123	0.193
11,063	11,202	0.272	22,120	22,685	0.232	241,124	252,929	0.192
11,203	11,346	0.271	22,686	23,282	0.231	252,930	265,952	0.191
11,347	11,493	0.270	23,283	23,911	0.230	265,953	280,389	0.190
11,494	11,644	0.269	23,912	24,575	0.229	280,390	296,482	0.189
11,645	11,799	0.268	24,576	25,276	0.228	296,483	314,536	0.188
11,800	11,959	0.267	25,277	26,019	0.227	314,537	334,931	0.187
11,960	12,123	0.266	26,020	26,807	0.226	334,932	358,155	0.186
12,124	12,291	0.265	26,808	27,644	0.225	358,156	384,838	0.185
12,292	12,464	0.264	27,645	28,536	0.224	384,839	415,818	0.184
12,465	12,642	0.263	28,537	29,486	0.223	415,819	452,223	0.183
12,643	12,825	0.262	29,487	30,502	0.222	452,224	495,613	0.182
12,826	13,014	0.261	30,503	31,591	0.221	495,614	548,214	0.181
13,015	13,208	0.260	31,592	32,760	0.220	548,215	613,306	0.180
13,209	13,408	0.259	32,761	34,019	0.219	613,307	695,937	0.179
13,409	13,614	0.258	34,020	35,378	0.218	695,938	804,302	0.178
13,615	13,827	0.257	35,379	36,851	0.217	804,303	952,637	0.177
13,828	14,046	0.256	36,852	38,452	0.216	952,638	1,168,060	0.176
14,047	14,273	0.255	38,453	40,198	0.215	1,168,061	1,509,380	0.175
14,274	14,507	0.254	40,199	42,110	0.214	1,509,381	1,826,261	0.174
14,508	14,748	0.253	42,111	44,213	0.213	1,826,262	1,990,054	0.173
14,749	14,998	0.252	44,214	46,538	0.212	1,990,055	2,186,122	0.172
14,999	15,257	0.251	46,539	49,120	0.211	2,186,123	2,425,048	0.171
15,258	15,524	0.250	49,121	52,006	0.210	2,425,049	2,722,607	0.170
15,525	15,801	0.249	52,007	55,252	0.209	2,722,608	3,103,401	0.169
15,802	16,089	0.248	55,253	58,930	0.208	3,103,402	3,608,035	0.168
16,090	16,386	0.247	58,931	63,133	0.207	3,608,036	4,308,651	0.167
16,387	16,695	0.246	63,134	67,981	0.206	4,308,652	5,346,929	0.166
16,696	17,016	0.245	67,982	73,637	0.205	5,346,930	7,044,472	0.165
17,017	17,350	0.244	73,638	80,318	0.204	7,044,473	10,321,267	0.164
17,351	17,697	0.243	80,319	88,332	0.203	10,321,268	19,297,800	0.163
17,698	18,058	0.242	88,333	98,124	0.202	19,297,801	OVER	0.162

Table based on the following discounts:

Standard Premium	Discount	
First	10,000	0.0%
Next	190,000	9.1%
Next	1,550,000	11.3%
Over	1,750,000	12.3%

Expected Loss and Allocated Loss Adjustment
 Expense Ratio (ALAE Option)

0.692

Tax Multiplier

1.028

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MASSACHUSETTS	RETROSPECTIVE RATING PLAN MANUAL
RR8	STATE SPECIAL RATING VALUES
<i>Proposed Effective July 1, 2018</i>	

**TABLE OF EXPENSE RATIOS—EXCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE
 AND TAXES AND INCLUDING PROFIT**

TYPE B COMPANY—MASSACHUSETTS

Standard Premium		Expense Ratio	Standard Premium		Expense Ratio	Standard Premium		Expense Ratio
From	To		From	To		From	To	
0	- 10,102	0.281	19,758	- 20,576	0.256	234,520	- 252,942	0.231
10,103	- 10,312	0.280	20,577	- 21,466	0.255	252,943	- 274,507	0.230
10,313	- 10,531	0.279	21,467	- 22,437	0.254	274,508	- 300,091	0.229
10,532	- 10,759	0.278	22,438	- 23,500	0.253	300,092	- 330,934	0.228
10,760	- 10,998	0.277	23,501	- 24,669	0.252	330,935	- 368,843	0.227
10,999	- 11,247	0.276	24,670	- 25,959	0.251	368,844	- 416,562	0.226
11,248	- 11,508	0.275	25,960	- 27,393	0.250	416,563	- 478,462	0.225
11,509	- 11,781	0.274	27,394	- 28,994	0.249	478,463	- 561,969	0.224
11,782	- 12,068	0.273	28,995	- 30,793	0.248	561,970	- 680,790	0.223
12,069	- 12,368	0.272	30,794	- 32,831	0.247	680,791	- 863,328	0.222
12,369	- 12,685	0.271	32,832	- 35,158	0.246	863,329	- 1,179,615	0.221
12,686	- 13,018	0.270	35,159	- 37,839	0.245	1,179,616	- 1,766,853	0.220
13,019	- 13,368	0.269	37,840	- 40,964	0.244	1,766,854	- 1,935,814	0.219
13,369	- 13,738	0.268	40,965	- 44,651	0.243	1,935,815	- 2,140,506	0.218
13,739	- 14,130	0.267	44,652	- 49,067	0.242	2,140,507	- 2,393,605	0.217
14,131	- 14,544	0.266	49,068	- 54,452	0.241	2,393,606	- 2,714,584	0.216
14,545	- 14,983	0.265	54,453	- 61,166	0.240	2,714,585	- 3,134,980	0.215
14,984	- 15,450	0.264	61,167	- 69,767	0.239	3,134,981	- 3,709,447	0.214
15,451	- 15,946	0.263	69,768	- 81,184	0.238	3,709,448	- 4,541,685	0.213
15,947	- 16,476	0.262	81,185	- 97,069	0.237	4,541,686	- 5,855,374	0.212
16,477	- 17,042	0.261	97,070	- 120,681	0.236	5,855,375	- 8,238,321	0.211
17,043	- 17,648	0.260	120,682	- 159,475	0.235	8,238,322	- 13,891,856	0.210
17,649	- 18,299	0.259	159,476	- 204,700	0.234	13,891,857	- OVER	0.209
18,300	- 19,000	0.258	204,701	- 218,597	0.233			
19,001	- 19,757	0.257	218,598	- 234,519	0.232			

