

WCRIBMA

THE WORKERS' COMPENSATION RATING
AND INSPECTION BUREAU OF MASSACHUSETTS

December 20, 2019

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

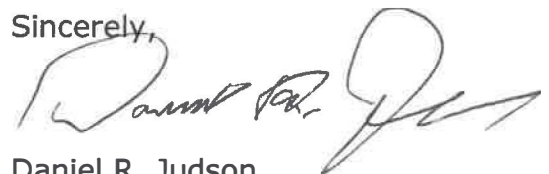
Dear Commissioner Anderson:

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 3.8%. 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, 2020, and to apply to each risk as of the first normal anniversary rating date following that effective date.

Sincerely,



Daniel R. Judson
President

**COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE**

Docket No. 19-

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, 2020**

PRE-FILED DIRECT TESTIMONY OF GEORGE ZANJANI

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of George Zanjani in support of its application for a general rate revision to be effective on and after July 1, 2020.

Q. Please state your full name.

A. George Zanjani.

Q. What are your professional qualifications?

A. I am Professor of Finance and the holder of the Frank Park Samford Chair of Insurance at the University of Alabama. A complete curriculum vitae is attached to this testimony as Exhibit 1. To summarize, my undergraduate studies were at Stanford University from 1987-1990, where I earned an A.B./B.S in Economics and Biology. I joined the commercial lines actuarial department of Fireman's Fund Insurance Companies in 1990 as an Assistant Actuarial Analyst. Upon leaving in 1994, I was a Senior Actuarial Analyst, an Associate of the Casualty Actuarial Society, and the head of the company's Workers' Compensation actuarial unit. I did my graduate studies in Economics at the University of Chicago, earning a Ph.D. in 2000. I joined the Research Department of the Federal Reserve

Bank of New York in the Capital Markets Function as a Research Economist in 2000, leaving as a Senior Economist in 2008. I joined the Robinson College of Business of Georgia State University in 2008 as an Associate Professor of Risk Management and Insurance and was the inaugural holder of the AAMGA Distinguished Chair in Risk Management and Insurance in 2011. I started my current position in 2017. Over the past five years I have also served as an expert witness on underwriting profit provisions in various rate hearings.

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

A. I reviewed the calculations, inputs, narrative, and model used in Section VII of the WCRIBMA's filing. Specifically, I reviewed the inputs to and estimation of the cost of capital and the portfolio rate of return, as well as the application of the discounted cash flow models to derive the proposed underwriting profit provision. I have relied on the WCRIBMA for estimates of underwriting cash flow patterns (for losses, expenses and premiums) and taken as given the actuarial projections of losses and expenses underlying the discounted cash flow models. Based on the information available to me, I believe that the data and calculations underlying Section VII of the filing to be 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 Massachusetts Commissioner of Insurance 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.

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. It is my opinion that---assuming 1) the actuarial projections of losses, expenses and premiums in the filing are reasonable and 2) that the cash flow patterns used in the models are reasonable---then the proposed rates satisfy the statutory standard. My conclusion follows from two main observations. First, the discounted cash flow models used to calculate the underwriting profit provision are correctly constructed to produce a provision that yields a fair return to invested capital. Second, the critical discretionary inputs to the models---specifically the weighted average cost of capital (WACC), the portfolio rate of return, and the leverage ratio---are reasonable and well-suited to the Massachusetts workers' compensation market.

Details of the models and the derivation of the inputs are provided in Section VII of the filing. Below, I offer additional perspective on the reasonableness of the critical discretionary inputs to the model.

Portfolio Rate of Return and Leverage Ratio

The WCRIBMA bases the portfolio allocations and leverage assumptions on data from the groups writing workers' compensation in Massachusetts. Specifically, the portfolio weights and the leverage ratio used in the models are premium-weighted averages of the figures

from the insurance groups operating in Massachusetts, with the premium weights being Massachusetts workers' compensation DPW. In my opinion, this approach gives figures more relevant and closely matched to the Massachusetts workers' compensation market than figures based on national industry composites.

To elaborate, the asset portfolio for the total industry reflects the heavy equity allocations of certain personal lines carriers and other companies that do not underwrite workers' compensation insurance. Similarly, reserve-to-surplus ratios vary considerably across lines of insurance, with long-tailed lines having higher ratios due to the additional loss reserves on the balance sheet. Both of these examples argue for a more tailored approach for finding the asset portfolio and leverage relevant for the workers' compensation line. Basing the assumptions on composites of segments of the industry, such as A.M. Best's Commercial Casualty Composite, is a step in the right direction, however, such composites may include data from companies focusing in other casualty lines and are also not tailored to Massachusetts specifically. By using averages based on groups serving the Massachusetts workers' compensation market, I believe the WCRIBMA is tailoring its assumptions as closely as possible to the ratemaking task at hand.

Cost of Capital

As described in the text of Section VII, the WCRIBMA considers two models to estimate the cost of equity---a CAPM-based approach and a Discounted Cash Flow Model. The output is then averaged and combined with an estimated cost of debt to produce a WACC of 7.15%. These methods are widely accepted means of estimating the cost of capital. However, all methods of estimation have various inputs and implementation choices that can affect the results. To get a sense of where the WCRIBMA estimate falls in relation to others, I gathered

alternative recent estimates of the WACC for the property-casualty insurance industry from publicly available sources in the following table:

Method	Source	Date	WACC Estimate
CAPM	Duff & Phelps	9/30/19	6.9%
CAPM + Size Premium	Duff & Phelps	9/30/19	7.2%
Fama-French 5-Factor	Duff & Phelps	9/30/19	7.0%
Discounted Cash Flow (1-stage)	Duff & Phelps	9/30/19	19.7%
Discounted Cash Flow (3-stage)	Duff & Phelps	9/30/19	18.2%
CAPM	Damodaran Online	1/5/19	6.2%

The figures are sourced from the industry composite for the latest available quarterly update of the *Valuation Handbook – U.S. Industry Cost of Capital* by Duff & Phelps and the latest available annual update of the costs of capital by industry sector released by Aswath Damodaran, a valuation expert at New York University (*available at <http://pages.stern.nyu.edu/~adamodar/>*). As can be seen from the table, the WCRIBMA figure of 7.15%---despite being a blend of the output of CAPM and Discounted Cash Flow methodologies--- falls toward the lower end of the span of estimates above and thus appears reasonable in the context of other available estimates for the industry.

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 filed rates are reasonable and not excessive, there are two additional points worth mentioning.

First, the cost of capital analysis of WCRIBMA is based entirely on publicly traded stock firms, which have the easiest access to financing and thus the lowest costs of capital. However, I estimated that---based on 2018 direct premiums written---only 64% of the workers' compensation market in Massachusetts is underwritten by firms associated with publicly traded holding companies. Firms associated with private, often mutual, ownership underwrite the remaining 36%. This segment is well-known to have more difficulty in accessing financing, with the problem for mutuals being especially acute.

Q. How much of a difference does this make?

A. Research dating back at least as far as the 1960's has demonstrated that private equity trades at a substantial discount to public equity. The discount is thought to derive from a variety of factors, including the illiquid nature of private equity stakes (also known as a "lack of marketability") as well as information, monitoring, and control issues. The discount translates into a higher cost of equity. For example, if a public firm's cost of equity is estimated at 10% and the equity of a comparable private firm is selling at a 20% discount to that of the public firm, the private firm's cost of equity would be estimated as:

$$12.5\% = 10\% / (1 - 20\%)$$

The discount is difficult to estimate. The attached Exhibit 2 to my testimony summarizes some of the academic research on the private firm discount. Studies have taken a variety of approaches to measurement. "IPO" studies compare the prices of pre-IPO share transactions in a private company with post-IPO share prices after the company is public. "Acquisition" studies compare the valuations of acquired private companies versus the valuations of acquired public companies. "Restricted stock" and

“private placement” studies compare the prices of restricted stock issued by public companies with the prices of their traded shares.

All the approaches have their flaws. IPO studies, for example, may have a bias toward overstating the discount because of the differences in timing of transactions. Restricted stock and private placement studies tend to understate the discount: Since they confine their attention to public companies, they do not account for factors other than the discount for lack of marketability (DLOM), and, moreover, the actual restrictions on marketability for private placements have been loosened significantly over the years by the Securities and Exchange Commission.

On balance, however, the studies point to a substantial discount. To get a sense of the import, I use a discount of 25%, which is slightly below the average of the averages of the three groups in Exhibit 2 (when taking the midpoint of the ranges for the studies with ranges of estimates). Accounting for a 25% valuation discount on 36% of the market would raise the WACC estimates presented earlier as follows:

Method	Source	Date	Adjusted WACC Estimate
CAPM	Duff & Phelps	9/30/19	7.6%
CAPM + Size Premium	Duff & Phelps	9/30/19	8.0%
Fama-French 5-Factor	Duff & Phelps	9/30/19	7.7%
Discounted Cash Flow (1-stage)	Duff & Phelps	9/30/19	23.2%
Discounted Cash Flow (3-stage)	Duff & Phelps	9/30/19	20.4%
CAPM	Damodaran Online	1/5/19	6.8%

This exercise underscores the conclusion that the WCRIBMA's WACC estimate of 7.15% is reasonable and far from aggressive when applied to the context of the Massachusetts workers' compensation market. Moreover, although the cost of capital input used in the filing does not contemplate any higher cost of capital endured by private firms, doing so would obviously produce a higher underwriting profit provision and higher rates.

Q. What is the second additional point you would like to make?

A. Consistent with the Commissioner's Decision on 2003 Rates, there is no consideration of policyholder dividends in the course of deriving the underwriting profit provision. While the interpretation of policyholder dividends may vary from company to company, at least in the case of stock companies the dividends represent cash payments that, like other expense items, reduce the profit of the firm. Accounting for such reasonably expected dividend payments connected with risk transfer would evidently reduce the projected rate of return on capital. Consideration of policyholder dividends would obviously produce a higher underwriting profit provision and higher rates.

Signed this 13th day of December 2019 under the pains and penalties of perjury.

George Zanjani Digitally signed by George
Zanjani
Date: 2019.12.13 16:17:30 -05'00'

George Zanjani

George Zanjani

University of Alabama
The Culverhouse College of Business
Department of Economics, Finance, & Legal Studies
200 Alston Hall
Box 870224
Tuscaloosa, AL 35487

Mobile: 917-863-9332
Email: ghzanjani@cba.ua.edu

Education

Ph.D., Economics, University of Chicago, 2000
ACAS, Casualty Actuarial Society, 1994
A.B./B.S., Economics and Biology, Stanford University, 1990

Work Experience

University of Alabama (Tuscaloosa, Alabama)
Professor of Finance and Frank Park Samford Chair of Insurance, 2017-

Georgia State University (Atlanta, Georgia)
AAMGA Distinguished Chair in Risk Management & Insurance, 2011-2017
Associate Professor, 2008-2017

Nanyang Technological University (Singapore)
Visiting Senior Research Fellow, 2011-12, 2013-2014

Federal Reserve Bank of New York (New York, New York)
Senior Economist, 2006-2008
Economist, 2000-2006

Fireman's Fund Insurance Companies (Novato, California)
Senior Actuarial Analyst, 1993-94
Actuarial Analyst, 1991-1993
Assistant Actuarial Analyst, 1990-1991

Publications: Refereed Scholarly

"Dynamic Capital Allocation with Irreversible Investments," (with Daniel Bauer, Shinichi Kamiya, and Xiaohu Ping), *Insurance: Mathematics and Economics* 85: 138-52, (2019)

“What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts,” (with Yiling Deng), *Journal of Risk & Insurance* 85: 959-991, (2018)

“Egalitarian Equivalent Capital Allocation,” (with Shinichi Kamiya), *North American Actuarial Journal* 21: 382-96, (2017)

“The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” (with Daniel Bauer), *Management Science* 62: 1431-1457 (2016)

“Economic Analysis of Risk and Uncertainty Induced by Health Shocks: A Review and Extension,” (with Tomas J. Philipson), in *Handbook of the Economics of Risk and Uncertainty*, Volume 1, Mark J. Machina and W. Kip Viscusi (eds.), North Holland: Elsevier (2014)

“Capital Allocation and Its Discontents,” (with Daniel Bauer), in *Handbook of Insurance* (2nd edition), Georges Dionne (ed.), New York: Springer (2013)

“Financial Pricing of Insurance,” (with Daniel Bauer and Richard D. Phillips), in *Handbook of Insurance* (2nd edition), Georges Dionne (ed.), New York: Springer (2013)

“Insurance Risk, Risk Measures, and Capital Allocation: Navigating a Copernican Shift,” (with Michael R. Powers), *Annual Review of Financial Economics* 5: 201-223 (2013)

“Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” (with Darius Lakdawalla), *Journal of Risk & Insurance* 79, pp. 449-76 (2012)

“An Economic Approach to Capital Allocation,” *Journal of Risk and Insurance* 77, pp. 523-549 (2010) [Winner of Casualty Actuarial Society ARIA Award, 2010]

“Federal Financial Exposure to Catastrophic Risk,” (with J. David Cummins and Michael Suher), in *Measuring and Managing Federal Financial Risk*, Deborah Lucas (ed.), Chicago: University of Chicago Press (2010)

“Public versus Private Underwriting of Catastrophe Risk: Lessons from the California Earthquake Authority,” in *Risking House and Home: Disasters, Cities, Public Policy*, John M. Quigley and Larry A. Rosenthal (eds.), Berkeley: Berkeley Public Policy Press (2008)

“Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance,” *American Economic Review* 97, pp. 973-983 (2007)

“Insurance, Self Protection, and the Economics of Terrorism,” (with Darius Lakdawalla), *Journal of Public Economics* 89, pp. 1891-1905 (2005)

“Terrorism Insurance Policy and the Public Good,” (with Darius Lakdawalla), *St. John's Journal of Legal Commentary* 18, pp. 463-469 (2004)

“The Production and Regulation of Health Insurance: Limiting Opportunism in Proprietary and Non-Proprietary Organizations,” (with Tomas Philipson) in *Individual Decisions for Health*, Bjorn Lindgren (ed.), pp. 194-206, Routledge International Studies in Health Economics, Routledge: London (2003)

“Pricing and Capital Allocation in Catastrophe Insurance,” *Journal of Financial Economics* 65, pp. 283-305 (2002) [reprinted in *Insurance and Risk Management Volume I: Economics of Insurance Markets*, Gregory Niehaus (ed.), Northampton: Edward Elgar Publishing, (2008)]

Publications: Professional/Practitioner

Book review of “Moral Hazard in Health Insurance,” *Journal of Economic Literature* 53, pp. 682-3 (2015)

“Microinsurance Lessons from History,” (with Rick Koven), *Microinsurance Learning and Knowledge (MILK)* (2013)

“Institutional Investors and Asset Allocations: Accounting and Regulation of Private Defined Benefit Pension Plans and Other Institutional Investors in the United States, Mexico, and Australia,” (with John Broadbent, Michael Palumbo, and Julio Santaella), *CGFS Publication No. 27, Working Group on Institutional Investors, Global Savings, and Asset Allocation* (2006)

“An Overview of Political Risk Insurance” (with Kausar Hamdani and Elise Liebers), *CGFS Publication No. 22, Working Group on Foreign Direct Investment in the Financial Sector of Emerging Market Economies* (2005)

Work in Progress

“Market Discipline and Guaranty Funds in Life Insurance,” (with Martin Grace, Shinichi Kamiya, and Robert W. Klein), working paper, 2019

“The Effect of Government Guarantees on Market Discipline in the Property-Casualty Insurance Industry,” (with Yiling Deng and Ty Leverty), working paper, 2019

“The Marginal Cost of Risk in a Multi-Period Model,” (with Daniel Bauer), working paper, 2019. [Winner of Casualty Actuarial Society Hachemester Prize, 2015]

- “An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions,” (with Daniel Bauer), working paper, 2019
- “Optimal Insurance Contracts with Insurer Background Risk,” (with Xiaohu Ping), working paper, 2015
- “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” (with Shinichi Kamiya and Jackie Li), working paper, 2015
- “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry” working paper, 2010
- “The Rise and Fall of the Fraternal Life Insurer: Law and Organizational Form in U.S. Life Insurance, 1870-1920,” working paper, (*revise and resubmit, Journal of Law & Economics*), 2007
- “Organizational Form and the Underwriting Cycle: Theory with Evidence from the Pennsylvania Fire Insurance Market, 1873-1909,” working paper, 2004
- “Consumption versus Production of Insurance,” (with Tomas Philipson), *NBER Working Paper #6225*, 1997

External Research Projects and Consulting

- 2019 Expert Witness, various rate filings in North Carolina
- 2018 NCCI Review of TCJA
- 2017 Expert Witness, Florida Workers’ Compensation Rate Hearing
- 2016 Expert Witness, Virginia Assigned Risk Workers’ Compensation Rate Hearing
- 2015 Expert Witness, Florida Workers’ Compensation Rate Hearing
- 2015 NCCI Revision of Underwriting Profit and Contingency Internal Rate of Return Model
- 2015 An Extension of the Project on the Costs of Holding Capital, sponsored by the CAS
- 2013 Microinsurance Centre Lessons from History Project
- 2012 Allocation of the Costs of Holding Capital, sponsored by the CAS,
- 2011 CRO Risk Index Project, co-sponsored by SOA and Bloomberg, co-founder
- 2009 “The Financial Crisis and Lessons for Insurers,” \$50,000 SOA grant, role: report co-author

Papers Presented at Professional Meetings

- 2019 “An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions,” EGRIE Annual Meeting, Rome, Italy
- 2019 “An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions,” ARIA Annual Meeting, San Francisco, CA
- 2019 “An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions,” RTS Annual Seminar, Tuscaloosa, AL

- 2017 “The Effect of Government Guarantees on Market Discipline in the Property-Casualty Insurance Industry,” NBER Insurance Project Workshop, Boston, MA
- 2015 “The Marginal Cost of Risk in a Multi-Period Model,” NBER Insurance Project Workshop, Stanford, CA
- 2015 “The Marginal Cost of Risk in a Multi-Period Model,” CAS Annual Meeting, Philadelphia, PA
- 2015 “Dynamic Capital Allocation,” IME Annual Conference, Liverpool UK
- 2015 “What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts,” ASSA Annual Meeting, Boston, MA
- 2014 “The Marginal Cost of Risk in a Multi-Period Model,” CAS Centennial, New York, NY
- 2014 “Market Discipline and Guaranty Funds in Life Insurance,” EGRIE Annual Seminar, St. Gallen, CH
- 2014 “Dynamic Capital Allocation with Irreversible Investments,” EGRIE Annual Seminar, St. Gallen, CH
- 2014 “What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts,” ARIA Annual Meeting, Seattle, WA
- 2014 “The Marginal Cost of Risk in a Multi-Period Model,” ARIA Annual Meeting, Seattle, WA
- 2014 “Market Discipline and Guaranty Funds in Life Insurance,” ARIA Annual Meeting, Seattle, WA
- 2014 “The Marginal Cost of Risk in a Multi-Period Model,” IME Conference, Shanghai, CN
- 2014 “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” Risk Theory Seminar, Munich, Germany
- 2013 “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” ASSA Annual Meeting, Philadelphia, PA
- 2013 “Optimal Insurance Contracts with Insurer Background Risk,” EGRIE Annual Meeting, Paris, FR
- 2013 “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” ARIA Annual Meeting, Washington D.C.
- 2013 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” IRFRC Catastrophe Risk Conference, Singapore
- 2013 “Optimal Insurance Contracts with Insurer Background Risk,” ARIA Annual Meeting, Washington D.C.
- 2013 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” CEAR/ETH Indices of Risk and New Risk Measures Conference, Zurich, CH
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” CAS Spring Meeting, Phoenix, AZ
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” Symposium: Risk and Catastrophic Events, State College, PA
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” ASSA Annual Meeting, Chicago, IL
- 2011 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” NBER Insurance Project Workshop, Cambridge, MA
- 2010 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” ASSA Annual Meeting, Atlanta, GA
- 2009 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” Risk Management and Corporate Governance Conference, Loyola University of Chicago
- 2009 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” ARIA Annual Meeting, Providence, RI
- 2008 “An Economic Approach to Capital Allocation,” Risk Theory Society, Annual Meeting, Fort Collins, CO
- 2007 “Federal Financial Exposure to Catastrophic Risk,” ARIA Annual Meeting, Quebec City, CA
- 2007 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” EFMA Annual Meeting, Vienna, AT
- 2007 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” 5th Infiniti Conference on International Financial Integration, Dublin, IE
- 2007 “Federal Financial Exposure to Catastrophic Risk,” NBER Conference on Measuring and Managing Federal Financial Risk, Evanston, IL
- 2006 Insuring Catastrophic Losses: The Status of TRIA and Proposed Natural Disaster Backstops, Wash., D.C.
- 2006 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” Risk Theory Society, Annual Meeting, Richmond, VA

- 2006 “Public versus Private Underwriting of Catastrophe Risk: Lessons from the California Earthquake Authority,” Berkeley Symposium on Real Estate, Catastrophic Risk, and Public Policy
- 2006 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” NBER Insurance Project Workshop, Cambridge, MA
- 2005 “Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance,” NBER Insurance Project Workshop, Cambridge, MA
- 2004 “The Rise and Fall of the Fraternal Life Insurer: Law and Organizational Form in U.S. Life Insurance,” NBER Insurance Project Workshop, Cambridge, MA
- 2004 “Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance,” American Finance Association, Annual Meeting, San Diego, CA
- 2003 “Insurance, Self-Protection, and the Economics of Terrorism,” Risk Theory Society, Annual Meeting, Atlanta, GA
- 2003 “Terrorism Insurance Policy and the Public Good,” St. John’s Journal of Legal Commentary 10th Annual Legal Symposium: Terrorism and its Impact on Insurance: Legislative Responses and Coverage Issues, Queens, NY
- 2003 “Insurance, Self-Protection, and the Economics of Terrorism,” NBER Insurance Project Workshop, Cambridge, MA
- 2002 “Pricing and Capital Allocation in Catastrophe Insurance,” CAS Risk and Capital Management Seminar, Toronto, CA
- 2002 “Market Discipline and Government Guarantees in U.S. Life Insurance,” Risk Theory Society, Annual Meeting, Urbana-Champaign, IL
- 2001 “Pricing and Capital Allocation in Catastrophe Insurance,” Risk Theory Society, Annual Meeting, Montreal

Other Conferences Talks and Panel Participation

- 2017 International Conference on Business Sciences, Cairo University, Egypt
- 2016 IIF Insurance Colloquium, Basel, Switzerland
- 2016 Surplus Lines Association of California, California (keynote)
- 2014 Surplus Lines Automation Conference, Florida
- 2011 PRMIA Annual Risk Leadership Conference, Atlanta, GA
- 2011 7th International Microinsurance Conference, Rio de Janeiro, Brazil
- 2010 Property Loss Research Bureau Eastern Adjusters Conference, Atlanta, GA (keynote)
- 2008 NCOIL Annual Meeting, Duck Key, FL
- 2007 Capital Markets Symposium on Securitizing Insurance Risk, New York, NY
- 2006 Insuring Catastrophic Losses: The Status of TRIA and Proposed Natural Disaster Backstops, Wash., D.C.
- 2006 Catastrophe Bonds and Insurance Linked Securities Summit, New York, NY
- 2005 12th Annual International Conference Promoting Business Ethics, New York, NY

Service Activities in Academic and Professional Organizations

- American Risk & Insurance Association President (2012-13)
- Risk Theory Society President (2011-2012)
- American Risk & Insurance Association Board Member (2007-2014)
- International Research Advisory Board, Risk and Insurance Research Center, NCCU, Taiwan
- Editorial Board, *Journal of Insurance Issues* (2012-2014)
- Senior Editor, *Journal of Risk and Insurance* (2019-)
- Huebner Colloquium Panelist (2016-2019)

External Committees

American Risk & Insurance Association Program Committee, 2006, 2011, 2012; ARIA Nominations Committee, 2015, 2016; Kulp-Wright Book Award Committee, 2005

Discussant: *EGRIE Annual Meeting, Rome, 2019; ARIA Annual Meeting, San Francisco, 2019; ARIA Annual Meeting, Chicago, 2018; ARIA Annual Meeting, Boston, 2016; SIFR Insurance Conference, Stockholm, 2015; EGRIE Annual Seminar, St. Gallen, 2014; ARIA Annual Meeting, Seattle, 2014; ARIA Annual Meeting, San Diego, 2011; CEAR Workshop on Insurance for the Poor, Atlanta, 2010; CEAR Workshop on Risk Perception and Subjective Beliefs, Atlanta, 2010; Midwest Finance Association Annual Meeting, Chicago, 2009; 5th Infiniti Conference, Dublin, 2007; EFMA Annual Meeting, Vienna, 2007; AEA Annual Meeting, San Diego, 2004*

Session Chair: *ARIA Annual Meeting, Chicago, 2018, ARC, Atlanta, 2017; IME, Atlanta, 2017; ARIA Annual Meeting, San Diego, 2011; Midwest Finance Association Annual Meeting, Chicago, 2009; ARIA Annual Meeting, Quebec City, 2007; EFMA Annual Meeting, Vienna, 2007;*

Referee for *Asia-Pacific Journal of Risk and Insurance, Astin Bulletin, Australian Social Monitor, Contemporary Economic Policy, Current Issues in Economics and Finance, Defense and Peace Economics, European Economic Review, Financial Review, Geneva Papers: Issues and Practice, Geneva Risk and Insurance Review, Health Affairs, Insurance: Mathematics and Economics, Journal of Banking and Finance, Journal of Business, Journal of Finance, Journal of Financial Intermediation, Journal of Financial Services Research, Journal of Law and Economics, Journal of Money, Credit, and Banking, Journal of Political Economy, Journal of Risk and Insurance, Management Science, North American Actuarial Journal, Proceedings of the National Academy of Sciences, Review of Financial Studies, Risk Management and Insurance Review, Scandinavian Actuarial Journal, and Science.*

Working Group Participation

Committee on the Global Financial System, Working Group on Institutional Investors, Global Savings, and Asset Allocation (2006); Presidential Working Group on Financial Markets, Working Group on Terrorism Insurance (2006)

Continuing Education Activities

- | | |
|-----------|---|
| 2004-2007 | Central Banking Seminar, Federal Reserve Bank of New York, Topics: Introduction to U.S. Financial Markets; Introduction to Non-bank Financial Institutions |
| 2009 | Texas Farm Bureau Program, Georgia State University, Topic: Securitization, the Insurance Industry, and the Panic of 2007 |
| 2009-2012 | Horst K. Jannott Visiting Fellows Program, Georgia State University, Topics: Securitization, the Insurance Industry, and the Panic of 2007; Introduction to Statistics; |

Sample of Findings on the Private Company Discount

Study	Years	Discount	Type
Emory (1994)	1992-1993	45%	IPO
Willamette Management Associates (various)	1975-1997	29% to 60%	IPO
Garland and Reilly (2004)	1998-2002	35%	IPO
Larcker et al. (2018)	2017	39% to 47%	IPO
Koeplin et al. (2000)	1984-1998	20% to 30%	Acquisitions
Block (2007)	1999-2006	20% to 25%	Acquisitions
Officer (2007)	1979-2003	15% to 30%	Acquisitions
Paglia and Harjoto (2010)	1993-2008	65% to 70%	Acquisitions
Jaffe et al. (2018)	1985-2014	0%	Acquisitions
Silber (1991)	1981-1988	34%	Restricted Stock
Johnson (1999)	1991-1995	20%	Restricted Stock
Bajaj et al. (2001)	1990-1995	7%	Private placements
Comment (2012)	2004-2010	5% to 6%	Private placements
Finnerty (2013)	1991-1997	21%	Private placements
Finnerty (2013)	1997-2007	15%	Private placements
Chen et al. (2015)	1999-2012	10%	Private placements

William L. Silber (1991), "Discounts on Restricted Stock: The Impact of Illiquidity on Stock Prices," *Financial Analyst Journal*, July-August 1991, 60-64.

John D. Emory, "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock-February 1992 through July 1993," *Business Valuation Review*, March 1994, 3-7.

BA Johnson (1999), "Quantitative Support for Discounts for Lack of Marketability" *Business Valuation Review* 16, 152-55.

John Koeplin, Atulya Sarin, Alan C. Shapiro (2000), "The Private Company Discount," *Journal of Applied Corporate Finance* 12, 94-101.

Mukesh Bajaj, David J. Denis, Stephen P Ferris, and Atulya Sarin (2001), "Firm Value and Marketability Discounts," *Journal of Corporation Law* 27, 89-115.

Garland, P.J., and Reilly, A.L. (2004), "Update on the Willamette Management Associates Pre-IPO Discount for Lack of Marketability Study for the Period 1998-2002," *Willamette Management Associates Insights*, Spring 2004, 38-44.

Block, S. (2007), "The Liquidity Discount in Valuing Privately Owned Companies," *Journal of Applied Finance* 17(2), 33-40.

Officer, M.S. (2007), "The Price of Corporate Liquidity: Acquisition Discounts for Unlisted Targets," *Journal of Financial Economics* 83(3), 571-598.

John K. Paglia and Maretno Harjoto (2010), "The Discount for Lack of Marketability in Private Companies: A Multiples Approach," *Journal of Business Valuation and Economic Loss Analysis* 5(1), Article 5.

Robert Comment (2012), "Revisiting the Illiquidity Discount: A New (and Skeptical) Restricted Stock Study," *Journal of Applied Corporate Finance* 24, 80-91.

John D. Finnerty (2013), "The Impact of Stock Transfer Restrictions on the Private Placement Discount," *Financial Management* 42, 575-609.

Chen, Linda H., Edward A. Dyl, George J. Jiang, and Januj A. Juneja (2015), "Risk, Illiquidity, or Marketability: What Matters for the Discounts on Private Placements?" *Journal of Banking and Finance* 57, 41-50.

Jeffrey F. Jaffe, Jan Jindra, David J. Pedersen, and Torben Voetmann (2018), "Do Unlisted Targets Sell at Discounts?" *Journal of Financial and Quantitative Analysis*, forthcoming.

David F. Larcker, Brian Tayan, and Edward Watts (2018), "Cashing it In: Private Company Exchanges and Employee Sales Prior to IPO," *Stanford Closer Look Series*, CGRP-73

* The Willamette research studies were unpublished but reported in [Business Valuation Discounts and Premiums](#), Chapter 5, by Shannon Pratt (New York: John Wiley & Sons, Inc., p. 85).

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE

Docket No. 19-

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, 2020

PRE-FILED DIRECT TESTIMONY OF CAROLYN J. BERGH

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of Carolyn J. Bergh in support of its application for a general rate revision to be effective on and after July 1, 2020.

Q. Please state your full name.

A. Carolyn J. Bergh.

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

A. I am presently employed as Vice President and Actuary at the WCRIBMA. I hold a bachelor's degree in mathematics and statistics from the University of Connecticut, Storrs. I am a Fellow of the Casualty Actuarial Society and a member of the American Academy of Actuaries. Before joining the WCRIBMA in September 2018, I spent five years as an assistant vice president and actuary for The Hartford overseeing their workers' compensation line of business, where my responsibilities included rating and pricing, reserving, claims and underwriting support. Prior to The Hartford, I was employed at the

NCCI for ten years. Six an half years as a Practice Leader and Senior Actuary, overseeing the Legislative Analysis area, Pool Reserving and Data Quality Team and three and a half years as a State Actuary / Project Leader for several states, including Virginia, Tennessee, Texas, Rhode Island and Iowa. My actuarial career began in 1987 at Aetna Property Casualty in Hartford where I worked on ratemaking for personal lines. Subsequently I have worked for several companies in both a ratemaking and reserving capacity: NCCI (9/89–10/91) Sr. Actuarial Analyst, Workers Compensation Class Ratemaking; Lancer Insurance Company (10/92-9/95) Commercial Auto and Personal Lines; Providence Washington Insurance Company (9/95-11/99) Commercial and Personal Lines; Bristol West Insurance Company (11/99-2/03) Non-Standard Auto. 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 ultimately responsible for preparation of the entire filing. I worked closely with the WCRIBMA's actuarial staff and our outside consulting experts in preparing the filing. I am testifying in support of the reasonableness of the WCRIBMA's overall rate indication and sponsor Sections I (Rate Recommendation), II (Loss Development), III (Premium), IV (Benefit Change Adjustments), V (Trend), VI (Expenses) and XIV (Cost Containment). I also oversaw preparation of 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 provided input into assumptions related to Volume 1, Section VII (Profit), which was prepared by the WCRIBMA's staff and peer reviewed by our outside consulting

expert George Zanjani. 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. Ms. Bergh, what general rate level change is the WCRIBMA recommending this year?

A. As shown in Section I of the filing, the WCRIBMA is recommending a decrease in average rates of 3.8% for workers' compensation, effective July 1, 2020.

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.

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. It is my professional opinion that the rates proposed in the WCRIBMA's current filing are not excessive, inadequate or unfairly discriminatory for the classifications to which they apply, and that they fall within a range of reasonableness. Accordingly, I recommend that the Commissioner approve the WCRIBMA's filing.

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

A. I oversaw 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 in the contacting of those companies about any outstanding questions the WCRIBMA had regarding the survey responses.

In addition to overseeing the compilation of these ten survey responses, I also peer reviewed the input of the 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 16th day of December 2019 under the pains and penalties of perjury.



Carolyn J. Bergh, FCAS, MAAA

PROFESSIONAL EXPERIENCE:

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

9/18 – present **Vice President and Actuary**

Responsible for the management of the Actuarial and Data Operations departments.
Oversee the collection of data and manage the preparation of workers' compensation rate filings for the Commonwealth of Massachusetts.

THE HARTFORD, Hartford, CT

10/12 – 5/18 **Assistant Vice President & Actuary, Workers Compensation Line of Business**

Ensure the profitability and rate adequacy of \$2.8B book of business
Work closely with product, underwriting, claims, reserving, finance, data scientist and field office
Oversee the functional areas of rating, pricing and planning
Indications, filings, trends monitoring, planning, predictive modeling implementation and monitoring
Pricing - Responsible for monitoring the regulatory environment and tracking marketplace activity including preparation of competitor analyses, rate-setting, and pricing proposals
Industry influence and participation - Actuarial Committee (MA, PA, CA and NCCI)

2003 – 2012 ***NATIONAL COUNCIL ON COMPENSATION INSURANCE, Boca Raton, FL***

2006 – 2012 **Practice Leader & Senior Actuary**

Legislative Analysis - Oversee the pricing of legislative proposals and enactments
Provide support to legislators and insurance industry by analyzing benefit proposals, conducting research and participate in educational forums on cost drivers
Residual Market Pool Reserving
Data Quality

2003 – 2006 **Director and Actuary**

Oversee the preparation of rate filings in several states
Expert witness testimony and educational forums
Team leader of legislative analysis oversee pricing proposals and enacted legislation and research on benefit structure and post reform analysis

BRISTOL WEST INSURANCE COMPANY, Davie, FL

1999-2003 **Actuary and Manager** (Non-Standard Auto)

Assist in building Actuarial and Product Management Department
Quarterly Reserving - presenting reserves and claims' trends to Sr. Management and BOD
Preparation of Actuarial Reports and Opinions
Liaison with external auditors, Department of Insurance personnel and Reinsurers
Claims metrics development and monitoring
Mergers and Acquisition activity

PROVIDENCE WASHINGTON INSURANCE COMPANY, Providence, RI

1995-1999 **Actuary and Product Manager**

Pricing / Reserving: Commercial and Personal Lines
Rate revisions, filings, product development, profitability studies
Quarterly reserving, year-end financial reporting, risk based capital analysis
Niche marketing analysis and program development

LANCER INSURANCE COMPANY, Long Beach, NY

1992-1995 **Actuary: Pricing / Reserving: Transportation Specialist and Personal Lines**

NATIONAL COUNCIL ON COMPENSATION INSURANCE, Boca Raton, FL

1989-1991 **Sr. Actuarial Analyst: Class Ratemaking, Countrywide Exhibits and Documentation**

AETNA PROPERTY CASUALTY, Hartford, CT

1987-1989 **Actuarial Analyst: Homeowners Pricing / Commercial Lines Reserving**

Education:

University of Connecticut 1987
Actuarial Science: Math & Statistics
B.S. Actuarial Science, Cum Laude

Storrs, Connecticut

Professional Designations and Activities

Fellow of Casualty Actuarial Society (FCAS): 2006
Member of the Academy of Actuaries (MAAA): 2018

CAS Examination Committee: (2006-2015)

EXPERT TESTIMONY:

Helena, Montana, February 2009
BOD MT State Fund – Medical Fee Schedule

Nashville, Tennessee, October 2007
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, April 2007
Workers Compensation Insurance Loss Cost Hearing – Medical Fee Schedule - Law Only

Providence, Rhode Island, January 2007
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, October 2006
Workers Compensation Insurance Loss Cost Hearing

Providence, Rhode Island, December 2005
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, September 2005
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, April 2005
Workers Compensation Insurance Loss Cost Hearing – Medical Fee Schedule - Law Only

Nashville, Tennessee, February 2005
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, November 2004
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, July 2004
Workers Compensation Insurance Loss Cost Hearing – Law Only

Nashville, Tennessee, February 2004
Joint Committee on Workers Compensation

Nashville, Tennessee, February 2004
Senate, Commerce, Labor and Agriculture Committee

PUBLIC PRESENTATIONS:

CAS Spring Meeting, June 2008
WC Second Injury Fund Eliminations

Data Reporting Workshop, Jan 2008
NCCI New Medical Call

Annual Issues Symposium, May 2007
Performance of Payroll as the Exposure Base for WC

STATE ADVISORY FORUMS:

Nashville, Tennessee, September 2006

Austin, Texas, November 2005

Nashville, Tennessee, September 2005

Providence, Rhode Island, September 2005

Nashville, Tennessee, September 2004

Austin, Texas, November 2004

Austin, Texas, November 2003

Nashville, Tennessee, September 2003

**COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE**

Docket No. 19-

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, 2020)

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, X, XI, XII and XIII of its filing for a general rate revision to be effective on and after July 1, 2020.

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 Assistant Vice President, Data Operations and 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, Carolyn Bergh, Vice President & Actuary, WCRIBMA, 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.


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), X (Experience Rating), XI (Miscellaneous Rating Values), and XII (Retrospective 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), X (Experience Rating), XI (Miscellaneous Rating Values), and XII (Retrospective Rating) are complete and accurate, and the narrative statements are also accurate and correct.

Signed this 20th day of December, 2019 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**

06/1998 - Present

Senior Actuarial Analyst

01/2004-08/2010

Data Operations Director / Actuary

09/2010–11/2018

Assistant Vice President, Data Operations and Actuary 12/2018–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, including loss development, premiums, benefit level adjustments, trend, expenses, experience rating, retrospective rating, class rates, F-Class rates, and miscellaneous rating.
- 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. 19-

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, 2020

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, 2020.

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 moving to 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 as a Senior Associate Editor of the *Journal of Risk and Insurance* and on the Editorial Board of 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 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, and continue to reflect the competitive situation of the workers compensation market in Massachusetts in 2019.

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.

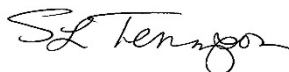
Q. Have you explained in your report how you came to these conclusions?

A. Yes.

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

A. Yes.

Signed this 17th day of December 2019 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-Universität, 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

VOLUME I: INDEX 7/1/20

		Page
Section I	Rate Recommendation	
A.	Introduction.....	I 001
B.	Calculation of Indicated Rate Change.....	I 009
C.	Indicated Rate Change Detail	I 010
D.	Section Summaries	I 012
E.	Reflecting the Impact of Large Deductibles	I 017
Section II	Loss Development	
A.	Summary	II 001
B.	Policy Year Data.....	II 012
C.	Tail Factor Calculation	II 017
D.	Adjustment for Escalated Benefits	II 023
E.	Accident Year Paid Loss Development Factors.....	II 027
Section III	Premiums	
A.	Summary	III 001
B.	Adjustment for Experience and Merit Rating, ARAP and Construction Credit Off-Balance	III 009
C.	Impact of the Loading for Recoupment of Insolvency Fund Assessments	III 011
D.	Premium On-Level Factors	III 012
E.	Premium Adjustment Factors	III 016
Section IV	Benefit Change Adjustments	
A.	Summary	IV 001
B.	Effects of SAWW Change	IV 010
C.	Provisions of the Law	IV 015
D.	Massachusetts Data.....	IV 016
E.	Injury Type Weights.....	IV 020
F.	Effects of USL&HW Benefit Changes	IV 024

		Page
Section V		
Trend		
A.	Summary	V 001
B.	Lost Time Frequencies	V 028
C.	Indemnity Severities	V 030
D.	Lost Time Medical Severities	V 032
E.	Payroll Development and Worker-Weeks Calculation	V 036
F.	Calculation of Class Mix Adjustment Factor	V 037
G.	External Data	V 038
H.	Expense Trends	V 039
Section VI		
Expenses		
A.	Summary	VI 001
B.	Fixed Expenses	VI 010
C.	Other Taxes	VI 015
D.	Expense Constant	VI 016
E.	Expenses Net of Premium Discount	VI 017
F.	Expense Constant Offset	VI 025
G.	Acquisition Expenses	VI 027
H.	Loss Adjustment Expense	VI 033
I.	Adjustment for Large Deductible Policies	VI 036
J.	Expected Loss Ratios Underlying the Proposed Rates & Rating Values	VI 039
Section VII		
Profit		
A.	Summary	VII 001
B.	DCF Models	VII 016
C.	Underwriting Cash Flows	VII 039
D.	Capital Needed From Investors	VII 056
E.	Cost of Capital	VII 058
F.	Leverage Ratio	VII 090
G.	Premium Flow	VII 092
H.	Expense Weights	VII 093
I.	Loss & LAE Flow	VII 094
J.	Portfolio Rate of Return	VII 097

Introduction

On behalf of our more than three hundred member carriers, the Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") recommends that average rates for workers' compensation insurance be decreased by 3.8% for policies effective on and after July 1, 2020.

Filing Summary

This filing is divided into three parts (Volumes). The Volume 1 is the main rate level filing, with explanatory text and actuarial exhibits underlying the calculation of the average rate indication. The Volume II contains the rate level indication for F-Classes, revised Experience and Retrospective Rating Plan parameters, miscellaneous rating values, and classification rate displays. The Volume III addresses cost containment. The pre-filed testimony of the two WCRIBMA actuaries supporting this filing, Carolyn Bergh and Anthony Salido, and the WCRIBMA's outside expert witnesses, Dr. George Zanjani of the University of Alabama, and Dr. Sharon Tennyson of Cornell University, is included with the 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.

I 000002

In this introduction, the WCRIBMA presents a summary of the principal ratemaking issues and methods 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 2016 data and the other from policy year 2017 data.¹ Policy year 2016 data consist of premium and loss experience generated by policies written during 2016. Policy year 2017 data consist of premium and loss experience generated by policies written during 2017. The WCRIBMA averages these two years of experience to get its filed indication.

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 that supports this filing (“Actual Cost Ratio”). The WCRIBMA adjusts Aggregate Financial premium and loss data from the 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, here 7/1/20-6/30/21. The recommended rate change is designed to bring the Actual Cost Ratio into alignment with the Target Cost Ratio.

It is important to understand that the ratemaking methodology used in this filing is not a series of unrelated calculations, but rather an integrated series of adjustments to

¹ Policy year data is used by 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).

the reported experience 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

Losses require three separate adjustments to rate period levels. The first, described in Section II of the filing, is loss development. Since the claims associated with policy year 2016 and policy year 2017 losses have not yet all been settled, the WCRIBMA looks at past settlement patterns to estimate ultimate values. As was demonstrated in the 2018 filing, the separate development of AIG and the remainder of the industry is no longer necessary and therefore industry data is analyzed in total.

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 are averaged when the WCRIBMA calculates the experience period loss ratios.

Next, losses are 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.² The WCRIBMA estimates the wage-based benefit effects with a simulation model.³

² As of 10/1/2019, Department of Unemployment Assistance (DUA) promulgated the State Average Weekly Wage (SAWW) of \$1,431.66 from the prior SAWW of \$1,383.41.

³ WCRIBMA simulation model is based on NCCI's previously utilized automatics model.

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. Regression techniques are used to analyze separately the distinct underlying components of observed loss trends: changes in claim frequency, claim severity and wages (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 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 rates. 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, namely, the internal rate of return (“IRR”) model and the insurer capital cost (“ICC”) model. The IRR model is widely used in insurance ratemaking⁴ and in the 2003 Rate Decision was approved by the Commissioner for use in workers’ compensation ratemaking in Massachusetts. The ICC model is mathematically equivalent to the IRR model and is used to explicitly quantify the capital costs in dollar terms.⁵

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.

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 three examples of models that may be used to directly develop an underwriting profit provision, including the Net Present Value (NPV) Model. ASOP #30 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 The list of models that may be used to directly develop an underwriting profit provision which are described in ASOP #30 also includes the total financial needs model. “Total financial needs models are used to develop the underwriting profit provision such that the sum of underwriting profit, miscellaneous (non-investment) income, investment 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.