Table based on the following discounts:

Standard Premium	Discount
First 10,000	0.0%
Next 190,000	5.1%
Next 1,550,000	6.5%
Over 1,750,000	7.5%

Expected Loss and Allocated Loss Adjustment
Expense Ratio (ALAE Option)

0.692

Tax Multiplier

1.028

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Section XII - Retrospective Rating
 Subsection D - NCCI's Item R-1413
 7/1/2018

Section XII - D
 Exhibit 1
 Page 1

NATIONAL COUNCIL ON COMPENSATION INSURANCE, INC.

R-1413
 PAGE 26

ITEM R-1413—2017 UPDATE TO THE RETROSPECTIVE RATING PLAN PARAMETERS—HAZARD GROUP DIFFERENTIALS, EXCESS LOSS PURE PREMIUM FACTORS AND EXCESS LOSS AND ALLOCATED EXPENSE PURE PREMIUM FACTORS

**EXHIBIT 2-HG
 DEVELOPMENT OF MICHIGAN HAZARD GROUP DIFFERENTIALS
 FOR HAZARD GROUPS A TO G**

- Step 1.** Five years of historical experience is trended, on-leveled, and developed to estimate the severities for each hazard group. For a given hazard group, state severities are calculated by weighting the severities by claim group together using claim counts. The severities and claim counts have been adjusted using countrywide relativities from NCCI's excess loss factor methodology.
- Step 2.** The severities are weighted with the countrywide severities by hazard group using a credibility that is based on the number of claims in the state's experience period. For this purpose, 155,000 claims are regarded as fully credible and the square root rule is used to compute partial credibilities.
- Step 3.** Credibility weighted severities for each hazard group are produced. A countrywide average severity is calculated by taking the weighted average of the state severities using claim counts as weights.
- Step 4.** The differentials are calculated by dividing the countrywide severity by the individual state hazard group severities.

<u>Step 1</u>	<u>Hazard Group</u>	<u>Michigan</u>	<u>Countrywide</u>
Severities	A	27,361	37,292
	B	33,796	45,689
	C	36,053	51,116
	D	42,308	60,165
	E	49,253	71,093
	F	58,989	87,212
	G	65,830	100,004
 <u>Step 2</u>	Claim Count	=	78,533
	Credibility	=	$(78,533 / 155,000)^{0.5} = 0.712$
 <u>Step 3</u>	<u>Hazard Group</u>	<u>Michigan</u>	
Credibility Weighted Severities	A	30,223	= $(0.712)(27,361) + (0.288)(37,292)$
	B	37,223	
	C	40,394	
	D	47,453	
	E	55,547	
	F	67,122	
	G	75,679	
	Countrywide Overall:	59,736	
 <u>Step 4</u>	<u>Hazard Group</u>	<u>Differentials</u>	
Differentials	A	1.98	= $59,736 / 30,223$
	B	1.60	
	C	1.48	
	D	1.28	
	E	1.08	
	F	0.89	
	G	0.79	

Note: The underlying data source for the above calculations is NCCI's Unit Statistical data, excluding medical-only claims. The Unit Statistical data for each state is adjusted accordingly, as reflected in the data underlying the Excess Loss Factor (ELF) calculation.

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Section XII - Retrospective Rating
 Subsection E - State Hazard Group Relativities
 7/1/2018

Section XII - E
 Exhibit 1

Development of State Hazard Group Differentials

Step 1, Severities:

Hazard Group (1)	Massachusetts Severities (2)	Countrywide Severities (3)	Massachusetts Overall Severity Split Using CW Severity Relativities = Overall (2) x (3) / Overall (3) (4)
A	26,188	37,292	30,584
B	30,014	45,689	37,471
C	39,149	51,116	41,922
D	46,029	60,165	49,343
E	65,151	71,093	58,306
F	86,391	87,212	71,525
G	155,635	100,004	82,016
Overall	48,991	59,736	48,991

Step 2, Credibility:

(5) Massachusetts Claim Count =	44,671
(6) Requirement for Full Credibility =	155,000
(7) Massachusetts Credibility = = [(5) / (6)] ^{0.5}	0.54

Step 3, Credibility Weighted Severities:

Hazard Group (8)	Massachusetts Credibility Weighted Severities (9)
A	31,331
B	37,274
C	44,692
D	52,576
E	67,903
F	86,771
G	129,869

Step 4, Relativities:

Hazard Group (10)	Indicated Relativities = Overall (3) / (9) (11)	Indicated Relativities Based on MA Severity Split Using CW Relativities = Overall (3) / (4) (12)	Average of the Two Indicated Relativities = [(11) + (12)] / 2.0 (13)	Selected Hazard Group Differential (14)
A	1.91	1.95	1.93	1.93
B	1.60	1.59	1.60	1.60
C	1.34	1.42	1.38	1.38
D	1.14	1.21	1.17	1.17
E	0.88	1.02	0.95	0.95
F	0.69	0.84	0.76	0.76
G	0.46	0.73	0.59	0.59

Notes:

- (2), (5): Lost Time Claim Data for Policy Years 2015 at 1st report, 2014
 at 2nd report, 2013 at 3rd report, adjusted for trend, law amendments and development factors.
- (3), (6): Section XII - D, Exhibit 1 (NCCI's Item R-1413, Page 26.)
- (9) = [(2) x (7)] + { (3) x [1.0 - (7)] }

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EXCESS LOSS FACTORS

This Section proposes new Excess Loss Factors (ELFs) to be effective July 1, 2018. The proposed ELFs for the seven hazard groups¹ are shown in Exhibit 1, page 1. Exhibit 1, page 2 shows the Excess Loss and ALAE Expense Factors for the seven hazard groups.

The proposed ELFs in Exhibit 1, page 1 are the selected Excess Ratios in Exhibit 3, page 1 times 63.2%, the proposed Expected Loss Ratio (without LAE) underlying the Retrospective Rating Plans from Section XII-A, Exhibit 3. Generally, the excess loss factor for a limit is the product of an excess ratio and a permissible loss ratio.

Exhibit 3, page 3 shows the Excess Ratios based on the data used in the September 1, 2008 filing adjusted for trend. Exhibit 3, page 2 shows the Excess Ratios for higher limits estimated by curve fitting. Exhibit 4 displays the parameters of the mixed Pareto-Exponential distribution and a calculation of excess factors for different entry ratios.

Analysis from September 1, 2008 Filing

The Excess Ratios calculated in this filing use the same data set and fitted curves used in September 1, 2008 filing, with an adjustment for trend. On-level adjusted Schedule Z data for composite policy years 00/01, 99/00, 98/97, 96/97, and 95/96 at fifth report are used, and the Pareto-Exponential parameters from the September 1, 2008 filing are also used. An adjustment factor for trend and benefit changes from September 1, 2008 to the July 1, 2018 proposed effective date is shown on Exhibit 5. Rather than applying the factor to the data itself, the trend and benefit adjustment is made by dividing

¹ The seven hazard groups are denoted using the letters A, B, C, D, E, F, and G. Hazard group A has the lowest expected claim severity while hazard group G has the highest expected claim severity.

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the limits, including the truncation point, by the trend and adjustment factor. Using the adjusted limits and truncation point and the on-level adjusted data from September 1, 2008, the excess ratios are estimated using the same methodology underlying the 2010, 2014 and 2016 filings.

Estimation of Excess Ratios

For each hazard group this fitted curve, scaled to the observed mean, is used in Exhibit 3 to estimate the excess ratios for the data truncated and shifted at \$150,000.

The excess ratios for accident limits less than or equal to \$150,000 are determined directly from the data, as has been done in past filings. For accident limits L above \$150,000 the excess ratio is estimated from the product of (Empirical Excess Ratio at \$150,000, $R(150,000)$) x (Excess Ratio estimated from mixed Pareto-Exponential curve for $L - \$150,000$). (See the Appendix). The former is shown in Exhibit 3, page 3, the latter in Exhibit 3, page 2, while the product is in Exhibit 3, page 1. For accident limits of \$150,000 or less, the estimated excess ratio is equal to the observed excess ratio.

This method thus provides a smooth transition from relying on data for lower accident limits to relying on a fitted curve to provide some of the information at higher accident limits. It is important to note that even at higher accident limits an important contribution to the excess ratio is $R(150,000)$, which is calculated directly from the data.

Calculation of Excess Loss Factors with ALAE Expenses

The calculation of the Excess Loss Factors including ALAE expenses follows the same general methodology outlined above. The assumption is made that ALAE expenses are proportional to the underlying losses. Let x be the factor to load losses for

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Section XII – Retrospective Rating Plans
Subsection F – Excess Loss Factors
7/1/2018

Section XII-F
Page 3

ALAE expenses. For an accident limit of L, the excess ratio is computed at a limit of L / x. The Excess Loss Factors are derived by multiplying this excess ratio by 69.2%, the expected loss and defense and cost containment ratio (from Section XII-A, Exhibit 4), which is a proxy for the expected loss and ALAE ratio.