Longshore and Harbor Workers' Compensation

Section VIII describes the derivation of rate recommendations for the risks that have exposure to the benefits and risks that apply under the United States Longshore and Harbor Workers' Compensation 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 its rate filings. Section XIII also provides details about certain adjustments to the reported data, including the exclusion of certain data, deemed necessary this year for purposes of this rate filing.

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 does address general expenses, such as salaries, travel, advertising, and rent. The current survey also addresses commissions.

I 000008

Section I - Rate Recommendation
Subsection A - Introduction
7/1/2020

Section I - A
Exhibit 1

RATE INDICATION SUMMARY

Statewide Rate Change Summary		
<i>Indication Effective Date: 7/1/2020</i>		
(1)	Indicated Rate Change Based on Policy Year 2016 Data (Section I-B, Exhibit 1)	-4.1%
(2)	Indicated Rate Change Based on Policy Year 2017 Data (Section I-B, Exhibit 1)	-3.5%
(3)	Average Indicated Rate Change = [(1) + (2)] / 2.0	-3.8%

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

I 000009

Section I - Rate Recommendation
 Subsection B - Calculation of Indicated Rate Change
 7/1/2020

Section I - B
 Exhibit 1

Calculation of Indicated Rate Change		Policy Year <u>2016</u>	Policy Year <u>2017</u>
(1)	Standard Earned Premium plus Adjusted ARAP Premium (Section I-D, Exhibit 2)	1,203,414,718	1,252,889,200
(2)	Composite Adjustment Factor (Section I-D, Exhibit 2)	1.041	1.043
(3)	Adjusted Standard Earned Premium plus Adjusted ARAP = [(1) x (2)]	1,252,810,112	1,307,148,410
(4)	Cumulative Premium Development Factor to Ultimate (Section I-D, Exhibit 2)	0.999	1.010
(5)	Rate On-Level Factor (Section I-D, Exhibit 2)	0.878	0.871
(6)	Factor to Remove Expense Constant (Section I-D, Exhibit 2)	0.960	0.962
(7)	Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = [(3) x (4) x (5) x (6)]	1,054,546,187	1,106,105,799
(8)	Annual Wage Trend (Section I-D, Exhibit 4)	0.034	0.034
(9)	Wage Trend Factor to 7/1/2021 (based on Section I-D, Exhibit 4)	1.160	1.122
(10)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period = [(7) x (9)]	1,222,981,872	1,241,211,376
(11)	Average On-Level Incurred Losses Projected to Prospective Effective Period (Section I-C Exhibit I, Page 1 Item (30), Page 2 Item (30))	723,449,094	740,318,438
(12)	Loss Ratio Projected to Prospective Effective Period = [(11) / (10)]	0.592	0.596
(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)	1.187	1.187
(15)	Fixed Expense Ratio (Section I-D, Exhibit 5)	0.051	0.050
(16)	Indicated Policy Year Loss, LAE, and Fixed Expense Ratio = [[(12) x (14)] + (15)] x (13)	0.753	0.758
(17)	Commission and Other Acquisition Expense Ratio (Section I-D, Exhibit 5)	0.122	0.122
(18)	Premium Tax Ratio (Section I-D, Exhibit 5)	0.022	0.022
(19)	Premium Discount Ratio (Section I-D, Exhibit 5)	0.053	0.053
(20)	Variable Expense Ratio = [(17) + (18) + (19)]	0.197	0.197
(21)	Underwriting Profit Provision (Section VII-A)	0.017	0.017
(22)	Permissible Loss, LAE, and Fixed Expense Ratio = [1.0 - (20) - (21)]	0.786	0.786
(23)	Indicated Rate Change = [(16) / (22)] - 1.0	-4.1%	-3.5%
(24)	Overall Indicated Rate Change = [(23) PY2016 + (23) PY2017] / 2.0		-3.8%

I 000010

Section I - Rate Recommendation
 Subsection C - Indicated Rate Change Detail
 7/1/2020

Section I - C
 Exhibit 1
 Page 1

Premium and Incurred Losses Projected to the Prospective Effective Period
 Policy Year 2016

Premium			
(1)	Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate (Section I -D, Exhibit 2)	1,054,546,187	
(2)	Annual Wage Trend (Section I-D, Exhibit 4)	0.034	
(3)	Wage Trend Factor to Prospective Effective Period (7/1/2021)	1.160	
(4)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period = [(1) x (3)]	1,222,981,872	
Indemnity Losses		<u>Paid</u>	<u>Paid + Case</u>
(5)	Indemnity Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	255,298,897	350,952,166
(6)	Indemnity Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.749	1.254
(7)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.034	1.014
(8)	Factor to Adjust for Escalated Benefits (Section I-D, Exhibit 1)	1.038	1.008
(9)	Estimated Ultimate Indemnity Loss = [(5) x (6) x (7) x (8)]	479,134,513	450,026,408
(10)	Annual Indemnity Loss Trend (Section I-D, Exhibit 4)	0.005	0.005
(11)	Indemnity Loss Trend Factor to 7/1/2021	1.023	1.023
(12)	Estimated Indemnity Losses Trended = [(9) x (11)]	490,237,914	460,455,261
(13)	Estimated Benefit Change Factor Prior to 1/1/2020 (Section I-D, Exhibit 3)	1.032	1.032
(14)	On Level Losses = [(12) x (13)]	506,135,547	475,387,091
(15)	Estimated Benefit Change Factor Subsequent to 1/1/2020 (Section I-D, Exhibit 3)	1.012	1.012
(16)	On-Level Incurred Losses Projected to Prospective Effective Period = [(14) x (15)]	512,023,862	480,917,681
Medical Losses			
(17)	Medical Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	162,736,370	219,904,647
(18)	Medical Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.292	1.026
(19)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.074	1.017
(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)]	225,856,310	229,455,014
(22)	Annual Medical Loss Trend (Section I-D, Exhibit 4)	-0.001	-0.001
(23)	Medical Loss Trend Factor to 7/1/2021	0.997	0.997
(24)	Estimated Medical Losses Trended = [(21) x (23)]	225,184,323	228,772,321
(25)	Estimated Benefit Change Factor Prior to 1/1/2020 (Section I-D, Exhibit 3)	1.000	1.000
(26)	On Level Losses = [(24) x (25)]	225,184,323	228,772,321
(27)	Estimated Benefit Change Factor Subsequent to 1/1/2020 (Section I-D, Exhibit 3)	1.000	1.000
(28)	On-Level Incurred Losses Projected to Prospective Effective Period = [(26) x (27)]	225,184,323	228,772,321
Total Combined Medical and Indemnity Losses			
(29)	Total Estimated Ultimate Losses Trended and On Level = [(16) + (28)]	737,208,185	709,690,002
(30)	Average On-Level Incurred Losses Projected to Prospective Effective Period	723,449,094	

I 000011

Section I - Rate Recommendation
 Subsection C - Indicated Rate Change Detail
 7/1/2020

Section I - C
 Exhibit 1
 Page 2

Premium and Incurred Losses Projected to the Prospective Effective Period
 Policy Year 2017

Premium

(1)	Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate (Section I -D, Exhibit 2)	1,106,105,799
(2)	Annual Wage Trend (Section I-D, Exhibit 4)	0.034
(3)	Wage Trend Factor to Prospective Effective Period (7/1/2021)	1.122
(4)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period = [(1) x (3)]	1,241,211,376

Indemnity Losses

		<u>Paid</u>	<u>Paid + Case</u>
(5)	Indemnity Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	141,456,490	254,587,379
(6)	Indemnity Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	3.288	1.773
(7)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.034	1.014
(8)	Factor to Adjust for Escalated Benefits (Section I-D, Exhibit 1)	1.038	1.008
(9)	Estimated Ultimate Indemnity Loss = [(5) x (6) x (7) x (8)]	499,031,585	461,363,899
(10)	Annual Indemnity Loss Trend (Section I-D, Exhibit 4)	0.005	0.005
(11)	Indemnity Loss Trend Factor to 7/1/2021	1.018	1.018
(12)	Estimated Indemnity Losses Trended = [(9) x (11)]	508,002,459	469,657,637
(13)	Estimated Benefit Change Factor Prior to 1/1/2020 (Section I-D, Exhibit 3)	1.023	1.023
(14)	On Level Losses = [(12) x (13)]	519,566,293	480,348,615
(15)	Estimated Benefit Change Factor Subsequent to 1/1/2020 (Section I-D, Exhibit 3)	1.012	1.012
(16)	On-Level Incurred Losses Projected to Prospective Effective Period = [(14) x (15)]	525,610,859	485,936,927

Medical Losses

(17)	Medical Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	132,614,660	212,723,290
(18)	Medical Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.652	1.086
(19)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.074	1.017
(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)]	235,313,949	234,863,448
(22)	Annual Medical Loss Trend (Section I-D, Exhibit 4)	-0.001	-0.001
(23)	Medical Loss Trend Factor to 7/1/2021	0.998	0.998
(24)	Estimated Medical Losses Trended = [(21) x (23)]	234,769,274	234,319,816
(25)	Estimated Benefit Change Factor Prior to 1/1/2020 (Section I-D, Exhibit 3)	1.000	1.000
(26)	On Level Losses = [(24) x (25)]	234,769,274	234,319,816
(27)	Estimated Benefit Change Factor Subsequent to 1/1/2020 (Section I-D, Exhibit 3)	1.000	1.000
(28)	On-Level Incurred Losses Projected to Prospective Effective Period = [(26) x (27)]	234,769,274	234,319,816

Total Combined Medical and Indemnity Losses

(29)	Total Estimated Ultimate Losses Trended and On Level = [(16) + (28)]	760,380,133	720,256,744
(30)	Average On-Level Incurred Losses Projected to Prospective Effective Period		740,318,438

I 000012

Section I - Rate Recommendation
 Subsection D - Loss Development Summary
 7/1/2020

Section I - D
 Exhibit 1

Summary of Estimated Ultimate Losses

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/18 (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)
2016	Indemnity	255,298,897	1.749	446,576,391	1.034	1.038	479,134,513
2016	Medical	162,736,370	1.292	210,232,031	1.074	1.000	225,856,310
2016	Total	418,035,267		656,808,422			704,990,823
2017	Indemnity	141,456,490	3.288	465,121,418	1.034	1.038	499,031,585
2017	Medical	132,614,660	1.652	219,035,411	1.074	1.000	235,313,949
2017	Total	274,071,150		684,156,829			734,345,534

Paid Plus Case Loss Development Method

Policy Year (9)	Benefit Type (10)	Paid Plus Case Losses at 12/31/18 (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)
2016	Indemnity	350,952,166	1.254	440,233,011	1.014	1.008	450,026,408
2016	Medical	219,904,647	1.026	225,717,324	1.017	1.000	229,455,014
2016	Total	570,856,813		665,950,335			679,481,422
2017	Indemnity	254,587,379	1.773	451,323,777	1.014	1.008	461,363,899
2017	Medical	212,723,290	1.086	231,037,658	1.017	1.000	234,863,448
2017	Total	467,310,669		682,361,435			696,227,347

Notes:

- (3), (11): Aggregate Financial Data.
- (4), (12): Section II - B, Exhibit 1.
- (5) = (3) x (4)
- (6): Section II - C, Exhibit 1, Page 1.
- (7): Section II - D, Exhibit 1, Page 1.
- (8) = (5) x (6) x (7)
- (13) = (11) x (12)
- (14): Section II - C, Exhibit 2, Page 1.
- (15): Section II - D, Exhibit 2, Page 1.
- (16) = (13) x (14) x (15)

I 000013

Section I - Rate Recommendation
Subsection D - Premium Summary
7/1/2020

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 12/31/2018	
	2016	2017
(1) Standard Earned Premium plus Adjusted ARAP Premium	1,203,414,718	1,252,889,200
(2) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.041	1.041
(3) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	1.000	1.002
(4) Composite Adjustment Factor = (2) x (3)	1.041	1.043
(5) Adjusted Standard Earned Premium plus ARAP = (1) x (4)	1,252,810,112	1,307,148,410
(6) Cumulative Premium Development Factor to Ultimate (see Section III-A, Exhibit 1, Page 2)	0.999	1.010
(7) Rate On-Level Factor	0.878	0.871
(8) Factor to Remove Expense Constant	0.960	0.962
(9) Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = (5) x (6) x (7) x (8)	1,054,546,187	1,106,105,799

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.

I 000014

Section I - Rate Recommendation
 Subsection D - Benefit Change Adjustments Summary
 7/1/2020

Section I - D
 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
1/1/2020	Prosp. Eff. Period					1.012	1.000	
PY 2016	1/1/2020					1.032	1.000	
PY 2017	1/1/2020					1.023	1.000	
PY 2003	Prosp. Eff. Period	1.092	1.110	1.192	1.064	1.147	1.046	
PY 2004	Prosp. Eff. Period	1.088	1.105	1.182	1.062	1.140	1.036	
PY 2005	Prosp. Eff. Period	1.083	1.097	1.165	1.057	1.128	1.032	
PY 2006	Prosp. Eff. Period	1.077	1.089	1.148	1.053	1.116	1.032	
PY 2007	Prosp. Eff. Period	1.071	1.080	1.132	1.048	1.104	1.032	
PY 2008	Prosp. Eff. Period	1.065	1.071	1.116	1.043	1.092	1.024	
PY 2009	Prosp. Eff. Period	1.063	1.068	1.111	1.041	1.087	1.002	
PY 2010	Prosp. Eff. Period	1.063	1.069	1.112	1.042	1.088	1.000	
PY 2011	Prosp. Eff. Period	1.060	1.064	1.102	1.040	1.081	1.000	
PY 2012	Prosp. Eff. Period	1.055	1.057	1.090	1.036	1.072	1.000	
PY 2013	Prosp. Eff. Period	1.053	1.054	1.085	1.034	1.067	1.000	
PY 2014	Prosp. Eff. Period	1.047	1.050	1.078	1.032	1.062	1.000	
PY 2015	Prosp. Eff. Period	1.036	1.043	1.067	1.029	1.053	1.000	
PY 2016	Prosp. Eff. Period	1.030	1.037	1.056	1.024	1.044	1.000	
PY 2017	Prosp. Eff. Period	1.023	1.029	1.044	1.019	1.035	1.000	
PY 2015	CPY 2016_07	1.009	1.011	1.016	1.007		1.000	
PY 2016	CPY 2017_07	1.010	1.012	1.019	1.008		1.000	
PY 2017	CPY 2018_07	1.010	1.013	1.019	1.008		1.000	
CPY 2016_07	Prosp. Eff. Period							1.026
CPY 2017_07	Prosp. Eff. Period							1.019
CPY 2018_07	Prosp. Eff. Period							1.013
CPY 2008_09	Prosp. Eff. Period							1.058
Prior Eff. Period (using benefit level projections from prior filing)	Prosp. Eff. Period					1.021	1.000	1.014

Notes:

From Section IV-A, Exhibit 1.

1/1/2020 refers to a point in time. All other time periods refer to Policy Years.

Example: PY 2009 to Prosp. Eff. Period for Permanent Partial = $1.111 = 1.193 / 1.074$

where 1.193 is the Index Factor for Prosp. Eff. Period and 1.074 is the Index Factor for PY 2009 for Indemnity Permanent Partial, from Exhibit 2.

Paid Trend Summary

	Indemnity				Medical								SAWW		
	Severity		Frequency		Lost-Time Medical				Medical Only				Trend	Credibility	
	Trend	Credibility	Trend	Credibility	Trend	Credibility	Trend	Credibility	Trend	Credibility	Trend	Credibility			
(1) Massachusetts Trend															
5 Year	2.5%	46.7%	-1.4%	59.7%	2.4%	40.0%	-1.4%	59.7%	2.5%	71.6%	-3.5%	39.5%	3.4%	100.0%	
6 Year	2.6%	67.9%	-1.5%	86.0%	2.5%	58.3%	-1.5%	86.0%	2.1%	91.9%	-3.8%	54.4%	3.3%	100.0%	
7 Year	2.6%	88.6%	-1.8%	98.6%	2.3%	75.2%	-1.8%	98.6%	2.3%	100.0%	-4.2%	53.5%	3.3%	100.0%	
8 Year	2.9%	99.6%	-2.0%	100.0%	2.5%	89.7%	-2.0%	100.0%	2.3%	100.0%	-4.5%	57.5%	3.0%	100.0%	
9 Year	2.6%	100.0%	-1.6%	80.0%	2.1%	84.3%	-1.6%	80.0%	2.2%	100.0%	-4.3%	60.3%	2.9%	100.0%	
10 Year	2.5%	100.0%	-1.5%	85.2%	2.2%	94.1%	-1.5%	85.2%	1.8%	100.0%	-4.2%	65.7%	3.0%	100.0%	
(2) Selected Trend	2.6%		-2.0%		2.2%		-2.0%		2.3%		-4.2%		3.4%		
(3) 15 Year Massachusetts Complement of Credibility	2.8%		-1.9%		2.5%		-1.9%		2.3%		-4.2%		2.7%		
(4) Credibility Weighted Trend	2.6%		-2.0%		2.3%		-2.0%		2.3%		-4.2%		3.4%		

	Lost-Time Medical	Medical Only
(5) Medical Loss Trend	0.2%	-2.0%
(6) Fraction of Total Medical	87.9%	12.1%
(7) Total Medical Loss Trend	-0.1%	

	Indemnity	Medical
(8) Total Loss Trend	0.5%	-0.1%
(9) SAWW Trend	3.4%	3.4%
(10) Total Net Trend	-2.7%	-3.3%

Notes:

- (1), (3): Section V, Exhibit 2 Severity; Exhibit 3 Frequency and SAWW.
- (2): Selection based on the fit with the highest credibility and least number of years.
- (4) = Credibility Weighted 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.

I 000015

I 000016

Section I - Rate Recommendation
Subsection D - Expenses Summary
7/1/2020

Section I - D
Exhibit 5

Summary of Expense Ratios

(1)	Commission and Other Acquisition Expense Ratio	12.2%
(2)	Average Premium Discount as a % of Standard Premium + ARAP	5.3%
(3)	Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4)	Variable Expense Ratio = (1) + (2) + (3)	19.7%
(5)	Fixed Expense Ratio	5.0%
(6)	Total Loss Adjustment Expense Ratio (LAE / Loss)	18.7%

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.

I 000018

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

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:

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

I 000019

Section I – Rate Recommendation
Subsection E – Reflecting the Impact of Large Deductibles
7/1/2020

Section I-E
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

I 000020

Section I – Rate Recommendation
Subsection E – Reflecting the Impact of Large Deductibles
7/1/2020

Section I-E
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 000021

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**.

I 000022

Section I - Rate Recommendation
 Subsection E - Reflecting the Impact of Large Deductibles
 7/1/2020

Section I - E
 Exhibit 1
 Page 1

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	78.6%		
(2) Fixed Expense Ratio	5.0%		
(3) Permissible Loss and LAE Ratio = [(1) - (2)]	73.5%		
(4) Loss Ratio Differential, r	1.193		
(5) Market Weight - w_x		23%	77%
(6) Implied Permissible Loss and LAE Ratio		0.840	0.704
(7) Implied Permissible Loss, LAE, and Fixed Expense Ratio		0.891	0.755
(8) Implied Permissible Loss, LAE, and Fixed Expense Ratio Differential	1.180		
(9) Variable Expense Ratio	19.7%	9.6%	22.7%
(10) Underwriting Profit Provision	1.75%		
(11) Implied Rate Factor Equivalent		1.004	0.998
(12) Implied Rate Differential, d	1.006		
(13) Residual Market Rate equivalent, Q_{rm}	1.005		
(14) Proportion of Total Voluntary Assessable Premium Not from Large Deductibles, u	0.751		
(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} x d)]

(14): Exhibit 2.

(15) = [1.0 - w_{rm} x Q_{rm} x (1.0 - u)] / [1.0 - w_{rm} x (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)
2011	953	581	61.0%	134	101	75.8%	819	480	58.6%	1.294
2012	968	583	60.2%	176	130	73.7%	792	453	57.2%	1.287
2013	1,020	576	56.4%	209	124	59.2%	811	452	55.7%	1.064
2014	1,078	664	61.5%	242	162	66.9%	836	502	60.0%	1.114
2015	1,151	630	54.7%	262	155	59.2%	889	474	53.4%	1.110
2016	1,201	571	47.5%	267	154	57.5%	934	417	44.7%	1.286
2017	1,250	467	37.4%	273	113	41.5%	978	354	36.2%	1.146
(12) Average Last 2 Years				270	133	49.4%	956	386	40.4%	1.225
(13) Average All Years				223	134	60.1%	866	448	51.7%	1.162
(14) Selected Loss Ratio Differential										1.193

Notes:
 Data as of 12/31/2018 from Aggregate Financial Database, excluding large deductible policies.

1000023

Residual Market Weight "w_m"
 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 _m " = (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)
2017	1153	39	36	277	288	861	0.236	0.749
2018	1170	50	46	266	287	879	0.222	0.754
Selected	1161	45	41	272	288	870	0.229	0.751

Note:

Refers to the prospective effective period from 7/1/2020 through 7/1/2021.

(2),(3),(4),(5),(6): Massachusetts Workers' Compensation Assigned Risk Pool Special Bulletin No. SB-09-18 for Calendar Year 2017 and Special Bulletin No. SB-11-19 for Calendar Year 2018.

(2),(3),(4),(5),(6),(7): Selected based on two-year average of Calendar Year 2017 and 2018.

LOSS DEVELOPMENT

As explained in the 2003 Rate 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.” 2003 Rate Decision, page 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 2016 and 2017 are developed to their estimated ultimate levels for the industry. 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 2016 policy year and 2017 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 future anticipated losses. 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 available.

II 000003

Due to the stability in the Massachusetts benefit delivery system and claim adjudication process², the WCRIBMA continues to select age-to-age development factors for the paid losses as the unweighted averages of the latest two indicated age-to-age link ratios. However, due to greater volatility in the paid plus case development, selected age-to-age development factors are the unweighted averages of the latest five years. One of the reasons for additional volatility in paid plus case results from the presence or absence of large losses in a given year.³ In order to better represent the occurrence of these events, a five year average is selected.

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. In this filing, we are developing losses for the entire industry⁴. 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. In addition, this

² Workers' Compensation Research Institute CompScope™ (Benchmarks for Massachusetts, 16th Edition and Medical Benchmarks for Massachusetts, 20th Edition)

³ Large losses are being defined as lost-time claims where indemnity plus medical losses are greater than or equal to ten million dollars.

⁴ As was mentioned in the 2018 Rate Filing, "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".

II 000004

filing excludes Aggregate Financial Losses associated with the catastrophic events of September 11, 2001⁵ and loss data from a single claim with a calendar year change in excess of ten million dollars due to a subrogation recovery.⁶

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. An industry based "tail factor" accounts for development beyond 252 months to ultimate (the point at which there is no further payment activity).

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

⁵ Consistent with past practice since the 2003 filing.

⁶ Consistent with unit statistical data reporting requirements, carriers are required to submit corrections for first through fifth reports.

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, this 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.

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. Each of the five years, in this filing, have a common report level of 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 prior to 1998 had the same level of ultimate losses as policy year 1998 – this assumption is not true. Stated mathematically, if the ratios used to calculate the tail factor reflect

II 000007

losses in the numerator that relate to a different level of ultimate losses than do the losses used in the denominator,⁷ 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 Page 3 and Exhibit 2, Page 2 and Page 3). In this filing, we make two changes: 1) developing indemnity and medical growth factors separately; and 2) calculating the growth factor for each individual policy year that contributes to the tail. These changes are consistent with the rationale for developing losses separately for indemnity and medical and will better capture any shifts in data between benefit types and policy years, creating a more accurate estimate of development in the tail. The growth factors continue to be derived for both paid (Section II-C, Exhibit 1, Pages 2 and 3) and paid plus case (Section II-C, Exhibit 2, Pages 2 and 3). Conceptually, the growth factor decomposes the calendar year development for policy years prior to 1998, 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 months.⁸

⁷ See Formula in Section II-C: [(Inception-to-date losses for PYs Prior to Policy Year 1998 at 12/31/[Y] - Inception-to-date losses for PYs Prior to Policy Year 1998 at 12/31/[Y] - 1 year)] / (Losses for policy year 1998 at 12/31/[Y]).

⁸ 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 1998 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 1998 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.

The same simulation model has been used 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, in Section II-D, estimate the differentials between the escalated and non-escalated development factors for both the paid and paid-plus-case loss development

II 000009

Section II - Loss Development
Subsection A - Summary
7/1/2020

Section II - A
Page 9

methods, 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. We compute accident year medical paid loss development factors from the averages of the two latest link ratios. Losses developed to 252 months are 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.

II 000011

Section II - Loss Development
 Subsection A - Loss Development Summary
 7/1/2020

Section II - A
 Exhibit 1

Summary of Estimated Ultimate Losses Industry

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/18 (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)
2016	Indemnity	255,298,897	1.749	446,576,391	1.034	1.038	479,134,513
2016	Medical	162,736,370	1.292	210,232,031	1.074	1.000	225,856,310
2016	Total	418,035,267		656,808,422			704,990,823

2017	Indemnity	141,456,490	3.288	465,121,418	1.034	1.038	499,031,585
2017	Medical	132,614,660	1.652	219,035,411	1.074	1.000	235,313,949
2017	Total	274,071,150		684,156,829			734,345,534

Paid Plus Case Loss Development Method

Policy Year (9)	Benefit Type (10)	Paid Plus Case Losses at 12/31/18 (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)
2016	Indemnity	350,952,166	1.254	440,233,011	1.014	1.008	450,026,408
2016	Medical	219,904,647	1.026	225,717,324	1.017	1.000	229,455,014
2016	Total	570,856,813		665,950,335			679,481,422

2017	Indemnity	254,587,379	1.773	451,323,777	1.014	1.008	461,363,899
2017	Medical	212,723,290	1.086	231,037,658	1.017	1.000	234,863,448
2017	Total	467,310,669		682,361,435			696,227,347

Notes:

- (3), (11): Aggregate Financial Data.
- (4), (12): Section II - B, Exhibit 1.
- (5) = (3) x (4)
- (6): Section II - C, Exhibit 1, Page 1.
- (7): Section II - D, Exhibit 1, Page 1.
- (8) = (5) x (6) x (7)
- (13) = (11) x (12)
- (14): Section II - C, Exhibit 2, Page 1.
- (15): Section II - D, Exhibit 2, Page 1.
- (16) = (13) x (14) x (15)

Policy Year Aggregate Financial Data
 Summary of Loss Development Factors
 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	1.880	1.343	1.139	1.056	1.026	1.014	1.006	1.006	1.006	1.004	1.004	1.003	1.001	1.002	1.001	1.001	1.002	1.002	1.002
Cumulative Factor to 252	3.288	1.749	1.302	1.144	1.083	1.056	1.041	1.035	1.029	1.022	1.018	1.014	1.011	1.010	1.008	1.007	1.006	1.004	1.002
(2) Medical Paid Losses																			
2 Year Average	1.279	1.090	1.033	1.015	1.011	1.013	1.010	1.006	1.006	1.010	1.011	1.007	1.005	1.008	1.007	1.009	1.008	1.007	1.005
Cumulative Factor to 252	1.652	1.292	1.185	1.147	1.130	1.118	1.104	1.092	1.086	1.080	1.069	1.057	1.050	1.045	1.037	1.029	1.020	1.012	1.005
(3) Indemnity Paid Plus Case Losses																			
5 Year Average	1.413	1.134	1.061	1.019	1.004	1.002	1.000	1.004	1.002	1.001	1.003	1.002	1.000	1.001	1.001	1.001	1.002	1.000	1.001
Cumulative Factor to 252	1.773	1.254	1.106	1.043	1.024	1.020	1.018	1.018	1.014	1.012	1.011	1.008	1.006	1.006	1.005	1.004	1.003	1.001	1.001
(4) Medical Paid Plus Case Losses																			
5 Year Average	1.058	1.025	1.005	0.997	0.993	0.996	1.002	0.996	1.000	0.999	1.002	1.002	1.005	0.997	1.005	1.003	1.003	0.997	1.000
Cumulative Factor to 252	1.086	1.026	1.002	0.997	0.999	1.007	1.011	1.009	1.013	1.012	1.013	1.012	1.010	1.005	1.008	1.003	1.000	0.997	1.000

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

II 000012

II 000013

Section II - Loss Development
 Subsection B - Policy Year Data
 7/1/2020

Section II - B
 Exhibit 2
 Page 1

Policy Year Aggregate Financial Data
 Calculation of Indemnity Paid Loss Development Factors
 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	
2012	108,696	209,757	1.930	2002	292,465	293,140	1.002
2013	119,627	224,862	1.880	2003	309,737	311,807	1.007
2014	130,054	246,507	1.895	2004	341,493	344,249	1.008
2015	135,004	251,394	1.862	2005	334,884	336,242	1.004
2016	134,208	254,641	1.897	2006	328,008	329,275	1.004
2 Yr Average			1.880	2 Yr Average			1.004
5 Yr Average			1.893	5 Yr Average			1.005
Selected Average			1.880	Selected Average			1.004
	36	48			156	168	
2011	209,327	286,765	1.370	2001	275,972	276,864	1.003
2012	209,757	281,436	1.342	2002	293,140	294,567	1.005
2013	224,862	294,980	1.312	2003	311,807	312,718	1.003
2014	246,507	334,241	1.356	2004	344,249	345,382	1.003
2015	251,394	334,561	1.331	2005	336,242	336,875	1.002
2 Yr Average			1.343	2 Yr Average			1.003
5 Yr Average			1.342	5 Yr Average			1.003
Selected Average			1.343	Selected Average			1.003
	48	60			168	180	
2010	262,060	303,410	1.158	2000	274,515	274,722	1.001
2011	286,765	326,982	1.140	2001	276,864	277,382	1.002
2012	281,436	324,567	1.153	2002	294,567	295,498	1.003
2013	294,980	335,853	1.139	2003	312,718	313,064	1.001
2014	334,241	380,578	1.139	2004	345,382	345,872	1.001
2 Yr Average			1.139	2 Yr Average			1.001
5 Yr Average			1.146	5 Yr Average			1.002
Selected Average			1.139	Selected Average			1.001
	60	72			180	192	
2009	278,743	299,198	1.073	1999	244,433	244,733	1.001
2010	303,410	323,319	1.066	2000	274,722	275,545	1.003
2011	326,982	344,162	1.053	2001	277,382	279,172	1.006
2012	324,567	346,094	1.066	2002	295,498	295,799	1.001
2013	335,853	351,257	1.046	2003	313,064	313,872	1.003
2 Yr Average			1.056	2 Yr Average			1.002
5 Yr Average			1.061	5 Yr Average			1.003
Selected Average			1.056	Selected Average			1.002
	72	84			192	204	
2008	308,164	317,912	1.032	1998	229,679	230,434	1.003
2009	299,198	305,836	1.022	1999	244,733	245,336	1.002
2010	323,319	331,972	1.027	2000	275,545	275,813	1.001
2011	344,162	352,144	1.023	2001	279,172	279,373	1.001
2012	346,094	355,972	1.029	2002	295,799	296,189	1.001
2 Yr Average			1.026	2 Yr Average			1.001
5 Yr Average			1.026	5 Yr Average			1.002
Selected Average			1.026	Selected Average			1.001
	84	96			204	216	
2007	321,955	329,628	1.024	1997	215,044	215,982	1.004
2008	317,912	322,198	1.013	1998	230,434	231,645	1.005
2009	305,836	310,433	1.015	1999	245,336	246,321	1.004
2010	331,972	335,829	1.012	2000	275,813	276,036	1.001
2011	352,144	357,569	1.015	2001	279,373	279,978	1.002
2 Yr Average			1.014	2 Yr Average			1.001
5 Yr Average			1.016	5 Yr Average			1.003
Selected Average			1.014	Selected Average			1.001
	96	108			216	228	
2006	319,182	322,781	1.011	1996	203,003	204,060	1.005
2007	329,628	334,077	1.013	1997	215,982	216,591	1.003
2008	322,198	324,078	1.006	1998	231,645	232,067	1.002
2009	310,433	313,061	1.008	1999	246,321	246,476	1.001
2010	335,829	337,344	1.005	2000	276,036	276,991	1.003
2 Yr Average			1.006	2 Yr Average			1.002
5 Yr Average			1.009	5 Yr Average			1.003
Selected Average			1.006	Selected Average			1.002
	108	120			228	240	
2005	330,849	332,025	1.004	1995	222,381	222,686	1.001
2006	322,781	324,196	1.004	1996	204,060	204,368	1.002
2007	334,077	336,399	1.007	1997	216,591	217,492	1.004
2008	324,078	325,989	1.006	1998	232,067	232,784	1.003
2009	313,061	314,927	1.006	1999	246,476	246,793	1.001
2 Yr Average			1.006	2 Yr Average			1.002
5 Yr Average			1.005	5 Yr Average			1.002
Selected Average			1.006	Selected Average			1.002
	120	132			240	252	
2004	336,837	338,699	1.006	1994	220,592	221,226	1.003
2005	332,025	333,488	1.004	1995	222,686	223,032	1.002
2006	324,196	327,064	1.009	1996	204,368	204,636	1.001
2007	336,399	337,679	1.004	1997	217,492	217,854	1.002
2008	325,989	328,849	1.009	1998	232,784	233,116	1.001
2 Yr Average			1.006	2 Yr Average			1.002
5 Yr Average			1.006	5 Yr Average			1.002
Selected Average			1.006	Selected Average			1.002
	132	144					
2003	308,155	309,737	1.005				
2004	338,699	341,493	1.008				
2005	333,488	334,884	1.004				
2006	327,064	328,008	1.003				
2007	337,679	339,509	1.005				
2 Yr Average			1.004				
5 Yr Average			1.005				
Selected Average			1.004				

Notes:
 Losses from Aggregate Financial Data.

II 000014

Section II - Loss Development
 Subsection B - Policy Year Data
 7/1/2020

Section II - B
 Exhibit 2
 Page 2

Policy Year Aggregate Financial Data Calculation of Medical Paid Loss Development Factors 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		
	<u>24</u>	<u>36</u>			<u>144</u>	<u>156</u>	
2012	114,494	147,821	1.291	2002	145,901	147,294	1.010
2013	116,338	148,178	1.282	2003	158,105	159,480	1.009
2014	127,722	166,209	1.301	2004	173,188	174,501	1.008
2015	126,440	164,026	1.297	2005	170,927	172,216	1.008
2016	128,868	162,346	1.260	2006	174,295	176,839	1.015
2 Yr Average			1.279	2 Yr Average			1.011
5 Yr Average			1.286	5 Yr Average			1.010
Selected Average			1.279	Selected Average			1.011
	<u>36</u>	<u>48</u>			<u>156</u>	<u>168</u>	
2011	146,774	160,779	1.095	2001	129,280	130,436	1.009
2012	147,821	160,938	1.089	2002	147,294	148,642	1.009
2013	149,178	161,172	1.080	2003	159,480	160,792	1.008
2014	166,209	181,517	1.092	2004	174,501	175,763	1.007
2015	164,026	178,421	1.088	2005	172,216	173,227	1.006
2 Yr Average			1.090	2 Yr Average			1.007
5 Yr Average			1.089	5 Yr Average			1.008
Selected Average			1.090	Selected Average			1.007
	<u>48</u>	<u>60</u>			<u>168</u>	<u>180</u>	
2010	153,214	159,208	1.039	2000	122,731	123,788	1.009
2011	160,779	166,974	1.039	2001	130,436	131,592	1.009
2012	160,938	166,543	1.035	2002	148,642	149,910	1.009
2013	161,172	165,728	1.028	2003	160,792	161,812	1.006
2014	181,517	188,400	1.038	2004	175,763	176,527	1.004
2 Yr Average			1.033	2 Yr Average			1.005
5 Yr Average			1.036	5 Yr Average			1.007
Selected Average			1.033	Selected Average			1.005
	<u>60</u>	<u>72</u>			<u>180</u>	<u>192</u>	
2009	152,754	155,531	1.018	1999	115,056	116,460	1.012
2010	159,208	162,002	1.018	2000	123,788	124,718	1.008
2011	166,974	171,106	1.025	2001	131,592	132,567	1.007
2012	166,543	168,744	1.013	2002	149,910	151,209	1.009
2013	165,728	168,572	1.017	2003	161,812	162,928	1.007
2 Yr Average			1.015	2 Yr Average			1.008
5 Yr Average			1.018	5 Yr Average			1.009
Selected Average			1.015	Selected Average			1.008
	<u>72</u>	<u>84</u>			<u>192</u>	<u>204</u>	
2008	155,233	156,346	1.007	1998	111,444	112,452	1.009
2009	155,531	157,509	1.013	1999	116,460	117,995	1.013
2010	162,002	165,590	1.022	2000	124,718	126,075	1.011
2011	171,106	173,174	1.012	2001	132,567	133,624	1.008
2012	168,744	170,350	1.010	2002	151,209	152,249	1.007
2 Yr Average			1.011	2 Yr Average			1.007
5 Yr Average			1.013	5 Yr Average			1.010
Selected Average			1.011	Selected Average			1.007
	<u>84</u>	<u>96</u>			<u>204</u>	<u>216</u>	
2007	167,526	169,090	1.009	1997	100,207	100,898	1.007
2008	156,346	157,527	1.008	1998	112,452	113,237	1.007
2009	157,509	157,759	1.002	1999	117,995	119,063	1.009
2010	165,590	167,771	1.013	2000	126,075	127,427	1.011
2011	173,174	175,393	1.013	2001	133,624	134,523	1.007
2 Yr Average			1.013	2 Yr Average			1.009
5 Yr Average			1.009	5 Yr Average			1.008
Selected Average			1.013	Selected Average			1.009
	<u>96</u>	<u>108</u>			<u>216</u>	<u>228</u>	
2006	165,428	167,501	1.013	1996	98,023	98,848	1.008
2007	169,090	170,536	1.009	1997	100,898	101,290	1.004
2008	157,527	158,607	1.007	1998	113,237	114,424	1.010
2009	157,759	159,034	1.008	1999	119,063	120,069	1.008
2010	167,771	169,863	1.012	2000	127,427	128,400	1.008
2 Yr Average			1.010	2 Yr Average			1.008
5 Yr Average			1.010	5 Yr Average			1.008
Selected Average			1.010	Selected Average			1.008
	<u>108</u>	<u>120</u>			<u>228</u>	<u>240</u>	
2005	166,523	167,887	1.008	1995	99,838	100,483	1.006
2006	167,501	169,573	1.012	1996	98,848	99,789	1.010
2007	170,536	171,746	1.007	1997	101,290	101,635	1.003
2008	158,607	159,326	1.005	1998	114,424	115,237	1.007
2009	159,034	160,109	1.007	1999	120,069	120,949	1.007
2 Yr Average			1.006	2 Yr Average			1.007
5 Yr Average			1.008	5 Yr Average			1.007
Selected Average			1.006	Selected Average			1.007
	<u>120</u>	<u>132</u>			<u>240</u>	<u>252</u>	
2004	170,567	172,035	1.009	1994	110,250	110,946	1.006
2005	167,887	169,477	1.009	1995	100,483	101,518	1.010
2006	169,573	171,889	1.014	1996	99,789	100,351	1.006
2007	171,746	172,968	1.007	1997	101,635	102,127	1.005
2008	159,326	160,187	1.005	1998	115,237	115,789	1.005
2 Yr Average			1.006	2 Yr Average			1.005
5 Yr Average			1.009	5 Yr Average			1.006
Selected Average			1.006	Selected Average			1.005
	<u>132</u>	<u>144</u>					
2003	156,506	158,105	1.010				
2004	172,035	173,188	1.007				
2005	169,477	170,927	1.009				
2006	171,889	174,295	1.014				
2007	172,968	173,981	1.006				
2 Yr Average			1.010				
5 Yr Average			1.009				
Selected Average			1.010				

Notes:
 Losses from Aggregate Financial Data.

II 000015

Section II - Loss Development
 Subsection B - Policy Year Data
 7/1/2020

Section II - B
 Exhibit 3
 Page 1

Policy Year Aggregate Financial Data
 Calculation of Indemnity Paid Plus Case Loss Development Factors
 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	
2012	206,853	296,005	1.431	2002	300,307	299,834	0.998
2013	229,996	312,626	1.359	2003	315,803	317,405	1.005
2014	244,560	352,859	1.442	2004	349,833	351,928	1.006
2015	250,045	350,171	1.400	2005	340,793	342,171	1.004
2016	244,171	350,021	1.434	2006	333,617	333,814	1.001
2 Yr Average			1.417	2 Yr Average			1.002
5 Yr Average			1.413	5 Yr Average			1.003
Selected Average			1.413	Selected Average			1.003
	36	48			156	168	
2011	293,617	340,663	1.160	2001	281,489	282,058	1.002
2012	296,005	336,705	1.137	2002	299,834	301,238	1.005
2013	312,626	346,083	1.107	2003	317,405	317,556	1.000
2014	352,659	397,783	1.128	2004	351,928	352,410	1.001
2015	350,171	398,126	1.137	2005	342,171	342,791	1.002
2 Yr Average			1.132	2 Yr Average			1.002
5 Yr Average			1.134	5 Yr Average			1.002
Selected Average			1.134	Selected Average			1.002
	48	60			168	180	
2010	317,959	336,637	1.059	2000	280,312	279,280	0.996
2011	340,663	363,049	1.066	2001	282,058	282,198	1.000
2012	336,705	358,235	1.064	2002	301,238	300,964	0.999
2013	346,083	366,011	1.058	2003	317,556	317,624	1.000
2014	397,783	420,571	1.057	2004	352,410	352,919	1.001
2 Yr Average			1.057	2 Yr Average			1.001
5 Yr Average			1.061	5 Yr Average			1.000
Selected Average			1.061	Selected Average			1.000
	60	72			180	192	
2009	318,596	323,290	1.015	1999	248,923	249,207	1.001
2010	336,637	344,326	1.023	2000	279,280	279,474	1.001
2011	363,049	366,678	1.010	2001	282,198	281,807	0.999
2012	358,235	367,202	1.025	2002	300,964	301,276	1.001
2013	366,011	373,753	1.021	2003	317,624	318,585	1.003
2 Yr Average			1.023	2 Yr Average			1.002
5 Yr Average			1.019	5 Yr Average			1.001
Selected Average			1.019	Selected Average			1.001
	72	84			192	204	
2008	332,557	334,314	1.005	1998	235,698	235,789	1.000
2009	323,290	323,530	1.001	1999	249,207	249,949	1.003
2010	344,326	342,951	0.996	2000	279,474	279,599	1.000
2011	366,678	368,558	1.005	2001	281,807	282,069	1.001
2012	367,202	371,812	1.013	2002	301,276	301,695	1.001
2 Yr Average			1.009	2 Yr Average			1.001
5 Yr Average			1.004	5 Yr Average			1.001
Selected Average			1.004	Selected Average			1.001
	84	96			204	216	
2007	340,289	343,425	1.009	1997	219,588	220,460	1.004
2008	334,314	333,016	0.996	1998	235,789	235,898	1.000
2009	323,530	323,554	1.000	1999	249,949	249,407	0.998
2010	342,951	343,788	1.002	2000	279,599	279,743	1.001
2011	368,558	369,558	1.003	2001	282,069	282,226	1.001
2 Yr Average			1.003	2 Yr Average			1.001
5 Yr Average			1.002	5 Yr Average			1.001
Selected Average			1.002	Selected Average			1.001
	96	108			216	228	
2006	328,089	331,005	1.009	1996	207,248	208,259	1.005
2007	343,425	342,873	0.998	1997	220,460	220,337	0.999
2008	333,016	331,476	0.995	1998	235,898	236,528	1.003
2009	323,554	322,237	0.996	1999	249,407	249,509	1.000
2010	343,788	344,153	1.001	2000	279,743	280,551	1.003
2 Yr Average			0.998	2 Yr Average			1.002
5 Yr Average			1.000	5 Yr Average			1.002
Selected Average			1.000	Selected Average			1.002
	108	120			228	240	
2005	339,984	340,247	1.001	1995	227,302	227,131	0.999
2006	331,005	332,214	1.004	1996	208,259	208,158	1.000
2007	342,873	343,136	1.001	1997	220,337	221,040	1.003
2008	331,476	334,199	1.008	1998	236,528	236,470	1.000
2009	322,237	323,982	1.005	1999	249,509	249,466	1.000
2 Yr Average			1.007	2 Yr Average			1.000
5 Yr Average			1.004	5 Yr Average			1.000
Selected Average			1.004	Selected Average			1.000
	120	132			240	252	
2004	348,296	348,868	1.002	1994	226,372	226,568	1.001
2005	340,247	340,034	0.999	1995	227,131	227,580	1.002
2006	332,214	333,061	1.003	1996	208,158	208,114	1.000
2007	343,136	344,084	1.003	1997	221,040	221,222	1.001
2008	334,199	335,243	1.003	1998	236,470	236,765	1.001
2 Yr Average			1.003	2 Yr Average			1.001
5 Yr Average			1.002	5 Yr Average			1.001
Selected Average			1.002	Selected Average			1.001
	132	144					
2003	315,630	315,803	1.001				
2004	348,868	349,833	1.003				
2005	340,034	340,793	1.002				
2006	333,061	333,617	1.002				
2007	344,084	343,977	1.000				
2 Yr Average			1.001				
5 Yr Average			1.001				
Selected Average			1.001				

Notes:
 Losses from Aggregate Financial Data.