APPENDIX – EXCESS LOSS FACTORS

Excess Ratios, Truncated and Shifted Data

Let $f(x)$ be the size of loss probability density function. Then the excess ratio for limit L is given by:

$$\begin{aligned} R(x) &= \frac{\int_L^{\infty} (x - L) f(x) dx}{\int_0^{\infty} x f(x) dx} \\ &= \frac{\text{average dollars of loss excess of } L}{\text{average size of loss}} \\ &= \frac{\text{total dollars of loss excess of } L}{\text{total dollars of loss}} \end{aligned}$$

Assume we have a truncation point of T . Assume we look at the size of loss distribution for the data truncated and shifted at T . So for a loss $x > T$, we instead look at $x - T$. Then the excess ratio for the truncated and shifted data for ground up limit $L > T$ can be written as

$$\hat{R}(L - T)$$

Assume we were computing the (observed) excess ratio for a \$500,000 accident limit, for hazard group 3 data

$$R(\$500,000) = \frac{\text{HG3 Losses Excess of } \$500,000}{\text{Total HG3 Losses}}$$

We can also express this in terms of the data truncated and shifted at \$150,000 as follows:

$$R(\$500,000) = \frac{\text{HG3 Losses Excess of } \$500,000}{\text{HG3 Losses Excess of } \$150,000} \times \frac{\text{HG3 Losses Excess of } \$150,000}{\text{Total HG3 Losses}}$$

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The second term is the excess ratio at \$150,000, $R(\$150,000)$, while the first term is $\hat{R}(\$350,000)$ = excess ratio at \$350,000 for the data truncated and shifted at \$150,000.

Thus

$$R(\$500,000) = \hat{R}(\$350,000) \times R(\$150,000).$$

In general, for limits $L > \$150,000$

$$R(L) = \hat{R}(L - \$150,000) \times R(\$150,000).$$

In the methodology we used, $\hat{R}(L - \$150,000)$ is estimated via a curve fit to the data truncated and shifted at \$150,000, while $R(\$150,000)$ is estimated from the data.

Excess Ratios, Mixed Distributions

Let a (mixed) distribution be a weighted average of two other distributions:

$$f(x) = pg(x) + (1-p)h(x).$$

Then the mean is a weighted average of the two means:

$$\begin{aligned} m_f &= \int_0^{\infty} x f(x) d(x) = \int_0^{\infty} x \{pg(x) + (1-p) h(x)\} dx \\ &= p \int_0^{\infty} xg(x) dx + (1-p) \int_0^{\infty} x h(x) dx \\ &= pm_g + (1-p)m_h. \end{aligned}$$

The excess ratio for limit L is given by:

$$\begin{aligned} R(L) &= \frac{\int_L^{\infty} (x - L) f(x) dx}{\int_0^{\infty} x f(x) dx} \\ &= \frac{p \int_L^{\infty} (x - L) g(x) dx + (1-p) \int_L^{\infty} (x - L) h(x) dx}{pm_g + (1-p)m_h} \end{aligned}$$

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$$= \frac{pm_g R_g(L) + (1-p)m_h R_h(L)}{pm_g + (1-p)m_h}$$

So the excess ratio for a mixed distribution is a weighted average of the excess ratios for the individual distributions, with weights equal to the product of the mean of each distribution times the weight in the mixture of each distribution.

For example, for the mixed Pareto-Exponential distribution with parameters:

$p = 0.7344$, $s = 2.3285$, $b = 1.4950$, $\theta = 0.6270$ (weight to Pareto, Pareto Shape, Pareto Scale, Exponential scale), at an entry ratio of 2, the excess ratio is computed as follows:

$$\text{Excess Ratio for Pareto} = \left(1 + \frac{x}{b}\right)^{1-s} = \left(1 + \frac{2}{1.4950}\right)^{1-2.3285} = 0.3236$$

$$\text{Excess Ratio for Exponential} = e^{-x/\theta} = e^{-2/0.6270} = 0.0412$$

$$\text{Mean for Pareto} = \frac{b}{s-1} = \frac{1.4950}{2.3285-1} = 1.1253$$

$$\text{Mean for Exponential} = \theta = 0.6270$$

Excess Ratio for Pareto-Exponential distribution at entry ratio 2

$$= \frac{(0.7344)(1.1253)(0.3236) + (1-0.7344)(0.6270)(0.0412)}{(0.7344)(1.1253) + (1-0.7344)(0.6270)} = 0.2763$$

This matches the value shown on Exhibit 4.

PARETO DISTRIBUTION

$$F(x;s,b) = 1 - \left(1 + \frac{x}{b}\right)^{-s}$$

$$f(x;s,b) = \frac{s}{b} \left(1 + \frac{x}{b}\right)^{-(s+1)}$$

$$E(X^y) = \frac{b^y \Gamma(y+1) \Gamma(s-y)}{\Gamma(s)}, \quad -1 < y < s$$

If y is an integer N ,

$$E(X^N) = \frac{b^N N!}{\prod_{i=1}^N (s-i)}, \quad N < s$$

$$\text{Mean} = \frac{b}{s-1}$$

$$\text{Variance} = \frac{b^2 s}{(s-1)^2 (s-2)}$$

$$\text{Coefficient of Variation} = \sqrt{\frac{s}{s-2}}, \quad s > 2$$

$$\text{Skewness} = \frac{2(s+1)}{s-3} \sqrt{\frac{s-2}{s}}, \quad s > 3$$

$$\text{Excess Ratio} = R(x) = \left(1 + \frac{x}{b}\right)^{1-s}$$

$$\text{Mean Residual Life} = e(x) = \frac{b+x}{s-1}$$

Note: s is the shape parameter, b is the scale parameter.

EXPONENTIAL DISTRIBUTION

$$F(x; \theta) = 1 - e^{-x/\theta}$$

$$f(x; \theta) = \frac{1}{\theta} e^{-x/\theta}$$

$$E(X^y) = \theta^y \Gamma(1 + y), \quad y > -1$$

If y is an integer N ,

$$E(X^N) = \theta^N N!, \quad N > -1$$

$$\text{Mean} = \theta$$

$$\text{Variance} = \theta^2$$

$$\text{Coefficient of Variation} = 1$$

$$\text{Skewness} = 2$$

$$\text{Excess ratio} = R(x) = e^{-x/\theta}$$

$$\text{Mean Residual Life} = e(x) = \theta$$

Note: θ is the scale parameter.

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Section XII - Retrospective Rating
Subsection F - Excess Loss Factors
7/1/2018

Section XII - F
Exhibit 1
Page 1

Excess Loss Factors Proposed to be Effective 07/01/2018

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.397	0.422	0.446	0.468	0.488	0.517	0.550
\$30,000	0.378	0.405	0.430	0.453	0.474	0.504	0.540
\$35,000	0.362	0.389	0.415	0.440	0.461	0.492	0.531
\$40,000	0.347	0.375	0.402	0.428	0.449	0.481	0.523
\$50,000	0.322	0.350	0.378	0.406	0.428	0.461	0.508
\$75,000	0.271	0.300	0.330	0.363	0.385	0.420	0.475
\$100,000	0.234	0.262	0.292	0.327	0.351	0.384	0.447
\$125,000	0.205	0.230	0.261	0.298	0.321	0.354	0.421
\$150,000	0.182	0.205	0.235	0.272	0.294	0.326	0.398
\$175,000	0.163	0.184	0.213	0.250	0.271	0.301	0.377
\$200,000	0.147	0.166	0.193	0.231	0.250	0.279	0.357
\$250,000	0.121	0.137	0.162	0.199	0.215	0.243	0.323
\$300,000	0.102	0.116	0.139	0.173	0.188	0.213	0.293
\$500,000	0.060	0.068	0.084	0.110	0.120	0.138	0.210
\$1,000,000	0.028	0.032	0.040	0.054	0.059	0.069	0.116
\$2,000,000	0.012	0.014	0.018	0.025	0.027	0.032	0.058
\$3,000,000	0.007	0.008	0.011	0.016	0.017	0.020	0.037
\$4,000,000	0.005	0.006	0.008	0.011	0.012	0.014	0.027
\$5,000,000	0.004	0.004	0.006	0.008	0.009	0.011	0.020

Notes:

Exhibit 3, page 1 times the Expected Loss Ratio without LAE of 63.2% from Section XII-A, Exhibit 3.

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Section XII - Retrospective Rating
Subsection F - Excess Loss Factors
7/1/2018

Section XII - F
Exhibit 1
Page 2

Excess Loss and ALAE Factors Proposed to be Effective 07/01/2018

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.444	0.471	0.497	0.520	0.541	0.573	0.607
\$30,000	0.424	0.453	0.480	0.504	0.526	0.559	0.597
\$35,000	0.407	0.436	0.464	0.490	0.513	0.547	0.588
\$40,000	0.391	0.421	0.450	0.477	0.500	0.535	0.579
\$50,000	0.364	0.394	0.424	0.455	0.478	0.514	0.563
\$75,000	0.310	0.341	0.373	0.408	0.433	0.470	0.529
\$100,000	0.269	0.300	0.333	0.371	0.397	0.434	0.500
\$125,000	0.238	0.266	0.300	0.340	0.365	0.401	0.473
\$150,000	0.212	0.238	0.272	0.312	0.337	0.372	0.448
\$175,000	0.191	0.215	0.247	0.288	0.311	0.346	0.426
\$200,000	0.173	0.195	0.226	0.267	0.289	0.322	0.405
\$250,000	0.144	0.162	0.192	0.232	0.251	0.282	0.369
\$300,000	0.122	0.138	0.165	0.203	0.220	0.249	0.337
\$500,000	0.073	0.082	0.101	0.132	0.143	0.165	0.245
\$1,000,000	0.034	0.038	0.048	0.066	0.071	0.083	0.138
\$2,000,000	0.015	0.017	0.022	0.031	0.033	0.039	0.069
\$3,000,000	0.009	0.010	0.013	0.019	0.021	0.025	0.045
\$4,000,000	0.006	0.007	0.009	0.013	0.015	0.017	0.032
\$5,000,000	0.005	0.005	0.007	0.010	0.011	0.013	0.025

Excess Loss Factors Effective 9/1/2008

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.382	0.409	0.436	0.460	0.482	0.514	0.552
\$30,000	0.362	0.390	0.417	0.444	0.466	0.499	0.541
\$35,000	0.344	0.373	0.401	0.429	0.451	0.485	0.531
\$40,000	0.328	0.357	0.386	0.415	0.438	0.472	0.521
\$50,000	0.299	0.329	0.359	0.391	0.414	0.449	0.503
\$75,000	0.246	0.275	0.306	0.342	0.366	0.401	0.464
\$100,000	0.208	0.233	0.265	0.303	0.326	0.360	0.430
\$125,000	0.179	0.201	0.232	0.271	0.292	0.325	0.400
\$150,000	0.156	0.176	0.205	0.244	0.264	0.294	0.374
\$175,000	0.137	0.155	0.183	0.221	0.239	0.266	0.350
\$200,000	0.122	0.138	0.164	0.201	0.217	0.243	0.329
\$250,000	0.098	0.112	0.135	0.169	0.183	0.205	0.291
\$300,000	0.081	0.092	0.113	0.144	0.156	0.176	0.260
\$500,000	0.046	0.053	0.066	0.088	0.095	0.108	0.177
\$1,000,000	0.020	0.024	0.030	0.042	0.045	0.051	0.093
\$2,000,000	0.009	0.010	0.013	0.019	0.020	0.023	0.045
\$3,000,000	0.005	0.006	0.008	0.011	0.012	0.014	0.028
\$4,000,000	0.004	0.004	0.006	0.008	0.009	0.010	0.020
\$5,000,000	0.003	0.003	0.004	0.006	0.006	0.007	0.015