II 000016

Policy Year Aggregate Financial Data
 Calculation of Medical Paid Plus Case Loss Development Factors
 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	
2012	195,998	209,560	1.069	2002	171,443	171,106	0.998
2013	193,375	199,412	1.031	2003	179,864	179,148	0.996
2014	224,140	237,529	1.060	2004	199,435	198,536	0.995
2015	209,018	226,295	1.083	2005	192,929	195,218	1.012
2016	209,378	219,391	1.048	2006	200,393	201,686	1.006
2 Yr Average			1.065	2 Yr Average			1.009
5 Yr Average			1.058	5 Yr Average			1.002
Selected Average			1.058	Selected Average			1.002
	36	48			156	168	
2011	203,011	213,860	1.053	2001	155,835	155,303	0.997
2012	209,560	216,736	1.034	2002	171,106	172,875	1.010
2013	199,412	199,004	0.998	2003	179,148	179,481	1.002
2014	237,529	241,178	1.015	2004	198,536	198,437	1.000
2015	226,295	231,168	1.022	2005	195,218	195,216	1.000
2 Yr Average			1.018	2 Yr Average			1.000
5 Yr Average			1.025	5 Yr Average			1.002
Selected Average			1.025	Selected Average			1.002
	48	60			168	180	
2010	198,386	199,788	1.007	2000	155,564	157,048	1.010
2011	213,860	214,906	1.005	2001	155,303	156,042	1.005
2012	216,736	217,665	1.004	2002	172,875	173,497	1.004
2013	199,004	200,382	1.007	2003	179,481	180,402	1.005
2014	241,178	241,678	1.002	2004	198,437	199,102	1.003
2 Yr Average			1.004	2 Yr Average			1.004
5 Yr Average			1.005	5 Yr Average			1.005
Selected Average			1.005	Selected Average			1.005
	60	72			180	192	
2009	189,421	190,837	1.007	1999	138,608	139,322	1.005
2010	199,788	201,052	1.006	2000	157,048	153,219	0.976
2011	214,906	211,313	0.983	2001	156,042	155,669	0.998
2012	217,665	215,028	0.988	2002	173,497	173,063	0.998
2013	200,382	200,877	1.002	2003	180,402	181,672	1.007
2 Yr Average			0.995	2 Yr Average			1.002
5 Yr Average			0.997	5 Yr Average			0.997
Selected Average			0.997	Selected Average			0.997
	72	84			192	204	
2008	179,469	176,872	0.986	1998	137,483	140,434	1.021
2009	190,837	189,421	0.993	1999	139,322	140,678	1.010
2010	201,052	201,167	1.001	2000	153,219	152,897	0.998
2011	211,313	212,516	1.006	2001	155,669	155,438	0.999
2012	215,028	210,549	0.979	2002	173,063	172,955	0.999
2 Yr Average			0.992	2 Yr Average			0.999
5 Yr Average			0.993	5 Yr Average			1.005
Selected Average			0.993	Selected Average			1.005
	84	96			204	216	
2007	194,810	195,459	1.003	1997	110,995	110,936	0.999
2008	176,872	174,103	0.984	1998	140,434	139,731	0.995
2009	189,421	187,055	0.988	1999	140,678	143,663	1.021
2010	201,167	203,305	1.011	2000	152,897	152,373	0.997
2011	212,516	211,533	0.995	2001	155,438	155,711	1.002
2 Yr Average			1.003	2 Yr Average			0.999
5 Yr Average			0.996	5 Yr Average			1.003
Selected Average			0.996	Selected Average			1.003
	96	108			216	228	
2006	195,798	199,149	1.017	1996	111,273	111,244	1.000
2007	195,459	193,528	0.990	1997	110,936	111,323	1.003
2008	174,103	173,560	0.997	1998	139,731	140,432	1.005
2009	187,055	187,392	1.002	1999	143,663	144,018	1.002
2010	203,305	203,809	1.002	2000	152,373	152,838	1.003
2 Yr Average			1.002	2 Yr Average			1.003
5 Yr Average			1.002	5 Yr Average			1.003
Selected Average			1.002	Selected Average			1.003
	108	120			228	240	
2005	195,104	194,255	0.996	1995	109,703	110,274	1.005
2006	199,149	200,949	1.009	1996	111,244	111,878	1.006
2007	193,528	192,467	0.995	1997	111,323	110,781	0.995
2008	173,560	173,124	0.997	1998	140,432	137,093	0.976
2009	187,392	184,434	0.984	1999	144,018	144,501	1.003
2 Yr Average			0.991	2 Yr Average			0.990
5 Yr Average			0.996	5 Yr Average			0.997
Selected Average			0.996	Selected Average			0.997
	120	132			240	252	
2004	199,483	199,410	1.000	1994	123,241	123,347	1.001
2005	194,255	193,262	0.995	1995	110,274	110,869	1.005
2006	200,949	200,692	0.999	1996	111,878	111,168	0.994
2007	192,467	193,536	1.006	1997	110,781	110,861	1.001
2008	173,124	173,611	1.003	1998	137,093	136,982	0.999
2 Yr Average			1.004	2 Yr Average			1.000
5 Yr Average			1.000	5 Yr Average			1.000
Selected Average			1.000	Selected Average			1.000
	132	144					
2003	178,051	179,864	1.010				
2004	199,410	199,435	1.000				
2005	193,262	192,929	0.998				
2006	200,692	200,393	0.999				
2007	193,536	191,380	0.989				
2 Yr Average			0.994				
5 Yr Average			0.999				
Selected Average			0.999				

Notes:
 Losses from Aggregate Financial Data.

Paid Loss Tail Factors

Indemnity Paid 252nd Month to Ultimate Loss Tail Development Factor

(1) Policy Year	(2) Losses for Policy Year 252 mo	(3) Losses for All Prior Years		(5) 252 - Ult for PY	(6) Growth Factor	(7) Indicated 252 - Ult for PY
		Previous	Current			
1993	268,665,927		8,880,158,689			
1994	221,225,984	9,148,824,616	9,167,116,861	1.083	0.490	1.041
1995	223,031,870	9,388,342,845	9,402,180,565	1.062	0.480	1.030
1996	204,636,242	9,625,212,435	9,638,721,643	1.066	0.450	1.030
1997	217,854,132	9,843,357,885	9,860,598,230	1.079	0.460	1.036
1998	233,116,085	10,078,452,362	10,092,933,458	1.062	0.530	1.033
					5yr average	1.034

Medical Paid 252nd Month to Ultimate Loss Tail Development Factor

(8) Policy Year	(9) Losses for Policy Year 252 mo	(10) Losses for All Prior Years		(12) 252 - Ult for PY	(13) Growth Factor	(14) Indicated 252 - Ult for PY
		Previous	Current			
1993	123,599,131		2,706,130,189			
1994	110,946,330	2,829,729,320	2,841,180,205	1.103	0.780	1.081
1995	101,518,268	2,952,126,535	2,962,984,911	1.107	0.700	1.075
1996	100,351,087	3,064,503,179	3,075,454,227	1.109	0.680	1.074
1997	102,127,029	3,175,805,314	3,187,040,541	1.110	0.670	1.074
1998	115,788,696	3,289,167,570	3,299,307,208	1.088	0.780	1.068
					5yr average	1.074

Notes:

(2), (3), (4): Indemnity Paid Losses from Aggregate Financial Data.

(9), (10), (11): Medical Paid Losses from Aggregate Financial Data.

(5) = 1.000 + ((4)-(3)) / (2)

(6): From Page 2

(7) = 1.000 + [(5) - 1.000] x (6)

(12) = 1.000 + ((11)-(10)) / (9)

(13): From Page 3

(14) = 1.000 + [(12) - 1.000] x (13)

II 000017

Growth Factor Adjustment
 Indemnity Paid Losses

Policy Year (1)	Paid Losses (2)	Relative Development for Report Interval (3)					Dollar Development (4)					On-Level Dollar Development (5)					
							Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994	
1969	60,409,628				0.013%					7,587					24,605		
1970	62,133,819			0.009%	0.025%				5,654	15,608				16,884	49,210		
1971	62,046,912		0.009%	0.018%	0.038%			5,727	11,292	23,379			15,960	33,767	73,814		
1972	68,104,266	0.011%	0.018%	0.027%	0.050%		7,546	12,573	18,592	34,215		18,669	31,920	50,651	98,419		
1973	79,377,586	0.010%	0.022%	0.028%	0.036%	0.063%	8,030	17,589	21,982	28,892	49,848	19,247	37,338	47,880	67,535	123,024	
1974	83,179,594	0.020%	0.033%	0.037%	0.045%	0.075%	16,829	27,647	30,713	37,845	62,682	38,494	56,006	63,840	84,418	147,629	
1975	83,787,702	0.030%	0.044%	0.046%	0.055%	0.088%	25,428	37,133	38,671	45,746	73,664	57,741	74,675	79,800	101,302	172,234	
1976	99,698,470	0.040%	0.055%	0.055%	0.064%	0.100%	40,342	55,230	55,218	63,505	100,174	76,988	93,344	95,760	118,186	196,839	
1977	115,808,647	0.051%	0.066%	0.065%	0.073%	0.113%	58,575	76,985	74,830	84,305	130,906	96,235	112,013	111,720	135,069	221,443	
1978	161,632,528	0.061%	0.078%	0.074%	0.082%	0.126%	98,103	125,355	119,360	132,371	203,005	115,482	130,681	127,680	151,953	246,048	
1979	186,642,127	0.071%	0.089%	0.083%	0.091%	0.138%	132,163	165,430	155,057	169,836	257,858	134,729	149,350	143,640	168,837	270,653	
1980	203,855,545	0.081%	0.100%	0.092%	0.100%	0.151%	164,974	203,273	188,175	204,050	307,243	153,976	168,019	159,600	185,720	295,258	
1981	240,399,527	0.091%	0.111%	0.102%	0.109%	0.163%	218,867	266,347	244,099	262,504	392,513	173,223	186,688	175,560	202,604	319,863	
1982	263,890,821	0.101%	0.122%	0.111%	0.118%	0.176%	266,949	321,611	292,311	312,168	464,013	192,470	205,356	191,520	219,488	344,468	
1983	295,901,319	0.111%	0.133%	0.120%	0.127%	0.188%	329,263	393,408	355,083	376,960	557,463	211,717	224,025	207,480	236,371	369,072	
1984	351,342,100	0.121%	0.144%	0.129%	0.136%	0.201%	426,496	506,044	454,043	479,559	706,037	230,964	242,694	223,440	253,255	393,677	
1985	428,313,707	0.132%	0.155%	0.138%	0.146%	0.214%	563,260	664,362	593,051	623,595	914,510	250,211	261,363	239,400	270,139	418,282	
1986	531,848,384	0.142%	0.166%	0.148%	0.155%	0.226%	753,216	883,881	785,501	822,730	1,202,369	269,458	280,031	255,360	287,022	442,887	
1987	668,269,072	0.152%	0.177%	0.157%	0.164%	0.239%	1,014,019	1,184,639	1,048,671	1,094,572	1,594,713	288,705	298,700	271,320	303,906	467,492	
1988	747,911,714	0.162%	0.188%	0.166%	0.173%	0.251%	1,210,526	1,408,685	1,242,688	1,293,078	1,878,702	307,952	317,369	287,280	320,790	492,097	
1989	792,578,577	0.172%	0.199%	0.175%	0.182%	0.264%	1,362,997	1,580,627	1,390,065	1,442,424	2,090,447	327,199	336,038	303,240	337,673	516,701	
1990	725,970,212	0.182%	0.211%	0.185%	0.191%	0.276%	1,321,889	1,528,224	1,340,257	1,387,263	2,005,945	346,446	354,706	319,200	354,557	541,306	
1991	493,224,395	0.192%	0.222%	0.194%	0.200%	0.289%	947,986	1,092,922	956,099	987,388	1,424,787	365,693	373,375	335,160	371,441	565,911	
1992	307,520,199	0.202%	0.233%	0.203%	0.209%	0.301%	622,167	715,497	624,504	643,609	926,963	384,940	392,044	351,120	388,324	590,516	
1993	246,449,020	0.212%	0.244%	0.212%	0.218%	0.314%	523,540	600,709	523,232	538,219	773,828	404,186	410,713	367,080	405,208	615,121	
1994	195,903,773	0.223%	0.255%	0.222%	0.227%		435,983	499,212	434,003	445,660		423,433	429,381	383,040	422,092		
1995	185,543,686	0.233%	0.266%	0.231%			431,696	493,369	428,179			442,680	448,050	399,000			
1996	172,899,617	0.243%	0.277%				419,768	478,904				461,927	466,719				
1997	168,500,322	0.253%					426,132					481,174					
1998	190,264,959																
							11,819,198	13,334,627	11,414,092	11,511,815	16,198,458	6,255,267	6,067,345	5,187,003	5,487,192	7,996,569	
(6) Indicated Growth Factor:												0.529	0.455	0.454	0.477	0.494	
(7) Selected Growth Factor:												0.530	0.460	0.450	0.480	0.490	

II 000018

- Notes:
 (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) for PY199X] respectively for each 'Prior to 199X' column
 (6) = [Sum of (5)] / [Sum of (4)]

Growth Factor Adjustment
 Medical Paid Losses

Policy Year (1)	Paid Losses (2)	Relative Development for Report Interval (3)					Dollar Development (4)					On-Level Dollar Development (5)						
		Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994		
1969	17,085,972				0.025%					4,256						23,118		
1970	17,572,415				0.023%	0.050%			4,068	8,754					19,342	46,236		
1971	19,495,393			0.023%	0.046%	0.075%			8,885	9,026	14,568				38,685	69,354		
1972	19,436,970		0.023%	0.046%	0.069%	0.100%			13,499	19,366					58,027	92,472		
1973	25,859,938	0.021%	0.046%	0.069%	0.093%	0.125%		5,419	11,793	17,732	23,946	32,207		18,929	36,056	55,212	77,369	115,590
1974	26,972,013	0.042%	0.068%	0.091%	0.116%	0.149%		11,304	18,450	24,659	31,220	40,311	37,858	54,084	73,617	96,712	138,708	
1975	29,079,251	0.063%	0.091%	0.114%	0.139%	0.174%		18,281	26,523	33,232	40,391	50,704	56,787	72,113	92,021	116,054	161,826	
1976	32,801,449	0.084%	0.114%	0.137%	0.162%	0.199%		27,495	37,397	44,982	53,154	65,364	75,716	90,141	110,425	135,396	184,944	
1977	36,708,898	0.105%	0.137%	0.160%	0.185%	0.224%		38,462	50,222	58,731	67,984	82,295	94,646	108,169	128,829	154,739	208,062	
1978	47,754,000	0.126%	0.160%	0.183%	0.208%	0.249%		60,042	76,222	87,317	99,494	118,951	113,575	126,197	147,233	174,081	231,180	
1979	54,206,504	0.147%	0.182%	0.206%	0.231%	0.274%		79,514	98,881	111,505	125,486	148,526	132,504	144,225	165,637	193,423	254,298	
1980	59,933,727	0.168%	0.205%	0.229%	0.255%	0.299%		100,475	122,995	136,984	152,619	179,147	151,433	162,253	184,042	212,766	277,416	
1981	71,126,568	0.189%	0.228%	0.251%	0.278%	0.324%		134,143	162,182	178,823	197,587	230,320	170,362	180,281	202,446	232,108	300,534	
1982	71,889,760	0.210%	0.251%	0.274%	0.301%	0.349%		150,648	180,315	197,173	216,349	250,699	189,291	198,309	220,850	251,450	323,652	
1983	80,732,951	0.231%	0.274%	0.297%	0.324%	0.374%		186,097	220,904	239,879	261,652	301,647	208,220	216,338	239,254	270,793	346,770	
1984	95,410,351	0.251%	0.296%	0.320%	0.347%	0.399%		239,923	282,820	305,297	331,308	380,253	227,149	234,366	257,658	290,135	369,888	
1985	122,388,062	0.272%	0.319%	0.343%	0.370%	0.423%		333,409	390,696	419,594	453,320	518,257	246,078	252,394	276,062	309,477	393,007	
1986	141,560,319	0.293%	0.342%	0.366%	0.394%	0.448%		415,303	484,178	517,678	557,103	634,704	265,007	270,422	294,466	328,820	416,125	
1987	171,653,953	0.314%	0.365%	0.389%	0.417%	0.473%		539,561	626,247	666,962	715,273	812,390	283,937	288,450	312,871	348,162	439,243	
1988	193,277,335	0.335%	0.388%	0.411%	0.440%	0.498%		648,031	749,207	795,155	850,119	962,871	302,866	306,478	331,275	367,504	462,361	
1989	215,620,217	0.356%	0.410%	0.434%	0.463%	0.523%		768,128	884,981	936,357	998,309	1,127,887	321,795	324,506	349,679	386,847	485,479	
1990	202,325,921	0.377%	0.433%	0.457%	0.486%	0.548%		763,166	876,551	924,869	983,595	1,108,744	340,724	342,534	368,083	406,189	508,597	
1991	173,622,086	0.398%	0.456%	0.480%	0.509%	0.573%		691,280	791,784	833,341	884,246	994,695	359,653	360,563	386,487	425,531	531,715	
1992	136,368,709	0.419%	0.479%	0.503%	0.532%	0.598%		571,531	652,989	685,703	726,086	815,235	378,582	378,591	404,891	444,874	554,833	
1993	108,690,977	0.440%	0.502%	0.526%	0.556%	0.623%		478,308	545,241	571,373	603,879	676,847	397,511	396,619	423,295	464,216	577,951	
1994	92,809,804	0.461%	0.524%	0.549%	0.579%			427,870	486,736	509,101	537,130		416,440	414,647	441,700	483,558		
1995	83,553,270	0.482%	0.547%	0.571%				402,704	457,243	477,421			435,369	432,675	460,104			
1996	80,522,506	0.503%	0.570%					404,971	459,018				454,299	450,703				
1997	79,063,966	0.524%						414,203					473,228					
1998	90,330,612																	
								7,910,269	8,698,007	8,787,208	8,936,843	9,578,995	6,151,960	5,859,141	5,981,349	6,286,258	7,513,360	
(6) Indicated Growth Factor:													0.778	0.674	0.681	0.703	0.784	
(7) Selected Growth Factor:													0.780	0.670	0.680	0.700	0.780	

II 000019

- Notes:
 (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) for PY199X] respectively for each 'Prior to 199X' column
 (6) = [Sum of (5)] / [Sum of (4)]

Paid Plus Case Loss Tail Factors

Indemnity Paid Plus Case 252nd Month to Ultimate Loss Tail Development Factor

(1) Policy Year	(2) Losses for Policy Year 252 mo	(3) Losses for All Prior Years		(5) 252 - Ult for PY	(6) Growth Factor	(7) Indicated 252 - Ult for PY
		Previous	Current			
1993	273,150,830		8,995,185,204			
1994	226,568,491	9,268,336,034	9,276,061,837	1.034	0.450	1.015
1995	227,580,266	9,502,630,328	9,510,686,884	1.035	0.430	1.015
1996	208,113,561	9,738,267,150	9,745,942,759	1.037	0.410	1.015
1997	221,222,248	9,954,056,320	9,960,113,766	1.027	0.420	1.012
1998	236,765,020	10,181,336,014	10,187,878,703	1.028	0.500	1.014
					5yr average	1.014

Medical Paid Plus Case 252nd Month to Ultimate Loss Tail Development Factor

(8) Policy Year	(9) Losses for Policy Year 252 mo	(10) Losses for All Prior Years		(12) 252 - Ult for PY	(13) Growth Factor	(14) Indicated 252 - Ult for PY
		Previous	Current			
1993	135,457,291		2,854,356,774			
1994	123,347,374	2,989,814,065	2,991,536,326	1.014	0.800	1.011
1995	110,868,845	3,114,883,700	3,125,894,585	1.099	0.670	1.067
1996	111,167,724	3,236,763,430	3,239,647,943	1.026	0.670	1.017
1997	110,861,446	3,350,815,667	3,346,132,902	0.958	0.660	0.972
1998	136,981,651	3,456,994,348	3,459,447,179	1.018	0.870	1.016
					5yr average	1.017

Notes:

(2), (3), (4): Indemnity Paid Plus Case Losses from Aggregate Financial Data.

(9), (10), (11): Medical Paid Plus Case Losses from Aggregate Financial Data.

(5) = $1.000 + ((4)-(3)) / (2)$

(6): From Page 2

(7) = $1.000 + [(5) - 1.000] \times (6)$

(12) = $1.000 + ((11)-(10)) / (9)$

(13): From Page 3

(14) = $1.000 + [(12) - 1.000] \times (13)$

II 000020

Growth Factor Adjustment
 Indemnity Paid Plus Case Losses

Policy Year (1)	Incurred Losses (2)	Relative Development for Report Interval (3)					Dollar Development (4)					On-Level Dollar Development (5)				
		Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994
1974	91,152,699										6,665					15,560
1975	92,432,703			0.007%	0.015%				6,751	13,516					14,462	31,121
1976	109,159,257			0.007%	0.015%	0.022%			7,894	15,946	23,943			13,082	28,924	46,681
1977	126,826,511		0.005%	0.014%	0.022%	0.029%			18,344	27,791	37,092		9,644	26,164	43,386	62,241
1978	175,746,046	0.007%	0.011%	0.022%	0.029%	0.037%	11,478	19,245	38,130	51,347	64,248	12,930	19,288	39,246	57,848	77,802
1979	202,774,794	0.013%	0.016%	0.029%	0.037%	0.044%	26,486	33,306	58,658	74,055	88,955	25,859	28,933	52,328	72,310	93,362
1980	224,715,277	0.020%	0.022%	0.036%	0.044%	0.051%	44,028	49,214	81,257	98,482	115,010	38,789	38,577	65,410	86,773	108,922
1981	265,459,458	0.026%	0.027%	0.043%	0.051%	0.058%	69,348	72,671	115,188	135,728	155,272	51,719	48,221	78,492	101,235	124,483
1982	287,951,219	0.033%	0.033%	0.051%	0.058%	0.066%	94,029	94,594	145,772	168,260	189,481	64,649	57,865	91,574	115,697	140,043
1983	325,573,350	0.039%	0.038%	0.058%	0.066%	0.073%	127,578	124,778	188,363	214,024	238,042	77,578	67,509	104,656	130,159	155,604
1984	382,533,293	0.046%	0.044%	0.065%	0.073%	0.080%	174,881	167,553	248,982	279,409	307,657	90,508	77,154	117,738	144,621	171,164
1985	457,098,269	0.052%	0.049%	0.072%	0.080%	0.088%	238,822	225,239	330,572	367,260	401,047	103,438	86,798	130,820	159,083	186,724
1986	570,469,669	0.059%	0.055%	0.080%	0.088%	0.095%	335,312	312,338	453,818	500,018	542,226	116,367	96,442	143,902	173,545	202,285
1987	721,226,773	0.065%	0.060%	0.087%	0.095%	0.102%	471,027	434,366	625,906	684,836	738,252	129,297	106,086	156,984	188,007	217,845
1988	793,660,812	0.072%	0.066%	0.094%	0.102%	0.110%	570,167	521,444	746,165	811,586	870,424	142,227	115,730	170,067	202,469	233,405
1989	842,600,605	0.078%	0.071%	0.101%	0.110%	0.117%	660,355	599,731	853,112	923,176	985,704	155,156	125,374	183,149	216,931	248,966
1990	772,487,363	0.085%	0.077%	0.108%	0.117%	0.124%	655,857	592,122	837,990	902,782	960,163	168,086	135,019	196,231	231,393	264,526
1991	520,328,229	0.091%	0.082%	0.116%	0.124%	0.132%	475,751	427,327	602,079	646,097	684,785	181,016	144,663	209,313	245,856	280,086
1992	324,527,186	0.098%	0.088%	0.123%	0.131%	0.139%	317,919	284,291	398,985	426,673	450,826	193,946	154,307	222,395	260,318	295,647
1993	262,411,634	0.104%	0.093%	0.130%	0.139%	0.146%	274,206	244,244	341,595	364,173	383,723	206,875	163,951	235,477	274,780	311,207
1994	212,821,168	0.111%	0.099%	0.137%	0.146%		236,286	209,739	292,432	310,897		219,805	173,595	248,559	289,242	
1995	197,997,378	0.118%	0.104%	0.145%			232,759	205,970	286,382			232,735	183,240	261,641		
1996	180,891,890	0.124%	0.110%				224,464	198,080				245,664	192,884			
1997	176,146,531	0.131%					230,080					258,594				
1998	197,976,890															
							5,470,830	4,823,195	6,671,624	7,009,294	7,257,030	2,715,238	2,025,280	2,747,228	3,037,039	3,267,674
(6) Indicated Growth Factor:												0.496	0.420	0.412	0.433	0.450
(7) Selected Growth Factor:												0.500	0.420	0.410	0.430	0.450

II 000021

- Notes:
 (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) for PY199X] respectively for each 'Prior to 199X' column
 (6) = [Sum of (5)] / [Sum of (4)]

Growth Factor Adjustment
 Medical Paid Plus Case Losses

Policy Year (1)	Incurred Losses (2)	Relative Development for Report Interval (3)				Dollar Development (4)					On-Level Dollar Development (5)						
						Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1994		
1974	28,715,431				0.005%					1,519					5,998		
1975	31,232,077				0.032%				9,903	3,304				30,328	11,996		
1976	34,805,380		0.008%	0.063%	0.016%			2,868	22,071	5,524				60,657	17,994		
1977	39,110,493		-0.013%	0.016%	0.095%			(5,209)	6,445	37,202			7,733	90,985	23,992		
1978	50,475,088	0.007%	-0.027%	0.025%	0.127%	0.026%		3,738	(13,445)	12,477	64,015	13,351	8,713	(24,402)	23,200	121,313	29,990
1979	58,236,716	0.015%	-0.040%	0.033%	0.159%	0.032%		8,626	(23,269)	19,193	92,324	18,485	17,426	(36,603)	30,934	151,641	35,987
1980	63,511,982	0.022%	-0.053%	0.041%	0.190%	0.037%		14,111	(33,835)	26,165	120,824	23,519	26,139	(48,804)	38,667	181,970	41,985
1981	78,210,917	0.030%	-0.067%	0.049%	0.222%	0.042%		23,168	(52,082)	38,665	173,585	33,099	34,852	(61,005)	46,401	212,298	47,983
1982	75,645,668	0.037%	-0.080%	0.058%	0.254%	0.048%		28,011	(60,449)	43,629	191,876	36,015	43,565	(73,206)	54,134	242,626	53,981
1983	85,968,660	0.044%	-0.093%	0.066%	0.285%	0.053%		38,200	(80,147)	56,666	245,318	45,478	52,278	(85,407)	61,868	272,955	59,979
1984	103,258,264	0.052%	-0.107%	0.074%	0.317%	0.058%		53,529	(110,018)	76,571	327,395	60,087	60,991	(97,608)	69,601	303,283	65,977
1985	136,398,028	0.059%	-0.120%	0.082%	0.349%	0.063%		80,810	(163,494)	112,384	475,716	86,586	69,704	(109,809)	77,335	333,611	71,975
1986	158,391,248	0.067%	-0.133%	0.091%	0.380%	0.069%		105,570	(210,951)	143,555	602,642	108,927	78,417	(122,010)	85,068	363,939	77,973
1987	190,892,878	0.074%	-0.147%	0.099%	0.412%	0.074%		141,370	(279,662)	188,741	786,828	141,377	87,130	(134,211)	92,802	394,268	83,971
1988	204,503,137	0.081%	-0.160%	0.107%	0.444%	0.079%		166,595	(326,837)	219,047	907,768	162,275	95,843	(146,412)	100,535	424,596	89,969
1989	226,813,731	0.089%	-0.173%	0.115%	0.476%	0.085%		201,567	(392,702)	261,633	1,078,717	191,977	104,556	(158,613)	108,269	454,924	95,966
1990	213,471,634	0.096%	-0.186%	0.124%	0.507%	0.090%		205,519	(398,032)	263,831	1,082,947	191,977	113,269	(170,814)	116,002	485,253	101,964
1991	183,528,813	0.104%	-0.200%	0.132%	0.539%	0.095%		190,283	(366,645)	241,946	989,236	174,758	121,982	(183,015)	123,736	515,581	107,962
1992	144,503,502	0.111%	-0.213%	0.140%	0.571%	0.101%		160,523	(307,928)	202,405	824,703	145,242	130,695	(195,216)	131,469	545,909	113,960
1993	124,121,327	0.118%	-0.226%	0.148%	0.602%	0.106%		147,074	(281,025)	184,083	747,734	131,322	139,408	(207,417)	139,203	576,237	119,958
1994	113,380,622	0.126%	-0.240%	0.157%	0.634%			142,743	(271,808)	177,495	718,978		148,121	(219,617)	146,936	606,566	
1995	95,653,516	0.133%	-0.253%	0.165%				127,509	(242,050)	157,625			156,834	(231,818)	154,670		
1996	93,860,099	0.141%	-0.266%					132,070	(250,012)				165,547	(244,019)			
1997	91,610,261	0.148%						135,688					174,260				
1998	117,651,799																
						2,106,705	(3,869,599)	2,435,425	9,499,782	1,583,098	1,829,728	(2,562,204)	1,624,034	6,368,940	1,259,560		
(6) Indicated Growth Factor:											0.869	0.662	0.667	0.670	0.796		
(7) Selected Growth Factor:											0.870	0.660	0.670	0.670	0.800		

II 000022

- Notes:
 (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) for PY199X] respectively for each 'Prior to 199X' column
 (6) = [Sum of (5)] / [Sum of (4)]

II 000023

Section II - Loss Development
 Subsection D - Adjustment for Escalation of Benefits
 7/1/2020

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	1.126	1.122	1.117	1.113	1.108
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	1.049	1.047	1.044	1.042	1.040

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	1.073	1.072	1.070	1.068	1.066

Selected Differential in Indemnity Loss Development at Month 384 1.038

Notes:

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

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

II 00024

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	8.44%
Escalated	Other Indemnity							55.92%
Escalated	Total Indemnity							65.86%
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	4.17%
Unescalated	Other Indemnity							55.92%
Unescalated	Total Indemnity							60.89%

Escalated or Unescalated (6)	Injury Type (7)	Estimated Losses at Month					
		Ultimate (8)	168	180	192 (9)	204	216
Escalated	Fatal	1,502	495	525	556	586	617
Escalated	Permanent Total	8,436	2,071	2,268	2,469	2,672	2,880
Escalated	Other Indemnity	55,920	55,920	55,920	55,920	55,920	55,920
Escalated	Total Indemnity	65,857	58,486	58,713	58,944	59,178	59,417
Unescalated	Fatal	799	411	429	447	463	479
Unescalated	Permanent Total	4,170	1,701	1,817	1,930	2,041	2,148
Unescalated	Other Indemnity	55,920	55,920	55,920	55,920	55,920	55,920
Unescalated	Total Indemnity	60,889	58,032	58,166	58,297	58,424	58,547

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, Page 1. 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 000025

Section II - Loss Development
 Subsection D - Adjustment for Escalation of Benefits
 7/1/2020

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	1.044	1.042	1.039	1.037	1.035
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	1.016	1.015	1.014	1.013	1.013

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	1.028	1.026	1.025	1.023	1.022

Selected Differential in Indemnity Loss Development at Month 384 1.008

Notes:

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

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

II 000026

Section II - Loss Development
 Subsection D - Adjustment for Escalation of Benefits
 7/1/2020

Section II - D
 Exhibit 2
 Page 2

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	8.44%
Escalated	Other Indemnity							55.92%
Escalated	Total Indemnity							65.86%
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	4.17%
Unescalated	Other Indemnity							55.92%
Unescalated	Total Indemnity							60.89%

Escalated or Unescalated (6)	Injury Type (7)	Estimated Losses at Month					
		Ultimate (8)	168	180	192 (9)	204	216
Escalated	Fatal	1,502	1,101	1,121	1,140	1,160	1,179
Escalated	Permanent Total	8,436	6,035	6,167	6,297	6,424	6,548
Escalated	Other Indemnity	55,920	55,920	55,920	55,920	55,920	55,920
Escalated	Total Indemnity	65,857	63,056	63,208	63,357	63,503	63,646
Unescalated	Fatal	799	659	667	675	682	689
Unescalated	Permanent Total	4,170	3,327	3,380	3,431	3,480	3,526
Unescalated	Other Indemnity	55,920	55,920	55,920	55,920	55,920	55,920
Unescalated	Total Indemnity	60,889	59,906	59,967	60,026	60,082	60,135

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, Page 1. 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

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	2.953	1.588	1.237	1.086	1.037	1.017	1.012	1.007	1.005	1.006	1.004	1.003	1.002	1.002	1.001	1.001	1.003	1.002	1.001	1.001	1.034	1.038
Cumulative	7.500	2.539	1.599	1.293	1.191	1.148	1.129	1.116	1.108	1.102	1.096	1.091	1.088	1.086	1.084	1.082	1.081	1.078	1.076	1.074	1.073	1.038
<u>(2) Medical Paid Losses</u>																						
2 Yr Average	1.923	1.143	1.059	1.024	1.012	1.010	1.013	1.009	1.005	1.010	1.010	1.007	1.006	1.007	1.009	1.007	1.008	1.009	1.005	1.004	1.074	1.000
Cumulative	2.916	1.516	1.326	1.252	1.223	1.209	1.198	1.182	1.172	1.165	1.154	1.143	1.134	1.128	1.120	1.110	1.103	1.094	1.085	1.079	1.074	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 000027

II 000028

Section II - Loss Development
 Subsection E - Accident Year Data
 7/1/2020

Section II - E
 Exhibit 1
 Page 2

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

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	
2013	54,849	169,194	3.085	2003	308,610	310,199	1.005
2014	57,771	167,813	2.905	2004	330,177	332,731	1.008
2015	64,170	191,369	2.982	2005	337,366	340,120	1.008
2016	63,647	184,722	2.902	2006	322,794	323,892	1.003
2017	63,579	191,025	3.005	2007	336,150	338,014	1.006
2 Yr Average			2.953	2 Yr Average			1.004
5 Yr Average			2.976	5 Yr Average			1.006
Selected Average			2.953	Selected Average			1.004
	24	36			144	156	
2012	148,469	238,936	1.609	2002	282,269	282,909	1.002
2013	169,194	270,493	1.599	2003	310,199	312,468	1.007
2014	167,813	266,977	1.591	2004	332,731	333,986	1.004
2015	191,369	304,289	1.590	2005	340,120	341,192	1.003
2016	184,722	292,908	1.586	2006	323,892	324,663	1.002
2 Yr Average			1.588	2 Yr Average			1.003
5 Yr Average			1.595	5 Yr Average			1.004
Selected Average			1.588	Selected Average			1.003
	36	48			156	168	
2011	250,230	312,299	1.248	2001	271,178	270,944	0.999
2012	238,936	293,612	1.229	2002	282,909	283,271	1.001
2013	270,493	326,679	1.208	2003	312,468	313,873	1.004
2014	266,977	331,154	1.240	2004	333,986	334,809	1.002
2015	304,289	375,241	1.233	2005	341,192	341,830	1.002
2 Yr Average			1.237	2 Yr Average			1.002
5 Yr Average			1.232	5 Yr Average			1.002
Selected Average			1.237	Selected Average			1.002
	48	60			168	180	
2010	263,439	295,487	1.122	2000	264,374	265,538	1.004
2011	312,299	343,440	1.100	2001	270,944	271,840	1.003
2012	293,612	320,490	1.092	2002	283,271	283,570	1.001
2013	326,679	356,379	1.091	2003	313,873	314,054	1.001
2014	331,154	357,750	1.080	2004	334,809	335,679	1.003
2 Yr Average			1.086	2 Yr Average			1.002
5 Yr Average			1.097	5 Yr Average			1.002
Selected Average			1.086	Selected Average			1.002
	60	72			180	192	
2009	289,416	300,553	1.038	1999	229,285	229,648	1.002
2010	295,487	304,418	1.030	2000	265,538	266,141	1.002
2011	343,440	358,668	1.044	2001	271,840	273,465	1.006
2012	320,490	334,652	1.044	2002	283,570	284,037	1.002
2013	356,379	367,107	1.030	2003	314,054	314,368	1.001
2 Yr Average			1.037	2 Yr Average			1.001
5 Yr Average			1.037	5 Yr Average			1.002
Selected Average			1.037	Selected Average			1.001
	72	84			192	204	
2008	327,421	336,031	1.026	1998	232,251	233,271	1.004
2009	300,553	306,542	1.020	1999	229,648	230,144	1.002
2010	304,418	309,943	1.018	2000	266,141	266,637	1.002
2011	358,668	361,922	1.009	2001	273,465	273,598	1.000
2012	334,652	343,074	1.025	2002	284,037	284,611	1.002
2 Yr Average			1.017	2 Yr Average			1.001
5 Yr Average			1.020	5 Yr Average			1.002
Selected Average			1.017	Selected Average			1.001
	84	96			204	216	
2007	325,159	330,442	1.016	1997	200,902	202,314	1.007
2008	336,031	340,694	1.014	1998	233,271	234,722	1.006
2009	306,542	309,247	1.009	1999	230,144	231,121	1.004
2010	309,943	314,447	1.015	2000	266,637	266,919	1.001
2011	361,922	365,503	1.010	2001	273,598	274,811	1.004
2 Yr Average			1.012	2 Yr Average			1.003
5 Yr Average			1.013	5 Yr Average			1.005
Selected Average			1.012	Selected Average			1.003
	96	108			216	228	
2006	315,846	318,502	1.008	1996	211,747	212,005	1.001
2007	330,442	332,709	1.007	1997	202,314	202,562	1.001
2008	340,694	342,924	1.007	1998	234,722	235,732	1.004
2009	309,247	312,263	1.010	1999	231,121	231,692	1.002
2010	314,447	315,693	1.004	2000	266,919	267,280	1.001
2 Yr Average			1.007	2 Yr Average			1.002
5 Yr Average			1.007	5 Yr Average			1.002
Selected Average			1.007	Selected Average			1.002
	108	120			228	240	
2005	333,022	334,808	1.005	1995	213,443	213,883	1.002
2006	318,502	320,020	1.005	1996	212,005	212,311	1.001
2007	332,709	334,673	1.006	1997	202,562	202,811	1.001
2008	342,924	343,953	1.003	1998	235,732	236,181	1.002
2009	312,263	314,751	1.008	1999	231,692	231,917	1.001
2 Yr Average			1.005	2 Yr Average			1.001
5 Yr Average			1.005	5 Yr Average			1.002
Selected Average			1.005	Selected Average			1.001
	120	132			240	252	
2004	328,882	330,177	1.004	1994	242,979	243,744	1.003
2005	334,808	337,366	1.008	1995	213,883	214,441	1.003
2006	320,020	322,794	1.009	1996	212,311	212,592	1.001
2007	334,673	336,150	1.004	1997	202,811	203,026	1.001
2008	343,953	346,264	1.007	1998	236,181	236,615	1.002
2 Yr Average			1.006	2 Yr Average			1.001
5 Yr Average			1.006	5 Yr Average			1.002
Selected Average			1.006	Selected Average			1.001

Notes:
 Losses from Aggregate Financial Data.

II 000029

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

Accident Year	Losses (in 000's)		Loss Development Factor	Accident Year	Losses (in 000's)		Loss Development Factor
	Evaluated at Month				Evaluated at Month		
	<u>12</u>	<u>24</u>			<u>132</u>	<u>144</u>	
2013	71,248	140,590	1.973	2003	156,017	157,751	1.011
2014	73,574	145,333	1.975	2004	170,253	171,832	1.009
2015	75,704	149,317	1.972	2005	172,454	174,100	1.010
2016	78,845	152,413	1.933	2006	163,310	164,518	1.007
2017	77,842	148,921	1.913	2007	179,995	182,263	1.013
2 Yr Average			1.923	2 Yr Average			1.010
5 Yr Average			1.953	5 Yr Average			1.010
Selected Average			1.923	Selected Average			1.010
	<u>24</u>	<u>36</u>			<u>144</u>	<u>156</u>	
2012	128,859	148,154	1.150	2002	138,977	140,541	1.011
2013	140,590	161,395	1.148	2003	157,751	159,083	1.008
2014	145,333	166,468	1.145	2004	171,832	173,205	1.008
2015	149,317	171,886	1.151	2005	174,100	175,541	1.008
2016	152,413	173,049	1.135	2006	164,518	165,550	1.006
2 Yr Average			1.143	2 Yr Average			1.007
5 Yr Average			1.146	5 Yr Average			1.008
Selected Average			1.143	Selected Average			1.007
	<u>36</u>	<u>48</u>			<u>156</u>	<u>168</u>	
2011	156,414	165,339	1.057	2001	122,255	122,939	1.006
2012	148,154	156,705	1.058	2002	140,541	142,004	1.010
2013	161,395	169,658	1.051	2003	159,083	160,308	1.008
2014	166,468	176,689	1.061	2004	173,205	174,439	1.007
2015	171,886	181,688	1.057	2005	175,541	176,424	1.005
2 Yr Average			1.059	2 Yr Average			1.006
5 Yr Average			1.057	5 Yr Average			1.006
Selected Average			1.059	Selected Average			1.006
	<u>48</u>	<u>60</u>			<u>168</u>	<u>180</u>	
2010	151,591	156,325	1.031	2000	118,970	120,452	1.012
2011	165,339	169,350	1.024	2001	122,939	123,685	1.006
2012	156,705	160,961	1.027	2002	142,004	143,451	1.010
2013	169,658	172,507	1.017	2003	160,308	161,298	1.006
2014	176,689	182,051	1.030	2004	174,439	175,752	1.008
2 Yr Average			1.024	2 Yr Average			1.007
5 Yr Average			1.026	5 Yr Average			1.008
Selected Average			1.024	Selected Average			1.007
	<u>60</u>	<u>72</u>			<u>180</u>	<u>192</u>	
2009	149,491	150,927	1.010	1999	114,595	115,641	1.009
2010	156,325	158,600	1.015	2000	120,452	121,963	1.013
2011	169,350	174,178	1.029	2001	123,685	124,272	1.005
2012	160,961	163,022	1.013	2002	143,451	145,086	1.011
2013	172,507	174,281	1.010	2003	161,298	162,222	1.006
2 Yr Average			1.012	2 Yr Average			1.009
5 Yr Average			1.015	5 Yr Average			1.009
Selected Average			1.012	Selected Average			1.009
	<u>72</u>	<u>84</u>			<u>192</u>	<u>204</u>	
2008	165,376	166,628	1.008	1998	105,249	106,048	1.008
2009	150,927	152,336	1.009	1999	115,641	116,551	1.008
2010	158,600	158,979	1.002	2000	121,963	123,579	1.013
2011	174,178	175,762	1.009	2001	124,272	124,879	1.005
2012	163,022	164,678	1.010	2002	145,086	146,315	1.008
2 Yr Average			1.010	2 Yr Average			1.007
5 Yr Average			1.008	5 Yr Average			1.008
Selected Average			1.010	Selected Average			1.007
	<u>84</u>	<u>96</u>			<u>204</u>	<u>216</u>	
2007	171,357	173,345	1.012	1997	97,333	98,181	1.009
2008	166,628	168,049	1.009	1998	106,048	106,589	1.005
2009	152,336	153,725	1.009	1999	116,551	117,478	1.008
2010	158,979	161,158	1.014	2000	123,579	125,123	1.012
2011	175,762	178,051	1.013	2001	124,879	125,342	1.004
2 Yr Average			1.013	2 Yr Average			1.008
5 Yr Average			1.011	5 Yr Average			1.008
Selected Average			1.013	Selected Average			1.008
	<u>96</u>	<u>108</u>			<u>216</u>	<u>228</u>	
2006	159,416	160,958	1.010	1996	98,521	99,353	1.008
2007	173,345	175,398	1.012	1997	98,181	98,767	1.006
2008	168,049	169,076	1.006	1998	106,589	107,446	1.008
2009	153,725	154,772	1.007	1999	117,478	118,312	1.007
2010	161,158	162,972	1.011	2000	125,123	126,367	1.010
2 Yr Average			1.009	2 Yr Average			1.009
5 Yr Average			1.009	5 Yr Average			1.008
Selected Average			1.009	Selected Average			1.009
	<u>108</u>	<u>120</u>			<u>228</u>	<u>240</u>	
2005	169,645	171,008	1.008	1995	101,708	102,357	1.006
2006	160,958	162,130	1.007	1996	99,353	100,594	1.012
2007	175,398	177,699	1.013	1997	98,767	99,206	1.004
2008	169,076	169,972	1.005	1998	107,446	108,129	1.006
2009	154,772	155,643	1.006	1999	118,312	118,857	1.005
2 Yr Average			1.005	2 Yr Average			1.005
5 Yr Average			1.008	5 Yr Average			1.007
Selected Average			1.005	Selected Average			1.005
	<u>120</u>	<u>132</u>			<u>240</u>	<u>252</u>	
2004	168,766	170,253	1.009	1994	113,530	114,052	1.005
2005	171,008	172,454	1.008	1995	102,357	102,946	1.006
2006	162,130	163,310	1.007	1996	100,594	101,184	1.006
2007	177,699	179,995	1.013	1997	99,206	99,675	1.005
2008	169,972	171,024	1.006	1998	108,129	108,574	1.004
2 Yr Average			1.010	2 Yr Average			1.004
5 Yr Average			1.009	5 Yr Average			1.005
Selected Average			1.010	Selected Average			1.004

Notes:
 Losses from Aggregate Financial Data.