Note:
 9/1/2008 Stipulation. Section XII-F, Exhibit 1, Page 1.

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Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2018

Section XII - F
 Exhibit 3
 Page 1

Estimated Excess Ratios Based on Adjusted Data and Curves Fit to Data Truncated and Shifted at \$150,000

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.627	0.668	0.706	0.740	0.772	0.818	0.870
\$30,000	0.598	0.640	0.680	0.717	0.749	0.798	0.855
\$35,000	0.573	0.616	0.657	0.696	0.729	0.779	0.841
\$40,000	0.549	0.593	0.635	0.677	0.710	0.762	0.828
\$50,000	0.509	0.553	0.598	0.643	0.677	0.730	0.804
\$75,000	0.429	0.474	0.522	0.574	0.610	0.664	0.752
\$100,000	0.370	0.414	0.462	0.518	0.555	0.608	0.707
\$125,000	0.325	0.365	0.413	0.471	0.508	0.559	0.666
\$150,000	0.288	0.324	0.372	0.431	0.465	0.516	0.630
\$175,000	0.258	0.290	0.336	0.396	0.428	0.477	0.596
\$200,000	0.232	0.262	0.306	0.366	0.395	0.442	0.565
\$250,000	0.192	0.217	0.257	0.315	0.341	0.384	0.510
\$300,000	0.162	0.183	0.220	0.274	0.297	0.337	0.464
\$500,000	0.095	0.108	0.133	0.175	0.190	0.219	0.332
\$1,000,000	0.044	0.050	0.063	0.086	0.094	0.110	0.183
\$2,000,000	0.019	0.022	0.028	0.040	0.043	0.051	0.091
\$3,000,000	0.012	0.013	0.017	0.025	0.027	0.032	0.058
\$4,000,000	0.008	0.009	0.012	0.017	0.019	0.022	0.042
\$5,000,000	0.006	0.007	0.009	0.013	0.014	0.017	0.032

Note:

For Accident Limit $L \leq \$150,000$ excess ratios are from Page 3. For Accident Limit $L > \$150,000$ excess ratios are from Page 2 times the estimated excess ratio at $L = \$150,000$ (See Appendix).

Fitted Excess Ratios Based on Losses Truncated and Shifted to \$150,000

Accident Limit	Hazard Group													
	A		B		C		D		E		F		G	
	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio
\$175,000	0.114	0.895	0.113	0.896	0.102	0.905	0.086	0.919	0.085	0.920	0.080	0.924	0.055	0.947
\$200,000	0.227	0.807	0.225	0.808	0.204	0.823	0.171	0.848	0.170	0.850	0.160	0.857	0.111	0.898
\$250,000	0.454	0.666	0.450	0.668	0.408	0.692	0.343	0.730	0.339	0.732	0.320	0.744	0.221	0.811
\$300,000	0.681	0.562	0.676	0.564	0.612	0.591	0.514	0.636	0.509	0.638	0.479	0.653	0.331	0.737
\$500,000	1.590	0.331	1.576	0.333	1.427	0.359	1.200	0.405	1.187	0.408	1.119	0.424	0.773	0.527
\$1,000,000	3.860	0.153	3.828	0.154	3.466	0.170	2.914	0.199	2.883	0.201	2.717	0.212	1.878	0.291
\$2,000,000	8.402	0.068	8.331	0.068	7.543	0.076	6.342	0.092	6.275	0.093	5.913	0.099	4.088	0.145
\$3,000,000	12.943	0.041	12.834	0.041	11.620	0.047	9.770	0.057	9.667	0.058	9.109	0.062	6.297	0.093
\$4,000,000	17.484	0.028	17.337	0.029	15.697	0.032	13.198	0.040	13.059	0.041	12.305	0.043	8.506	0.067
\$5,000,000	22.026	0.021	21.840	0.022	19.774	0.024	16.626	0.030	16.450	0.031	15.501	0.033	10.716	0.051

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Notes:

Entry Ratio = ([Limit] - [\$150,000 Truncation Point]) / [Average Size of Data Truncated and Shifted to \$150,000]

For the seven Hazard Groups, the detrended average sizes are \$171,896 for HGA, \$173,361 for HGB, \$191,469 for HGC, \$227,728 for HGD, \$230,154 for HGE, \$244,252 for HGF and \$353,324 for HGG.

Excess Ratio is computed for a Mixed Pareto - Exponential distribution with parameters: 0.7344, 2.3285, 1.4950, 0.6270 (weight to Pareto, Pareto Shape, Pareto Scale, Exponential Scale).