PREMIUMS

Background

To derive a rate indication, this filing evaluates the adequacy of the current rate level by comparing a historical loss, Loss Adjustment Expense (“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 2016 and policy year 2017 are calculated in Section III-A.

Policy years 2016 and 2017 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 CCPAP 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

III 000003

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. 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 2016 and policy year 2017 are calculated in Section III-B.

III 000004

Consistent with past practice, the WCRIBMA uses the historical experience modification anticipated in the rates in the derivation of the adjustment factor. This is 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 2016 and policy year 2017 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 data for policy year 2016 and policy year 2017 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 2016 and policy year 2017 premiums so that the one-time loadings for recoupment of Insolvency Fund assessments are excluded.

On-Level Adjustment

WCRIBMA also 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 appropriate for calculating the current rate need. Further, workers' compensation premium is not written evenly throughout the year, and a disproportionate number of policies take effect 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
 7/1/2020

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 12/31/2018	
	2016	2017
(1) Standard Earned Premium plus Adjusted ARAP Premium	1,203,414,718	1,252,889,200
(2) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.041	1.041
(3) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	1.000	1.002
(4) Composite Adjustment Factor = (2) x (3)	1.041	1.043
(5) Adjusted Standard Earned Premium plus ARAP = (1) x (4)	1,252,810,112	1,307,148,410
(6) Cumulative Premium Development Factor to Ultimate (see Page 2)	0.999	1.010
(7) Rate On-Level Factor	0.878	0.871
(8) Factor to Remove Expense Constant	0.960	0.962
(9) Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = (5) x (6) x (7) x (8)	1,054,546,187	1,106,105,799

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	1.010	0.999	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	1.000
Cumulative Factor to 252	1.009	0.999	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	1.000
5 Year Average	1.011	0.998	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	1.000
Cumulative Factor to 252	1.010	0.999	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	1.000

Notes:
 From Page 3

III 000007

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)				2016 (9)	2017 (10)	2016 (11)	2017 (12)	2018 (13)
7/1/2016	1.000	0.845	-0.020	0.155	0.997	0.052	-0.042	45.8%	100.0%	13.5%	89.6%	88.1%
7/1/2018	1.000	0.856	-0.021	0.144	0.997	0.051	-0.033					11.9%

	Policy Year		Calendar Year Earned		
	2016	2017	2016	2017	2018
(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	0.052	0.052	0.052	0.052	0.052
(16) Percentage of Premium for CCPAP Eligible Classes	0.364	0.376	0.361	0.370	0.370
(17) Weighted Average Construction Credit anticipated in rates	-0.013	-0.016	-0.012	-0.015	-0.015
(18) Combined Weighted Average impact anticipated in rates = (14) x [1.0 + (15)] x [1.0 + (17)]	1.035	1.032	1.036	1.033	1.033
(19) Manual Premium	1,172,596,373	1,250,143,763	1,146,911,773	1,211,370,068	
(20) Standard Earned Premium at DSR Level, excluding Expense Constants	1,114,359,165	1,185,670,158	1,088,819,498	1,150,014,662	
(21) ARAP Premium	48,619,726	51,254,264	47,711,894	49,936,995	
(22) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.049	1.053	1.049	1.051	
(23) Standard Earned Premium plus Adjusted ARAP = (20) + [(21) x (22)]	1,165,354,761	1,239,646,633	1,138,871,240	1,202,496,068	
(24) Combined Actual impact = (23) / (19)	0.994	0.992	0.993	0.993	0.993
(25) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance = (18) / (24)	1.041	1.041	1.043	1.040	1.040

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 2018 uses CY 2017 values.
 (22): from Section III-B, Exhibit 2.

III 00009

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

	Policy Year valued as of 12/31/2018		Calendar Years		
	2016	2017	2016	2017	2018
(1) Aggregate Financial: Standard Earned Premium at DSR Level	1,152,105,090	1,199,295,709	1,148,727,923	1,183,565,353	1,212,615,339
(2) Aggregate Financial: Standard Earned Premium at Company Level	1,098,428,843	1,138,811,280	1,095,026,520	1,126,183,565	1,151,652,761
(3) Aggregate Financial: ARAP Premium	48,919,127	50,890,595	47,797,438	50,885,683	51,617,455
(4) Adjustment Factor to Adjust from Company Level to DSR Level Premium = (1) / (2)	1.049	1.053	1.049	1.051	1.053
(5) Adjusted ARAP Premium = (3) x (4)	51,309,628	53,593,491	50,141,481	53,478,432	54,349,818
(6) Standard Earned Premium plus adjusted ARAP Premium = (1) + (5)	1,203,414,718	1,252,889,200	1,198,869,404	1,237,043,785	1,266,965,157

Notes:

(1),(2),(3): Aggregate Financial Policy Year Calls

III 000010

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		
		2016 (3)	2017 (4)	2016 (5)	2017 (6)	2018 (7)
4/1/2014	0.19%	54.2%		86.5%	10.4%	
7/1/2016	-0.23%	45.8%	100.0%	13.5%	89.6%	88.1%
7/1/2018	0.26%					11.9%

Policy Year		Calendar Year Earned		
2016	2017	2016	2017	2018

(8) Weighted Average Loading for Recoupment of Insolvency Fund Assessment in the Rates = Sum [(2) x (3) through (7)]	0.0000	-0.0023	0.0014	-0.0019	-0.0017
(9) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments = [1.0 - (8)]	1.000	1.002	0.999	1.002	1.002

- Notes:
 (2): Previous filings.
 (3),(4): Section III-D, Exhibit 2.
 (5),(6): Section III-D, Exhibit 3.
 (7): Section III-D, Exhibit 4.

III 000011

III 000012

Section III - Premiums
 Subsection D - Rate On-Level Factors
 7/1/2020

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	
				2016 (5)	2017 (6)
4/1/2014		1.000	0.884	54.2%	
7/1/2016	1.015	1.015	0.871	45.8%	100.0%
7/1/2018	0.871	0.884	1.000		

Policy Year	
2016	2017
0.878	0.871

(7) Rate On-Level Factor
 = Sum [(4) x (5) through (6)]

Notes:

- (2) From previous filings.
- (3): 1 + (2) for first date; (3) for prior date * (2)
- (4): (3)_{latest rate level effective date} / (3).
- (5),(6): From Exhibit 2.

III 000013

Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2020

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)
		4/1/2014 (3)	7/1/2016 (4)	7/1/2018 (5)	
2016	1	191,429,491			191,429,491
2016	2	71,114,570			71,114,570
2016	3	88,737,616			88,737,616
2016	4	112,172,544			112,172,544
2016	5	87,247,456			87,247,456
2016	6	104,275,842			104,275,842
2016	7		134,145,362		134,145,362
2016	8		74,505,307		74,505,307
2016	9		92,375,226		92,375,226
2016	10		89,917,412		89,917,412
2016	11		67,626,257		67,626,257
2016	12		95,698,307		95,698,307
2016	Total	654,977,519	554,267,871		1,209,245,390

2017	1		206,862,765		206,862,765
2017	2		76,980,595		76,980,595
2017	3		96,134,869		96,134,869
2017	4		118,802,392		118,802,392
2017	5		93,446,474		93,446,474
2017	6		109,259,457		109,259,457
2017	7		145,982,825		145,982,825
2017	8		76,883,220		76,883,220
2017	9		93,060,873		93,060,873
2017	10		94,109,673		94,109,673
2017	11		73,824,165		73,824,165
2017	12		98,437,447		98,437,447
2017	Total		1,283,784,756		1,283,784,756

2018	1		217,746,219		217,746,219
2018	2		81,037,524		81,037,524
2018	3		101,192,562		101,192,562
2018	4		125,052,566		125,052,566
2018	5		98,362,580		98,362,580
2018	6		115,007,460		115,007,460
2018	7			133,841,027	133,841,027
2018	8			70,488,632	70,488,632
2018	9			85,320,736	85,320,736
2018	10			86,282,267	86,282,267
2018	11			67,683,998	67,683,998
2018	12			90,250,023	90,250,023
2018	Total		738,398,911	533,866,683	1,272,265,594

Rate Level Effective Date (7)	Policy Year Weights		
	2016 (8)	2017 (9)	2018 (10)
4/1/2014	54.2%		
7/1/2016	45.8%	100.0%	58.0%
7/1/2018			42.0%

Notes:

(3),(4),(5): From Unit Statistical Plan Data. PY 2018 based on PY 2017 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)]

III 000014

Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2020

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)
			4/1/2014 (4)	7/1/2016 (5)	7/1/2018 (6)	
2014	12	2016				0
2015	1	2016	1,917,711			1,917,711
2015	2	2016	7,266,384			7,266,384
2015	3	2016	16,457,969			16,457,969
2015	4	2016	28,851,067			28,851,067
2015	5	2016	28,878,282			28,878,282
2015	6	2016	46,090,162			46,090,162
2015	7	2016	62,627,929			62,627,929
2015	8	2016	40,096,185			40,096,185
2015	9	2016	61,916,246			61,916,246
2015	10	2016	65,171,763			65,171,763
2015	11	2016	51,870,178			51,870,178
2015	12	2016	88,351,245			88,351,245
2016	1	2016	189,251,622			189,251,622
2016	2	2016	63,882,871			63,882,871
2016	3	2016	71,990,634			71,990,634
2016	4	2016	82,775,439			82,775,439
2016	5	2016	57,545,420			57,545,420
2016	6	2016	58,758,508			58,758,508
2016	7	2016		66,688,628		66,688,628
2016	8	2016		30,070,097		30,070,097
2016	9	2016		28,743,821		28,743,821
2016	10	2016		21,253,955		21,253,955
2016	11	2016		9,967,343		9,967,343
2016	12	2016		3,572,630		3,572,630
Total		2016	1,023,699,613	160,296,475		1,183,996,088

2015	12	2017				0
2016	1	2017	2,179,653			2,179,653
2016	2	2017	7,232,514			7,232,514
2016	3	2017	16,748,550			16,748,550
2016	4	2017	29,400,009			29,400,009
2016	5	2017	29,704,362			29,704,362
2016	6	2017	45,520,934			45,520,934
2016	7	2017		67,464,781		67,464,781
2016	8	2017		44,439,359		44,439,359
2016	9	2017		63,637,781		63,637,781
2016	10	2017		68,669,232		68,669,232
2016	11	2017		57,663,164		57,663,164
2016	12	2017		92,131,864		92,131,864
2017	1	2017		204,560,654		204,560,654
2017	2	2017		69,040,483		69,040,483
2017	3	2017		78,415,738		78,415,738
2017	4	2017		87,766,200		87,766,200
2017	5	2017		61,290,772		61,290,772
2017	6	2017		61,423,890		61,423,890
2017	7	2017		72,921,872		72,921,872
2017	8	2017		30,618,373		30,618,373
2017	9	2017		28,763,674		28,763,674
2017	10	2017		22,159,830		22,159,830
2017	11	2017		10,811,630		10,811,630
2017	12	2017		3,576,521		3,576,521
Total		2017	130,786,021	1,125,355,816		1,256,141,837

Rate Level Effective Date (8)	Calendar Year Earned Weights	
	2016 (9)	2017 (10)
4/1/2014	86.5%	10.4%
7/1/2016	13.5%	89.6%
7/1/2018		

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)]

III 000015

Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2020

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)
			4/1/2014 (4)	7/1/2016 (5)	7/1/2018 (6)	
2016	12	2018		30		30
2017	1	2018		2,279,269		2,279,269
2017	2	2018		7,935,320		7,935,320
2017	3	2018		17,713,569		17,713,569
2017	4	2018		31,028,509		31,028,509
2017	5	2018		32,150,608		32,150,608
2017	6	2018		47,830,191		47,830,191
2017	7	2018		73,053,469		73,053,469
2017	8	2018		46,261,934		46,261,934
2017	9	2018		64,294,115		64,294,115
2017	10	2018		71,947,496		71,947,496
2017	11	2018		63,011,342		63,011,342
2017	12	2018		94,860,098		94,860,098
2018	1	2018		215,345,055		215,345,055
2018	2	2018		72,683,679		72,683,679
2018	3	2018		82,546,507		82,546,507
2018	4	2018		92,390,785		92,390,785
2018	5	2018		64,519,932		64,519,932
2018	6	2018		64,660,212		64,660,212
2018	7	2018			66,862,581	66,862,581
2018	8	2018			28,073,950	28,073,950
2018	9	2018			26,373,524	26,373,524
2018	10	2018			20,318,294	20,318,294
2018	11	2018			9,913,096	9,913,096
2018	12	2018			3,279,281	3,279,281
	Total	2018		1,144,512,121	154,820,727	1,299,332,848

Rate Level Effective Date (8)	Calendar Year Earned Weights
	2018 (9)
4/1/2014	
7/1/2016	88.1%
7/1/2018	11.9%

Notes:

(4),(5),(6): From Unit Statistical Plan Data. PY 2018 based on PY 2017 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)]

III 000016

Section III - Premiums
Subsection E - Premium Adjustment Factors
7/1/2020

Section III - E
Exhibit 1

Calculation of Premium Adjustment Factor PY 2017 to Prospective Effective Period 7/1/2020 - 6/30/2021

(1)	Wage Trend from PY 2017 to Prospective Effective Period 7/1/2020 - 6/30/2021	1.123
(2)	Exposure Growth	1.064
(3)	Rate On-Level Factor	0.871
(4)	Overall Indicated Rate Change for Policies Effective 7/1/2020	0.962
(5)	Adjustment Factor to Balance Experience Rating, ARAP, and Construction Credits	1.041
(6)	Impact of Change in Indicated Loading for Recoupment of Insolvency Fund Assessments	0.997
(7)	Adjustment Factor = (1) x (2) x (3) x (4) x (5) x (6)	1.039
(8)	Selected Factor	1.04

Notes:

(1):	Statewide Average Weekly Wage for PY 2017 (Section V-G, Exhibit 1)	1,395.56
	Statewide Average Weekly Wage for 10/1/2019, based on data period 4/1/18 to 4/1/19 (Section V-G, Exhibit 1)	1,431.66
	Statewide Average Weekly Wage at 7/1/2021 (using wage trend of 3.4%, Section V-A, Exhibit 1)	1,567.50
(2):	Exposure growth from PY 2017 to Prospective Effective Period 7/1/2020 - 6/30/2021 (Section V-H, Exhibit 3)	
(3):	Section III-D Exhibit 1.	
(4):	Section I-B Exhibit 1.	
(5):	Exhibit 2.	
(6):	PY 2017 factor to load for Recoupment of Insolvency Fund (Section III-C, Exhibit 1: [1.0 + (8)]).	0.998
	Policy Effective factor to load for Recoupment of Insolvency Fund Assessments (Section IX-K, Exhibit 5, Page 1).	0.995

III 000017

Section III - Premiums
Subsection E - Premium Adjustment Factors
7/1/2020

Section III - E
Exhibit 2

Factor to Balance Experience Rating, ARAP, and Construction Credit

Beginning Period - PY 2017

(1)	Anticipated Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	1.032
(2)	Actual Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	0.992
(3)	Ratio of Anticipated to Actual = (1) / (2)	1.041

Ending Period - Prospective Effective Period 7/1/2020 - 6/30/2021

(4)	Anticipated Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	1.037
(5)	Actual is Assumed to be equal to the Anticipated, Since the Actual Impact has yet to be Determined	1.037
(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)	1.041

Notes:

(1),(2): PY 2017, Section III-B, Exhibit 1.

(4),(5): Prospective Effective Period, Section IX-K, Exhibit 1.

IV 000001

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 2016 and 2017 to the July 1, 2020 benefit level, and additional adjustments to bring losses from the July 1, 2020 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 2019 and projected for 2020 and 2021. 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

IV 000002

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 prior rate filing, 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, 2019, and the projected SAWW changes of October 1, 2020 and October 1, 2021. 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.

IV 000003

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 1.7%. 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 2016 was \$7,360. If a vault is included, something that is typically required by a cemetery, the median cost is \$8,755. The cost does not take into account cemetery, monument or marker costs or miscellaneous cash-advance charges, such as for flowers or an obituary."

IV 000004

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 Section 36 of M.G.L. Chapter 152, specific injury payments are made for the loss of use of various body parts. In

IV 000005

this exhibit, we weigh 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.

IV 000006

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.

IV 000007

Section IV - Benefit Change Adjustments
 Subsection A - Summary
 7/1/2020

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
1/1/2020	Prosp. Eff. Period					1.012	1.000	
PY 2016	1/1/2020					1.032	1.000	
PY 2017	1/1/2020					1.023	1.000	
PY 2003	Prosp. Eff. Period	1.092	1.110	1.192	1.064	1.147	1.046	
PY 2004	Prosp. Eff. Period	1.088	1.105	1.182	1.062	1.140	1.036	
PY 2005	Prosp. Eff. Period	1.083	1.097	1.165	1.057	1.128	1.032	
PY 2006	Prosp. Eff. Period	1.077	1.089	1.148	1.053	1.116	1.032	
PY 2007	Prosp. Eff. Period	1.071	1.080	1.132	1.048	1.104	1.032	
PY 2008	Prosp. Eff. Period	1.065	1.071	1.116	1.043	1.092	1.024	
PY 2009	Prosp. Eff. Period	1.063	1.068	1.111	1.041	1.087	1.002	
PY 2010	Prosp. Eff. Period	1.063	1.069	1.112	1.042	1.088	1.000	
PY 2011	Prosp. Eff. Period	1.060	1.064	1.102	1.040	1.081	1.000	
PY 2012	Prosp. Eff. Period	1.055	1.057	1.090	1.036	1.072	1.000	
PY 2013	Prosp. Eff. Period	1.053	1.054	1.085	1.034	1.067	1.000	
PY 2014	Prosp. Eff. Period	1.047	1.050	1.078	1.032	1.062	1.000	
PY 2015	Prosp. Eff. Period	1.036	1.043	1.067	1.029	1.053	1.000	
PY 2016	Prosp. Eff. Period	1.030	1.037	1.056	1.024	1.044	1.000	
PY 2017	Prosp. Eff. Period	1.023	1.029	1.044	1.019	1.035	1.000	
PY 2015	CPY 2016_07	1.009	1.011	1.016	1.007		1.000	
PY 2016	CPY 2017_07	1.010	1.012	1.019	1.008		1.000	
PY 2017	CPY 2018_07	1.010	1.013	1.019	1.008		1.000	
CPY 2016_07	Prosp. Eff. Period							1.026
CPY 2017_07	Prosp. Eff. Period							1.019
CPY 2018_07	Prosp. Eff. Period							1.013
CPY 2008_09	Prosp. Eff. Period							1.058
Prior Eff. Period (using benefit level projections from prior filing)	Prosp. Eff. Period					1.021	1.000	1.014

Notes:

1/1/2020 refers to a point in time. All other time periods refer to Policy Years.

Example: $PY\ 2009\ to\ Prosp.\ Eff.\ Period\ for\ Permanent\ Partial = 1.111 = 1.193 / 1.074$

where 1.193 is the Index Factor for Prosp. Eff. Period and 1.074 is the Index Factor for PY 2009 for Indemnity Permanent Partial, from Exhibit 2.

Benefit Level Changes and Weights

Date of Change Benefit Level Change	Injury Type: Death																				Weighted Average Benefit Level			
	12/1/2002	10/1/2003	9/1/2004	10/1/2004	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	10/1/2020	10/1/2021
Benefit Level Change	1.000	1.000	1.000	1.005	1.005	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	1.007	1.007	1.007	1.004	1.000
Level Change	1.000	1.000	1.000	1.005	1.010	1.015	1.021	1.027	1.027	1.027	1.026	1.032	1.037	1.038	1.042	1.051	1.056	1.062	1.069	1.076	1.084	1.091	1.096	
Time Period																								1.008
PY 2003	0.346	0.608	0.020	0.026																				
PY 2004		0.281	0.062	0.629	0.028																			1.019
PY 2005				0.336	0.635	0.029																		
PY 2006					0.341	0.632	0.027																	1.027
PY 2007						0.343	0.630	0.027																
PY 2008							0.350	0.417	0.208	0.024														1.035
PY 2009								0.055	0.290	0.629	0.026													
PY 2010										0.333	0.640	0.027												1.043
PY 2011											0.343	0.632	0.025											
PY 2012												0.341	0.634	0.025										1.060
PY 2013													0.340	0.635	0.025									
PY 2014														0.340	0.408	0.227	0.025							1.064
PY 2015															0.044	0.295	0.636	0.024	0.025					
PY 2016																0.340	0.636	0.025	0.025	0.025				1.078
PY 2017																	0.636	0.025	0.635	0.025				
CPY 2016_07																	0.037	0.689	0.274	0.277				1.092
CPY 2017_07																	0.046	0.677	0.277	0.277				
CPY 2018_07																		0.046	0.677	0.277	0.277			1.092
CPY 2008_09																			0.046	0.677	0.277	0.277		
Prior Eff. Period								0.004	0.180	0.426	0.390									0.046	0.677	0.277	0.277	1.092
Prosp. Eff. Period 1/1/2020																					1.000	0.677	0.277	

Indemnity All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2018 (using benefit level projections from prior filing).

Date of Change	12/1/2002	10/1/2003	9/1/2004	10/1/2004	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	Weighted Average Benefit Level
Benefit Level Change	1.000	1.000	1.000	1.009	1.011	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	1.010	1.008	1.008	1.123
Cumulative Level Change	1.000	1.000	1.000	1.009	1.020	1.031	1.043	1.055	1.055	1.055	1.053	1.065	1.073	1.075	1.083	1.083	1.092	1.101	1.112	1.121	1.130	1.123

Medical All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2018 (using benefit level projections from prior filing).

Date of Change	12/1/2002	10/1/2003	9/1/2004	10/1/2004	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	Weighted Average Benefit Level
Benefit Level Change	1.000	1.000	1.014	1.000	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	1.000	1.000	1.046
Cumulative Level Change	1.000	1.000	1.014	1.014	1.014	1.014	1.014	1.014	1.046	1.046	1.046	1.046	1.046	1.046	1.046	1.046	1.046	1.046	1.046	1.046	1.046	1.046

All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2018 (using benefit level projections from prior filing).

Date of Change	12/1/2002	10/1/2003	9/1/2004	10/1/2004	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	Weighted Average Benefit Level
Benefit Level Change	1.000	1.000	1.005	1.006	1.007	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	1.007	1.005	1.005	1.096
Cumulative Level Change	1.000	1.000	1.005	1.011	1.018	1.025	1.032	1.040	1.053	1.053	1.052	1.059	1.065	1.066	1.071	1.071	1.077	1.082	1.090	1.095	1.100	1.096

Index Factors for All Injury Types

Time Period	Indemnity				All Injury Types	Medical All Injury Types	Total All Injury Types
	Death	Permanent Total	Permanent Partial	Temporary Total			
PY 2003	1.000	1.000	1.001	1.000	1.000	1.001	1.000
PY 2004	1.003	1.005	1.009	1.003	1.006	1.010	1.008
PY 2005	1.008	1.013	1.024	1.007	1.017	1.014	1.016
PY 2006	1.014	1.020	1.039	1.011	1.028	1.014	1.023
PY 2007	1.019	1.028	1.054	1.016	1.039	1.014	1.030
PY 2008	1.025	1.037	1.069	1.020	1.051	1.022	1.040
PY 2009	1.027	1.040	1.074	1.022	1.055	1.045	1.052
PY 2010	1.027	1.039	1.073	1.022	1.054	1.046	1.053
PY 2011	1.030	1.044	1.082	1.024	1.061	1.046	1.057
PY 2012	1.035	1.051	1.094	1.027	1.070	1.046	1.063
PY 2013	1.037	1.054	1.100	1.029	1.075	1.046	1.066
PY 2014	1.043	1.058	1.107	1.032	1.081	1.046	1.069
PY 2015	1.054	1.064	1.118	1.035	1.089	1.046	1.075
PY 2016	1.060	1.071	1.130	1.039	1.098	1.046	1.081
PY 2017	1.067	1.080	1.143	1.044	1.109	1.046	1.087
CPY 2016_07	1.064	1.076	1.137	1.042	1.104	1.046	1.084
CPY 2017_07	1.071	1.084	1.151	1.048	1.115	1.046	1.091
CPY 2018_07	1.078	1.093	1.165	1.053	1.126	1.046	1.098
CPY 2008_09	1.027	1.040	1.074	1.022	1.055	1.040	1.051
Prior Eff. Period	1.078	1.093	1.165	1.053	1.126	1.046	1.098
Prosp. Eff. Period	1.092	1.111	1.193	1.064	1.147	1.046	1.112
1/1/2020	1.084	1.100	1.176	1.058	1.134	1.046	1.104

Notes:
 1/1/2020 refers to a point in time. All other time periods refer to Policy Years.
 Index Factors for All Injury Types Table is an 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
 7/1/2020

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)
10/1/2002	-0.1%	-0.1%	-0.3%	-0.1%	-0.2%	0.0%	-0.1%
12/1/2002	0.0%	0.0%	0.0%	0.0%	0.0%	5.2%	2.0%
10/1/2003	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
9/1/2004	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.5%
10/1/2004	0.5%	0.7%	1.2%	0.4%	0.9%	0.0%	0.6%
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	0.7%	0.8%	1.2%	0.5%	1.0%	0.0%	0.6%
10/1/2019	0.7%	0.8%	1.2%	0.5%	1.0%	0.0%	0.6%
10/1/2020	0.7%	0.8%	1.2%	0.5%	0.9%	0.0%	0.6%
10/1/2021	0.4%	0.8%	1.2%	0.5%	0.9%	0.0%	0.6%

Notes:

Estimated changes for 10/1/2020 and 10/1/2021 use projected SAWW values for 10/1/2020 and 10/1/2021.

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 10/1/2018		Effects of SAWW Change of 10/1/2019		Effects of SAWW Change of 10/1/2020		Effects of SAWW Change of 10/1/2021	
						10/1/2017 Cost (7)	10/1/2018 Cost (8)	10/1/2018 Cost (9)	10/1/2019 Cost (10)	10/1/2019 Cost (11)	10/1/2020 Cost (12)	10/1/2020 Cost (13)	10/1/2021 Cost (14)
None	204	0	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Spouse, No Children	212	1	40	$a_{40:\overline{Life}}$	24.73	207,038,394	208,357,170	213,981,030	215,378,567	221,199,862	222,584,148	194,676,046	195,438,263
Spouse with Children	407	1	38	$a_{38:\overline{Life}}$	24.71	397,131,791	399,661,408	410,448,845	413,129,537	424,295,686	426,950,961	373,418,887	374,880,937
Child(ren)		1.9	10	$a_{\overline{8}}$	7.35								
Orphan, No Sibling	21	1	13	$a_{13:\overline{5}}$	4.69	3,890,186	3,914,965	4,020,636	4,046,895	4,156,276	4,182,286	3,657,901	3,672,223
Orphan with Sibling(s)	15	2.5	12	$a_{\overline{6}}$	5.59	3,313,383	3,334,488	3,424,491	3,446,857	3,540,019	3,562,173	3,115,540	3,127,738
Other Dependents (No Spouse)	141	1.7	58	$a_{58:\overline{Life}}$	19.48	18,907,165	18,907,165	18,909,478	18,909,478	18,911,870	18,911,870	18,941,117	18,941,117
(15) Total Survivor Benefits	1,000					630,280,918	634,175,196	650,784,481	654,911,335	672,103,713	676,191,437	593,809,491	596,060,278
(16) Cost of Burial (1,000 cases)						10,704,400	11,067,280	11,067,280	11,453,280	11,453,280	11,837,092	11,837,092	12,233,765
(17) Total Monetary Cost [= (15) + (16)]						640,985,318	645,242,476	661,851,761	666,364,615	683,556,993	688,028,529	605,646,582	608,294,043
(18) Fatal Benefit Change Factors							1.007		1.007		1.007		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 7/1/2019).
- 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) = $52 \times (2) \times (6) \times$ [Page 2, (14)] for Spouses and Orphans and = $52 \times (2) \times (3) \times (6) \times$ [Page 2, (30)] for All Others Dependents
- (8), (10), (12), (14) = $52 \times (2) \times (6) \times$ [Page 2, (15)] for Spouses and Orphans and = $52 \times (2) \times (3) \times (6) \times$ [Page 2, (31)] for All Others Dependents
- (16) = 8 x SAWW
- (18): Ratio of (17) for later date to (17) for earlier date.

IV 000010

IV 000011

Determination of the Average Weekly Survivor Benefit for Fatalities

Fatal: Spouse and Orphans - Effective 10/1/2018

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	66.67%
(2)	Min Weekly Compensation	110.00
(3)	Max Weekly Compensation	1,383.41
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2018	1,203.82

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%	107.00	110.00
165.00 - 2,075.12	Actual Wage x Comp. Rate	0.15	1.70	88.29%	76.94%	1,048.99	699.33
2,075.12 - over	Statutory Maximum	1.70	over	10.52%	22.96%	2,628.27	1,383.41

(12) Average Weekly Benefit **764.23**

	Effects of SAWW Change			
	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(13) Starting date of 12 month period for AIWWW				
(14) Benefits Effective Average Weekly Benefits	10/1/2017 759.39	10/1/2018 784.86	10/1/2019 811.34	10/1/2020 714.05
(15) Benefits Effective Average Weekly Benefits	10/1/2018 764.23	10/1/2019 789.98	10/1/2020 816.41	10/1/2021 716.85
(16) Fatal: Spouse and Orphans Benefit Change Factors	1.006	1.007	1.006	1.004

Fatal: All Others - Effective 10/1/2018

(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 10/1/2018	1,203.82

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%	68.11	45.41
120.00 - over	Statutory Maximum	0.10	over	99.36%	99.96%	1,211.15	80.00

(28) Average Weekly Benefit **79.78**

	Effects of SAWW Change			
	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(29) Starting date of 12 month period for AIWWW				
(30) Benefits Effective Average Weekly Benefits	10/1/2017 79.78	10/1/2018 79.79	10/1/2019 79.80	10/1/2020 79.92
(31) Benefits Effective Average Weekly Benefits	10/1/2018 79.78	10/1/2019 79.79	10/1/2020 79.80	10/1/2021 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
 7/1/2020

Section IV-B
 Exhibit 2

Determination of the Average Weekly Benefit for Permanent Totals

Permanent Total - Effective 10/1/2018

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	66.67%
(2)	Min Weekly Compensation	276.68
(3)	Max Weekly Compensation	1,383.41
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2018	1,203.82

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	415.02	Statutory Minimum	0.00	0.35	6.21%	1.46%	282.12	276.68
415.02	2,075.12	Actual Wage x Comp. Rate	0.35	1.70	83.27%	75.59%	1,092.71	728.47
2,075.12	over	Statutory Maximum	1.70	over	10.52%	22.96%	2,628.27	1,383.41

(12) Average Weekly Benefit **769.27**

	Effects of SAWW Change			
	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(13) Starting date of 12 month period for AIWWW	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(14) Benefits Effective	10/1/2017	10/1/2018	10/1/2019	10/1/2020
Average Weekly Wage Loss Benefit	763.87	789.54	816.24	843.59
(15) Benefits Effective	10/1/2018	10/1/2019	10/1/2020	10/1/2021
Average Weekly Wage Loss Benefit	769.27	795.26	821.91	849.46
(16) Permanent Total Wage Loss Benefit Change Factors	1.007	1.007	1.007	1.007
(17) Specific Injury Benefits				
SAWW Effect on Specific Injury Benefits	1.034	1.035	1.034	1.034
(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	1.008	1.008	1.008	1.008
= [(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 10/1/2019 = SAWW 10/1/2019 / SAWW 10/1/2018 = 1.035 = 1,431.66 / 1,383.41
- (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
 7/1/2020

Section IV-B
 Exhibit 3

Determination of the Average Weekly Benefit for Permanent Partials

Permanent Partial - Effective 10/1/2018

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	37.20%
(2)	Min Weekly Compensation	0.00
(3)	Max Weekly Compensation	1,037.56
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2018	1,203.82
(5)	SAWW effective 10/1/2018	1,383.41

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 - 2,789.13	Actual Wage x Comp. Rate	0.00	2.30	97.00%	91.62%	1,137.03	422.98
2,789.13 - 4,550.69	Statutory Maximum	2.30	3.80	2.85%	7.72%	3,263.42	1037.56
4,550.69 - 7,281.11	Statutorily Reduced	3.80	6.05	0.15%	0.64%	5,189.86	794.67
7,281.11 over	Exceeds Statutory Limit	6.05	over	0.00%	0.02%	8,037.28	0.00

(13) Average Weekly Benefit **441.01**

	Effects of SAWW Change			
	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(14) Starting date of 12 month period for AIWWW	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(15) Benefits Effective	10/1/2017	10/1/2018	10/1/2019	10/1/2020
Average Weekly Wage Loss Benefit	439.84	454.60	469.88	485.63
(16) Benefits Effective	10/1/2018	10/1/2019	10/1/2020	10/1/2021
Average Weekly Wage Loss Benefit	441.01	455.83	471.11	486.89
(17) Permanent Partial Wage Loss Benefit Change Factors	1.003	1.003	1.003	1.003
(18) Specific Injury Benefits				
SAWW Effect on Specific Injury Benefits	1.034	1.035	1.034	1.034
(19) Permanent Partial Healing Period				
Effect on Healing Period Benefits	1.005	1.005	1.005	1.005
(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	1.012	1.012	1.012	1.012
= [(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 10/1/2019 = 1.035 = 1,431.66 / 1,383.41
- (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
 7/1/2020

Section IV-B
 Exhibit 4

Determination of the Average Weekly Benefit for Temporary Totals

Temporary Total - Effective 10/1/2018

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	60.00%
(2)	Min Weekly Compensation	276.68
(3)	Max Weekly Compensation	1,383.41
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2018	1,203.82

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	276.68	Actual Wage	0.00	0.25	2.99%	0.48%	191.10	191.10
276.68	461.14	Statutory Minimum	0.25	0.40	5.58%	1.87%	403.01	276.68
461.14	2,305.68	Actual Wage x Comp. Rate	0.40	1.90	84.49%	81.12%	1,155.79	693.47
2,305.68	over	Statutory Maximum	1.90	over	6.93%	16.53%	2,870.86	1,383.41

(12) Average Weekly Benefit **703.02**

	Effects of SAWW Change			
	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(13) Starting date of 12 month period for AIWW	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(14) Benefits Effective Average Weekly Benefits	10/1/2017 699.29	10/1/2018 722.77	10/1/2019 747.15	10/1/2020 772.19
(15) Benefits Effective Average Weekly Benefits	10/1/2018 703.02	10/1/2019 726.73	10/1/2020 751.08	10/1/2021 776.25
(16) Temporary Total Benefit Change Factors	1.005	1.005	1.005	1.005

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:

	10/1/2017	10/1/2018	10/1/2019	10/1/2020	10/1/2021
(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	\$1,338.05	\$1,383.41	\$1,431.66	<i>\$1,479.64</i>	<i>\$1,529.22</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	\$267.61	\$276.68	\$286.33	<i>\$295.93</i>	<i>\$305.84</i>
Maximum Weekly Benefit	\$1,338.05	\$1,383.41	\$1,431.66	<i>\$1,479.64</i>	<i>\$1,529.22</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	\$267.61	\$276.68	\$286.33	<i>\$295.93</i>	<i>\$305.84</i>
Maximum Weekly Benefit	\$1,338.05	\$1,383.41	\$1,431.66	<i>\$1,479.64</i>	<i>\$1,529.22</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	\$1,003.54	\$1,037.56	\$1,073.75	<i>\$1,109.73</i>	<i>\$1,146.92</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 000016

Section IV - Benefit Change Adjustments
 Subsection D - Massachusetts Data
 7/1/2020

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
 7/1/2020

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	3	12
3 Children	1	4	12
4 Children	1	5	12
More than 4 Children			
Orphans with Sibling(s)	15	2.5	12
Summary			
Other Dependents (No Spouse)	41	1	62
1 Parent	91	2	58
2 Parents	7	1	37
Sibling	2	2	31
Other			
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)
10/1/2017	4/1/16 to 4/1/17	10/1/2016	1,338.05		1,338.05	10/1/17 to 10/1/18	1,164.03
10/1/2018	4/1/17 to 4/1/18	10/1/2017	1,383.41		1,383.41	10/1/18 to 10/1/19	1,203.82
10/1/2019	4/1/18 to 4/1/19	10/1/2018	1,431.66		1,431.66	10/1/19 to 10/1/20	1,244.16
10/1/2020	4/1/19 to 4/1/20	10/1/2019		1.034	1,479.64	10/1/20 to 10/1/21	1,285.86
10/1/2021	4/1/20 to 4/1/21	10/1/2020		1.034	1,529.22	10/1/21 to 10/1/22	1,328.95

Notes:

(4): Section V-G, Exhibit 2.

(5): 3.4% Estimated Annual Trend in SAWW, Section V-A, Exhibit 1.

(6): For SAWW Effective Date 10/1/2017 - 10/1/2019, (6) = (4)

For SAWW Effective Date 10/1/2020 & 10/1/2021, (6) = (5) x (6 from Prior Period)

(8): 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 Period 10/1/18 to 10/1/19, (8) is the product of .827 and the average of the SAWWs effective 10/1/2019 and 10/1/2020, respectively.

For the AIWWW Period 10/1/19 to 10/1/20, (8) is the product of .827 and the average of the SAWWs effective 10/1/2020 and 10/1/2021, respectively.

For the AIWWW Periods 10/1/20 to 10/1/21 and 10/1/21 to 10/1/22, (8) = (5) x (8 from Prior Period).

Historical Relationship of .827 for the ratio of AIWWW to SAWW is selected based on DCI data.

4/1/1996: SAWW = 648, AIWWW = 536

4/1/1994: SAWW = 595, AIWWW = 492

IV 000019

Section IV - Benefit Change Adjustments
 Subsection D - Massachusetts Data
 7/1/2020

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	2009	1,354,447	1.063	1,439,666	6,993,542	1.063	7,433,560	8,873,226	
Death	2010	1,811,505	1.063	1,926,408	4,442,116	1.063	4,723,878	6,650,286	
Death	2011	381,438	1.060	404,198	7,241,840	1.060	7,673,951	8,078,149	
Death	2012	1,909,719	1.055	2,014,377	8,207,921	1.055	8,657,740	10,672,117	
Death	2013	1,592,212	1.053	1,675,963	8,257,420	1.053	8,691,762	10,367,724	
Total Death		7,049,321		7,460,612	35,142,839		37,180,891	44,641,502	1.51%
Permanent Total	2009	35,820,594	1.068	38,269,478	0	1.068	0	38,269,478	
Permanent Total	2010	32,315,172	1.069	34,539,193	0	1.069	0	34,539,193	
Permanent Total	2011	41,303,252	1.064	43,932,331	0	1.064	0	43,932,331	
Permanent Total	2012	58,086,200	1.057	61,380,655	0	1.057	0	61,380,655	
Permanent Total	2013	56,457,147	1.054	59,492,166	0	1.054	0	59,492,166	
Total Permanent Total		223,982,365		237,613,822	0		0	237,613,822	8.05%
Permanent Partial	2009	78,570,735	1.111	87,261,282	116,945,244	1.111	129,880,316	217,141,598	
Permanent Partial	2010	81,967,235	1.112	91,116,367	129,328,575	1.112	143,764,150	234,880,517	
Permanent Partial	2011	86,787,257	1.102	95,670,160	124,177,025	1.102	136,886,869	232,557,029	
Permanent Partial	2012	74,816,277	1.090	81,562,927	118,198,273	1.090	128,856,948	210,419,875	
Permanent Partial	2013	72,384,170	1.085	78,527,599	124,896,982	1.085	135,497,308	214,024,907	
Total Permanent Partial		394,525,674		434,138,335	613,546,099		674,885,590	1,109,023,925	37.59%
Temporary Total	2009	27,258,036	1.041	28,386,528	57,477,123	1.041	59,856,695	88,243,222	
Temporary Total	2010	30,245,454	1.042	31,514,477	63,408,679	1.042	66,069,148	97,583,626	
Temporary Total	2011	32,011,447	1.040	33,279,236	77,272,315	1.040	80,332,627	113,611,863	
Temporary Total	2012	36,643,350	1.036	37,969,449	72,651,696	1.036	75,280,913	113,250,362	
Temporary Total	2013	31,778,602	1.034	32,871,701	83,369,545	1.034	86,237,235	119,108,937	
Total Temporary Total		157,936,889		164,021,391	354,179,358		367,776,618	531,798,010	18.03%
(11) Total Indemnity		783,494,249		843,234,160	1,002,868,296		1,079,843,099	1,923,077,259	65.19%

- (12) Aggregate Financial Policy Year Call, Indemnity Fifth to Ultimate Development Factor Paid + Case 1.047
 (13) Tail Development Attributed to Likely to Develop Claims 0.8
 (14) Percentage Likely to Develop 0.438
 (15) Indemnity Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(12) - 1.0] \times (13) \} / (14)$ 1.085
 (16) Indemnity Not Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(12) - 1.0] \times [1.0 - (13)] \} / [1.0 - (14)]$ 1.017

Notes:

- (3), (6): Unit Statistical Plan data, excluding Large Deductibles.
 (4), (7): Section IV - A, Exhibit 1
 (10) = (9), Total / Page 2, Column (9), Total Medical & Indemnity
 (12) = $1.024 \times 1.014 \times 1.008$ where 1.024 is the loss development factor from Section II - B, Exhibit 1, 1.014 is the tail factor from Section II - C, Exhibit 2, Page 1.
 and 1.008 is the escalation factor from Section II - D, Exhibit 2, Page 1.
 (14) = (5), Total Indemnity / (9), Total Indemnity

IV 000020

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	2009	777,286	1.002	778,624	378,555	1.002	379,207	1,157,830	
Death	2010	63,834	1.000	63,834	176,427	1.000	176,427	240,261	
Death	2011	13,739	1.000	13,739	271,119	1.000	271,119	284,858	
Death	2012	233,322	1.000	233,322	334,710	1.000	334,710	568,032	
Death	2013	277,312	1.000	277,312	593,619	1.000	593,619	870,931	
Total Death		1,365,493		1,366,831	1,754,430		1,755,082	3,121,912	0.11%
Permanent Total	2009	19,379,593	1.002	19,412,946	0	1.002	0	19,412,946	
Permanent Total	2010	31,951,308	1.000	31,951,308	0	1.000	0	31,951,308	
Permanent Total	2011	29,341,328	1.000	29,341,328	0	1.000	0	29,341,328	
Permanent Total	2012	42,854,830	1.000	42,854,830	0	1.000	0	42,854,830	
Permanent Total	2013	27,720,398	1.000	27,720,398	0	1.000	0	27,720,398	
Total Permanent Total		151,247,457		151,280,810	0		0	151,280,810	5.13%
Permanent Partial	2009	35,903,999	1.002	35,965,791	50,699,935	1.002	50,787,191	86,752,982	
Permanent Partial	2010	28,038,664	1.000	28,038,664	51,642,011	1.000	51,642,011	79,680,675	
Permanent Partial	2011	40,439,521	1.000	40,439,521	47,591,743	1.000	47,591,743	88,031,264	
Permanent Partial	2012	32,686,497	1.000	32,686,497	43,255,190	1.000	43,255,190	75,941,687	
Permanent Partial	2013	27,412,480	1.000	27,412,480	49,920,834	1.000	49,920,834	77,333,314	
Total Permanent Partial		164,481,161		164,542,953	243,109,713		243,196,969	407,739,922	13.82%
Temporary Total	2009	13,192,788	1.002	13,215,493	45,467,853	1.002	45,546,104	58,761,598	
Temporary Total	2010	14,733,512	1.000	14,733,512	48,490,007	1.000	48,490,007	63,223,519	
Temporary Total	2011	16,302,716	1.000	16,302,716	55,255,968	1.000	55,255,968	71,558,684	
Temporary Total	2012	17,045,582	1.000	17,045,582	55,948,615	1.000	55,948,615	72,994,197	
Temporary Total	2013	12,953,904	1.000	12,953,904	59,472,525	1.000	59,472,525	72,426,429	
Total Temporary Total		74,228,502		74,251,207	264,634,968		264,713,219	338,964,427	11.49%
Medical Only	2009	0	1.002	0	23,928,366	1.002	23,969,547	23,969,547	
Medical Only	2010	0	1.000	0	25,549,114	1.000	25,549,114	25,549,114	
Medical Only	2011	0	1.000	0	25,605,549	1.000	25,605,549	25,605,549	
Medical Only	2012	0	1.000	0	25,210,465	1.000	25,210,465	25,210,465	
Medical Only	2013	0	1.000	0	25,628,010	1.000	25,628,010	25,628,010	
Total Medical Only		0		0	125,921,504		125,962,685	125,962,685	4.27%
(11) Total Medical		391,322,613		391,441,801	635,420,615		635,627,955	1,027,069,756	34.81%
(12) Total Medical & Indemnity		1,174,816,862		1,234,675,961	1,638,288,911		1,715,471,054	2,950,147,015	