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Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2018

Section XII - F
 Exhibit 3
 Page 3

Excess Ratios Based on Adjusted Data

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.627	0.668	0.706	0.740	0.772	0.818	0.870
\$30,000	0.598	0.640	0.680	0.717	0.749	0.798	0.855
\$35,000	0.573	0.616	0.657	0.696	0.729	0.779	0.841
\$40,000	0.549	0.593	0.635	0.677	0.710	0.762	0.828
\$50,000	0.509	0.553	0.598	0.643	0.677	0.730	0.804
\$75,000	0.429	0.474	0.522	0.574	0.610	0.664	0.752
\$100,000	0.370	0.414	0.462	0.518	0.555	0.608	0.707
\$125,000	0.325	0.365	0.413	0.471	0.508	0.559	0.666
\$150,000	0.288	0.324	0.372	0.431	0.465	0.516	0.630
\$175,000	0.258	0.291	0.337	0.397	0.428	0.477	0.597
\$200,000	0.232	0.262	0.307	0.366	0.395	0.441	0.566
\$250,000	0.192	0.219	0.259	0.317	0.339	0.380	0.514
\$300,000	0.162	0.187	0.223	0.279	0.294	0.330	0.470
\$500,000	0.096	0.111	0.140	0.188	0.183	0.204	0.347
\$1,000,000	0.045	0.046	0.074	0.120	0.088	0.098	0.223
\$2,000,000	0.015	0.020	0.042	0.086	0.040	0.045	0.121
\$3,000,000	0.005	0.015	0.032	0.077	0.027	0.027	0.076
\$4,000,000	0.001	0.013	0.027	0.072	0.022	0.018	0.051
\$5,000,000	0.000	0.012	0.023	0.068	0.019	0.013	0.032

Notes:

Unit Statistical Plan Data for Composite Policy Years 00/01, 99/00, 98/99, 97/98, 96/97, 95/96 at fifth report, adjusted for trend, law amendments and development factors using factors from Section XI-C, Exhibit 1.

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Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2018

Section XII - F
 Exhibit 4

Mixed Pareto-Exponential Distribution

Parameters:

Pareto shape = s	2.3285
Pareto scale = b	1.4950
Exponential scale = θ	0.6270
Weight to Pareto = p	0.7344
Mean =	1.0000
Variance =	5.5243
Coefficient of Variation =	2.3504
Skewness =	18.0452
Pareto Mean = $b / (s - 1.0)$	1.1253
Exponential Mean = θ	0.6270

Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio
0.1	0.9067	11	0.0496
0.2	0.8263	12	0.0448
0.3	0.7567	13	0.0407
0.4	0.6960	14	0.0372
0.5	0.6428	15	0.0343
0.6	0.5960	20	0.0241
0.7	0.5546	25	0.0183
0.8	0.5178	30	0.0145
0.9	0.4849	35	0.0119
1.0	0.4555	40	0.0101
1.25	0.3941	45	0.0087
1.5	0.3460	50	0.0076
1.75	0.3075	55	0.0067
2.0	0.2763	60	0.0060
2.50	0.2286	65	0.0054
3.0	0.1942	70	0.0049
3.5	0.1682	75	0.0045
4.0	0.1479	80	0.0041
4.5	0.1316	85	0.0038
5.0	0.1183	90	0.0035
6.0	0.0978	95	0.0033
7.0	0.0828	100	0.0031
8.0	0.0714		
9.0	0.0625		
10.0	0.0554		

Notes:
 See the Appendix for a sample calculation of an excess ratio.

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Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2018

Section XII - F
 Exhibit 5

Total Severity Trend & Benefit Change Adjustment

	Indemnity	Lost Time Medical	Medical Only	Total
(1) PY 9/1/2008 Average Severity	26,021	11,830	809	
(2) PY 2015 Average Severity	29,689	13,544	902	
(3) Annual Severity Trend - From PY 2015 to Prospective Effective Period	2.1%	2.2%	1.9%	
(4) Trend Factor from PY 9/1/2008 to Prospective Effective Period = $[(2) / (1)] \times [1.000 + (3)]^{3.5}$	1.226	1.235	1.191	
(5) Injury Type Weight at Ultimate	65.28%	30.17%	4.55%	
(6) Total Severity Trend Factor from PY 9/1/2008 to Prospective Effective Period = (4) Weighted by (5)				1.227
(7) Total Benefit Level Change Factor from PY 9/1/2008 to Prospective Effective Period				1.044
(8) Combined Trend and Benefit Factor from PY 9/1/2008 to Prospective Effective Period = (6) x (7)				1.281

Notes:

(1),(2) : From Section V-A, Exhibit 2, Page 1. PY9/1/2008 is a weighted average of PY2008 and PY2009. = $(1/3) \times \text{PY2008} + (2/3) \times \text{PY2009}$

(3): From Section V-A, Exhibit 1.

(5): From Section IV-E, Exhibit 2, Page 1.

(7): From Section IV-A, Exhibit 1.

Data

The WCRIBMA systematically reviews the Aggregate Financial and Unit Statistical Report (“USR”) data submitted to the WCRIBMA by its members. Aggregate Financial data, the basis for the overall rate indication, is collected electronically. The application used to collect Aggregate Financial data, MAFDRA, contains both data validations and data edits. The data validations check individual fields against valid codes and values.