- (13) Medical Only fraction of Total Medical 12.26%
- (14) Aggregate Financial Policy Year Call, Medical Fifth to Ultimate Development Factor Paid + Cash 1.016
- (15) Tail Development Attributed to Likely to Develop Claims 0.8
- (16) Percentage Likely to Develop 0.381
- (17) Medical Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(14) - 1.0] \times (15) \} / (16)$ 1.033
- (18) Medical Not Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(14) - 1.0] \times [1.0 - (15)] \} / [1.0 - (16)]$ 1.005
- (19) Indemnity Likely Weight at 5th Report 28.58%
- (20) Indemnity Not Likely Weight at 5th Report 36.60%
- (21) Medical Likely Weight at 5th Report 13.27%
- (22) Medical Not Likely Weight at 5th Report 21.55%

Notes:

- (3), (6): Unit Statistical Plan data, excluding Large Deductibles.
- (4), (7): Section IV - A, Exhibit 1
- (10) = (9), Total / (9), Total Medical & Indemnity
- (13) = (10), Total Medical Only / (10), Total Medical
- (14) = 0.999×1.017 where 0.999 is the loss development factor from Section II - B, Exhibit 1, 1.017 is the tail factor from Section II - C, Exhibit 2, Page 1.
- (16) = (5), Total Medical / (9), Total Medical
- (19) = Page 1, (5), Total Indemnity / (9), Total Medical & Indemnity
- (20) = Page 1, (8), Total Indemnity / (9), Total Medical & Indemnity
- (21) = (5), Total Medical / (9), Total Medical & Indemnity
- (22) = (8), Total Medical / (9), Total Medical & Indemnity

IV 000021

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	2009	1,439,666	1.085	1,561,953	7,433,560	1.017	7,556,826	9,118,779	1.50%
Death	2010	1,926,408	1.085	2,090,040	4,723,878	1.017	4,802,211	6,892,251	
Death	2011	404,198	1.085	438,531	7,673,951	1.017	7,801,203	8,239,734	
Death	2012	2,014,377	1.085	2,185,481	8,657,740	1.017	8,801,306	10,986,787	
Death	2013	1,675,963	1.085	1,818,321	8,691,762	1.017	8,835,891	10,654,212	
Total Death		7,460,612		8,094,326	37,180,891		37,797,437	45,891,763	
Permanent Total	2009	38,269,478	1.085	41,520,137	0	1.017	0	41,520,137	8.44%
Permanent Total	2010	34,539,193	1.085	37,472,996	0	1.017	0	37,472,996	
Permanent Total	2011	43,932,331	1.085	47,663,999	0	1.017	0	47,663,999	
Permanent Total	2012	61,380,655	1.085	66,594,407	0	1.017	0	66,594,407	
Permanent Total	2013	59,492,166	1.085	64,545,507	0	1.017	0	64,545,507	
Total Permanent Total		237,613,822		257,797,046	0		0	257,797,046	
Permanent Partial	2009	87,261,282	1.085	94,673,367	129,880,316	1.017	132,034,038	226,707,405	37.86%
Permanent Partial	2010	91,116,367	1.085	98,855,908	143,764,150	1.017	146,148,099	245,004,007	
Permanent Partial	2011	95,670,160	1.085	103,796,507	136,886,869	1.017	139,156,777	242,953,283	
Permanent Partial	2012	81,562,927	1.085	88,490,987	128,856,948	1.017	130,993,700	219,484,687	
Permanent Partial	2013	78,527,599	1.085	85,197,835	135,497,308	1.017	137,744,173	222,942,008	
Total Permanent Partial		434,138,335		471,014,603	674,885,590		686,076,787	1,157,091,390	
Temporary Total	2009	28,386,528	1.085	30,797,716	59,856,695	1.017	60,849,260	91,646,976	18.06%
Temporary Total	2010	31,514,477	1.085	34,191,358	66,069,148	1.017	67,164,731	101,356,088	
Temporary Total	2011	33,279,236	1.085	36,106,017	80,332,627	1.017	81,664,732	117,770,749	
Temporary Total	2012	37,969,449	1.085	41,194,623	75,280,913	1.017	76,529,248	117,723,871	
Temporary Total	2013	32,871,701	1.085	35,663,866	86,237,235	1.017	87,667,252	123,331,118	
Total Temporary Total		164,021,391		177,953,579	367,776,618		373,875,223	551,828,803	
(11) Total Indemnity		843,234,160		914,859,555	1,079,843,099		1,097,749,448	2,012,609,003	65.86%

IV 000022

Notes:

- (3): Exhibit 1, Page 1, Column (5)
- (4): Exhibit 1, Page 1, Row (15)
- (6): Exhibit 1, Page 1, Column (8)
- (7): Exhibit 1, Page 1, Row (16)
- (10) = (9), Total / Page 2, Column (9), Total Medical & Indemnity

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	2009	778,624	1.033	804,620	379,207	1.005	381,156	1,185,776	
Death	2010	63,834	1.033	65,965	176,427	1.005	177,334	243,299	
Death	2011	13,739	1.033	14,198	271,119	1.005	272,513	286,710	
Death	2012	233,322	1.033	241,112	334,710	1.005	336,431	577,543	
Death	2013	277,312	1.033	286,571	593,619	1.005	596,670	883,241	
Total Death		1,366,831		1,412,466	1,755,082		1,764,103	3,176,569	0.10%
Permanent Total	2009	19,412,946	1.033	20,061,102	0	1.005	0	20,061,102	
Permanent Total	2010	31,951,308	1.033	33,018,092	0	1.005	0	33,018,092	
Permanent Total	2011	29,341,328	1.033	30,320,971	0	1.005	0	30,320,971	
Permanent Total	2012	42,854,830	1.033	44,285,659	0	1.005	0	44,285,659	
Permanent Total	2013	27,720,398	1.033	28,645,921	0	1.005	0	28,645,921	
Total Permanent Total		151,280,810		156,331,745	0		0	156,331,745	5.12%
Permanent Partial	2009	35,965,791	1.033	37,166,610	50,787,191	1.005	51,048,255	88,214,865	
Permanent Partial	2010	28,038,664	1.033	28,974,814	51,642,011	1.005	51,907,469	80,882,282	
Permanent Partial	2011	40,439,521	1.033	41,789,708	47,591,743	1.005	47,836,381	89,626,089	
Permanent Partial	2012	32,686,497	1.033	33,777,828	43,255,190	1.005	43,477,537	77,255,364	
Permanent Partial	2013	27,412,480	1.033	28,327,723	49,920,834	1.005	50,177,444	78,505,167	
Total Permanent Partial		164,542,953		170,036,682	243,196,969		244,447,085	414,483,767	13.56%
Temporary Total	2009	13,215,493	1.033	13,656,730	45,546,104	1.005	45,780,227	59,436,957	
Temporary Total	2010	14,733,512	1.033	15,225,432	48,490,007	1.005	48,739,262	63,964,694	
Temporary Total	2011	16,302,716	1.033	16,847,028	55,255,968	1.005	55,540,003	72,387,031	
Temporary Total	2012	17,045,582	1.033	17,614,697	55,948,615	1.005	56,236,210	73,850,907	
Temporary Total	2013	12,953,904	1.033	13,386,407	59,472,525	1.005	59,778,234	73,164,641	
Total Temporary Total		74,251,207		76,730,292	264,713,219		266,073,936	342,804,229	11.22%
Medical Only	2009	0	1.033	0	23,969,547	1.005	24,092,759	24,092,759	
Medical Only	2010	0	1.033	0	25,549,114	1.005	25,680,445	25,680,445	
Medical Only	2011	0	1.033	0	25,605,549	1.005	25,737,170	25,737,170	
Medical Only	2012	0	1.033	0	25,210,465	1.005	25,340,055	25,340,055	
Medical Only	2013	0	1.033	0	25,628,010	1.005	25,759,747	25,759,747	
Total Medical Only		0		0	125,962,685		126,610,177	126,610,177	4.14%
(11) Total Medical		391,441,801		404,511,186	635,627,955		638,895,302	1,043,406,487	34.14%
(12) Total Medical & Indemnity		1,234,675,961		1,319,370,740	1,715,471,054		1,736,644,749	3,056,015,490	

- (13) Medical Only fraction of Total Medical 12.13%
- (14) Indemnity Likely to Develop at Ultimate 29.94%
- (15) Indemnity Not Likely to Develop at Ultimate 35.92%
- (16) Medical Likely to Develop at Ultimate 13.24%
- (17) Medical Not Likely to Develop at Ultimate 20.91%

Notes:

- (3): Exhibit 1, Page 2, Column (5)
- (4): Exhibit 1, Page 2, Row (17)
- (6): Exhibit 1, Page 2, Column (8)
- (7): Exhibit 1, Page 2, Row (18)
- (10) = (9), Total / Total Medical & Indemnity
- (12) = (11), Total Medical + Page 1, (11) Total Indemnity
- (13) = (10), Total Medical Only / (10), Total Medical

IV 000023

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 2013	Prosp. Eff. Period	1.036	1.029	1.013	1.029		1.000	
PY 2014	Prosp. Eff. Period	1.032	1.026	1.012	1.026		1.000	
PY 2015	Prosp. Eff. Period	1.028	1.022	1.010	1.022		1.000	
PY 2016	Prosp. Eff. Period	1.024	1.019	1.009	1.019		1.000	
PY 2017	Prosp. Eff. Period	1.019	1.015	1.008	1.015		1.000	
CPY 2016_07	Prosp. Eff. Period							1.008
CPY 2017_07	Prosp. Eff. Period							1.006
CPY 2018_07	Prosp. Eff. Period							1.004
Prior Eff. Period (using benefit level projections from prior filing)	Prosp. Eff. Period					1.009	1.000	1.007

IV 000024

Notes:

All time periods refer to Policy Years.

Example: PY 2017 to Prosp. Eff. Period for Indemnity Permanent Partial = 1.008 = 1.014 / 1.006

where 1.014 is the Index Factor of Prosp. Eff. Period and 1.006 is the Index Factor of PY 2017 for Indemnity Permanent Partial, from Exhibit 2.

USL&HW Benefit Level Changes and Weights

Death											
Benefit Level Change	10/1/2012	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	10/1/2018	10/1/2019	10/1/2020	10/1/2021	Weighted Average Benefit Level
Cumulative Benefit Level Change	1.000	1.003	1.007	1.011	1.015	1.020	1.025	1.030	1.036	1.041	
Time Period											
PY 2013	0.356	0.627	0.017								1.002
PY 2014		0.383	0.607	0.010							1.006
PY 2015			0.355	0.639	0.006						1.010
PY 2016				0.372	0.622	0.005					1.014
PY 2017					0.321	0.675	0.004				1.019
CPY 2016_07				0.016	0.460	0.524					1.018
CPY 2017_07					0.025	0.457	0.518				1.023
CPY 2018_07						0.025	0.457	0.519			1.028
Prior Eff. Period						0.025	0.457	0.519			1.028
Prosp. Eff. Period								0.025	0.457	0.518	1.038

Indemnity All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2018 (using benefit level projections from prior filing).

Date of Change	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	1.002	1.003	1.002	1.002	1.002	1.002	1.002	
Cumulative Level Change	1.000	1.002	1.005	1.007	1.009	1.011	1.013	1.015	1.014

Medical All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2018 (using benefit level projections from prior filing).

Date of Change	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	1.000	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 7/1/2018 (using benefit level projections from prior filing).

Date of Change	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	1.001	1.002	1.001	1.001	1.001	1.001	1.001	
Cumulative Level Change	1.000	1.001	1.003	1.004	1.005	1.006	1.007	1.008	1.008

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 2013	1.002	1.002	1.001	1.002	1.001	1.000	1.001
PY 2014	1.006	1.006	1.002	1.006	1.004	1.000	1.002
PY 2015	1.010	1.009	1.004	1.009	1.006	1.000	1.004
PY 2016	1.014	1.012	1.005	1.012	1.008	1.000	1.005
PY 2017	1.019	1.016	1.006	1.016	1.011	1.000	1.006
CPY 2016_07	1.018	1.015	1.006	1.015	1.011	1.000	1.006
CPY 2017_07	1.023	1.019	1.008	1.019	1.014	1.000	1.008
CPY 2018_07	1.028	1.023	1.010	1.023	1.017	1.000	1.010
Prior Eff. Period	1.028	1.023	1.010	1.023	1.017	1.000	1.010
Prosp. Eff. Period	1.038	1.031	1.014	1.031	1.023	1.000	1.014

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.

IV 000026

Section IV - Benefit Change Adjustments
 Subsection F - Effects of USL&HW Benefit Changes
 7/1/2020

Section IV - F
 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)
10/1/2012	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	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2018	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2019	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2020	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2021	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%

Notes:

Values prior to 10/1/2018 are from NCCI's Annual Statistical Bulletin, 2019 Edition, Exhibit 3.
 Changes for 10/1/2018 - 10/1/2021 are assumed to be the same as 10/1/2017.

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, 2020), 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 2016 and 2017) to July 1, 2021, 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 -2.7% per year for indemnity losses, and

V 000002

Section V - Trend
Subsection A - Summary
7/1/2020

Section V - A
Page 2

-3.3% per year for medical losses.¹ The indicated trend factors and their key components are summarized in Section V-A Exhibit 1, Page 1.

Indemnity Net Trend	-2.7%
Medical Net Trend	-3.3%

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 2.6% and 2.3% for indemnity and lost-time medical benefits, respectively and 2.3% 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 4.2% for medical-only claims. Finally, we are projecting an increase of 3.4% annually in average wages.

Trend	Indemnity	Lost-Time Medical	Medical Only
Severity	2.6%	2.3%	2.3%
Frequency	-2.0%	-2.0%	-4.2%
SAWW	3.4%		
Net	-2.7%	-3.3%	

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.

¹ Based on NCCI's latest pending and approved filings as of November 22, 2019, with respect to medical net trend, nineteen NCCI states filed higher medical trends than the WCRIBMA is proposing in this filing. With respect to indemnity net trend, nine NCCI states filed higher indemnity trends than the WCRIBMA is proposing in this filing.

General Methodology

The WCRIBMA has separately calculated claim severity trends (for indemnity benefits, for medical on lost-time claims, and for medical only claims); 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, 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. In this filing we are relying on paid data for measuring our loss trends. Paid data tends to reduce the volatility in the development of ultimate severities and therefore results in better fits of the data, higher credibility and better predictive power. Due to higher credibility of the Massachusetts fitted data there is also less reliance on the complement of credibility. We performed regressions using data series of varying lengths, spanning from five to ten policy years, all ending with Policy Year 2017. A summary of the results is shown in the attached exhibits, Section V-A. The

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.

V 000004

Section V - Trend
Subsection A - Summary
7/1/2020

Section V - A
Page 4

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,³ we assigned higher credibility to the indicated trend if the trend line more closely fit the data, and a 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 frequency trends, claim severity trends, and average weekly wage trends, we looked to longer term (i.e., 15 years) Massachusetts trends to provide the complement to the Massachusetts 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 shortest series with the best fit of these six trend indications for each component of the net 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.

³ Venter, Gary, "Classical Partial Credibility with Application to Trend," *PCAS LXXIII* (the "Venter Paper") (1986) pp. 27-51.

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 and its credibility parameter (Row (1)), applying the credibility parameter to each based on how well the indicated trend fits the underlying data (Row (10), Exhibits 2 and 3), and applying the complement of the credibility to the trend indications that are based on longer data series (Row (3)). 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 (Row (7)). 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 (Row (10)).

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 2017. 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, the LOGEST function returns statistics that describes an exponential curve matching known data points.

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 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 (10). 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

V 000007

Section V - Trend
Subsection A - Summary
7/1/2020

Section V - A
Page 7

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 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, claim severity and average weekly wage. The calculations of the annual trend rates from these complementary data series are documented in Section V-B (frequency), Sections V-C (indemnity severity), Section V-D (medical severity) and Section V-

G (average weekly wage), and use the same exponential fit function (LOGEST) 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 is changing the severity complement⁴ from a countrywide severity trend to one more specific to Massachusetts economic cycles and business environment. The WCRIBMA expects trends observed over a longer period of time (i.e., 15 years) using Massachusetts data will provide useful information related to variation in the claim data resulting from the Great Recession of 2008 and the ensuing economic recovery specific to Massachusetts⁵. The 15 years of severities and supporting information are provided in Section V-C and V-D.

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 selected a long-term Massachusetts trend as the complement of credibility for the historical Massachusetts frequency and

⁴ The prior complement relied on adjusted NCCI severities. NCCI no longer calculates the on-level factors previously used for the adjustment.

⁵ According to Massachusetts Labor Market Statistics, <https://www.mass.gov/find-other-labor-market-information> (January 2001 to October 2019), Massachusetts experienced lower unemployment rates than the U.S. as a whole during the 2008 recession and recovered more quickly (higher participation rates).

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 =

$[Z] \times$ [indicated annual trend based on historical n-years of Massachusetts data]

+ $[1.0 \text{ minus } Z] \times$ [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. In Exhibit 1, we demonstrate the selection process of choosing the shortest series of Massachusetts trend with the greatest credibility.

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).

V 000010

Section V - Trend
Subsection A - Summary
7/1/2020

Section V - A
Page 10

Unit Statistical Plan Data are available for policies written through December 2017. 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 2017, for example, includes all policies with inception dates between January 1, 2017 and December 31, 2017. For policy year 2017, the average policy inception date is assumed to be July 1, 2017 and the average accident date is assumed to be January 1, 2018.

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.⁶ These successive reports are compiled in order to evaluate each policy year at various maturities. This in turn enables us to

⁶ 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.

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, we use the data for all policy years at tenth report in the interest of not adding unnecessary complexity to the filing.

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 loss development factors in Section II - Loss Development used to determine the overall indication, paid data relies on two years of data to calculate age-to-age factors and paid plus case relies on five years of data.

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 describe 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 LOGEST 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 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 2010 policy year were handled and reported based on the benefits in effect at that time. Similarly, claims from the 2017 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 Section IV of the filing and their impact should not be reflected here. Therefore, before the Unit Statistical 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-C and V-D also display the indicated loss severity trend based on an exponential fit to fifteen years of Massachusetts data, calculated using the loss severities as shown, and the standard (LOGEST) function in Microsoft Excel. This long-term loss severity trend is used as the complement of credibility in Section V-A.

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.

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.⁷

As with claim counts and frequency, we have consistently developed the payrolls to tenth report.

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.

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 2017 distribution of payrolls by classification, the weighted average of the current rates is \$0.855, while using the 2003 distribution of payrolls by

⁷ We have used the actual values for the state average weekly wage in the corresponding periods, as opposed to utilizing a smoothed value.

classification against the same current rates produces an average rate of \$.991. 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, Section IX) 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 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 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. With regards to the Average Weekly Earnings, 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.

Specifically, the selected indices are:

V 000018

Section V - Trend
Subsection A - Summary
7/1/2020

Section V - A
Page 18

Expense	Index
Average Weekly Earnings	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 2017, Exhibit 2, Page 4 for calendar year 2018, and weights from prior filings for all other years to derive the overall average 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 2018 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.

Paid Trend Summary

	Indemnity				Medical								SAWW		
	Severity		Frequency		Lost-Time Medical				Medical Only				Trend	Credibility	
	Trend	Credibility	Trend	Credibility	Severity		Frequency		Severity		Frequency				
					Trend	Credibility	Trend	Credibility	Trend	Credibility	Trend	Credibility			
(1) Massachusetts Trend															
5 Year	2.5%	46.7%	-1.4%	59.7%	2.4%	40.0%	-1.4%	59.7%	2.5%	71.6%	-3.5%	39.5%	3.4%	100.0%	
6 Year	2.6%	67.9%	-1.5%	86.0%	2.5%	58.3%	-1.5%	86.0%	2.1%	91.9%	-3.8%	54.4%	3.3%	100.0%	
7 Year	2.6%	88.6%	-1.8%	98.6%	2.3%	75.2%	-1.8%	98.6%	2.3%	100.0%	-4.2%	53.5%	3.3%	100.0%	
8 Year	2.9%	99.6%	-2.0%	100.0%	2.5%	89.7%	-2.0%	100.0%	2.3%	100.0%	-4.5%	57.5%	3.0%	100.0%	
9 Year	2.6%	100.0%	-1.6%	80.0%	2.1%	84.3%	-1.6%	80.0%	2.2%	100.0%	-4.3%	60.3%	2.9%	100.0%	
10 Year	2.5%	100.0%	-1.5%	85.2%	2.2%	94.1%	-1.5%	85.2%	1.8%	100.0%	-4.2%	65.7%	3.0%	100.0%	
(2) Selected Trend	2.6%		-2.0%		2.2%		-2.0%		2.3%		-4.2%		3.4%		
(3) 15 Year Massachusetts Complement of Credibility	2.8%		-1.9%		2.5%		-1.9%		2.3%		-4.2%		2.7%		
(4) Credibility Weighted Trend	2.6%		-2.0%		2.3%		-2.0%		2.3%		-4.2%		3.4%		

	Lost-Time Medical	Medical Only
(5) Medical Loss Trend	0.2%	-2.0%
(6) Fraction of Total Medical	87.9%	12.1%
(7) Total Medical Loss Trend	-0.1%	

	Indemnity	Medical
(8) Total Loss Trend	0.5%	-0.1%
(9) SAWW Trend	3.4%	3.4%
(10) Total Net Trend	-2.7%	-3.3%

- Notes:
- (1), (3): Section V, Exhibit 2 Severity; Exhibit 3 Frequency and SAWW.
 - (2): Selection based on the fit with the highest credibility and least number of years.
 - (4) = Credibility Weighted 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

V 000019

Indemnity Paid Severity Trend Calculation

Policy Year	Massachusetts Indemnity 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
2008	25,214											24,978	55,688
2009	26,284											25,600	467,848
2010	25,235							25,751	266,830	25,493	625,297	26,237	1,003,663
2011	26,834					26,808	694	26,499	112,195	26,819	226	26,889	3,038
2012	27,376			27,489	12,751	27,507	17,140	27,269	11,432	27,508	17,455	27,558	33,292
2013	27,410	28,304	799,698	28,211	641,929	28,224	662,816	28,061	424,066	28,214	647,529	28,244	695,866
2014	30,203	29,012	1,418,793	28,952	1,564,452	28,960	1,545,543	28,876	1,760,688	28,939	1,597,276	28,947	1,578,224
2015	29,773	29,737	1,242	29,713	3,566	29,715	3,338	29,715	3,338	29,682	8,132	29,667	11,168
2016	30,644	30,481	26,639	30,493	22,700	30,490	23,919	30,578	4,392	30,445	39,767	30,405	57,194
2017	30,789	31,243	206,643	31,295	256,102	31,284	245,842	31,466	458,968	31,227	191,918	31,161	139,056
(1)	Massachusetts Trend		2.5%		2.6%		2.6%		2.9%		2.6%		2.5%
(2)	n		5		6		7		8		9		10
(3)	s		904.25		790.81		707.01		712.03		752.23		711.08
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.50		6.00		6.50		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		4,372.77		3,027.43		2,319.32		2,094.63		2,039.36		1,810.97
(8)	Projected Value Prospective Period		34,062.19		34,272.22		34,230.66		34,787.02		34,121.74		33,963.06
(9)	CI/Projected Severity		0.13		0.09		0.07		0.06		0.06		0.05
(10)	Credibility - MA Trend (Z)		47%		68%		89%		100%		100%		100%
(11)	Complement of Credibility							2.8%					
(12)	Credibility Weighted Severity Trend		2.6%		2.7%		2.6%		2.9%		2.6%		2.5%

- 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 fifteen-year exponential fit to the MA Indemnity Paid + Case Severities. Section C, Exhibit 1, Page 3
 - (12) = [(1) x (10)] + [(11) x [1.0 - (10)]]

V 000020

Lost Time Medical Paid Severity Trend Calculation

Policy Year	Lost Time Medical 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
2008	9,623												
2009	10,500												
2010	9,971												
2011	10,501					10,436	4,246						
2012	10,598			10,635	1,319	10,679	6,487						
2013	10,532	10,926	155,166	10,896	132,533	10,928	156,617	10,887	125,858	10,964	186,531	10,942	168,384
2014	11,742	11,183	312,297	11,164	334,023	11,182	312,929	11,161	336,852	11,193	301,211	11,187	307,282
2015	11,494	11,446	2,273	11,438	3,081	11,443	2,577	11,443	2,577	11,427	4,476	11,438	3,098
2016	11,625	11,715	8,135	11,719	8,874	11,710	7,137	11,732	11,342	11,666	1,634	11,694	4,782
2017	11,890	11,991	10,236	12,007	13,828	11,982	8,594	12,028	18,992	11,909	381	11,956	4,418
(1)	Massachusetts Trend		2.4%		2.5%		2.3%		2.5%		2.1%		2.2%
(2)	n		5		6		7		8		9		10
(3)	s		403.36		351.30		315.78		298.33		336.26		323.57
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.50		6.00		6.50		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		1,950.58		1,344.89		1,035.91		877.61		911.64		824.08
(8)	Projected Value Prospective Period		13,007.08		13,073.89		12,987.75		13,124.82		12,802.29		12,921.10
(9)	CI/Projected Severity		0.15		0.10		0.08		0.07		0.07		0.06
(10)	Credibility - MA Trend (Z)		40%		58%		75%		90%		84%		94%
(11)	Complement of Credibility						2.5%						
(12)	Credibility Weighted Severity Trend		2.4%		2.5%		2.4%		2.5%		2.2%		2.3%

- 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 fifteen-year exponential fit to the MA Lost Time Medical Paid + Case Severities. Section D, Exhibit 1, Page 3.
 - (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

V 000021

Medical Only Paid 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
2008	819											785	1,148
2009	792									784	64	799	47
2010	797							797	0	801	17	814	269
2011	809					815	40	815	40	819	92	828	371
2012	848			838	97	834	201	834	202	836	139	843	24
2013	866	848	325	856	101	853	174	853	174	855	135	859	58
2014	850	869	365	874	586	873	501	873	501	873	529	874	578
2015	887	891	17	893	38	892	32	892	32	892	29	890	11
2016	906	913	55	912	41	913	54	913	54	912	36	906	0
2017	949	936	174	931	308	934	229	934	228	931	306	923	686
(1)	Massachusetts Trend		2.5%		2.1%		2.3%		2.3%		2.2%		1.8%
(2)	n		5		6		7		8		9		10
(3)	s		17.66		17.10		15.69		14.32		13.87		19.97
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.50		6.00		6.50		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		85.42		65.48		51.47		42.13		37.61		50.86
(8)	Projected Value Prospective Period		1,019.41		1,002.45		1,010.41		1,010.59		1,004.03		982.58
(9)	CI/Projected Severity		0.08		0.07		0.05		0.04		0.04		0.05
(10)	Credibility - MA Trend (Z)		72%		92%		100%		100%		100%		100%
(11)	Complement of Credibility						2.3%						
(12)	Credibility Weighted Severity Trend		2.4%		2.1%		2.3%		2.3%		2.2%		1.8%

- 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 fifteen-year exponential fit to the MA Medical Only Paid+Case Severities. Section D, Exhibit 2, Page 2.
 - (12) = [(1) x (10)] + [(11) x [1.0 - (10)]]

V 000022

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
2008	188.63											192	15
2009	184.60									191	46	190	26
2010	194.85							192	10	188	43	187	63
2011	188.39					186	5	188	0	185	10	184	18
2012	181.90			181	0	183	1	184	5	182	0	181	0
2013	179.16	178	1	179	0	180	0	180	2	179	0	179	0
2014	177.22	176	3	176	2	176	1	177	0	176	1	176	1
2015	169.96	173	9	173	10	173	11	173	11	173	12	174	14
2016	167.50	170	9	170	9	170	7	170	5	171	10	171	13
2017	171.34	168	11	168	13	167	18	166	25	168	12	169	7
(1)	Massachusetts Trend		-1.4%		-1.5%		-1.8%		-2.0%		-1.6%		-1.5%
(2)	n		5		6		7		8		9		10
(3)	s		3.32		2.90		2.91		3.09		4.38		4.43
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.50		6.00		6.50		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		16.06		11.09		9.55		9.10		11.88		11.28
(8)	Projected Value Prospective Period		159.67		158.94		156.97		154.97		158.51		160.16
(9)	CI/Projected Frequency		0.10		0.07		0.06		0.06		0.07		0.07
(10)	Credibility - MA Trend (Z)		60%		86%		99%		100%		80%		85%
(11)	Complement of Credibility								-1.9%				
(12)	Credibility Weighted Frequency Trend		-1.6%		-1.6%		-1.8%		-2.0%		-1.7%		-1.5%

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 the Adjusted Claim Frequencies. Section B, Exhibit 1.
- (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

V 000023

Medical Only Frequency Trend Calculation

Policy Year	Adjusted Med Only 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
2008	435.20											441	39
2009	417.35									425	66	423	29
2010	419.89									407	167	405	225
2011	397.51					387	102			389	68	388	95
2012	368.32			365	13	371	7			372	16	371	9
2013	353.54	348	29	351	7	355	3			356	7	356	4
2014	336.97	336	1	338	1	340	10			341	14	341	13
2015	317.22	324	53	325	62	326	72			326	75	326	80
2016	305.91	313	54	313	49	312	35			312	34	312	42
2017	311.10	302	76	301	98	299	156			298	166	299	143
(1)	Massachusetts Trend		-3.5%		-3.8%		-4.2%		-4.5%		-4.3%		-4.2%
(2)	n		5		6		7		8		9		10
(3)	s		8.40		7.59		8.77		8.95		9.36		9.22
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.50		6.00		6.50		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		40.62		29.07		28.77		26.32		25.39		23.48
(8)	Projected Value Prospective Period		267.31		263.47		256.56		252.26		255.30		257.19
(9)	CI/Projected Frequency		0.15		0.11		0.11		0.10		0.10		0.09
(10)	Credibility - MA Trend (Z)		39%		54%		54%		58%		60%		66%
(11)	Complement of Credibility								-4.2%				
(12)	Credibility Weighted Frequency Trend		-3.9%		-3.9%		-4.2%		-4.4%		-4.3%		-4.2%

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 the Adjusted Claim Frequencies. Section B, Exhibit 2.
- (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

V 000024

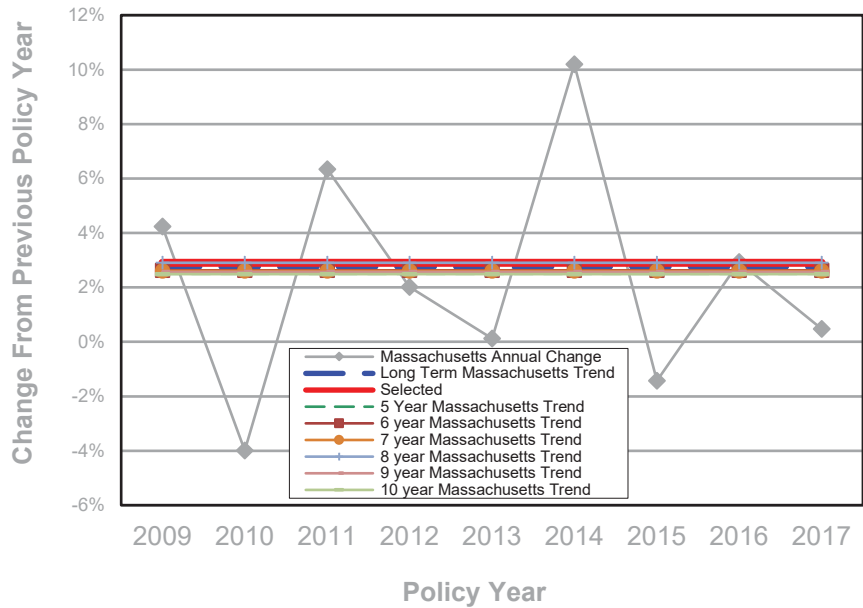
Statewide Average Weekly Wage Trend Calculation

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
4/1/09 to 4/1/10	1,088.06											1,092	15
4/1/10 to 4/1/11	1,135.82											1,124	134
4/1/11 to 4/1/12	1,173.06											1,158	241
4/1/12 to 4/1/13	1,181.28											1,192	110
4/1/13 to 4/1/14	1,214.99			1,214	1	1,178	12	1,189	58	1,193	136	1,227	145
4/1/14 to 4/1/15	1,256.47	1,253	9	1,254	5	1,216	2	1,225	97	1,228	166	1,227	145
4/1/15 to 4/1/16	1,291.74	1,295	13	1,296	18	1,256	0	1,262	29	1,264	54	1,263	47
4/1/16 to 4/1/17	1,338.05	1,339	1	1,339	1	1,297	27	1,300	68	1,301	82	1,301	80
4/1/17 to 4/1/18	1,383.41	1,384	0	1,384	0	1,339	2	1,339	2	1,339	1	1,339	1
4/1/18 to 4/1/19	1,431.66	1,430	3	1,430	4	1,383	0	1,380	13	1,378	28	1,379	22
				1,430	4	1,428	12	1,421	103	1,418	175	1,420	147
(1)	Massachusetts Trend		3.4%		3.3%		3.3%		3.0%		2.9%		3.0%
(2)	n		5		6		7		8		9		10
(3)	s		2.95		2.71		3.32		11.05		11.56		10.84
(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		12.90		9.56		10.20		30.79		29.95		26.58
(8)	Projected Value Prospective Period		1,565.72		1,564.25		1,560.02		1,542.97		1,535.56		1,538.21
(9)	CI/Projected Wage		0.01		0.01		0.01		0.02		0.02		0.02
(10)	Credibility - MA Trend (Z)		100%		100%		100%		100%		100%		100%
(11)	Complement of Credibility								2.7%				
(12)	Credibility Weighted Wage Trend		3.4%		3.3%		3.3%		3.0%		2.9%		3.0%

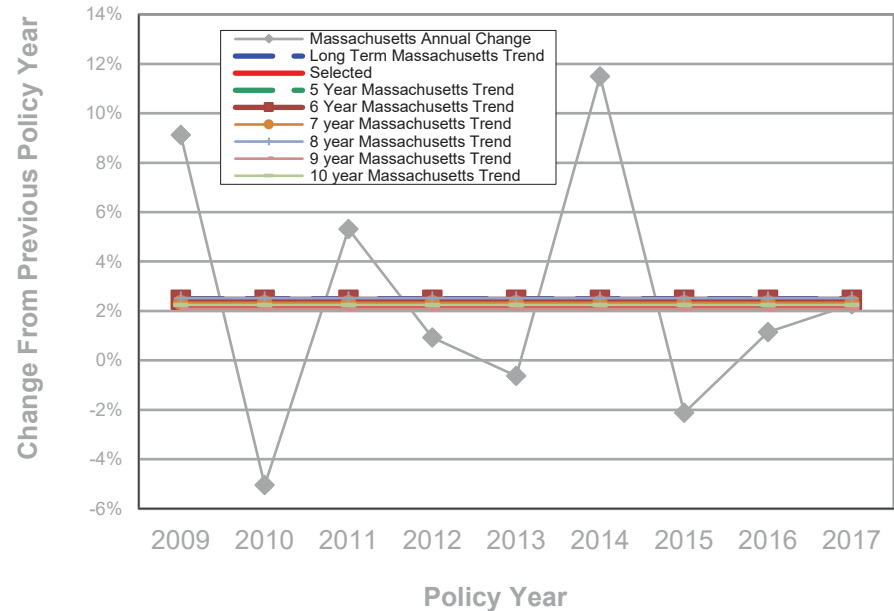
- Notes:
- (1): Massachusetts Trend from exponential fit to the SAWW.
 - (2): Number of data points used in the exponential fitting of the statewide average weekly wages.
 - (3): $\sqrt{SSR/(n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential 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. Section G, Exhibit 1.
 - (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

V 000025

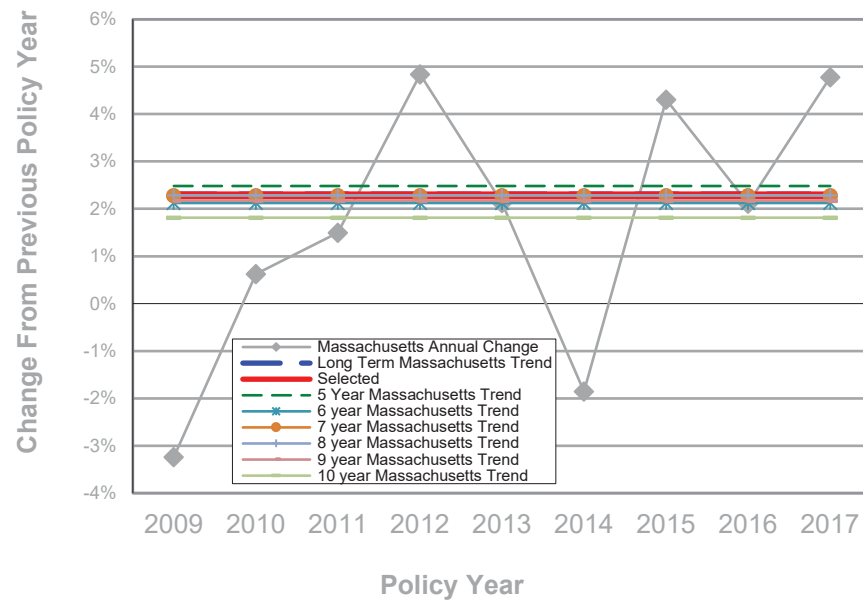
Indemnity Severity Trend



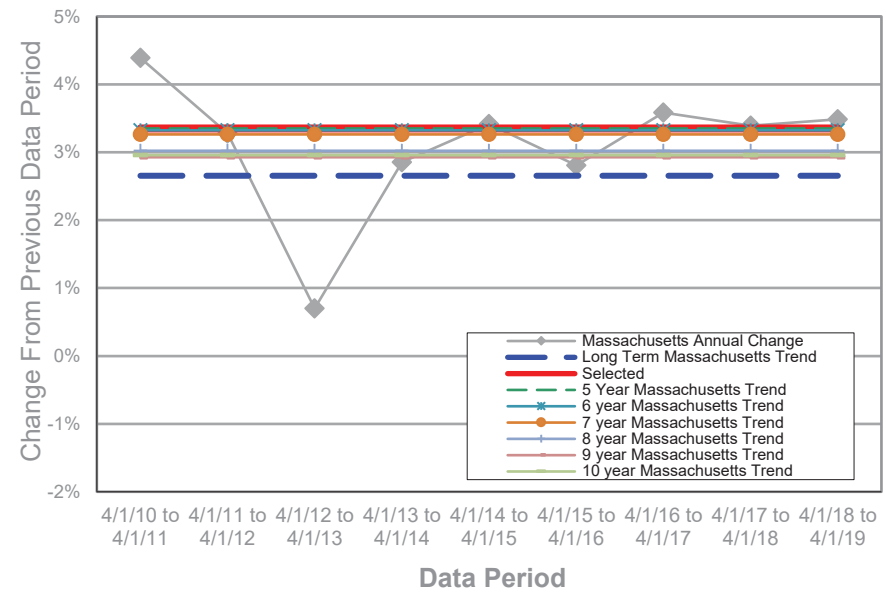
Lost Time Medical Severity Trend



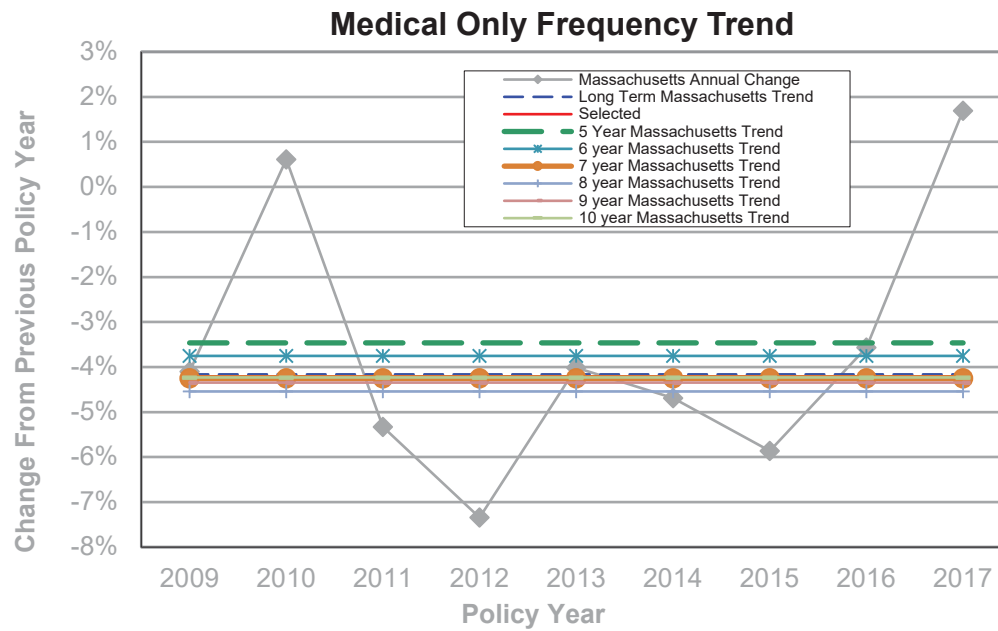
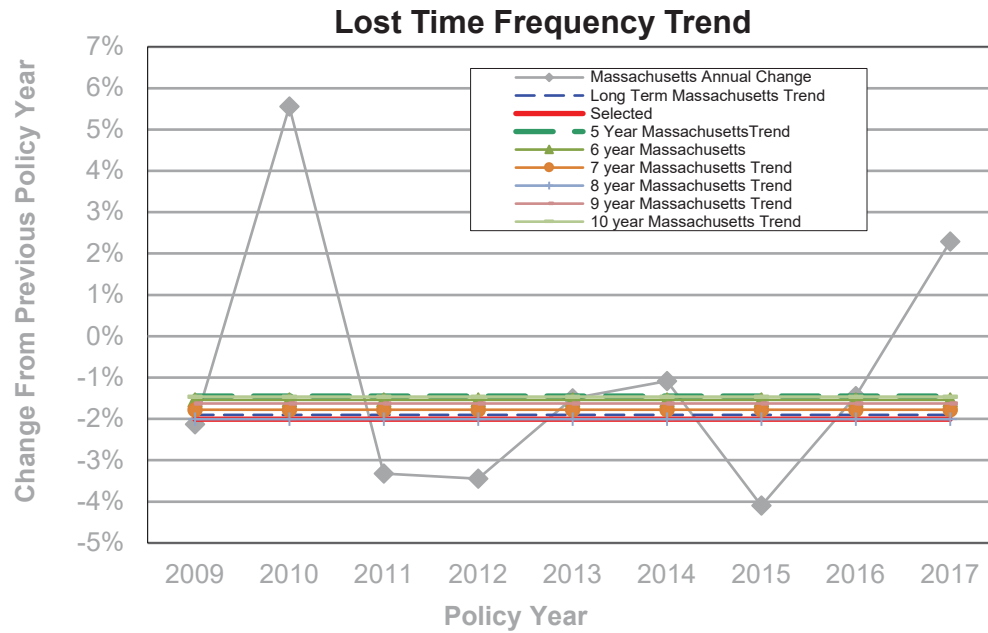
Medical Only Severity Trend



SAWW Trend



V 000026



V 000027

Lost Time Reported Claim Counts - Industrywide

Policy Year (1)	Lost Time Reported Claim Counts Age of Development										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)	Percent Change = (7)/previous year (7)-1 (8)	
	18	30	42	54	66	78	90	102	114	126							
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	0.863	224.82		
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	0.867	216.36	-3.8%	
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	0.896	209.96	-3.0%	
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	0.950	200.54	-4.5%	
2007_01	15,211	15,548	15,655	15,698	15,720	15,729	15,733	15,740	15,752	15,756	15,756	78.30	201.23	0.996	200.41	-0.1%	
2008_01	13,908	14,174	14,264	14,313	14,352	14,365	14,367	14,374	14,381	14,387	14,387	78.57	183.11	1.030	188.63	-5.9%	
2009_01	12,976	13,210	13,270	13,305	13,317	13,327	13,334	13,336	13,346		13,350	75.29	177.33	1.041	184.60	-2.1%	
2010_01	14,379	14,656	14,725	14,773	14,799	14,814	14,817	14,816			14,830	79.76	185.93	1.048	194.85	5.6%	
2011_01	14,463	14,692	14,786	14,826	14,862	14,875	14,875				14,890	82.97	179.47	1.050	188.39	-3.3%	
2012_01	14,208	14,462	14,532	14,562	14,587	14,590					14,606	83.64	174.62	1.042	181.90	-3.4%	
2013_01	14,409	14,672	14,748	14,798	14,818						14,842	85.13	174.34	1.028	179.16	-1.5%	
2014_01	14,799	15,071	15,154	15,190							15,238	87.11	174.94	1.013	177.22	-1.1%	
2015_01	14,849	15,064	15,147								15,239	90.32	168.71	1.007	169.96	-4.1%	
2016_01	14,634	14,844									15,016	90.16	166.55	1.006	167.50	-1.4%	
2017_01	15,261										15,660	91.40	171.34	1.000	171.34	2.3%	
Age-to-Age Development Factors											Selected Complement of Credibility				-1.9%		
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126								
2 Yr Weighted Average	1.014	1.006	1.003	1.002	1.001	1.000	1.000	1.001	1.000								
Selected	1.014	1.006	1.003	1.002	1.001	1.000	1.000	1.001	1.000								
Cumulative	1.026	1.012	1.006	1.003	1.002	1.001	1.001	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.

V 000028

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)	Percent Change = (7)/previous year (7)-1 (8)	
	Age of Development																
	18	30	42	54	66	78	90	102	114	126							
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	0.863	531.22		
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	0.867	520.46	-2.0%	
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	0.896	503.44	-3.3%	
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	0.950	479.44	-4.8%	
2007_01	36,550	37,075	37,123	37,122	37,131	37,121	37,124	37,161	37,161	37,159	37,159	78.30	474.58	0.996	472.64	-1.4%	
2008_01	32,711	33,074	33,138	33,153	33,174	33,171	33,190	33,193	33,191	33,194	33,194	78.57	422.48	1.030	435.20	-7.9%	
2009_01	29,840	30,132	30,166	30,174	30,180	30,187	30,186	30,186	30,186	30,182	30,182	75.29	400.90	1.041	417.35	-4.1%	
2010_01	31,543	31,912	31,962	31,969	31,962	31,960	31,962	31,960			31,957	79.76	400.66	1.048	419.89	0.6%	
2011_01	30,930	31,362	31,413	31,436	31,431	31,427	31,422				31,418	82.97	378.69	1.050	397.51	-5.3%	
2012_01	29,124	29,506	29,561	29,587	29,582	29,580					29,575	83.64	353.59	1.042	368.32	-7.3%	
2013_01	28,891	29,220	29,281	29,299	29,296						29,288	85.13	344.03	1.028	353.54	-4.0%	
2014_01	28,523	28,924	28,983	28,985							28,974	87.11	332.62	1.013	336.97	-4.7%	
2015_01	27,916	28,378	28,443								28,442	90.32	314.89	1.007	317.22	-5.9%	
2016_01	26,905	27,366									27,424	90.16	304.16	1.006	305.91	-3.6%	
2017_01	27,904										28,434	91.40	311.10	1.000	311.10	1.7%	
	Age-to-Age Development Factors																
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126			Selected Complement of Credibility			-4.2%		
2 Yr Weighted Average	1.017	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000								
Selected	1.017	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000								
Cumulative	1.019	1.002	1.000	1.000	1.000	1.000	1.000	1.000	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.

V 000029

Indemnity Paid 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)
2003_01	335,428	1.147	384,706	19,344	19,888
2004_01	359,957	1.140	410,382	17,882	22,949
2005_01	349,657	1.128	394,531	17,237	22,889
2006_01	343,142	1.116	382,996	15,968	23,985
2007_01	342,885	1.104	378,550	15,756	24,026
2008_01	332,279	1.092	362,756	14,387	25,214
2009_01	322,739	1.087	350,897	13,350	26,284
2010_01	343,859	1.088	374,231	14,830	25,235
2011_01	369,497	1.081	399,550	14,890	26,834
2012_01	373,054	1.072	399,846	14,606	27,376
2013_01	381,141	1.067	406,819	14,842	27,410
2014_01	433,544	1.062	460,233	15,238	30,203
2015_01	430,848	1.053	453,692	15,239	29,773
2016_01	440,574	1.044	460,153	15,016	30,644
2017_01	466,008	1.035	482,161	15,660	30,789

15 Year Indemnity Trend

2.8%

Notes:

- (2): (3) Exhibit 1, Page 2
- (3): Section IV-A, Exhibit 1.
- (5): Section V-B, Exhibit 1.

V 000030

Indemnity Paid Losses (in 000's)
 Industrywide

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2003_01	101,479	186,179	246,009	278,979	304,787	318,609	324,492	330,577	332,616	335,428	335,428
2004_01	107,820	198,020	260,479	301,960	327,370	339,300	348,443	352,669	356,713	359,957	359,957
2005_01	110,114	196,752	259,782	297,958	321,547	335,386	342,734	344,717	347,959	349,657	349,657
2006_01	100,324	186,197	254,668	293,733	313,566	324,673	333,625	338,678	341,533	343,142	343,142
2007_01	106,029	195,075	253,709	293,152	314,356	325,087	333,860	339,052	341,169	342,885	342,885
2008_01	103,033	194,337	253,244	288,542	309,174	320,808	324,438	327,815	329,773	332,279	332,279
2009_01	96,056	181,069	241,730	281,316	301,948	311,450	316,235	318,414	320,721		322,739
2010_01	101,956	196,131	261,099	302,564	325,334	333,604	337,047	339,468			343,859
2011_01	108,687	209,231	285,644	326,952	345,906	355,217	362,228				369,497
2012_01	109,361	213,179	283,925	327,790	349,790	360,248					373,054
2013_01	117,458	223,418	294,875	337,198	357,887						381,141
2014_01	127,684	248,464	337,091	382,536							433,544
2015_01	132,380	251,999	333,799								430,848
2016_01	132,947	254,625									440,574
2017_01	141,049										466,008

Age-to-Age Development Factors

	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126
2003_01	1.835	1.321	1.134	1.093	1.045	1.018	1.019	1.006	1.008
2004_01	1.837	1.315	1.159	1.084	1.036	1.027	1.012	1.011	1.009
2005_01	1.787	1.320	1.147	1.079	1.043	1.022	1.006	1.009	1.005
2006_01	1.856	1.368	1.153	1.068	1.035	1.028	1.015	1.008	1.005
2007_01	1.840	1.301	1.155	1.072	1.034	1.027	1.016	1.006	1.005
2008_01	1.886	1.303	1.139	1.072	1.038	1.011	1.010	1.006	1.008
2009_01	1.885	1.335	1.164	1.073	1.031	1.015	1.007	1.007	
2010_01	1.924	1.331	1.159	1.075	1.025	1.010	1.007		
2011_01	1.925	1.365	1.145	1.058	1.027	1.020			
2012_01	1.949	1.332	1.154	1.067	1.030				
2013_01	1.902	1.320	1.144	1.061					
2014_01	1.946	1.357	1.135						
2015_01	1.904	1.325							
2016_01	1.915								
2 Yr Weighted Average	1.909	1.341	1.139	1.064	1.028	1.015	1.007	1.007	1.006
5 Yr Weighted Average	1.923	1.339	1.147	1.067	1.030	1.017	1.011	1.007	1.006
Selected	1.909	1.341	1.139	1.064	1.028	1.015	1.007	1.007	1.006
Cumulative	3.304	1.730	1.291	1.133	1.065	1.036	1.020	1.013	1.006

Notes:
 Development factors are loss weighted average, paid data uses two years.

V 000031

Lost Time Medical Paid 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)
2003_01	142,226	1.046	148,735	19,344	7,689
2004_01	156,198	1.036	161,825	17,882	9,050
2005_01	148,621	1.032	153,377	17,237	8,898
2006_01	152,728	1.032	157,616	15,968	9,871
2007_01	152,795	1.032	157,684	15,756	10,008
2008_01	135,151	1.024	138,444	14,387	9,623
2009_01	139,943	1.002	140,184	13,350	10,500
2010_01	147,863	1.000	147,863	14,830	9,971
2011_01	156,351	1.000	156,351	14,890	10,501
2012_01	154,795	1.000	154,795	14,606	10,598
2013_01	156,315	1.000	156,315	14,842	10,532
2014_01	178,920	1.000	178,920	15,238	11,742
2015_01	175,147	1.000	175,147	15,239	11,494
2016_01	174,563	1.000	174,563	15,016	11,625
2017_01	186,198	1.000	186,198	15,660	11,890

15 Year Lost Time Medical Trend

2.5%

Notes:

- (2): (3) Exhibit 1, Page 2
- (3): Section IV-A, Exhibit 1.
- (5): Section V-B, Exhibit 1.

V 000032

Lost Time Medical Paid Losses (in 000's)
 Industrywide

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2003_01	79,877	108,253	120,967	127,862	131,696	134,227	136,039	138,170	140,432	142,226	142,226
2004_01	87,471	118,219	131,022	139,202	144,312	147,598	149,998	152,404	154,748	156,198	156,198
2005_01	88,369	115,528	127,448	134,077	138,067	140,547	143,417	145,078	146,961	148,621	148,621
2006_01	85,564	112,793	126,804	133,695	138,424	141,821	145,744	148,143	150,548	152,728	152,728
2007_01	92,238	120,976	132,565	138,596	142,037	144,973	147,725	149,794	151,366	152,795	152,795
2008_01	84,096	110,557	122,487	127,169	129,750	131,263	132,319	133,517	134,272	135,151	135,151
2009_01	86,791	113,282	124,639	129,678	132,474	134,607	135,956	137,559	138,821		139,943
2010_01	88,064	116,171	127,782	133,969	137,176	141,219	143,573	145,595			147,863
2011_01	93,489	121,606	136,243	142,658	146,865	149,767	151,981				156,351
2012_01	96,073	126,396	137,083	142,844	146,091	148,143					154,795
2013_01	96,130	124,744	137,351	143,980	147,110						156,315
2014_01	108,017	141,443	156,009	164,722							178,920
2015_01	106,168	140,360	153,235								175,147
2016_01	109,544	139,171									174,563
2017_01	114,556										186,198

Age-to-Age Development Factors

	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126
2003_01	1.355	1.117	1.057	1.030	1.019	1.013	1.016	1.016	1.013
2004_01	1.352	1.108	1.062	1.037	1.023	1.016	1.016	1.015	1.009
2005_01	1.307	1.103	1.052	1.030	1.018	1.020	1.012	1.013	1.011
2006_01	1.318	1.124	1.054	1.035	1.025	1.028	1.016	1.016	1.014
2007_01	1.312	1.096	1.045	1.025	1.021	1.019	1.014	1.010	1.009
2008_01	1.315	1.108	1.038	1.020	1.012	1.008	1.009	1.006	1.007
2009_01	1.305	1.100	1.040	1.022	1.016	1.010	1.012	1.009	
2010_01	1.319	1.100	1.048	1.024	1.029	1.017	1.014		
2011_01	1.301	1.120	1.047	1.029	1.020	1.015			
2012_01	1.316	1.085	1.042	1.023	1.014				
2013_01	1.298	1.101	1.048	1.022					
2014_01	1.309	1.103	1.056						
2015_01	1.322	1.092							
2016_01	1.270								
2 Yr Weighted Average	1.296	1.097	1.052	1.022	1.017	1.016	1.013	1.007	1.008
5 Yr Weighted Average	1.303	1.100	1.049	1.024	1.018	1.014	1.013	1.011	1.010
Selected	1.296	1.097	1.052	1.022	1.017	1.016	1.013	1.007	1.008
Cumulative	1.625	1.254	1.143	1.086	1.063	1.045	1.029	1.016	1.008

Notes:
 Development factors are loss weighted averages, paid data uses two years

V 000033

Medical Only Paid 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)
2003_01	28,088	1.046	29,374	45,707	643
2004_01	27,544	1.036	28,536	43,016	663
2005_01	28,840	1.032	29,763	41,332	720
2006_01	28,353	1.032	29,260	38,176	766
2007_01	28,845	1.032	29,768	37,159	801
2008_01	26,531	1.024	27,177	33,194	819
2009_01	23,871	1.002	23,912	30,182	792
2010_01	25,476	1.000	25,476	31,957	797
2011_01	25,420	1.000	25,420	31,418	809
2012_01	25,087	1.000	25,087	29,575	848
2013_01	25,371	1.000	25,371	29,288	866
2014_01	24,633	1.000	24,633	28,974	850
2015_01	25,222	1.000	25,222	28,442	887
2016_01	24,833	1.000	24,833	27,424	906
2017_01	26,979	1.000	26,979	28,434	949

15 Year Medical Only Trend

2.3%

Notes:

- (2): (3) Exhibit 2, Page 2
- (3): Section IV-A, Exhibit 1.
- (5): Section V-B, Exhibit 2.

V 000034

Medical Only Paid Losses (in 000's)
 Industrywide

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2003_01	24,321	26,968	27,818	28,007	28,005	28,058	28,032	28,045	28,059	28,088	28,088
2004_01	24,717	26,986	27,384	27,426	27,459	27,520	27,497	27,511	27,524	27,544	27,544
2005_01	26,403	28,509	28,742	28,784	28,775	28,798	28,790	28,807	28,825	28,840	28,840
2006_01	25,974	27,944	28,154	28,278	28,296	28,344	28,192	28,258	28,354	28,353	28,353
2007_01	26,357	28,208	28,474	28,642	28,693	28,681	28,714	28,837	28,837	28,845	28,845
2008_01	24,281	25,926	26,165	26,213	26,321	26,367	26,412	26,528	26,536	26,531	26,531
2009_01	21,701	23,376	23,513	23,670	23,777	23,851	23,870	23,891	23,870		23,871
2010_01	23,377	25,030	25,320	25,359	25,419	25,452	25,471	25,482			25,476
2011_01	23,232	25,031	25,318	25,436	25,401	25,428	25,410				25,420
2012_01	22,797	24,520	24,896	25,047	25,033	25,076					25,087
2013_01	23,723	24,869	25,205	25,272	25,325						25,371
2014_01	22,822	24,283	24,653	24,569							24,633
2015_01	22,991	24,800	25,165								25,222
2016_01	22,586	24,412									24,833
2017_01	24,562										26,979

Age-to-Age Development Factors

	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126
2003_01	1.109	1.032	1.007	1.000	1.002	0.999	1.000	1.000	1.001
2004_01	1.092	1.015	1.002	1.001	1.002	0.999	1.001	1.000	1.001
2005_01	1.080	1.008	1.001	1.000	1.001	1.000	1.001	1.001	1.001
2006_01	1.076	1.007	1.004	1.001	1.002	0.995	1.002	1.003	1.000
2007_01	1.070	1.009	1.006	1.002	1.000	1.001	1.004	1.000	1.000
2008_01	1.068	1.009	1.002	1.004	1.002	1.002	1.004	1.000	1.000
2009_01	1.077	1.006	1.007	1.005	1.003	1.001	1.001	0.999	
2010_01	1.071	1.012	1.002	1.002	1.001	1.001	1.000		
2011_01	1.077	1.011	1.005	0.999	1.001	0.999			
2012_01	1.076	1.015	1.006	0.999	1.002				
2013_01	1.048	1.013	1.003	1.002					
2014_01	1.064	1.015	0.997						
2015_01	1.079	1.015							
2016_01	1.081								
2 Yr Weighted Average	1.080	1.015	1.000	1.001	1.001	1.000	1.001	1.000	1.000
5 Yr Weighted Average	1.069	1.014	1.002	1.001	1.002	1.001	1.003	1.001	1.000
Selected	1.080	1.015	1.000	1.001	1.001	1.000	1.001	1.000	1.000
Cumulative	1.098	1.017	1.002	1.003	1.002	1.000	1.000	1.000	1.000

Notes:
 Development factors are loss weighted averages, paid data uses two years

V 000035

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)													
2003_01											69,014	69,014	928.90	74.30
2004_01											69,408	69,408	969.11	71.62
2005_01											74,399	74,399	1,011.25	73.57
2006_01										79,901	79,901	79,901	1,056.18	75.65
2007_01								85,512	85,512	85,512	85,512	85,512	1,092.12	78.30
2008_01							85,857	85,859	85,859	85,859	85,859	85,859	1,092.79	78.57
2009_01						82,945	82,942	82,944	82,944	82,944	82,944	82,944	1,101.70	75.29
2010_01					91,319	91,313	91,311	91,311	91,311	91,311	91,311	91,311	1,144.80	79.76
2011_01				97,435	97,427	97,424	97,419	97,419	97,419	97,419	97,420	97,420	1,174.21	82.97
2012_01			99,610	99,600	99,595	99,579	99,579	99,579	99,579	99,579	99,576	99,576	1,190.50	83.64
2013_01		104,387	104,396	104,382	104,352	104,352	104,352	104,352	104,352	104,352	104,340	104,340	1,225.60	85.13
2014_01	110,287	110,264	110,244	110,230	110,230	110,230	110,230	110,230	110,230	110,230	110,198	110,198	1,265.09	87.11
2015_01	117,826	117,820	117,798	117,798	117,798	117,798	117,798	117,798	117,798	117,798	117,749	117,749	1,303.66	90.32
2016_01	121,768	121,733	121,733	121,733	121,733	121,733	121,733	121,733	121,733	121,733	121,660	121,660	1,349.36	90.16
2017_01	127,651	127,651	127,651	127,651	127,651	127,651	127,651	127,651	127,651	127,651	127,553	127,553	1,395.56	91.40
	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	1.000	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 1.
 For all policy years the following class codes are excluded from reported Schedule Z payrolls: 0059, 0065, 0066, 0067, 0088, 0770, 0771, 0773, 0774, 0775, 0776, 0779, 0799, 0908, 0909, 0912, 0913, 7445, 7453, and 9985.

V 000036

V 000037

Section V - Trend
Subsection F - Calculation of Class Mix Adjustment Factor
7/1/2020

Section V - F
Exhibit 1

Class Mix Adjustment Factors

Policy Year (1)	Average Rates Based on Rates Effective 7/1/18 (2)	Class Mix Adjustment Factor = 0.855 / (2) (3)
2003_01	0.991	0.863
2004_01	0.987	0.867
2005_01	0.955	0.896
2006_01	0.900	0.950
2007_01	0.859	0.996
2008_01	0.830	1.030
2009_01	0.822	1.041
2010_01	0.816	1.048
2011_01	0.815	1.050
2012_01	0.821	1.042
2013_01	0.832	1.028
2014_01	0.844	1.013
2015_01	0.849	1.007
2016_01	0.851	1.006
2017_01	0.855	1.000

Notes:

(2): Current rates (Effective 7/1/18) averaged over class payrolls (excluding large deductibles) by Policy Year.

(3): Adjustment to 2017_01 Policy Year level.

V 000038

Section V - Trend
 Subsection G - External Data
 7/1/2020

Section V - G
 Exhibit 1

Summary of Statewide Average Weekly Wage (SAWW) Data

Date Promulgated by DUA (1)	Period of Data Used by DUA (2)	SAWW (3)
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
10/1/18	4/1/17 to 4/1/18	1,383.41
10/1/19	4/1/18 to 4/1/19	1,431.66
15 Year Exponential Fit, Trend =		2.7%

Policy Year (4)	SAWW (5)
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
2016_01	1,349.36
2017_01	1,395.56

Notes:

(5): $SAWW \text{ for Policy Year } i = [0.03125 \times SAWW \text{ during period } 4/1/(i-1) \text{ to } 4/1/i] + [0.6875 \times SAWW \text{ during period } 4/1/i \text{ to } 4/1/(i+1)] + [0.28125 \times SAWW \text{ during period } 4/1/(i+1) \text{ to } 4/1/(i+2)]$
 The DUA is the Department of Unemployment Assistance; previously this data was compiled by the DET (Division of Employment and Training).

V 000039

Section V - Trend
 Subsection H - Expense Trends
 7/1/2020

Section V - H
 Exhibit 1

Calculation of Expense Trend Index

Time Interval (1)	Time Index (2)	Expense Trend Index (3)	Expense Trend Factors		
			PY2016 (4)	PY2017 (5)	7/1/2020 (6)
CY2004	7/1/2004	64.20			
CY2005	7/1/2005	71.93			
CY2006	7/1/2006	70.39			
CY2007	7/1/2007	77.60			
CY2008	7/1/2008	82.51			
CY2009	7/1/2009	82.85			
CY2010	7/1/2010	85.19			
CY2011	7/1/2011	82.13			
CY2012	7/1/2012	82.35			
CY2013	7/1/2013	87.29			
CY2014	7/1/2014	87.65			
CY2015	7/1/2015	93.01			
CY2016	7/1/2016	94.59	1.006	1.034	1.157
CY2017	7/1/2017	95.68	0.994	1.023	1.144
CY2018	7/1/2018	100.00	0.951	0.978	1.094

15 Year Exponential Fit, Trend: 2.6%

PY2016	1/1/2017	95.13			1.150
PY2017	1/1/2018	97.84			1.119
7/1/2019	7/1/2020	106.20			1.031
7/1/2020	7/1/2021	109.44			

Notes:

- (1): 7/1/19 and 7/1/20 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 3.1%.
- (3): Calendar Years: Exhibit 2, Page 2, col (17), Converted to Index with 2018 = 100.
 PY2016 - Average of indices for CY2016 and CY2017.
 PY2017 - Average of indices for CY2017 and CY2018.
 The exponential trend rate derived from an exponential regression of the Expense Trend Index for CY2012 - CY2018 is applied to the CY2018 Expense Trend Index value to derive the Expense Trend Index values for 7/1/2019 and 7/1/2020.
- (4) = [(3) for PY2016] / (3)
- (5) = [(3) for PY2017] / (3)
- (6) = [(3) for 7/1/2020] / (3)

V 000040

Section V - Trend
 Subsection H - Expense Trends
 7/1/2020

Section V - H
 Exhibit 2
 Page 1

Calculation of Credibility Weighted Expense Trend

Calendar Year (1)	Expense Index (2)	7 Year Exponential Fit (3)	Difference Squared (4)
2012	82.35	83.46	1.23
2013	87.29	86.01	1.66
2014	87.65	88.63	0.97
2015	93.01	91.34	2.80
2016	94.59	94.13	0.21
2017	95.68	97.00	1.76
2018	100.00	99.96	0.00

(5)	7 Year Expense Index Trend	3.1%
(6)	n	7
(7)	s	1.31
(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	4.13
(12)	Projected Value Prospective Period	109.41
(13)	CI/Projected Expense Index	0.04
(14)	Credibility - 7 Year Expense Index Trend (Z)	100%
(15)	Complement of Credibility - 15 year	2.6%
(16)	Credibility Weighted Expense Trend	3.1%

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)]]

V 000041

Section V - Trend
 Subsection H - Expense Trends
 7/1/2020

Section V - H
 Exhibit 2
 Page 2

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)
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
2017	2,212.00	269.03	196.44	89.56	283.79	122.50	186.40
2018	2,338.00	276.13	207.10	88.00	289.73	121.10	197.60

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)
2004								
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%
2017	1.5%	2.3%	4.0%	-7.8%	2.6%	-0.5%	-0.2%	1.2%
2018	5.7%	2.6%	5.4%	-1.7%	2.1%	-1.1%	6.0%	4.5%

Weights							
Calendar Year (18)	Average Weekly Earnings (19)	Food (20)	Private Transportation (21)	Phone (22)	Postage (23)	Machines & Equipment (24)	Paper (25)
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%
2017	79.0%	1.7%	1.7%	1.3%	1.3%	14.4%	0.6%
2018	48.9%	1.0%	1.0%	0.8%	0.8%	8.9%	38.6%

Notes:

- (2): Average Weekly Earnings, Covered Employment and Wages, Private Fire, Marine, and Casualty Insurers - Massachusetts
 Unadjusted for Seasonality
 Years CY2012 - CY2018: 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, Page 3 and Page 4 for Calendar Year 2017-2018. Prior Filings for all other years.

V 000042

Section V - Trend
 Subsection H - Expense Trends
 7/1/2020

Section V - H
 Exhibit 2
 Page 3

Calendar Year 2017
 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	7.94%	64.1%	Average Weekly Earnings Covered Employment and Wages; Private Fire, Marine, Casualty Massachusetts	79.0%
Payroll Taxes	0.52%	4.2%		
Employee Relations	1.33%	10.7%		
Travel & Travel Items	0.43%	3.5%	Food Away From Home-CPI-US	1.7%
			Private Transportation-CPI-US	1.7%
Postage & Telephone	0.31%	2.5%	Postage-CPI-US	1.3%
			Telephone-CPI-US	1.3%
Equipment	1.78%	14.4%	Office & Stores Machines & Equipment-PPI	14.4%
Printing & Stationery	0.08%	0.6%	Paper-PPI	0.6%
Total	12.39%	100.0%		100.0%

Notes:

(2): 2019 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)

V 000043

Section V - Trend
 Subsection H - Expense Trends
 7/1/2020

Section V - H
 Exhibit 2
 Page 4

Calendar Year 2018
 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	7.21%	39.8%	Average Weekly Earnings Covered Employment and Wages; Private Fire, Marine, Casualty Massachusetts	48.9%
Payroll Taxes	0.46%	2.5%		
Employee Relations	1.19%	6.6%		
Travel & Travel Items	0.37%	2.0%	Food Away From Home-CPI-US	1.0%
			Private Transportation-CPI-US	1.0%
Postage & Telephone	0.28%	1.5%	Postage-CPI-US	0.8%
			Telephone-CPI-US	0.8%
Equipment	1.61%	8.9%	Office & Stores Machines & Equipment-PPI	8.9%
Printing & Stationary	7.00%	38.6%	Paper-PPI	38.6%
Total	18.12%	100.0%		100.0%

Notes:

(2): 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)

V 000044

Section V - Trend
 Subsection H - Expense Trends
 7/1/2020

Section V - H
 Exhibit 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)
2003	74.30		
2004	71.62		
2005	73.57		
2006	75.65		
2007	78.30		
2008	78.57		
2009	75.29		
2010	79.76		
2011	82.97		
2012	83.64		
2013	85.13	85.71	0.34
2014	87.11	87.24	0.02
2015	90.32	88.79	2.34
2016	90.16	90.37	0.05
2017	91.40	91.98	0.34

15 Year Million Worker-Weeks Trend

1.8%

(5)	5 Year MA Trend	1.8%
(6)	n	5
(7)	s	1.01
(8)	t	2.35
(9)	m	5.50
(10)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$	2.05
(11)	Confidence Interval	4.90
(12)	Projected	97.84
(13)	CI / Projected	0.05
(14)	Credibility - 5 Year MA Trend (Z)	100%
(15)	Complement of Credibility	1.8%
(16)	Credibility-Weighted Overall Exposure Growth	1.8%

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 has used the same methods to calculate expenses as it has 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, Massachusetts Workers’ Compensation Assigned Risk (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 midpoint of the experience period, 7/1/2021). The three years of estimated general expenses are averaged to obtain an estimate of Massachusetts general expense requirements for all

VI 000002

companies. As in all of the filings from 2003 forward, general expenses relating to Boards and Bureaus were estimated using the actual 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 (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 midpoint of the experience period, 7/1/2021). The three years of estimated Pool expenses are averaged to obtain an estimate of 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 (2019) 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 (the midpoint of the experience period, 7/1/2021) (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 has been used since the 2012 rate filing.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. 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.²

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

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.

² 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.

adjustments and premium in a balanced retrospective plan should approximate guaranteed cost premium.

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 1999 Rate Decision and used in each of the WCRIBMA's subsequent rate filings. For interstate-rated risks, 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.

Insurers 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.

Premium Taxes

The premium tax rate is 2.28% of net premiums (Section VI-B, Exhibit 3). 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-A, 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 EBUP. The calculation used by the WCRIBMA, which accounts for both incidental income and EBUP, is based upon the average of the experience reported in the latest three calendar years (2016-2018). 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

VI 000006

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 insurers must cover their costs of purchasing reinsurance and provide an opportunity for reinsurers to earn a fair rate of return on their invested capital. Since the 2005 filing, the WCRIBMA calculates an expense load intended to recognize 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 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

The current expense constants³ 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.

³ WCRIBMA introduced a three tiered expense constants system in the September 1, 2008 rate filing.

Loss Adjustment Expense

Loss adjustment expense is made up of two components, DCCE and Adjusting and Other Expense (“AO”). In this filing, the WCRIBMA continues to use 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.⁴ Using the Policy Year Call, the WCRIBMA calculated policy year ratios of paid DCCE to paid loss (this is in contrast to the calendar year ratios calculated in the 2018 filing). The WCRIBMA developed these ratios to a tenth report (120 months) utilizing historical policy year paid DCCE to paid loss ratio development factors based on the weighted average of the latest three years. Evaluating this expense on a policy year basis, aligns the dollar spend of DCCE with the losses being paid and claims being adjudicated. (Section VI-H, Exhibit 1 Page 2). The average of the latest three policy year ratios was selected as the DCCE load (Section VI-H, Exhibit 1, Page 1).⁵

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

⁴ 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.

⁵ The WCRIBMA analyzed alternative approaches to this method, including (1) the development of calendar year paid DCCE to paid loss ratios and (2) the development of policy year paid plus case DCCE to paid plus case loss ratios. The resulting estimates using the paid to paid policy year ratios were more stable than the alternative methods and stability lends itself to better predictability.

VI 000008

than it would have been as a percentage of net losses.⁶ 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).

⁶ “*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 a 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.

VI 000009

Section VI - Expenses
Subsection A - Summary
7/1/2020

Section VI - A
Exhibit 1

Summary of Expense Ratios

(1)	Commission and Other Acquisition Expense Ratio	12.2%
(2)	Average Premium Discount as a % of Standard Premium + ARAP	5.3%
(3)	Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4)	Variable Expense Ratio = (1) + (2) + (3)	19.7%
(5)	Fixed Expense Ratio	5.0%
(6)	Total Loss Adjustment Expense Ratio (LAE / Loss)	18.7%

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 2016			Projected to PY 2017		
				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)
2016	29,152,831	1,638,027	30,790,858	1.006	1.009	31,242,660	1.034	1.027	32,703,772
2017	36,233,909	1,559,318	37,793,227	0.994	0.991	37,247,919	1.023	1.009	38,989,876
2018	34,659,662	1,648,021	36,307,683	0.951	0.974	33,637,443	0.978	0.991	35,210,551
Average			34,963,923			34,042,674			35,634,733

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 7/1/2021 (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)
2016	34,042,674	2,350,596	36,393,270	1.150	41,869,095	821,762,759	5.1%
2017	35,634,733	2,460,525	38,095,258	1.119	42,614,608	853,219,813	5.0%
Average							5.0%

Notes:

- (2): Exhibit 2, Page 1.
- (3): Exhibit 2, Page 3.
- (5): Section V-H, Exhibit 1.
- (6): 1.8% annual growth in worker-weeks, from Section V-H, Exhibit 3; 0.5 years from CY 2016 to PY 2016, -0.5 years from CY 2017 to PY 2016, -1.5 years from CY 2018 to PY 2016.
- (8): Section V-H, Exhibit 1.
- (9): 1.8% annual growth in worker-weeks, from Section V-H, Exhibit 3; 1.5 years from CY 2016 to PY 2017, 0.5 years from CY 2017 to PY 2017, -0.5 years from CY 2018 to PY 2017.
- (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 company groups 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 000011

Section VI - Expenses
 Subsection B - Fixed Expenses
 7/1/2020

Section VI - B
 Exhibit 2
 Page 1

General Expense Exclusive of Proposed Expense Constant

	Calendar Year		
	2016	2017	2018
(1) Standard Earned Premium Including Expense Constant Premium	758,175,113	808,676,141	838,748,849
(2) ARAP Premium at Company Level	30,458,689	32,718,842	34,328,191
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.049	1.051	1.053
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	790,127,532	843,062,087	874,894,198
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.043	1.040	1.040
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	1.002	1.002
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	823,116,737	878,768,343	911,801,141
(8) Ratio of Adjusted General Expense to Adjusted Standard Earned Premium plus ARAP	5.3%	5.8%	5.5%
(9) General Expenses = (7) x (8)	43,516,457	51,062,173	50,158,144
(10) Expense Constant Premium	31,191,835	31,935,671	31,894,777
(11) General Expense Portion of Expense Constant	51.0%	51.0%	51.0%
(12) Average Expense Constant in Effect	251.93	252.73	252.41
(13) Proposed Average Expense Constant	263.35	263.35	263.35
(14) Expense Trend Factor - Calendar Year XXXX to 7/1/21, the midpoint of the Prospective Effective Period	1.157	1.144	1.094
(15) Trend Factor to Adjust Proposed Average Expense Constant to Calendar Year XXXX = 1.0 / (14)	0.864	0.874	0.914
(16) Detrended Proposed Average Expense Constant = (13) x (15)	227.60	230.22	240.62
(17) Adjusted General Expenses Generated by the Expense Constant = [(10) x (11)] x [(16) / (12)]	14,363,626	14,828,264	15,498,483
(18) General Expenses Exclusive of Expense Constant Premium = (9) - (17)	29,152,831	36,233,909	34,659,662

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.

VI 000012

Section VI - Expenses
 Subsection B - Fixed Expenses
 7/1/2020

Section VI - B
 Exhibit 2
 Page 2

Calculation of General Expense

	Calendar Year		
	2016	2017	2018
(1) Standard Earned Premium Including Expense Constant Premium	977,592,112	1,052,364,914	1,091,757,245
(2) ARAP Premium at Company Level	41,781,275	42,331,721	45,616,548
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.049	1.051	1.053
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	1,021,422,390	1,096,853,539	1,139,788,499
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.043	1.040	1.040
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	1.002	1.002
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	1,064,068,560	1,143,308,639	1,187,869,866
(8) Actual WCRIBMA Expenses	10,209,998	11,285,278	9,314,953
(9) General Expenses (excluding Boards & Bureaus Expenses)	46,045,077	55,148,412	56,029,721
(10) Adjusted General Expense = (8) + (9)	56,255,075	66,433,690	65,344,674
(11) Ratio of Adjusted General Expense to Adjusted Standard Earned Premium plus ARAP (including expense constants) = (10) / (7)	5.3%	5.8%	5.5%

Notes:

- (1),(2): Aggregate Financial Reconciliation Report Calls, Calendar Years 2016 - 2018, 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 2016 - 2018.

VI 000013

Section VI - Expenses
 Subsection B - Fixed Expenses
 7/1/2020

Section VI - B
 Exhibit 2
 Page 3

Calculation of Pool Expense

	Calendar Year		
	2016	2017	2018
(1) Administrative Expenses	507,781	520,626	484,110
(2) Other Expense Allowances	-	-	-
(3) Workers' Compensation Bureau Pool Expenses	2,552,578	2,294,318	2,403,510
(4) Total Pool Expenses = (1) + (2) + (3)	3,060,359	2,814,944	2,887,620
(5) Target Pool Expenses for Excluded Companies	880,562	739,888	694,524
(6) Total Pool Expenses, excluding 4 company(ies) = (4) - (5)	2,179,796	2,075,055	2,193,096
(7) Proportion of Voluntary Assessable Premium Not from Large Deductibles " u "	0.751	0.751	0.751
(8) Total Pool Expenses for Non-Large Deductibles = (6) x (7)	1,638,027	1,559,318	1,648,021

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-E, Exhibit 2.

VI 000014

Section VI - Expenses
Subsection B - Fixed Expenses
7/1/2020

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, 2018 Form 63-23P.

2.28% is Premium Tax as % of Net Premium.

VI 000015

Section VI - Expenses
 Subsection C - Other Taxes
 7/1/2020

Section VI - C
 Exhibit 1

Calculation of Other Taxes

(1)	Calendar Year 2018 Standard Earned Premium Including Expense Constant Premium	838,748,849	
(2)	Calendar Year 2018 ARAP Premium at Company Level	34,328,191	
(3)	Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.053	
(4)	Calendar Year 2018 Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	874,894,198	
(5)	Calendar Year 2018 Other Taxes Ratio	0.29%	
(6)	Calendar Year 2018 Other Taxes = (4) x (5)	2,537,193	
		<u>PY2016</u>	<u>PY2017</u>
(7)	Other Tax Trend Factor from CY 2018 to PY XXXX	0.951	0.978
(8)	Annual Exposure Growth	1.8%	1.8%
(9)	Trend Length	-1.5	-0.5
(10)	Provision for Other Taxes = (6) x (7) x { [1.0 + (8)] ^ (9) }	2,350,596	2,460,525

Notes:

(1),(2): Based on from Aggregate Financial Policy Year Call.

(3): Section III-B, Exhibit 2.

(5): 2019 Best's Aggregates and Averages. Page 659.

(7): Section V-H, Exhibit 1.

(8): Section V-H, Exhibit 3.

(9): -1.5 years from CY 2018 to PY 2016, -0.5 years from CY 2018 to PY 2017.

VI 000016

Section VI - Expenses
 Subsection D - Expense Constant
 7/1/2020

Section VI - D
 Exhibit 1

Calculation of Expense Constant

Standard Premium Ranges		PY 2017 Adjusted Policy Count	Adjusted Policy Distribution	Current Expense Constant	Trend Factor from 7/1/20 to 7/1/21	Selected Trend Factor	Proposed Expense Constant = (5) x (7) (8)
Unadjusted (1)	Adjusted (2)						
Less than \$200	Less Than \$192	38,726	30%	\$159.00	1.031	1.000	\$159.00
\$200 to \$1,000	\$192 to \$962	29,151	23%	\$250.00	1.031	1.000	\$250.00
\$1,000 or more	\$962 or more	59,346	47%	\$338.00	1.031	1.000	\$338.00
Total		127,223	100%	\$263.35			\$263.35

Notes:

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, 1.04, from Section III-E, Exhibit 1.

(3): Unit Statistical Plan Data PY 2017 (excluding Large Deductible policies).

(4) = (3) / Total (3)

TOTAL (5) = (5) weighted by (4)

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

Total (8) = (8) weighted by (4)

VI 000017

Section VI - Expenses
Subsection E - Expenses Net of Premium Discount
7/1/2020

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	7.6%	4.0%
(2) Percentage of Voluntary Written Premium by Discount Type	75.5%	24.5%
(3) Weighted Average Premium Discount as a % of Standard Premium in Voluntary Market = (1) weighted by (2)	6.7%	
(4) Voluntary Market Share	83.6%	
(5) Average Premium Discount in Total Market = (3) x (4)	5.6%	
(6) Average ARAP Surcharge for Prospective Effective Period as a % of Standard Premium	5.3%	
(7) Average Premium Discount as a % of Standard Premium + ARAP = (5) / [1.0 + (6)]	5.3%	

Notes:

(1): Type "A" - Exhibit 2, Total (10).

Type "B" - Exhibit 3, Total (10).

(2): Exhibit 4.

(4): Special Bulletin 10/18/2019 Market Share is estimated using Standard Premium plus ARAP.

(6): Section IX-K, Exhibit 3.

VI 000018

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2020

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 2017				Total = [Sum of (2)] (3)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	104,219,413	75,070,000	2,740,000	60,000	182,089,413
10,000 - 200,000		179,842,822	52,060,000	1,140,000	233,042,822
200,000 - 1,750,000			65,927,631	9,300,000	75,227,631
1,750,000 - & Over				8,553,413	8,553,413
Total	104,219,413	254,912,822	120,727,631	19,053,413	498,913,279

Interstate Intervals					
Layer of Standard Premium (4)	Standard Premium Ranges - PY 2017				Total Premium in Layer (6)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	139,141	4,125,632	1,689,286	182,078	6,136,137
10,000 - 200,000		25,769,147	32,096,431	3,459,470	61,325,048
200,000 - 1,750,000			58,092,698	28,221,999	86,314,697
1,750,000 - & Over				74,513,182	74,513,182
Total	139,141	29,894,779	91,878,415	106,376,729	228,289,064

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	188,225,550	25.9%	0.0%
10,000 - 200,000	294,367,870	40.5%	9.1%
200,000 - 1,750,000	161,542,328	22.2%	11.3%
1,750,000 - & Over	83,066,595	11.4%	12.3%
Total	727,202,343	100.0%	7.6%

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 000019

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2020

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 2017				Total = [Sum of (2)] (3)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	56,490,183	28,170,000	760,000	10,000	85,430,183
10,000 - 200,000		47,692,271	14,440,000	190,000	62,322,271
200,000 - 1,750,000			16,546,739	1,550,000	18,096,739
1,750,000 - & Over				6,890,374	6,890,374
Total	56,490,183	75,862,271	31,746,739	8,640,374	172,739,567

Interstate Intervals					
Layer of Standard Premium (4)	Standard Premium Ranges - PY 2017				Total Premium in Layer (6)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	47,786	1,250,268	366,967	47,988	1,713,009
10,000 - 200,000		6,998,140	6,972,386	911,778	14,882,304
200,000 - 1,750,000			11,131,172	7,438,191	18,569,363
1,750,000 - & Over				41,257,537	41,257,537
Total	47,786	8,248,408	18,470,525	49,655,494	76,422,213

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	87,143,192	35.0%	0.0%
10,000 - 200,000	77,204,575	31.0%	5.1%
200,000 - 1,750,000	36,666,102	14.7%	6.5%
1,750,000 - & Over	48,147,911	19.3%	7.5%
Total	249,161,780	100.0%	4.0%

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 000020

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2020

Section VI - E
 Exhibit 4
 Page 1

Calendar Year 2018 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	95,873,791	55,499,890	40,373,901	40,373,901	0
22667	ACE AMERICAN INSURANCE COMPANY	A	58,845,653	28,247,563	30,598,090	30,598,090	0
23841	NEW HAMPSHIRE INSURANCE COMPANY	B	52,055,789	0	52,055,789	0	52,055,789
25682	TRAVELERS INDEMNITY COMPANY OF CONNECTICUT	A	47,547,273	0	47,547,273	47,547,273	0
25666	TRAVELERS INDEMNITY COMPANY OF AMERICA	A	42,515,081	37,132,259	5,382,822	5,382,822	0
44326	ATLANTIC CHARTER INSURANCE COMPANY	A	36,098,821	10,425,675	25,673,146	25,673,146	0
42390	AMGUARD INSURANCE COMPANY	A	34,713,014	19,915,358	14,797,656	14,797,656	0
11104	ASSOCIATED EMPLOYERS INSURANCE COMPANY	B	34,618,222	0	34,618,222	0	34,618,222
30104	HARTFORD UNDERWRITERS INSURANCE COMPANY	A	34,196,497	21,904,776	12,291,721	12,291,721	0
25658	TRAVELERS INDEMNITY COMPANY	A	33,027,788	24,756	33,003,032	33,003,032	0
40142	AMERICAN ZURICH INSURANCE COMPANY	A	32,945,995	15,089,231	17,856,764	17,856,764	0
33600	LM INSURANCE CORPORATION	A	28,742,411	25,003,717	3,738,694	3,738,694	0
25674	TRAVELERS PROPERTY CASUALTY COMPANY OF AMERICA	A	28,121,656	24,522,093	3,599,563	3,599,563	0
31470	NORGUARD INSURANCE COMPANY	A	25,968,799	0	25,968,799	25,968,799	0
23035	LIBERTY MUTUAL FIRE INSURANCE COMPANY	A	25,377,549	15,851,767	9,525,782	9,525,782	0
16535	ZURICH AMERICAN INSURANCE COMPANY	A	25,285,186	0	25,285,186	25,285,186	0
31325	ACADIA INSURANCE COMPANY	B	23,829,565	9,034,412	14,795,153	0	14,795,153
29459	TWIN CITY FIRE INSURANCE COMPANY	B	23,286,275	0	23,286,275	0	23,286,275
42404	LIBERTY INSURANCE CORPORATION	A	23,061,056	0	23,061,056	23,061,056	0
25011	WESCO INSURANCE COMPANY	A	22,976,972	0	22,976,972	22,976,972	0
11984	INDEPENDENCE CASUALTY INSURANCE COMPANY	A	22,161,613	0	22,161,613	22,161,613	0
19682	HARTFORD FIRE INSURANCE COMPANY	B	18,116,816	0	18,116,816	0	18,116,816
19429	INSURANCE COMPANY OF THE STATE OF PENNSYLVANIA	A	16,492,375	0	16,492,375	16,492,375	0
12886	MASSACHUSETTS EMPLOYERS INSURANCE COMPANY	A	15,520,165	0	15,520,165	15,520,165	0
22357	HARTFORD ACCIDENT AND INDEMNITY COMPANY	A	14,986,356	0	14,986,356	14,986,356	0
24074	OHIO CASUALTY INSURANCE COMPANY (THE)	A	13,736,740	0	13,736,740	13,736,740	0
20281	FEDERAL INSURANCE COMPANY	A	13,461,016	0	13,461,016	13,461,016	0
37478	HARTFORD INSURANCE COMPANY OF THE MIDWEST	B	13,316,306	0	13,316,306	0	13,316,306
24147	OLD REPUBLIC INSURANCE COMPANY	A	13,142,708	0	13,142,708	13,142,708	0
29424	HARTFORD CASUALTY INSURANCE COMPANY	B	12,243,810	0	12,243,810	0	12,243,810
23809	GRANITE STATE INSURANCE COMPANY	B	11,613,133	0	11,613,133	0	11,613,133
41360	ARBELLA PROTECTION INSURANCE COMPANY, INC.	A	10,778,798	0	10,778,798	10,778,798	0
13083	NEW HAMPSHIRE EMPLOYERS INSURANCE COMPANY	A	9,675,742	0	9,675,742	9,675,742	0
28258	CONTINENTAL INDEMNITY COMPANY	B	9,343,705	0	9,343,705	0	9,343,705
12777	CHUBB INDEMNITY INSURANCE COMPANY	A	9,183,992	0	9,183,992	9,183,992	0
12262	PENNSYLVANIA MANUFACTURERS' ASSOCIATION INS. CO.	A	8,571,454	0	8,571,454	8,571,454	0
20443	CONTINENTAL CASUALTY COMPANY	B	8,300,400	3,190,440	5,109,960	0	5,109,960
21458	EMPLOYERS INSURANCE COMPANY OF WAUSAU	B	8,209,179	0	8,209,179	0	8,209,179
22292	HANOVER INSURANCE COMPANY (THE)	A	7,750,927	0	7,750,927	7,750,927	0
11030	MEMIC INDEMNITY COMPANY	A	7,744,191	0	7,744,191	7,744,191	0
23965	NORFOLK & DEDHAM MUTUAL FIRE INSURANCE COMPANY	A	7,676,157	0	7,676,157	7,676,157	0
38318	STARR INDEMNITY & LIABILITY COMPANY	A	7,458,060	0	7,458,060	7,458,060	0
25224	GREAT DIVIDE INSURANCE COMPANY	A	7,397,579	0	7,397,579	7,397,579	0
18023	STAR INSURANCE COMPANY	A	7,383,966	0	7,383,966	7,383,966	0
42376	TECHNOLOGY INSURANCE COMPANY INC.	A	7,305,057	0	7,305,057	7,305,057	0
19445	NATIONAL UNION FIRE INS. CO. OF PITTSBURGH PA	B	7,274,030	0	7,274,030	0	7,274,030
21113	UNITED STATES FIRE INSURANCE COMPANY	A	6,861,346	0	6,861,346	6,861,346	0
13374	ARROW MUTUAL LIABILITY INSURANCE COMPANY	B	6,671,270	0	6,671,270	0	6,671,270
13803	FARM FAMILY CASUALTY INSURANCE COMPANY	A	6,612,033	0	6,612,033	6,612,033	0
11150	ARCH INSURANCE COMPANY	A	6,148,213	0	6,148,213	6,148,213	0
25623	PHOENIX INSURANCE COMPANY, (THE)	A	6,108,875	0	6,108,875	6,108,875	0
20346	PACIFIC INDEMNITY COMPANY	A	5,850,514	0	5,850,514	5,850,514	0
39926	SELECTIVE INSURANCE COMPANY OF THE SOUTHEAST	A	5,803,851	0	5,803,851	5,803,851	0
12831	STATE NATIONAL INSURANCE COMPANY INC.	A	5,632,476	0	5,632,476	5,632,476	0
20052	NATIONAL LIABILITY & FIRE INSURANCE COMPANY	A	5,546,562	0	5,546,562	5,546,562	0
25976	UTICA MUTUAL INSURANCE COMPANY	A	5,394,072	0	5,394,072	5,394,072	0