Aggregate Financial data is also subject to rigorous review and editing that compares the data reported for a given field to other data elements reported to the WCRIBMA. Edits are characterized as either basic or actuarial. Basic edits identify circumstances where something is obviously wrong. For example, if losses are reported for a policy year, a basic edit failure would occur if no premiums were reported for that same policy year. Actuarial edits identify circumstances where data appear to be anomalous but may in fact be correct. Data flagged by actuarial edits require either an explanation or a correction.

Aggregate Financial data used in ratemaking are carefully reviewed by the WCRIBMA’s actuarial staff for purposes of ratemaking. Actuarial staff review by individual data reporter loss development factors, premium development factors, and expense ratios to identify anomalies that would have a material impact on the overall rate indication. Data reporters that have provided data deemed to be outliers are asked to explain the anomaly or provide a correction if needed. Actuarial staff also provides diagnostic reports to larger writers of workers’ compensation in Massachusetts. Carriers

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are asked to review these reports and explain to the WCRIBMA whether or not the diagnostic reports align with their expectations.

USR data, the basis for the WCRIBMA's trend estimates and class rates, are collected electronically using a software system called Spectrum. Like Aggregate Financial data, USR data are subject to a multitude of validations and edits. Additionally, the WCRIBMA's actuarial staff extracts the USR data from Spectrum and maps the data into data marts used by the actuarial staff. As part of the process to load the data into the actuarial data marts, the data are again subject to a number of validations. Records that fail validation are flagged for explanation or correction by the carrier who submitted the data.

In 2005 the Commissioner ordered the WCRIBMA to develop a number of reconciliations that compare Aggregate Financial data to USR data. In 2006 the Commissioner approved changes to the Massachusetts Workers' Compensation Statistical Plan that call for the WCRIBMA to annually conduct a series of mandated reconciliations and compare the results of the reconciliation process to tolerances defined within the Massachusetts Workers' Compensation Statistical Plan. Carriers whose data fell outside of tolerance are required to provide an explanation for why the data are correct as reported or they are required to submit corrections. Carriers who do not comply are subject to potential further review by an independent audit firm if the Commissioner deems it to be necessary.

In preparation for this rate filing, WCRIBMA actuarial staff assessed the available data to determine what it deemed suitable for ratemaking. As a consequence, the

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Aggregate Financial data for several carriers were excluded from certain sections of the filing or excluded from use in the rate filing entirely as explained below.

First, Aggregate Financial data from Praetorian Insurance Company were excluded from the estimation of loss development factors and premium development factors. For purposes of Aggregate Financial data reporting, Redland Insurance Company, and Praetorian Insurance Company began submitting consolidated data beginning with the 2010 year end valuation. Prior to that, Redland Insurance Company had been exempt from filing Aggregate Financial data (consistent with the terms outlined in the Massachusetts Worker's Compensation Statistical Plan) for one of the valuation dates contained in the development triangles. Therefore, the consolidated data for one of the valuation dates used in the development triangle are necessarily understated and the use of the data from these companies in the loss development calculations would be inappropriate. The exclusion of data from Praetorian Insurance Company from the estimation of loss development factors and premium development factors has no material impact on the rate indication.

Second, Aggregate Financial data from Travelers Group was excluded from the estimation of premium development factors and expenses. Travelers Group, in response to questions about premium development anomalies identified by the WCRIBMA, indicated the anomalies the WCRIBMA noted likely relate to legacy systems and would not affect more recent policy year premiums. However, the estimation of premium development factors in this filing makes use of policy years whose reported Aggregate Financial premium may have been distorted by legacy systems at Travelers Group. The

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exclusion of data from Travelers Group from the estimation of premium development factors is therefore appropriate and has no material impact on the rate indication.

Adjusting and other expenses reported by Travelers are also considered outliers. For calendar years 2014, 2015, and 2016, Travelers Group has continued to report negative values for adjusting and other expenses on their Insurance Expense Exhibits. Had the WCRIBMA not excluded the data of the Travelers Group from expenses, the rate indication would have been lower.

As discussed in the Introduction, development factors for AIG have consistently differed from the development factors for the remainder of the industry. In and of itself, this is not problematic. However, AIG has also seen large changes in market share over time which, coupled with their atypical development factors, create distortions in our development triangles. Had AIG's market share remained constant overtime, no adjustment would be needed. With respect to loss development, AIG's losses were developed independently from the remainder of the industry. With respect to estimating premium development factors, AIG's premiums were excluded and this has no material impact on the rate indication.

Aggregate Financial data from Zurich Insurance Group was excluded from the estimation of premium development factors because the data for certain valuation points appeared anomalous. The exclusion of data from Zurich Insurance Group from the estimation of premium development factors has no material impact on the rate indication.

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Aggregate Financial data from the Ace Group was not used in the expense section of this filing. Expense ratios for the Ace Group have historically been outliers when compared to the balance of the industry. This appears to be a result of the high concentration of large deductible policies in Ace Group's book of business. Had the WCRIBMA not excluded Ace Group's Aggregate Financial data from the estimation of expense ratios, the rate indication would have been slightly lower.

Aggregate Financial data from Zurich Insurance Group was not used in the expense section of this filing. For calendar years 2014, 2015, and 2016, Zurich Group reported negative values for general expenses on their Insurance Expense Exhibits. Had the WCRIBMA not excluded the data of Zurich Insurance Group from expenses, the rate indication would have been lower.