VI 000021

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2020

Section VI - E
 Exhibit 4
 Page 2

Calendar Year 2018 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)
19038	TRAVELERS CASUALTY AND SURETY COMPANY	A	5,149,249	0	5,149,249	5,149,249	0
13935	FEDERATED MUTUAL INSURANCE COMPANY	A	5,007,107	0	5,007,107	5,007,107	0
21784	FIREMEN'S INSURANCE COMPANY OF WASHINGTON, D.C.	B	4,868,998	0	4,868,998	0	4,868,998
14788	NGM INSURANCE COMPANY	A	4,752,760	0	4,752,760	4,752,760	0
31534	CITIZENS INSURANCE COMPANY OF AMERICA	A	4,598,122	0	4,598,122	4,598,122	0
21261	ELECTRIC INSURANCE COMPANY	A	4,451,129	0	4,451,129	4,451,129	0
15105	SAFETY NATIONAL CASUALTY CORPORATION	A	4,395,858	0	4,395,858	4,395,858	0
21415	EMPLOYERS MUTUAL CASUALTY COMPANY	A	4,393,786	0	4,393,786	4,393,786	0
22306	MASSACHUSETTS BAY INSURANCE COMPANY	A	4,379,026	0	4,379,026	4,379,026	0
24988	SENTRY INSURANCE A MUTUAL COMPANY	A	4,219,862	0	4,219,862	4,219,862	0
24139	OLD REPUBIC GENERAL INSURANCE CORPORATION	A	3,812,397	0	3,812,397	3,812,397	0
10017	ARBELLA INDEMNITY INSURANCE COMPANY, INC.	A	3,587,849	0	3,587,849	3,587,849	0
12416	PROTECTIVE INSURANCE COMPANY	A	3,399,172	0	3,399,172	3,399,172	0
25615	CHARTER OAK FIRE INSURANCE COMPANY, (THE)	A	3,201,544	0	3,201,544	3,201,544	0
24082	OHIO SECURITY INSURANCE COMPANY	A	3,087,734	0	3,087,734	3,087,734	0
21105	NORTH RIVER INSURANCE COMPANY	A	3,072,870	0	3,072,870	3,072,870	0
20427	AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA	A	2,995,663	0	2,995,663	2,995,663	0
37257	PRAETORIAN INSURANCE COMPANY	A	2,991,424	0	2,991,424	2,991,424	0
16608	NEW YORK MARINE AND GENERAL INSURANCE COMPANY	A	2,975,840	0	2,975,840	2,975,840	0
20303	GREAT NORTHERN INSURANCE COMPANY	A	2,924,662	0	2,924,662	2,924,662	0
20508	VALLEY FORGE INSURANCE COMPANY	A	2,905,035	0	2,905,035	2,905,035	0
25844	UNION INSURANCE COMPANY	B	2,787,902	0	2,787,902	0	2,787,902
19801	ARGONAUT INSURANCE COMPANY	A	2,728,084	0	2,728,084	2,728,084	0
41343	HDI GLOBAL INSURANCE COMPANY	A	2,715,714	0	2,715,714	2,715,714	0
20494	TRANSPORTATION INSURANCE COMPANY	B	2,544,012	0	2,544,012	0	2,544,012
10664	ENDEAVOUR INSURANCE COMPANY	B	2,529,793	0	2,529,793	0	2,529,793
35289	CONTINENTAL INSURANCE COMPANY, (THE)	A	2,483,898	0	2,483,898	2,483,898	0
21172	VANLINER INSURANCE COMPANY	A	2,482,646	0	2,482,646	2,482,646	0
23817	ILLINOIS NATIONAL INSURANCE COMPANY	B	2,440,524	0	2,440,524	0	2,440,524
19259	SELECTIVE INSURANCE COMPANY OF SOUTH CAROLINA	A	2,385,222	0	2,385,222	2,385,222	0
10052	CHUBB NATIONAL INSURANCE COMPANY	A	2,335,548	0	2,335,548	2,335,548	0
33588	FIRST LIBERTY INSURANCE CORPORATION (THE)	A	2,308,904	0	2,308,904	2,308,904	0
31348	CRUM & FORSTER INDEMNITY COMPANY	B	2,295,664	0	2,295,664	0	2,295,664
27855	ZURICH AMERICAN INSURANCE COMPANY OF ILLINOIS	A	2,281,484	0	2,281,484	2,281,484	0
14702	EASTGUARD INSURANCE COMPANY	A	2,268,739	0	2,268,739	2,268,739	0
37885	XL SPECIALTY INSURANCE COMPANY	A	2,144,681	0	2,144,681	2,144,681	0
14164	MEMIC CASUALTY COMPANY	A	1,971,375	0	1,971,375	1,971,375	0
21423	UNION INSURANCE COMPANY OF PROVIDENCE	A	1,931,826	0	1,931,826	1,931,826	0
25984	GRAPHIC ARTS MUTUAL INSURANCE COMPANY	A	1,924,674	0	1,924,674	1,924,674	0
20478	NATIONAL FIRE INSURANCE COMPANY OF HARTFORD	A	1,897,756	0	1,897,756	1,897,756	0
23329	MERCHANTS MUTUAL INSURANCE COMPANY	A	1,887,408	0	1,887,408	1,887,408	0
19380	AMERICAN HOME ASSURANCE COMPANY	B	1,867,899	0	1,867,899	0	1,867,899
19410	COMMERCE AND INDUSTRY INSURANCE COMPANY	B	1,840,618	0	1,840,618	0	1,840,618
12475	REPUBLIC FRANKLIN INSURANCE COMPANY	A	1,741,536	0	1,741,536	1,741,536	0
10687	UTICA NATIONAL ASSURANCE COMPANY	A	1,726,922	0	1,726,922	1,726,922	0
29939	MAIN STREET AMERICA ASSURANCE COMPANY	A	1,672,805	0	1,672,805	1,672,805	0
10120	EVEREST NATIONAL INSURANCE COMPANY	B	1,666,163	0	1,666,163	0	1,666,163
42552	NOVA CASUALTY COMPANY	A	1,656,887	0	1,656,887	1,656,887	0
11126	SOMPO JAPAN INSURANCE COMPANY OF AMERICA	A	1,624,296	0	1,624,296	1,624,296	0
10346	EMPLOYERS PREFERRED INSURANCE COMPANY	A	1,599,478	0	1,599,478	1,599,478	0
36064	HANOVER AMERICAN INSURANCE COMPANY (THE)	A	1,598,804	0	1,598,804	1,598,804	0
11149	MAINE EMPLOYERS' MUTUAL INSURANCE COMPANY	B	1,523,605	0	1,523,605	0	1,523,605
24554	XL INSURANCE AMERICA, INC.	A	1,473,998	0	1,473,998	1,473,998	0
38911	BERKLEY NATIONAL INSURANCE COMPANY	A	1,425,849	0	1,425,849	1,425,849	0
26247	AMERICAN GUARANTEE AND LIABILITY INSURANCE COMPANY	A	1,416,880	0	1,416,880	1,416,880	0
31232	WORK FIRST CASUALTY COMPANY	A	1,413,914	0	1,413,914	1,413,914	0

VI 000022

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2020

Section VI - E
 Exhibit 4
 Page 3

Calendar Year 2018 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)
41840	ALLMERICA FINANCIAL BENEFIT INSURANCE COMPANY	A	1,404,881	0	1,404,881	1,404,881	0
20230	CENTRAL MUTUAL INSURANCE COMPANY	B	1,363,152	0	1,363,152	0	1,363,152
18767	CHURCH MUTUAL INSURANCE COMPANY	B	1,362,676	0	1,362,676	0	1,362,676
28460	SENTRY CASUALTY COMPANY	A	1,221,056	0	1,221,056	1,221,056	0
10804	CONTINENTAL WESTERN INSURANCE COMPANY	B	1,180,543	0	1,180,543	0	1,180,543
15954	AMTRUST INSURANCE COMPANY OF KANSAS, INC.	A	1,074,144	0	1,074,144	1,074,144	0
28304	FEDERATED SERVICE INSURANCE COMPANY	A	1,003,652	0	1,003,652	1,003,652	0
25496	STARSTONE NATIONAL INSURANCE COMPANY	A	997,146	0	997,146	997,146	0
43478	UTICA NATIONAL INSURANCE COMPANY OF TEXAS	A	991,166	0	991,166	991,166	0
27154	ATLANTIC SPECIALTY INSURANCE COMPANY	A	966,462	0	966,462	966,462	0
20044	BERKSHIRE HATHAWAY HOMESTATE INSURANCE COMPANY	A	964,359	0	964,359	964,359	0
23442	PATRIOT GENERAL INSURANCE COMPANY	A	899,296	0	899,296	899,296	0
20362	MITSUI SUMITOMO INSURANCE COMPANY OF AMERICA	A	885,813	0	885,813	885,813	0
13706	DORCHESTER MUTUAL INSURANCE COMPANY	A	875,378	0	875,378	875,378	0
20397	VIGILANT INSURANCE COMPANY	A	871,110	0	871,110	871,110	0
25402	EMPLOYERS ASSURANCE COMPANY	A	867,341	0	867,341	867,341	0
22136	GREAT AMERICAN INSURANCE COMPANY OF NEW YORK	A	865,532	0	865,532	865,532	0
26182	HARLEYSVILLE WORCESTER INSURANCE COMPANY	A	834,766	0	834,766	834,766	0
11000	SENTINEL INSURANCE COMPANY, LTD.	A	817,818	0	817,818	817,818	0
44393	WEST AMERICAN INSURANCE COMPANY	A	806,031	0	806,031	806,031	0
19879	SECURITY NATIONAL INSURANCE COMPANY	A	805,580	0	805,580	805,580	0
20222	ALL AMERICA INSURANCE COMPANY	A	752,914	0	752,914	752,914	0
32620	NATIONAL INTERSTATE INSURANCE COMPANY	A	729,648	0	729,648	729,648	0
23434	MIDDLESEX INSURANCE COMPANY	A	716,626	0	716,626	716,626	0
12901	MERCHANTS PREFERRED INSURANCE COMPANY	A	715,665	0	715,665	715,665	0
15067	QUINCY MUTUAL FIRE INSURANCE COMPANY	A	690,150	0	690,150	690,150	0
13978	FLORISTS' MUTUAL INSURANCE COMPANY	A	678,896	0	678,896	678,896	0
38997	SOMPO AMERICAN FIRE AND MARINE INSURANCE COMPANY	A	676,276	0	676,276	676,276	0
23396	AMERISURE MUTUAL INSURANCE COMPANY	B	666,684	0	666,684	0	666,684
11512	EMPLOYERS COMPENSATION INSURANCE COMPANY	A	658,355	0	658,355	658,355	0
13714	PHARMACISTS MUTUAL INSURANCE COMPANY	A	649,903	0	649,903	649,903	0
35408	IMPERIUM INSURANCE COMPANY	A	634,436	0	634,436	634,436	0
38970	MARKEL INSURANCE COMPANY	A	625,045	0	625,045	625,045	0
27626	FIRSTCOMP INSURANCE COMPANY	A	583,845	0	583,845	583,845	0
11673	REDWOOD FIRE AND CASUALTY INSURANCE COMPANY	A	554,218	0	554,218	554,218	0
21849	AMERICAN AUTOMOBILE INSURANCE COMPANY	A	544,760	0	544,760	544,760	0
10166	ACCIDENT FUND INSURANCE COMPANY OF AMERICA	A	544,450	0	544,450	544,450	0
10340	STONINGTON INSURANCE COMPANY	A	530,995	0	530,995	530,995	0
21180	SENTRY SELECT INSURANCE COMPANY	A	527,323	0	527,323	527,323	0
40045	STARNET INSURANCE COMPANY	A	509,835	0	509,835	509,835	0
26662	MILWAUKEE CASUALTY INSURANCE CO.	A	507,105	0	507,105	507,105	0
24414	GENERAL CASUALTY COMPANY OF WISCONSIN	A	494,540	0	494,540	494,540	0
28223	NATIONWIDE AGRIBUSINESS INSURANCE COMPANY	B	478,324	0	478,324	0	478,324
15032	GUIDEONE MUTUAL INSURANCE COMPANY	A	476,774	0	476,774	476,774	0
26832	GREAT AMERICAN ALLIANCE INSURANCE COMPANY	A	471,238	0	471,238	471,238	0
24198	PEERLESS INSURANCE COMPANY	A	446,925	0	446,925	446,925	0
28932	MARKEL AMERICAN INSURANCE COMPANY	A	446,154	0	446,154	446,154	0
11185	FOREMOST INSURANCE COMPANY GRAND RAPIDS, MICHIGAN	B	440,896	0	440,896	0	440,896
21873	FIREMAN'S FUND INSURANCE COMPANY	A	432,851	0	432,851	432,851	0
28886	TRANSGUARD INSURANCE COMPANY OF AMERICA, INC.	A	429,806	0	429,806	429,806	0
22551	MITSUI SUMITOMO INSURANCE USA INC.	A	398,638	0	398,638	398,638	0
11991	NATIONAL CASUALTY COMPANY	A	396,002	0	396,002	396,002	0
24066	AMERICAN FIRE AND CASUALTY COMPANY	A	384,850	0	384,850	384,850	0
10800	PREMIER GROUP INSURANCE COMPANY	B	366,676	0	366,676	0	366,676
10945	TOKIO MARINE AMERICA INSURANCE COMPANY	A	354,705	0	354,705	354,705	0
29157	UNITED WISCONSIN INSURANCE COMPANY	A	334,414	0	334,414	334,414	0

VI 000023

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2020

Section VI - E
 Exhibit 4
 Page 4

Calendar Year 2018 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)
10665	AMERITRUST INSURANCE CORPORATION	A	332,753	0	332,753	332,753	0
23582	HARLEYSVILLE INSURANCE COMPANY	A	302,183	0	302,183	302,183	0
10391	BERKSHIRE HATHAWAY DIRECT INSURANCE COMPANY	A	300,926	0	300,926	300,926	0
11800	FOREMOST PROPERTY AND CASUALTY INSURANCE COMPANY	B	277,156	0	277,156	0	277,156
11371	GREAT WEST CASUALTY COMPANY	A	258,613	0	258,613	258,613	0
14190	OBI NATIONAL INSURANCE COMPANY	A	252,700	0	252,700	252,700	0
41513	FOREMOST SIGNATURE INSURANCE COMPANY	B	252,630	0	252,630	0	252,630
41238	TRANS PACIFIC INSURANCE COMPANY	A	248,125	0	248,125	248,125	0
31003	TRI-STATE INSURANCE COMPANY OF MINNESOTA	A	246,283	0	246,283	246,283	0
14923	PATRONS MUTUAL INSURANCE COMPANY OF CONNECTICUT	A	239,683	0	239,683	239,683	0
41106	TRIUMPHE CASUALTY COMPANY	A	236,011	0	236,011	236,011	0
21881	NATIONAL SURETY CORPORATION	A	217,891	0	217,891	217,891	0
23043	LIBERTY MUTUAL INSURANCE COMPANY	B	213,843	0	213,843	0	213,843
25135	STATE AUTOMOBILE MUTUAL INSURANCE COMPANY	A	196,502	0	196,502	196,502	0
13269	ZENITH INSURANCE COMPANY	A	194,340	0	194,340	194,340	0
19984	ACIG INSURANCE COMPANY	A	187,094	0	187,094	187,094	0
10677	CINCINNATI INSURANCE COMPANY	A	184,916	0	184,916	184,916	0
25127	STATE AUTO PROPERTY & CASUALTY INSURANCE COMPANY	A	175,526	0	175,526	175,526	0
19488	AMERISURE INSURANCE COMPANY	B	143,428	0	143,428	0	143,428
13528	BROTHERHOOD MUTUAL INSURANCE COMPANY	B	139,388	0	139,388	0	139,388
24449	REGENT INSURANCE COMPANY	A	136,580	0	136,580	136,580	0
18279	BANKERS STANDARD INSURANCE COMPANY	A	134,382	0	134,382	134,382	0
12866	T.H.E INSURANCE COMPANY	B	129,687	0	129,687	0	129,687
31925	FALLS LAKE NATIONAL INSURANCE COMPANY	A	125,512	0	125,512	125,512	0
43575	INDEMNITY INSURANCE COMPANY OF NORTH AMERICA	A	121,231	0	121,231	121,231	0
11045	EXCELSIOR INSURANCE COMPANY	A	114,995	0	114,995	114,995	0
13056	RLI INSURANCE COMPANY	A	113,758	0	113,758	113,758	0
10642	CHEROKEE INSURANCE COMPANY	A	109,301	0	109,301	109,301	0
16024	FEDERATED RESERVE INSURANCE COMPANY	A	105,860	0	105,860	105,860	0
40460	SAGAMORE INSURANCE COMPANY	A	99,585	0	99,585	99,585	0
15911	AMERICAN MINING INSURANCE COMPANY	A	98,842	0	98,842	98,842	0
19720	AMERICAN ALTERNATIVE INSURANCE CORPORATION	A	91,885	0	91,885	91,885	0
28665	CINCINNATI CASUALTY COMPANY	A	91,388	0	91,388	91,388	0
23280	CINCINNATI INDEMNITY COMPANY	A	90,800	0	90,800	90,800	0
11123	SAFETY FIRST INSURANCE COMPANY	A	90,422	0	90,422	90,422	0
29580	BERKLEY REGIONAL INSURANCE COMPANY	A	81,718	0	81,718	81,718	0
15645	OBI AMERICA INS CO	A	79,058	0	79,058	79,058	0
27740	NORTH POINTE INSURANCE COMPANY	A	64,455	0	64,455	64,455	0
12304	ACCIDENT FUND GENERAL INSURANCE COMPANY	A	61,128	0	61,128	61,128	0
35696	HARLEYSVILLE PREFERRED INSURANCE COMPANY	A	60,803	0	60,803	60,803	0
31895	AMERICAN INTERSTATE INSURANCE COMPANY	A	60,414	0	60,414	60,414	0
40517	ADVANTAGE WORKERS COMPENSATION INSURANCE COMPANY	A	55,191	0	55,191	55,191	0
24767	ST. PAUL FIRE & MARINE INSURANCE COMPANY	A	51,891	0	51,891	51,891	0
16044	EVEREST DENALI INSURANCE COMPANY	A	51,821	0	51,821	51,821	0
20699	ACE PROPERTY AND CASUALTY INSURANCE COMPANY	A	47,529	0	47,529	47,529	0
27847	INSURANCE COMPANY OF THE WEST	A	43,960	0	43,960	43,960	0
12305	ACCIDENT FUND NATIONAL INSURANCE COMPANY	A	39,513	0	39,513	39,513	0
19828	ARGONAUT-MIDWEST INSURANCE COMPANY	A	37,733	0	37,733	37,733	0
25143	STATE FARM FIRE AND CASUALTY COMPANY	A	34,603	0	34,603	34,603	0
10510	CAROLINA CASUALTY INSURANCE COMPANY	A	32,679	0	32,679	32,679	0
41394	BENCHMARK INSURANCE COMPANY	A	25,508	0	25,508	25,508	0
26344	GREAT AMERICAN ASSURANCE COMPANY	A	21,034	0	21,034	21,034	0
22322	GREENWICH INSURANCE COMPANY	A	16,925	0	16,925	16,925	0
21709	TRUCK INSURANCE EXCHANGE	A	16,473	0	16,473	16,473	0
38300	SAMSUNG FIRE & MARINE INSURANCE CO. LTD (U.S. BRANCH)	A	16,224	0	16,224	16,224	0
26069	WAUSAU BUSINESS INSURANCE COMPANY	A	15,304	0	15,304	15,304	0

VI 000024

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2020

Section VI - E
 Exhibit 4
 Page 5

Calendar Year 2018 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	14,130	0	14,130	14,130	0
16691	GREAT AMERICAN INSURANCE COMPANY	A	12,631	0	12,631	12,631	0
14982	PENN MILLERS INSURANCE COMPANY	A	11,863	0	11,863	11,863	0
22713	INSURANCE COMPANY OF NORTH AMERICA	A	9,329	0	9,329	9,329	0
16045	EVEREST PREMIER INSURANCE COMPANY	A	8,698	0	8,698	8,698	0
26042	WAUSAU UNDERWRITERS INSURANCE COMPANY	A	7,357	0	7,357	7,357	0
16551	SAVERS PROPERTY AND CASUALTY INSURANCE COMPANY	A	6,722	0	6,722	6,722	0
12297	PETROLEUM CASUALTY COMPANY	A	6,453	0	6,453	6,453	0
10724	EASTERN ALLIANCE INSURANCE COMPANY	A	6,447	0	6,447	6,447	0
36684	RIVERPORT INSURANCE COMPANY	A	6,102	0	6,102	6,102	0
10212	ALLMERICA FINANCIAL ALLIANCE INSURANCE COMPANY	A	5,635	0	5,635	5,635	0
24171	NETHERLANDS INSURANCE COMPANY (THE)	A	5,612	0	5,612	5,612	0
11242	ALLIED EASTERN INDEMNITY COMPANY	A	5,449	0	5,449	5,449	0
19690	AMERICAN ECONOMY INSURANCE COMPANY	A	5,048	0	5,048	5,048	0
23612	MIDWEST EMPLOYERS CASUALTY COMPANY	A	4,470	0	4,470	4,470	0
15563	CLEAR SPRING PROPERTY AND CASUALTY COMPANY	A	3,681	0	3,681	3,681	0
19399	AIU INSURANCE COMPANY	B	3,562	0	3,562	0	3,562
19704	AMERICAN STATES INSURANCE COMPANY	A	1,936	0	1,936	1,936	0
14990	PENNSYLVANIA NATIONAL MUTUAL CASUALTY INS. CO.	B	1,854	0	1,854	0	1,854
36307	GRAY INSURANCE COMPANY (THE)	A	812	0	812	812	0
34690	PROPERTY AND CASUALTY INSURANCE CO. OF HARTFORD	A	320	0	320	320	0
27120	TRUMBULL INSURANCE COMPANY	A	227	0	227	227	0
13019	EASTERN ADVANTAGE ASSURANCE COMPANY	A	120	0	120	120	0
22195	INSURANCE COMPANY OF GREATER NEW YORK	A	87	0	87	87	0
13331	MOTORISTS COMMERCIAL MUTUAL INSURANCE COMPANY	A	82	0	82	82	0
20702	ACE FIRE UNDERWRITERS INSURANCE COMPANY	A	79	0	79	79	0
41483	FARMINGTON CASUALTY COMPANY	A	72	0	72	72	0
20095	BITCO GENERAL INSURANCE CORPORATION	A	44	0	44	44	0
23787	NATIONWIDE MUTUAL INSURANCE COMPANY	A	3	0	3	3	0
Total			1,277,531,307	265,841,937	1,011,689,370	763,650,045	248,039,325

Percentage of Voluntary written premium electing Type A Discount: 75.5%
 Percentage of Voluntary written premium electing Type B Discount: 24.5%

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

VI 000025

Section VI - Expenses
Subsection F - Expense Constant Offset
7/1/2020

Section VI - F
Exhibit 1

Calculation of Expense Constant as Percent of Premium for Prospective Effective Period

(1) Expense Constant Offset for Policy Year 2017	0.963
(2) Expense Constant as Percent of Premium for Policy Year 2017 = 1.0 - (1)	3.7%
(3) Calculated Expense Constant for Policy Year 2017	\$253.13
(4) Factor to Bring Policy Year 2017 Premium to Premium Level of Prospective Effective Period	1.04
(5) Estimated Expense Constant for Prospective Effective Period	\$263.35
(6) Expense Constant as Percent of Premium for Prospective Effective Period = { (2) x [(5) / (3)] } / { [(1) x (4)] + [(2) x ((5) / (3))] }	3.7%

Notes:

(1): Exhibit 2.

(3): Based on Unit Statistical Plan Data

(4): Section III-E, Exhibit 1.

(5): Section D, Exhibit 1.

VI 000026

Section VI - Expenses
 Subsection F - Expense Constant Offset
 7/1/2020

Section VI - F
 Exhibit 2

Expense Constant Offsets

Used in Section I and Section III

Policy Year	Standard Premium Excluding Expense Constant	ARAP at Company Level	Factor to Adjust ARAP from Company Level to DSR Level Premium	Expense Constant	Expense Constant Offset
(1)	(2)	(3)	(4)	(5)	(6)
2016	1,107,736,305	48,619,726	1.049	48,205,269	0.960
2017	1,179,226,932	51,254,264	1.053	48,314,728	0.962

Used in the Calculation of Expense Constant as Percent of Premium for Prospective Effective Period

Policy Year	Standard Premium Excluding Expense Constant	ARAP at Company Level	Factor to Adjust ARAP from Company Level to DSR Level Premium	Expense Constant	Expense Constant Offset
(7)	(8)	(9)	(10)	(11)	(12)
2017	810,336,855	33,357,672	1.053	32,451,403	0.963

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 2017 used in Section I and Section III differ from those used in the calculation of the Expense Constant because of a differing company mixes.

VI 000027

Section VI - Expenses
Subsection G - Acquisition Expenses
7/1/2020

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	2.0%
(2)	Selected Average Commission Ratio, Excluding Expense Constants	9.1%
(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)	12.2%

Notes:

(1): Exhibit 2.

(2): Exhibit 3.

(3): Exhibit 4, Page 1.

(4): Exhibit 5.

VI 000028

Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2020

Section VI - G
 Exhibit 2

Calculation of Other Acquisition Expense

	Calendar Year		
	2016	2017	2018
(1) Standard Earned Premium Including Expense Constant Premium	977,592,112	1,052,364,914	1,091,757,245
(2) ARAP Premium at Company Level	41,781,275	42,331,721	45,616,548
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.049	1.051	1.053
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	1,021,422,390	1,096,853,539	1,139,788,499
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.043	1.040	1.040
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	1.002	1.002
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	1,064,068,560	1,143,308,639	1,187,869,866
(8) Other Acquisition, Field Supervision, Collection Expenses for Home Office and Branch Office, excluding Commissions	45,412,517	37,490,316	42,037,368
(9) Other Acquisition Expense Ratio = (8) / (7)	4.3%	3.3%	3.5%
(10) Three Year Average		3.7%	
(11) Expense Constant as Percent of Premium for Prospective Effective Period		3.7%	
(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)		1.7%	
(14) Other Acquisition and Field Supervision Expense Ratio, Excluding Expense Constants = [(10) - (13)] / [1.0 - (11)]		2.0%	

Notes:

- (1), (2): Aggregate Financial Reconciliation Report Calls, Calendar Years 2016 - 2018.
 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 2016 - 2018.
- (11): Section VI-F, Exhibit 1.
- (12): Section VI-B, Exhibit 3.

VI 000029

Section VI - Expenses
Subsection G - Acquisition Expenses
7/1/2020

Section VI - G
Exhibit 3

Calculation of Average Commission Rate

	Calendar Year		
	2016	2017	2018
(1) Direct Written Premium	834,888,549	881,014,774	895,327,373
(2) Total Commissions for Agents and Brokers	72,835,503	79,985,653	77,272,093
(3) Average Commission Rate = (2) / (1)	8.7%	9.1%	8.6%
(4) Three Year Average		8.8%	
(5) Expense Constant as Percent of Premium for Prospective Effective Period		3.7%	
(6) Average Commission Ratio, Excluding Expense Constants = (4) / [1.0 - (5)]		9.1%	
(7) Selected Average Commission Ratio, Excluding Expense Constants		9.1%	

Notes:

- (1): Annual Statement Exhibit of Premium and Losses, Calendar Years 2016 - 2018.
(2): Aggregate Financial Expense Calls, Calendar Years 2016 - 2018.
(5): Section VI-F, Exhibit 1.

VI 000030

Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2020

Section VI - G
 Exhibit 4
 Page 1

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)
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%
2017	18.8%	2.6%	3.0%	0.3%	24.7%
2018	20.9%	2.0%	2.1%	0.2%	25.2%
(7) Average	18.5%	3.7%	3.7%	0.4%	26.3%
(8) Estimated Ceding Commission & Brokerage Rate for Workers' Compensation Non-Proportional Reinsurance	16.3%				
(9) Adjusted Average = (7) - (8)	2.2%	3.7%	3.7%	0.4%	10.0%
(10) Estimated % of Direct Premium Ceded for Workers' Compensation Non-Proportional Reinsurance					14.5%
(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 2005 - 2019.

(8): Page 2, (10).

(10): Page 2, (11).

VI 000031

Estimate of Ceding Commission & Brokerage Rate for Workers' Compensation Non-Proportional Reinsurance

Calendar Year	Written Premiums (000's)			Ratio of Commission & Brokerage Incurred to Written Premium		Commission & Brokerage Expenses Incurred (000's)		
	Direct	Net	Direct - Net = (2) - (3)	Direct	Net	Direct = (2) x (5) (7)	Net = (3) x (6) (8)	Direct - Net = (7) - (8) (9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
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
2017	55,749,285	45,032,688	10,716,597	0.092	0.075	5,128,934	3,377,452	1,751,483
2018	54,900,760	47,963,539	6,937,221	0.091	0.085	4,995,969	4,076,901	919,068
Total	735,817,565	628,999,585	106,817,980	0.081	0.067	59,605,015	42,196,696	17,408,319

- (10) Estimated Ceding Commission & Brokerage Rate for Workers' Compensation Non-Proportional Reinsurance = Total (9) / Total (4) 16.3%
- (11) Estimated % of Direct Premium Ceded for Workers' Compensation Non-Proportional Reinsurance = Total (4) / Total (2) 14.5%

Notes:
 (2), (3), (5), (6): Insurance Expense Exhibit database - By Line Underwriting Experience from Best's Aggregates & Averages for Workers' Comp Editions 2005 - 2019.

VI 000032

Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2020

Section VI - G
 Exhibit 5

Effect of Incidental Income and Earned but Uncollected Premium

	Calendar Year		
	2016	2017	2018
(1) Standard Earned Premium Including Expense Constant Premium	977,592,112	1,052,364,914	1,091,757,245
(2) ARAP Premium at Company Level	41,781,275	42,331,721	45,616,548
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.049	1.051	1.053
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	1,021,422,390	1,096,853,539	1,139,788,499
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.043	1.040	1.040
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	0.999	1.002	1.002
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	1,064,068,560	1,143,308,639	1,187,869,866
(8) Earned But Uncollected Premium ("EBUP")	3,956,924	5,475,413	5,715,900
(9) Incidental Income	1,322,398	1,243,591	1,205,981
(10) Net Effect of Incidental Income and EBUP Expense = [(8) - (9)] / (7)	0.2%	0.4%	0.4%
(11) Three Year Average		0.3%	
(12) Expense Constant as Percent of Premium for Prospective Effective Period		3.7%	
(13) Effect of Incidental Income and EBUP Expense, Exclusive of Expense Constants = (11) / [1.0 - (12)]		0.3%	
(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 2016 - 2018.
 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.

VI 000033

Section VI - Expenses
 Subsection H - Loss Adjustment Expense
 7/1/2020

Section VI - H
 Exhibit 1
 Page 1

Defense and Cost Containment Expense ("DCCE") Ratio and Total Loss Adjustment Expense ("LAE") Ratio

	Calendar Year		
	2016	2017	2018
(1) Ground Up Paid Losses	411,597,582	438,317,057	441,167,849
(2) Ground Up Paid Defense and Cost Containment Expense	35,263,120	36,787,198	37,962,295
(3) Defense and Cost Containment Expense Ratio = (2) / (1)	8.6%	8.4%	8.6%
(4) Three Year Average Defense and Cost Containment Expense Ratio = Average of (3)		8.5%	
(5) Selected Three Year Average Defense and Cost Containment Expense Ratio		8.5%	
(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]

	Policy Year		
	2016	2017	2018
(1) Defense and Cost Containment Expense Ratio	8.8%	8.8%	8.8%
(2) Three Year Average Defense and Cost Containment Expense Ratio = Average of (1)		8.8%	
(3) Selected Three Year Average Defense and Cost Containment Expense Ratio		8.8%	
(4) Total Loss Adjustment Expense Ratio (LAE / Loss)		18.7%	

Notes:

(1): Section VI-H, Exhibit 1, Page 2
 (4): (3) + [(9) from Section VI-H, Exhibit 2]

VI 000034

Section VI - Expenses
 Subsection H - Loss Adjustment Expense
 7/1/2020

Section VI - H
 Exhibit 1
 Page 2

Paid Defense and Cost Containment ("DCCE")

Policy Year (1)	Age of Development									
	12	24	36	48	60	72	84	96	108	120
2003						18,400,635	19,310,297	19,829,417	20,119,628	20,291,313
2004					17,336,132	18,478,225	19,181,810	19,620,853	19,932,806	20,040,561
2005				15,677,826	17,076,816	17,940,391	18,473,854	18,799,256	19,073,334	19,273,221
2006			13,818,852	16,833,413	18,530,108	19,447,777	20,069,728	20,402,171	20,686,036	20,855,655
2007		9,921,053	16,030,493	19,129,027	20,955,507	22,052,800	22,745,615	23,197,858	23,547,682	23,837,061
2008	2,551,238	11,126,554	16,857,123	19,757,692	21,584,549	22,808,787	23,537,960	24,074,431	24,428,931	24,728,320
2009	2,433,649	11,060,018	17,095,200	20,497,568	22,394,674	23,609,065	24,406,313	24,874,142	25,264,583	25,648,482
2010	2,338,440	10,880,972	17,467,350	21,242,282	23,606,936	24,871,162	25,609,567	26,045,432	26,363,193	
2011	2,563,788	13,021,363	20,556,786	25,060,791	27,456,219	28,707,039	29,513,546	29,965,272		
2012	2,691,679	13,463,095	21,596,694	25,864,671	28,481,144	29,884,508	30,387,553			
2013	2,960,744	14,337,522	22,566,519	26,743,061	28,994,050	30,171,231				
2014	3,363,569	15,726,790	24,693,611	29,296,796	32,456,975					
2015	2,669,920	14,149,132	23,082,460	27,668,371						
2016	3,011,155	15,662,261	25,016,352							
2017	3,016,212	15,963,618								
2018	3,245,353									

Paid Losses

Policy Year (1)	Age of Development									
	12	24	36	48	60	72	84	96	108	120
2003						222,732,169	227,885,925	231,854,686	234,277,393	235,778,395
2004					220,212,773	229,860,481	235,436,664	238,594,076	241,045,008	243,316,255
2005				198,029,818	215,864,283	225,762,015	230,359,739	234,796,841	237,459,882	239,108,611
2006			166,832,128	206,898,906	228,585,828	238,808,836	244,490,346	249,624,698	253,568,007	254,601,394
2007		124,584,975	191,270,304	231,979,598	252,994,011	265,538,290	270,344,016	276,184,355	281,052,517	283,770,184
2008	31,275,729	127,505,490	193,051,452	231,962,366	253,098,893	265,067,396	271,574,147	275,248,156	277,713,697	279,023,889
2009	31,848,703	132,177,192	202,144,759	243,772,320	272,552,546	289,138,799	295,547,937	300,324,462	303,332,237	305,314,031
2010	32,929,798	132,720,346	202,891,783	248,356,736	277,616,491	290,358,002	298,247,436	301,957,462	303,522,002	
2011	35,627,939	142,418,237	221,845,178	279,597,524	310,039,685	321,316,234	327,549,904	332,092,306		
2012	33,838,977	147,772,949	236,577,817	290,666,540	322,039,453	339,481,450	346,725,200			
2013	34,299,069	151,121,098	237,718,412	288,244,493	317,684,042	329,032,870				
2014	39,629,213	167,526,580	267,502,073	337,628,506	374,116,529					
2015	38,401,064	165,341,595	265,714,514	328,097,002						
2016	40,963,640	174,793,393	278,671,325							
2017	40,003,185	177,723,859								
2018	43,656,569									

Paid Defense and Cost Containment ("DCCE") Ratios

Policy Year (1)	Age of Development										Developed to Tenth Report (3)	
	12	24	36	48	60	72	84	96	108	120		
2003						(4) = (2) / (3)	0.083	0.085	0.086	0.086	0.086	0.086
2004					0.079	0.080	0.081	0.082	0.083	0.082	0.082	0.082
2005				0.079	0.079	0.079	0.080	0.080	0.080	0.081	0.081	0.081
2006			0.083	0.081	0.081	0.081	0.082	0.082	0.082	0.082	0.082	0.082
2007		0.080	0.084	0.082	0.083	0.083	0.084	0.084	0.084	0.084	0.084	0.084
2008	0.082	0.087	0.087	0.085	0.085	0.086	0.087	0.087	0.088	0.089	0.089	0.089
2009	0.076	0.084	0.085	0.084	0.082	0.082	0.083	0.083	0.083	0.084	0.084	0.084
2010	0.071	0.082	0.086	0.086	0.085	0.086	0.086	0.086	0.087	0.087	0.087	0.087
2011	0.072	0.091	0.093	0.090	0.089	0.089	0.090	0.090	0.090	0.090	0.091	0.091
2012	0.080	0.091	0.091	0.089	0.088	0.088	0.088	0.088			0.089	0.089
2013	0.086	0.095	0.095	0.093	0.091	0.092					0.093	0.093
2014	0.085	0.094	0.092	0.087	0.087						0.089	0.089
2015	0.070	0.086	0.087	0.084							0.085	0.085
2016	0.074	0.090	0.090								0.088	0.088
2017	0.075	0.090									0.088	0.088
2018	0.074										0.088	0.088
					Age-to-Age Development Factors							
		12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - 96	96 - 108	108 - 120		
2003						1.026	1.009	1.004	1.002			
2004						1.021	1.013	1.009	1.006	0.996		
2005				0.999	1.005	1.009	0.998	1.003	1.004	1.004		
2006			0.982	0.996	1.005	1.008	0.996	1.008	1.004	1.004		
2007		1.052	0.984	1.004	1.003	1.013	0.998	0.997	1.003	1.003		
2008		1.070	1.001	0.975	1.001	1.009	1.007	1.009	1.006	1.008		
2009		1.095	1.011	0.994	0.977	0.994	1.011	1.003	1.006	1.009		
2010		1.154	1.050	0.993	0.994	1.007	1.002	1.005	1.007			
2011		1.271	1.013	0.967	0.988	1.009	1.009	1.001				
2012		1.145	1.002	0.975	0.994	0.995	0.996					
2013		1.099	1.001	0.977	0.984	1.005						
2014		1.106	0.983	0.940	1.000							
2015		1.231	1.015	0.971								
2016		1.219	1.002									
2017		1.191										
2 Yr Weighted Average	1.205	1.008	0.955	0.991	1.000	1.002	1.003	1.006	1.008			
3 Yr Weighted Average	1.213	1.000	0.963	0.992	1.003	1.002	1.003	1.006	1.006			
5 Yr Weighted Average	1.165	1.000	0.966	0.992	1.002	1.005	1.003	1.003	1.005			
Selected	1.213	1.000	0.963	0.992	1.003	1.002	1.003	1.006	1.006			
Cumulative	1.182	0.975	0.975	1.013	1.021	1.018	1.015	1.012	1.006			

Notes:
 (2),(3): Aggregate Financial Policy Year Calls.
 Paid DCCE Ratios are calculated as Paid DCCE/(Paid Medical + Paid Indemnity)

VI 000035

Section VI - Expenses
 Subsection H - Loss Adjustment Expense
 7/1/2020

Section VI - H
 Exhibit 2

Adjusting and Other ("AO") Expense Ratio

	Calendar Year		
	2016	2017	2018
(1) Direct Incurred Losses	526,727,149	527,721,101	500,942,197
(2) Factor to Adjust the Direct Losses to Full Coverage Losses	1.254	1.263	1.252
(3) Estimated Full Coverage Incurred Losses = (1) x (2)	660,764,488	666,250,677	627,242,549
(4) Direct Incurred Adjusting and Other Expense	57,165,279	60,499,895	56,941,646
(5) Factor to Adjust the Direct Adjusting and Other Expense to Full Coverage AO Expense	1.113	1.116	1.112
(6) Estimated Full Coverage Adjusting and Other Expense = (4) x (5)	63,617,772	67,519,345	63,316,267
(7) Adjusted Adjusting and Other Expense Ratio = (6) / (3)	9.63%	10.13%	10.09%
(8) Three Year Average Adjusted Adjusting and Other Expense Ratio = Average of (7)		10.0%	
(9) Selected Three Year Average Adjusted Adjusting and Other Expense Ratio		10.0%	

Notes:

(1),(4): Aggregate Financial Calendar Year Expense Data Calls, 2016 - 2018.

(2),(5): Section VI-I, Exhibit 1, Page 1.

VI 000036

Section VI - Expenses
 Subsection I - Adjustment for Large Deductible Policies
 7/1/2020

Section VI - I
 Exhibit 1
 Page 1

Adjustment to the Adjusting and Other Expense Provision

	Calendar Year		
	2016	2017	2018
(1) Average Premium Reduction Factor for Large Deductible Policies	0.814	0.818	0.815
(2) Loss Elimination Ratio (LER) for Large Deductible Policies = (1) x 1.105	89.9%	90.4%	90.1%
(3) Market Share (Standard Premium Basis) of Large Deductible Policies	22.6%	23.0%	22.4%
(4) LER for Full Coverage plus Large Deductible Policies = [(2) x (3)] + { 0.0 x [1.0 - (3)] }	20.3%	20.8%	20.1%
(5) Factor to Adjust the Direct Losses to Full Coverage Losses = 1.0 / [1.0 - (4)]	1.254	1.263	1.252
(6) Factor to Adjust the Direct AO Expense to Full Coverage AO Expense = 1.0 / { 1.0 - [0.5 x (4)] }	1.113	1.116	1.112

Notes:

(1),(3): Exhibit 2.

(2): 1.105 from Exhibit 1, Page 2.

(6): Assumes 50% of Adjusting & Other expense varies directly with losses.

VI 000037

Section VI - Expenses
 Subsection I - Adjustment for Large Deductible Policies
 7/1/2020

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	12.6%
(2) Average Premium Discount as a % of Standard Premium + ARAP	5.1%
(3) Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4) Profit Provision	-1.4%
(5) Insolvency Fund Assessment	0.3%
(6) Residual Market Subsidy (Retrospectively-rated policies)	-0.2%
(7) Variable Expense Ratio = (1) + (2) + (3) + (4) + (5) + (6)	18.6%
(8) Expected Loss Ratio without LAE	64.6%
(9) Defense and Cost Containment Expense ("DCC")	6.1%
(10) Adjusting and Other Expenses ("AO")	5.9%
(11) Variable Adjusting and Other Expenses = 0.5 x (10)	2.9%
(12) Portion of Expected Loss + LAE Ratio that varies with deductible (ELARD) = (8) + (9) + (11)	73.7%
(13) LER / D = [1.0 - (7)] / (12)	1.105

D = Average Premium Reduction Factor for Large Deductible Policies

LER = Loss Elimination Ratio

ELARD = Loss + DCC + (1/2 x AO)

$D = [\text{LER} \times \text{ELARD}] / [100\% - (\text{Variable Expense})]$

$\text{LER} = D \times [1.0 - (\text{Variable Expense})] / \text{LER} \times (1.0 + \text{DCC} + 1/2 \times \text{AO})$

Notes:

Values approved for rates effective 7/1/18.

(1) - (6) = From prior Rate Decision/Stipulation

(8) = From prior Rate Decision/Stipulation

(9) = 9.4% x (8), ratio of DCC to Losses from the 7/1/18 filing.

(10) = 9.1% x (8), ratio of AO to Losses from the 7/1/18 filing.

VI 000038

Section VI - Expenses
 Subsection I - Adjustment for Large Deductible Policies
 7/1/2020

Section VI - I
 Exhibit 2

Average Large Deductible Premium Reduction Factor and Large Deductible Market Share

	Policy Year			
	2015	2016	2017	2018*
(1) Standard Earned Premium Excluding Large Deductible Policies	725,547,414	775,712,173	826,402,806	452,446,245
(2) Earned Premium Net of Deductible Credit for Large Deductible Policies	38,250,410	43,209,862	43,802,618	24,190,484
(3) Standard Earned Premium for Large Deductible Policies	200,205,654	238,288,619	240,079,458	129,172,696
(4) Standard Earned Premium for All Policies = (1) + (3)	925,753,068	1,014,000,792	1,066,482,264	581,618,941
(5) Average Premium Reduction Factor for Large Deductible Policies = $1.0 - [(2) / (3)]$	0.809	0.819	0.818	0.813
(6) Market Share (Standard Premium Basis) of Large Deductible Policies = (3) / (4)	21.6%	23.5%	22.5%	22.2%
	Calendar Year			
	2016	2017	2018	
(7) Average Premium Reduction Factor for Large Deductible Policies = Average of PY-1 and PY	0.814	0.818	0.815	
(8) Market Share (Standard Premium Basis) of Large Deductible Policies = Average of PY-1 and PY	22.6%	23.0%	22.4%	

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 2018 is an incomplete Policy Year, valued as of 12/31/2018

VI 000039

Section VI - Expenses
Subsection J - Expected Loss Ratios Underlying the Proposed Rates & Rating Values
7/1/2020

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	12.2%
(2) Average Premium Discount as a % of Standard Premium + ARAP	5.3%
(3) Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4) Variable Expense Ratio = (1) + (2) + (3)	19.7%
(5) Underwriting Profit Provision	1.7%
(6) Permissible Loss, LAE, and Fixed Expense Ratio = 1.0 - [(4) + (5)]	78.6%
(7) Fixed Expense Ratio	5.2%
(8) Expected Loss and Loss Adjustment Expense Ratio = (6) - (7)	73.3%
(9) Total Loss Adjustment Expense Ratio (LAE / Loss)	18.7%
(10) Expected Loss Ratio without Loss Adjustment Expense = (8) / [1.0 + (9)]	61.8%

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, 5%, is divided by [1.0 + indicated rate change], -3.8%, to derive 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 filings since 2014, 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.

VII 000002

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 George Zanjani, a Professor of Finance and the Frank Park Samford Chair of Insurance at the University of Alabama, 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. Zanjani has performed the following work for the WCRIBMA:

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).

VII 000003

1. He has assisted the WCRIBMA in refining and applying 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.
2. He has assisted the WCRIBMA in refining and applying 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 refining and applying the portfolio rate of return analysis.
4. He has reviewed the critical inputs to these models, particularly the leverage ratios, returns on assets, tax rates, and cost of capital, and the underwriting profit factors they produce. He has assessed the suitability of these models, and the inputs and outputs for the Massachusetts workers' compensation market.

In this filing, the calculated underwriting profit provision is 1.75%. 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. 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. In this filing, consistent with filing since 2014, 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 including a detailed appendix describing the methods used. In filings since 2010, the WCRIBMA relied on a sample of large, publicly traded property/casualty insurers that was drawn from the Value Line Investment Survey, Part 3 – The Ratings and Report, the Value Line Investment Survey, Small & Mid Cap Edition and also all property and casualty companies in Standard & Poor's Compustat database (Research Insight) with SIC codes 6300 – 6399 and revenue in SIC codes 6331 or 6351. In June of 2019, Standard & Poor's discontinued the Research Insight database. In this filing the WCRIBMA therefore relied exclusively on Value Line sample of companies. The sample includes data from Value Line Investment Survey, Part 3 – The Ratings and Report and from Value Line Investment Survey, Mid Cap Edition.

Consistent with the 2016 and 2018 filings, the WCRIBMA has implemented 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.

Prior to this filing the WCRIBMA relied on data from the Commercial Casualty Composite in calculating the reserves-to-surplus ratio taken from the annual edition of Best's Aggregates and Averages. In this filing, in an effort to add more accuracy in the calculations, the WCRIBMA relies on all group companies that write workers' compensation in Massachusetts, a total of 78 groups. The motivation for this change is to obtain a better assessment of the average surplus leverage of the companies that are actually bearing the workers compensation risks in Massachusetts, since industry composites may be affected by carriers that are serving other lines or geographic areas. This data is obtained from A.M. Best's Global Insurance Database using BestLink, an online service that allows you to access data, including data from statutory filings, from Best's Financial Suite and Best's Insurance Reports via the Internet.

We estimate this ratio by calculating a premium weighted average of group-level leverage ratios (loss and LAE reserves plus unearned premium reserves divided by surplus) for each of the past five years. We use Massachusetts workers compensation direct premiums written in each respective year for the weights. We then take a straight average of the five years of figures. The calculation of the ratio is shown in Exhibit 1.

VII 000008

VII-G - Premium Flow

The WCRIBMA continue to rely on the 2007 special premium payment call with underlying premium cash flow pattern from 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 2016 and policy year 2017 weights are calculated for general expenses, miscellaneous and other taxes, and loss and loss

VII 000009

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. Loss development factors used in Exhibit 2 for the calculation of the combined loss flow, are from Section II, Exhibit 1, Pages 1 and 4.

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

VII 000010

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. A.M. 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.

Prior to this filing the WCRIBMA relied on A.M. Best's aggregation of the total US Property and Casualty Industry, taken from the latest annual edition of Best's Aggregates

VII 000011

and Averages, to estimate the proportion of assets in the portfolio. In this filing and consistent with the calculation of the leverage ratio (Section VII – F, Exhibit 1), the WCRIBMA instead bases its estimates on to groups writing workers' compensation insurance in Massachusetts. The motivation for this change is to obtain a better assessment of the asset portfolio that is actually supporting the business of workers compensation in Massachusetts, as the industry portfolio allocations reflect the investments of personal lines underwriters and other companies that do not underwrite workers compensation in Massachusetts. These data are taken from A.M. Best's Global Insurance Database using BestLink.

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. The proportion of each asset (shown in column (2) of Exhibit 1, Page 1) is based on a premium weighted average of the corresponding proportions from each of the 78 company groups in the sample. The data is sourced from the latest available annual statement for each group, with the premium weights again being based on Massachusetts workers compensation premiums. Supporting data for the calculation are provided in Exhibit 1, Page 3.

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 months⁴.

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 use the return on 1-month T-bill to estimate the pre-tax return for cash and short-term investments (3-month average from Exhibit 2, Page 3). 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 3. 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.⁵

⁴ 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 maturities of newly purchased compared to existing bonds, they did not appear to have a material impact on the yield calculation.

⁵ 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.

Market Risk Premium

We use market returns from 1926-2018 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 is required for internal consistency in the rate filing.) The calculation, shown on Exhibit 4, uses data drawn from the *2019 SBB* Yearbook.

Investment Expenses

The WCRIBMA has relied on the same data source and sample for this value as for the asset portfolio and leverage ratio, A.M. Best's Global Insurance Database. 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, Page 1 we calculate investment expenses using data from the annual statement for all Massachusetts Workers' Compensation group of companies. In this filing, consistent with the 2014 and subsequent filings, the WCRIBMA did not include interest expense and depreciation of real estate in the calculation of total invested expenses.⁶ The pre-tax average investment expense is estimated using an average of ten years of premium

⁶ 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.

weighted data, with the premium weights again based on Massachusetts workers compensation direct premiums written.

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 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. In this filing, consistent with the 2010 and subsequent filings, the WCRIBMA relied on capital gains and dividend data since 1926. Combining a tax rate of 13.13% for common stock dividends and 15.80% on capital gains, we derive an overall average tax rate of 14.89% (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 2.45%. The tax rates used in these calculations fully reflect the changes associated with the Tax Cut and Jobs Act of 2017, including the reduction in the base corporate rate, as well as the adjustments to the proration provision and the dividends received deduction.

VII 000015

Section VII - Profit
Subsection A - Summary
7/1/2020

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	946.69
(2)	Collected Premium Net - After Premium Discount	946.69
(3)	Loss & LAE Ratio	73.33%
(4)	Commission Ratio	9.15%
(5)	Premium Discount	5.33%
(6)	General Expense Ratio	4.91%
(7)	Other Acquisition Expense Ratio	2.04%
(8)	Premium Tax Rate	2.16%
(9)	Reinsurance Expense Ratio	1.00%
(10)	Miscellaneous and Other Taxes	0.34%
Cost of Capital:		
(11)	Weighted Average Cost of Capital	7.15%
Portfolio Rate of Return:		
(12)	After Tax Portfolio Rate of Return	2.45%
Leverage Ratio:		
(13)	Reserves to Surplus Ratio	1.93
Profit Provision:		
(14)	Profit Provision Calculation	1.75%

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 model 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 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.

VII 000018

2. DCF analyses account for all investment income on both policyholder and investor supplied funds.

Both the IRR and ICC models 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

VII 000019

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

VII 000020

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

VII 000021

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.

VII 00022

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

VII 000023

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

VII 000024

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

VII 000025

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

VII 000026

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).

VII 00027

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 1.75%, 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 7.15%. Since the underwriting profit provision is set specifically

VII 000028

Section VII – Profit
Subsection B – DCF Models
7/1/2020

Section VII- B
Page 13

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)

VII 000030

- 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:

$$\text{DFD}_{\text{IRR}} = \text{DFD}_{\text{ICC}}$$

VII 000031

➤ **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.

$$IR_{S_{IRR}} + IR_{R_{IRR}} = IR_{INV_{ICC}} + IR_{PH_{ICC}}$$

➤ **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:

VII 000032

$UWCF_{ICC} = \text{Collected Premium} - \text{Losses \& LAE Paid} - \text{Total Pretax Underwriting Expenses} - \text{Federal Income Tax Expense on Underwriting} - \text{Investor Supplied Reserves}$

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:

$$PV(C) = PV(CC)$$

VII 000033

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

$$\begin{aligned} \sum_{i=1}^n \frac{C_i}{(1+r)^{i-1}} &= \sum_{i=1}^{n-1} \frac{(\sum_{j=1}^i C_j) \times r}{(1+r)^i} \\ &= r \times \left[\frac{C_1}{(1+r)} + \frac{C_1 + C_2}{(1+r)^2} + \frac{C_1 + C_2 + C_3}{(1+r)^3} + \dots + \frac{C_1 + C_2 + C_3 + \dots + C_{n-1}}{(1+r)^{n-1}} \right] \\ &= r \times \left[\left(\sum_{i=1}^{n-1} \frac{C_1}{(1+r)^i} \right) + \left(\sum_{i=2}^{n-1} \frac{C_2}{(1+r)^i} \right) + \dots + \left(\sum_{i=n-1}^{n-1} \frac{C_{n-1}}{(1+r)^i} \right) \right] \\ &= r \times \left[C_1 \left(\frac{1}{(1+r)} - \frac{1}{(1+r)^n} \right) + C_2 \left(\frac{1}{(1+r)^2} - \frac{1}{(1+r)^n} \right) + \dots \right. \\ &\quad \left. + C_{n-1} \left(\frac{1}{(1+r)^{n-1}} - \frac{1}{(1+r)^n} \right) \right] \\ &= r \times \left[C_1 \left(\frac{1}{r} - \frac{1}{r(1+r)^{n-1}} \right) + C_2 \left(\frac{1}{r(1+r)} - \frac{1}{r(1+r)^{n-1}} \right) + \dots + C_{n-1} \left(\frac{1}{r(1+r)^{n-2}} - \frac{1}{r(1+r)^{n-1}} \right) \right] \\ &= \left[C_1 \left(1 - \frac{1}{(1+r)^{n-1}} \right) + C_2 \left(\frac{1}{(1+r)} - \frac{1}{(1+r)^{n-1}} \right) + \dots + C_{n-1} \left(\frac{1}{(1+r)^{n-2}} - \frac{1}{(1+r)^{n-1}} \right) \right] \\ &= C_1 + \frac{C_2}{(1+r)} + \dots + \frac{C_{n-1}}{(1+r)^{n-2}} - \frac{C_1}{(1+r)^{n-1}} - \frac{C_2}{(1+r)^{n-1}} - \dots - \frac{C_{n-1}}{(1+r)^{n-1}} \\ &= \sum_{i=1}^{n-1} \frac{C_i}{(1+r)^{i-1}} - \frac{(\sum_{i=1}^{n-1} C_i)}{(1+r)^{n-1}} \quad \text{where } \sum_{i=1}^n C_i = 0 \rightarrow \sum_{i=1}^{n-1} C_i = -C_n \\ &= \sum_{i=1}^{n-1} \frac{C_i}{(1+r)^{i-1}} + \frac{C_n}{(1+r)^{n-1}} \\ &= \sum_{i=1}^n \frac{C_i}{(1+r)^{i-1}} \end{aligned}$$

VII 00035

Section VII - Profit
 Subsection B - DCF Models
 7/1/2020

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)								
07/01/19	09/30/19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/01/19	12/31/19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/20	03/31/20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/01/20	06/30/20	(4.55)	0.00	(4.55)	0.00	0.00	0.00	(4.55)	(4.32)
07/01/20	09/30/20	(6.11)	0.00	(6.11)	0.03	(113.47)	0.00	(119.55)	(111.57)
10/01/20	12/31/20	(12.22)	0.02	(12.20)	0.22	(84.78)	0.69	(96.07)	(88.12)
01/01/21	03/31/21	(12.82)	0.04	(12.78)	0.70	(112.43)	1.20	(123.31)	(111.17)
04/01/21	06/30/21	(1.99)	0.07	(1.92)	1.43	(80.19)	1.88	(78.80)	(69.82)
07/01/21	09/30/21	15.78	0.08	15.86	2.14	46.76	2.37	67.13	58.46
10/01/21	12/31/21	17.67	0.07	17.74	2.60	41.70	2.09	64.12	54.89
01/01/22	03/31/22	12.19	0.06	12.25	2.72	34.51	1.83	51.31	43.17
04/01/22	06/30/22	(12.83)	0.05	(12.78)	2.64	28.25	1.62	19.73	16.32
07/01/22	09/30/22	(9.45)	0.05	(9.40)	2.58	24.22	1.45	18.85	15.32
10/01/22	12/31/22	11.35	0.05	11.39	2.48	22.54	1.31	37.72	30.13
01/01/23	03/31/23	6.30	0.04	6.34	2.23	20.06	1.17	29.80	23.40
04/01/23	06/30/23	3.09	0.03	3.13	2.00	17.89	1.05	24.06	18.57
07/01/23	09/30/23	1.31	0.03	1.34	1.80	16.06	0.94	20.14	15.27
10/01/23	12/31/23	0.59	0.03	0.61	1.61	14.73	0.84	17.80	13.27
01/01/24	03/31/24	0.28	0.02	0.31	1.44	12.80	0.75	15.30	11.21
04/01/24	06/30/24	0.28	0.02	0.31	1.29	11.12	0.68	13.39	9.64
07/01/24	09/30/24	0.28	0.02	0.30	1.16	9.59	0.61	11.66	8.26
10/01/24	12/31/24	0.28	0.02	0.30	1.05	8.40	0.55	10.31	7.17
01/01/25	03/31/25	0.14	0.02	0.15	0.96	6.73	0.50	8.34	5.71
04/01/25	06/30/25	0.14	0.01	0.15	0.88	5.28	0.46	6.77	4.55
07/01/25	09/30/25	0.14	0.01	0.15	0.82	4.28	0.43	5.67	3.75
10/01/25	12/31/25	0.14	0.01	0.15	0.77	3.78	0.40	5.10	3.31
01/01/26	03/31/26	0.10	0.01	0.12	0.72	3.08	0.38	4.30	2.74
04/01/26	06/30/26	0.10	0.01	0.12	0.69	2.47	0.36	3.63	2.28
07/01/26	09/30/26	0.10	0.01	0.12	0.66	2.04	0.34	3.16	1.95
10/01/26	12/31/26	0.10	0.01	0.11	0.64	1.83	0.33	2.91	1.77
01/01/27	03/31/27	0.10	0.01	0.11	0.62	1.53	0.32	2.58	1.54
04/01/27	06/30/27	0.10	0.01	0.11	0.60	1.27	0.31	2.29	1.34
07/01/27	09/30/27	0.10	0.01	0.11	0.58	1.13	0.30	2.13	1.22
10/01/27	12/31/27	0.10	0.01	0.11	0.57	1.10	0.30	2.08	1.18
01/01/28	03/31/28	0.08	0.01	0.09	0.56	1.05	0.29	1.98	1.10
04/01/28	06/30/28	0.08	0.01	0.09	0.54	1.01	0.28	1.92	1.05
07/01/28	09/30/28	0.08	0.01	0.09	0.53	0.94	0.28	1.84	0.99
10/01/28	12/31/28	0.08	0.01	0.09	0.52	0.86	0.27	1.74	0.92
01/01/29	03/31/29	0.10	0.01	0.11	0.51	0.75	0.27	1.63	0.85
04/01/29	06/30/29	0.10	0.01	0.11	0.50	0.65	0.26	1.52	0.77
07/01/29	09/30/29	0.10	0.01	0.11	0.50	0.58	0.26	1.44	0.72
10/01/29	12/31/29	0.10	0.01	0.11	0.49	0.55	0.25	1.40	0.69
01/01/30	03/31/30	0.08	0.01	0.09	0.48	0.50	0.25	1.32	0.64
04/01/30	06/30/30	0.08	0.01	0.09	0.48	0.46	0.25	1.27	0.61
07/01/30	09/30/30	0.08	0.01	0.09	0.47	0.46	0.24	1.26	0.59
10/01/30	12/31/30	0.08	0.01	0.09	0.47	0.48	0.24	1.28	0.59
01/01/31	03/31/31	0.07	0.01	0.08	0.46	0.51	0.24	1.29	0.58
04/01/31	06/30/31	0.07	0.01	0.08	0.45	0.54	0.24	1.31	0.58
07/01/31	09/30/31	0.07	0.01	0.08	0.45	0.55	0.23	1.31	0.57
10/01/31	12/31/31	0.07	0.01	0.08	0.44	0.54	0.23	1.29	0.55
01/01/32	03/31/32	0.06	0.01	0.07	0.44	0.52	0.23	1.26	0.53
04/01/32	06/30/32	0.06	0.01	0.07	0.43	0.51	0.22	1.23	0.51
07/01/32	09/30/32	0.06	0.01	0.07	0.42	0.49	0.22	1.20	0.49
10/01/32	12/31/32	0.06	0.01	0.07	0.42	0.45	0.22	1.16	0.46
01/01/33	03/31/33	0.06	0.01	0.06	0.41	0.41	0.21	1.10	0.43
04/01/33	06/30/33	0.06	0.01	0.06	0.41	0.36	0.21	1.05	0.40
07/01/33	09/30/33	0.06	0.01	0.06	0.40	0.34	0.21	1.01	0.38
10/01/33	12/31/33	0.06	0.01	0.06	0.40	0.32	0.21	1.00	0.37
01/01/34	03/31/34	0.05	0.01	0.06	0.40	0.30	0.21	0.97	0.36
04/01/34	06/30/34	0.05	0.01	0.06	0.39	0.29	0.20	0.94	0.34
07/01/34	09/30/34	0.05	0.01	0.06	0.39	0.28	0.20	0.93	0.33
10/01/34	12/31/34	0.05	0.01	0.06	0.39	0.28	0.20	0.93	0.32
01/01/35	03/31/35	0.05	0.01	0.06	0.38	0.27	0.20	0.91	0.31
04/01/35	06/30/35	0.05	0.01	0.06	0.38	0.27	0.20	0.91	0.30
07/01/35	09/30/35	0.05	0.01	0.06	0.38	0.28	0.20	0.91	0.30
10/01/35	12/31/35	0.05	0.01	0.06	0.37	0.28	0.19	0.91	0.30
01/01/36	03/31/36	0.05	0.01	0.06	0.37	0.29	0.19	0.91	0.29
04/01/36	06/30/36	0.05	0.01	0.06	0.37	0.30	0.19	0.91	0.29
07/01/36	09/30/36	0.05	0.01	0.06	0.36	0.30	0.19	0.90	0.28
10/01/36	12/31/36	0.05	0.01	0.06	0.36	0.29	0.19	0.89	0.27
01/01/37	03/31/37	0.05	0.01	0.05	0.36	0.27	0.18	0.86	0.26
04/01/37	06/30/37	0.05	0.01	0.05	0.35	0.26	0.18	0.84	0.25
07/01/37	09/30/37	0.05	0.01	0.05	0.35	0.27	0.18	0.85	0.25
10/01/37	12/31/37	0.05	0.01	0.05	0.35	0.30	0.18	0.88	0.25
01/01/38	03/31/38	0.04	0.01	0.05	0.34	0.33	0.18	0.90	0.25
04/01/38	06/30/38	0.04	0.01	0.05	0.34	0.36	0.18	0.92	0.25
07/01/38	09/30/38	0.04	0.01	0.05	0.34	0.37	0.17	0.92	0.25
10/01/38	12/31/38	0.04	0.01	0.05	0.33	0.36	0.17	0.91	0.24
01/01/39	03/31/39	0.01	0.01	0.02	0.33	0.35	0.17	0.87	0.23
04/01/39	06/30/39	0.01	0.01	0.02	0.32	0.34	0.17	0.85	0.22
07/01/39	09/30/39	0.01	0.01	0.02	0.32	0.33	0.17	0.83	0.21
10/01/39	12/31/39	0.01	0.01	0.02	0.32	0.30	0.16	0.80	0.20
01/01/40	03/31/40	0.00	0.01	0.01	0.31	0.27	0.16	0.75	0.18
04/01/40	06/30/40	0.00	0.01	0.01	0.31	0.24	0.16	0.72	0.17

VII 000036

Section VII - Profit
Subsection B - DCF Models
7/1/2020

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)
07/01/40	09/30/40	0.00	0.01	0.01	0.31	0.23	0.16	0.70	0.16
10/01/40	12/31/40	0.00	0.01	0.01	0.30	0.22	0.16	0.69	0.16
01/01/41	03/31/41	0.00	0.01	0.01	0.30	0.21	0.16	0.68	0.15
04/01/41	06/30/41	0.00	0.01	0.01	0.30	0.21	0.15	0.67	0.15
07/01/41	09/30/41	0.00	0.00	0.01	0.30	0.24	0.15	0.69	0.15
10/01/41	12/31/41	0.00	0.00	0.01	0.29	0.29	0.15	0.74	0.16
01/01/42	03/31/42	0.00	0.00	0.01	0.29	0.36	0.15	0.80	0.17
04/01/42	06/30/42	0.00	0.00	0.01	0.29	0.41	0.15	0.85	0.18
07/01/42	09/30/42	0.00	0.00	0.01	0.28	0.44	0.15	0.88	0.18
10/01/42	12/31/42	0.00	0.00	0.01	0.28	0.45	0.14	0.87	0.17
01/01/43	03/31/43	0.00	0.00	0.01	0.27	0.44	0.14	0.86	0.17
04/01/43	06/30/43	0.00	0.00	0.01	0.26	0.44	0.14	0.85	0.16
07/01/43	09/30/43	0.00	0.00	0.01	0.26	0.44	0.13	0.85	0.16
10/01/43	12/31/43	0.00	0.00	0.01	0.25	0.45	0.13	0.84	0.16
01/01/44	03/31/44	0.00	0.00	0.01	0.25	0.44	0.13	0.83	0.15
04/01/44	06/30/44	0.00	0.00	0.01	0.24	0.44	0.13	0.82	0.15
07/01/44	09/30/44	0.00	0.00	0.01	0.24	0.44	0.12	0.81	0.14
10/01/44	12/31/44	0.00	0.00	0.01	0.23	0.45	0.12	0.81	0.14
01/01/45	03/31/45	0.00	0.00	0.01	0.23	0.44	0.12	0.80	0.14
04/01/45	06/30/45	0.00	0.00	0.01	0.22	0.44	0.12	0.79	0.13
07/01/45	09/30/45	0.00	0.00	0.01	0.22	0.44	0.11	0.78	0.13
10/01/45	12/31/45	0.00	0.00	0.01	0.21	0.45	0.11	0.78	0.13
01/01/46	03/31/46	0.00	0.00	0.01	0.21	0.44	0.11	0.77	0.12
04/01/46	06/30/46	0.00	0.00	0.01	0.20	0.44	0.10	0.76	0.12
07/01/46	09/30/46	0.00	0.00	0.01	0.20	0.44	0.10	0.75	0.12
10/01/46	12/31/46	0.00	0.00	0.01	0.19	0.45	0.10	0.74	0.11
01/01/47	03/31/47	0.00	0.00	0.01	0.19	0.44	0.10	0.73	0.11
04/01/47	06/30/47	0.00	0.00	0.01	0.18	0.44	0.09	0.72	0.11
07/01/47	09/30/47	0.00	0.00	0.01	0.18	0.44	0.09	0.72	0.10
10/01/47	12/31/47	0.00	0.00	0.01	0.17	0.45	0.09	0.71	0.10
01/01/48	03/31/48	0.00	0.00	0.01	0.17	0.44	0.09	0.70	0.10
04/01/48	06/30/48	0.00	0.00	0.01	0.16	0.44	0.08	0.69	0.09
07/01/48	09/30/48	0.00	0.00	0.01	0.16	0.44	0.08	0.69	0.09
10/01/48	12/31/48	0.00	0.00	0.01	0.15	0.45	0.08	0.68	0.09
01/01/49	03/31/49	0.00	0.00	0.01	0.15	0.44	0.08	0.67	0.09
04/01/49	06/30/49	0.00	0.00	0.01	0.14	0.44	0.07	0.66	0.08
07/01/49	09/30/49	0.00	0.00	0.01	0.14	0.44	0.07	0.65	0.08
10/01/49	12/31/49	0.00	0.00	0.01	0.13	0.45	0.07	0.65	0.08
01/01/50	03/31/50	0.00	0.00	0.00	0.12	0.44	0.06	0.64	0.08
04/01/50	06/30/50	0.00	0.00	0.00	0.12	0.44	0.06	0.63	0.07
07/01/50	09/30/50	0.00	0.00	0.00	0.11	0.44	0.06	0.62	0.07
10/01/50	12/31/50	0.00	0.00	0.00	0.11	0.45	0.06	0.62	0.07
01/01/51	03/31/51	0.00	0.00	0.00	0.10	0.44	0.05	0.61	0.07
04/01/51	06/30/51	0.00	0.00	0.00	0.10	0.44	0.05	0.60	0.07
07/01/51	09/30/51	0.00	0.00	0.00	0.09	0.44	0.05	0.59	0.06
10/01/51	12/31/51	0.00	0.00	0.00	0.09	0.45	0.05	0.58	0.06
01/01/52	03/31/52	0.00	0.00	0.00	0.08	0.44	0.04	0.57	0.06
04/01/52	06/30/52	0.00	0.00	0.00	0.08	0.44	0.04	0.56	0.06
07/01/52	09/30/52	0.00	0.00	0.00	0.07	0.44	0.04	0.56	0.06
10/01/52	12/31/52	0.00	0.00	0.00	0.07	0.45	0.04	0.55	0.06
01/01/53	03/31/53	0.00	0.00	0.00	0.06	0.44	0.03	0.54	0.05
04/01/53	06/30/53	0.00	0.00	0.00	0.06	0.44	0.03	0.53	0.05
07/01/53	09/30/53	0.00	0.00	0.00	0.05	0.44	0.03	0.53	0.05
10/01/53	12/31/53	0.00	0.00	0.00	0.05	0.45	0.02	0.52	0.05
01/01/54	03/31/54	0.00	0.00	0.00	0.04	0.44	0.02	0.51	0.05
04/01/54	06/30/54	0.00	0.00	0.00	0.04	0.44	0.02	0.50	0.05
07/01/54	09/30/54	0.00	0.00	0.00	0.03	0.44	0.02	0.49	0.04
10/01/54	12/31/54	0.00	0.00	0.00	0.03	0.45	0.01	0.49	0.04
01/01/55	03/31/55	0.00	0.00	0.00	0.02	0.44	0.01	0.48	0.04
04/01/55	06/30/55	0.00	0.00	0.00	0.02	0.44	0.01	0.47	0.04
07/01/55	09/30/55	0.00	0.00	0.00	0.01	0.38	0.01	0.40	0.03
10/01/55	12/31/55	0.00	0.00	0.00	0.01	0.29	0.00	0.30	0.02
01/01/56	03/31/56	(0.00)	0.00	0.00	0.00	0.16	0.00	0.17	0.01
04/01/56	06/30/56	0.00	0.00	0.00	0.00	0.05	0.00	0.06	0.00
TOTAL		13.79	1.38	15.17	69.07	(0.00)	41.27	125.50	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 07/01/19

WACC is the weighted average cost of capital from Section VII-E, Exhibit 1 which is equal to 7.15%.

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 1.75% 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)						
07/01/19	09/30/19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/01/19	12/31/19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/20	03/31/20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/01/20	06/30/20	4.55	0.00	0.00	0.00	0.00	0.86	0.00	0.00	0.00	0.00
07/01/20	09/30/20	124.14	0.08	0.00	0.08	0.03	26.34	0.01	0.00	(0.05)	(0.04)
10/01/20	12/31/20	221.14	2.16	0.02	2.14	0.75	92.86	0.16	0.00	(1.23)	(1.12)
01/01/21	03/31/21	346.40	3.85	0.04	3.81	1.34	200.32	0.56	0.00	(1.91)	(1.72)
04/01/21	06/30/21	428.58	6.04	0.07	5.97	2.10	314.57	1.21	0.00	(2.65)	(2.35)
07/01/21	09/30/21	366.05	7.47	0.08	7.38	2.60	406.22	1.91	0.00	(2.88)	(2.51)
10/01/21	12/31/21	306.68	6.38	0.07	6.31	2.22	443.71	2.46	0.00	(1.62)	(1.39)
01/01/22	03/31/22	267.92	5.34	0.06	5.28	1.86	435.32	2.69	7.94	7.20	6.06
04/01/22	06/30/22	244.57	4.67	0.05	4.62	1.62	421.24	2.64	(7.94)	(8.29)	(6.85)
07/01/22	09/30/22	229.80	4.26	0.05	4.21	1.48	394.57	2.55	0.00	(0.18)	(0.14)
10/01/22	12/31/22	195.91	4.00	0.05	3.96	1.39	365.04	2.39	0.00	(0.17)	(0.14)
01/01/23	03/31/23	172.86	3.41	0.04	3.38	1.19	330.30	2.21	3.30	3.32	2.61
04/01/23	06/30/23	154.97	3.01	0.03	2.98	1.05	296.36	2.00	3.09	3.16	2.44
07/01/23	09/30/23	138.91	2.70	0.03	2.67	0.94	265.74	1.80	1.31	1.38	1.05
10/01/23	12/31/23	124.18	2.42	0.03	2.39	0.84	237.58	1.61	0.59	0.65	0.48
01/01/24	03/31/24	111.38	2.16	0.02	2.14	0.75	213.12	1.44	0.28	0.34	0.25
04/01/24	06/30/24	100.26	1.94	0.02	1.92	0.68	191.90	1.29	0.28	0.33	0.24
07/01/24	09/30/24	90.67	1.75	0.02	1.73	0.61	173.64	1.16	0.28	0.33	0.23
10/01/24	12/31/24	82.27	1.58	0.02	1.56	0.55	157.67	1.05	0.28	0.32	0.23
01/01/25	03/31/25	75.53	1.43	0.02	1.42	0.50	144.81	0.96	0.14	0.18	0.12
04/01/25	06/30/25	70.25	1.32	0.01	1.30	0.46	134.76	0.88	0.14	0.17	0.12
07/01/25	09/30/25	65.97	1.22	0.01	1.21	0.43	126.65	0.82	0.14	0.17	0.11
10/01/25	12/31/25	62.19	1.15	0.01	1.14	0.40	119.50	0.77	0.14	0.17	0.11
01/01/26	03/31/26	59.12	1.08	0.01	1.07	0.38	113.59	0.72	0.10	0.13	0.09
04/01/26	06/30/26	56.65	1.03	0.01	1.02	0.36	108.86	0.69	0.10	0.13	0.08
07/01/26	09/30/26	54.60	0.99	0.01	0.98	0.34	104.95	0.66	0.10	0.13	0.08
10/01/26	12/31/26	52.77	0.95	0.01	0.94	0.33	101.44	0.64	0.10	0.13	0.08
01/01/27	03/31/27	51.24	0.92	0.01	0.91	0.32	98.49	0.62	0.10	0.13	0.08
04/01/27	06/30/27	49.97	0.89	0.01	0.88	0.31	96.04	0.60	0.10	0.13	0.08
07/01/27	09/30/27	48.84	0.87	0.01	0.86	0.30	93.86	0.58	0.10	0.13	0.07
10/01/27	12/31/27	47.74	0.85	0.01	0.84	0.30	91.74	0.57	0.10	0.13	0.07
01/01/28	03/31/28	46.69	0.83	0.01	0.82	0.29	89.74	0.56	0.08	0.10	0.06
04/01/28	06/30/28	45.69	0.81	0.01	0.80	0.28	87.82	0.54	0.08	0.10	0.05
07/01/28	09/30/28	44.75	0.80	0.01	0.79	0.28	86.04	0.53	0.08	0.10	0.05
10/01/28	12/31/28	43.88	0.78	0.01	0.77	0.27	84.40	0.52	0.08	0.10	0.05
01/01/29	03/31/29	43.14	0.76	0.01	0.76	0.27	82.94	0.51	0.10	0.12	0.06
04/01/29	06/30/29	42.49	0.75	0.01	0.74	0.26	81.66	0.50	0.10	0.12	0.06
07/01/29	09/30/29	41.91	0.74	0.01	0.73	0.26	80.52	0.50	0.10	0.12	0.06
10/01/29	12/31/29	41.36	0.73	0.01	0.72	0.25	79.43	0.49	0.10	0.12	0.06
01/01/30	03/31/30	40.86	0.72	0.01	0.71	0.25	78.48	0.48	0.08	0.10	0.05
04/01/30	06/30/30	40.40	0.71	0.01	0.70	0.25	77.61	0.48	0.08	0.10	0.05
07/01/30	09/30/30	39.94	0.70	0.01	0.70	0.24	76.75	0.47	0.08	0.10	0.05
10/01/30	12/31/30	39.46	0.70	0.01	0.69	0.24	75.83	0.47	0.08	0.10	0.05
01/01/31	03/31/31	38.95	0.69	0.01	0.68	0.24	74.86	0.46	0.07	0.09	0.04
04/01/31	06/30/31	38.41	0.68	0.01	0.67	0.24	73.83	0.45	0.07	0.09	0.04
07/01/31	09/30/31	37.86	0.67	0.01	0.66	0.23	72.78	0.45	0.07	0.09	0.04
10/01/31	12/31/31	37.32	0.66	0.01	0.65	0.23	71.75	0.44	0.07	0.09	0.04
01/01/32	03/31/32	36.80	0.65	0.01	0.64	0.23	70.75	0.44	0.06	0.08	0.03
04/01/32	06/30/32	36.29	0.64	0.01	0.63	0.22	69.77	0.43	0.06	0.08	0.03
07/01/32	09/30/32	35.80	0.63	0.01	0.63	0.22	68.85	0.42	0.06	0.08	0.03
10/01/32	12/31/32	35.35	0.62	0.01	0.62	0.22	67.98	0.42	0.06	0.08	0.03
01/01/33	03/31/33	34.94	0.62	0.01	0.61	0.21	67.20	0.41	0.06	0.07	0.03
04/01/33	06/30/33	34.58	0.61	0.01	0.60	0.21	66.51	0.41	0.06	0.07	0.03
07/01/33	09/30/33	34.24	0.60	0.01	0.60	0.21	65.86	0.40	0.06	0.07	0.03
10/01/33	12/31/33	33.92	0.60	0.01	0.59	0.21	65.24	0.40	0.06	0.07	0.03
01/01/34	03/31/34	33.61	0.59	0.01	0.58	0.21	64.66	0.40	0.05	0.07	0.03
04/01/34	06/30/34	33.32	0.59	0.01	0.58	0.20	64.10	0.39	0.05	0.07	0.03
07/01/34	09/30/34	33.04	0.58	0.01	0.57	0.20	63.57	0.39	0.05	0.07	0.03
10/01/34	12/31/34	32.77	0.58	0.01	0.57	0.20	63.03	0.39	0.05	0.07	0.02
01/01/35	03/31/35	32.49	0.57	0.01	0.56	0.20	62.50	0.38	0.05	0.07	0.02
04/01/35	06/30/35	32.22	0.57	0.01	0.56	0.20	61.98	0.38	0.05	0.07	0.02
07/01/35	09/30/35	31.94	0.56	0.01	0.56	0.20	61.45	0.38	0.05	0.07	0.02
10/01/35	12/31/35	31.66	0.56	0.01	0.55	0.19	60.91	0.37	0.05	0.07	0.02
01/01/36	03/31/36	31.37	0.55	0.01	0.55	0.19	60.35	0.37	0.05	0.06	0.02
04/01/36	06/30/36	31.07	0.55	0.01	0.54	0.19	59.78	0.37	0.05	0.06	0.02
07/01/36	09/30/36	30.78	0.54	0.01	0.54	0.19	59.21	0.36	0.05	0.06	0.02
10/01/36	12/31/36	30.49	0.54	0.01	0.53	0.19	58.66	0.36	0.05	0.06	0.02
01/01/37	03/31/37	30.22	0.53	0.01	0.53	0.18	58.14	0.36	0.05	0.06	0.02
04/01/37	06/30/37	29.97	0.53	0.01	0.52	0.18	57.65	0.35	0.05	0.06	0.02
07/01/37	09/30/37	29.70	0.52	0.01	0.52	0.18	57.13	0.35	0.05	0.06	0.02
10/01/37	12/31/37	29.40	0.52	0.01	0.51	0.18	56.57	0.35	0.05	0.06	0.02
01/01/38	03/31/38	29.07	0.51	0.01	0.51	0.18	55.94	0.34	0.04	0.05	0.02
04/01/38	06/30/38	28.72	0.51	0.01	0.50	0.18	55.26	0.34	0.04	0.05	0.01
07/01/38	09/30/38	28.35	0.50	0.01	0.49	0.17	54.55	0.34	0.04	0.05	0.01
10/01/38	12/31/38	27.98	0.49	0.01	0.49	0.17	53.86	0.33	0.04	0.05	0.01
01/01/39	03/31/39	27.63	0.49	0.01	0.48	0.17	53.20	0.33	0.01	0.03	0.01
04/01/39	06/30/39	27.29	0.48	0.01	0.48	0.17	52.57	0.32	0.01	0.03	0.01

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)						
07/01/39	09/30/39	26.96	0.48	0.01	0.47	0.17	51.97	0.32	0.01	0.03	0.01
10/01/39	12/31/39	26.66	0.47	0.01	0.46	0.16	51.40	0.32	0.01	0.03	0.01
01/01/40	03/31/40	26.38	0.46	0.01	0.46	0.16	50.89	0.31	0.00	0.02	0.00
04/01/40	06/30/40	26.14	0.46	0.01	0.45	0.16	50.43	0.31	0.00	0.02	0.00
07/01/40	09/30/40	25.91	0.46	0.01	0.45	0.16	49.99	0.31	0.00	0.02	0.00
10/01/40	12/31/40	25.69	0.45	0.01	0.45	0.16	49.57	0.30	0.00	0.02	0.00
01/01/41	03/31/41	25.47	0.45	0.01	0.44	0.16	49.16	0.30	0.00	0.02	0.00
04/01/41	06/30/41	25.26	0.44	0.01	0.44	0.15	48.76	0.30	0.00	0.02	0.00
07/01/41	09/30/41	25.03	0.44	0.00	0.44	0.15	48.30	0.30	0.00	0.02	0.00
10/01/41	12/31/41	24.74	0.44	0.00	0.43	0.15	47.74	0.29	0.00	0.02	0.00
01/01/42	03/31/42	24.38	0.43	0.00	0.43	0.15	47.05	0.29	0.00	0.02	0.00
04/01/42	06/30/42	23.97	0.42	0.00	0.42	0.15	46.26	0.29	0.00	0.02	0.00
07/01/42	09/30/42	23.53	0.42	0.00	0.41	0.15	45.40	0.28	0.00	0.02	0.00
10/01/42	12/31/42	23.08	0.41	0.00	0.41	0.14	44.54	0.28	0.00	0.02	0.00
01/01/43	03/31/43	22.64	0.40	0.00	0.40	0.14	43.68	0.27	0.00	0.02	0.00
04/01/43	06/30/43	22.19	0.39	0.00	0.39	0.14	42.83	0.26	0.00	0.01	0.00
07/01/43	09/30/43	21.75	0.39	0.00	0.38	0.13	41.97	0.26	0.00	0.01	0.00
10/01/43	12/31/43	21.30	0.38	0.00	0.37	0.13	41.11	0.25	0.00	0.01	0.00
01/01/44	03/31/44	20.86	0.37	0.00	0.37	0.13	40.26	0.25	0.00	0.01	0.00
04/01/44	06/30/44	20.42	0.36	0.00	0.36	0.13	39.40	0.24	0.00	0.01	0.00
07/01/44	09/30/44	19.98	0.36	0.00	0.35	0.12	38.55	0.24	0.00	0.01	0.00
10/01/44	12/31/44	19.53	0.35	0.00	0.34	0.12	37.69	0.23	0.00	0.01	0.00
01/01/45	03/31/45	19.09	0.34	0.00	0.34	0.12	36.83	0.23	0.00	0.01	0.00
04/01/45	06/30/45	18.64	0.33	0.00	0.33	0.12	35.98	0.22	0.00	0.01	0.00
07/01/45	09/30/45	18.20	0.32	0.00	0.32	0.11	35.12	0.22	0.00	0.01	0.00
10/01/45	12/31/45	17.75	0.32	0.00	0.31	0.11	34.26	0.21	0.00	0.01	0.00
01/01/46	03/31/46	17.31	0.31	0.00	0.31	0.11	33.40	0.21	0.00	0.01	0.00
04/01/46	06/30/46	16.87	0.30	0.00	0.30	0.10	32.55	0.20	0.00	0.01	0.00
07/01/46	09/30/46	16.43	0.29	0.00	0.29	0.10	31.69	0.20	0.00	0.01	0.00
10/01/46	12/31/46	15.98	0.29	0.00	0.28	0.10	30.83	0.19	0.00	0.01	0.00
01/01/47	03/31/47	15.54	0.28	0.00	0.28	0.10	29.98	0.19	0.00	0.01	0.00
04/01/47	06/30/47	15.09	0.27	0.00	0.27	0.09	29.13	0.18	0.00	0.01	0.00
07/01/47	09/30/47	14.65	0.26	0.00	0.26	0.09	28.27	0.18	0.00	0.01	0.00
10/01/47	12/31/47	14.20	0.26	0.00	0.25	0.09	27.41	0.17	0.00	0.01	0.00
01/01/48	03/31/48	13.76	0.25	0.00	0.24	0.09	26.55	0.17	0.00	0.01	0.00
04/01/48	06/30/48	13.32	0.24	0.00	0.24	0.08	25.70	0.16	0.00	0.01	0.00
07/01/48	09/30/48	12.88	0.23	0.00	0.23	0.08	24.84	0.16	0.00	0.01	0.00
10/01/48	12/31/48	12.43	0.22	0.00	0.22	0.08	23.98	0.15	0.00	0.01	0.00
01/01/49	03/31/49	11.99	0.22	0.00	0.21	0.08	23.12	0.15	0.00	0.01	0.00
04/01/49	06/30/49	11.54	0.21	0.00	0.21	0.07	22.27	0.14	0.00	0.01	0.00
07/01/49	09/30/49	11.10	0.20	0.00	0.20	0.07	21.42	0.14	0.00	0.01	0.00
10/01/49	12/31/49	10.65	0.19	0.00	0.19	0.07	20.55	0.13	0.00	0.01	0.00
01/01/50	03/31/50	10.21	0.19	0.00	0.18	0.06	19.70	0.12	0.00	0.01	0.00
04/01/50	06/30/50	9.77	0.18	0.00	0.18	0.06	18.85	0.12	0.00	0.01	0.00
07/01/50	09/30/50	9.33	0.17	0.00	0.17	0.06	17.99	0.11	0.00	0.01	0.00
10/01/50	12/31/50	8.88	0.16	0.00	0.16	0.06	17.13	0.11	0.00	0.01	0.00
01/01/51	03/31/51	8.44	0.15	0.00	0.15	0.05	16.27	0.10	0.00	0.01	0.00
04/01/51	06/30/51	7.99	0.15	0.00	0.15	0.05	15.42	0.10	0.00	0.01	0.00
07/01/51	09/30/51	7.55	0.14	0.00	0.14	0.05	14.56	0.09	0.00	0.01	0.00
10/01/51	12/31/51	7.10	0.13	0.00	0.13	0.05	13.70	0.09	0.00	0.01	0.00
01/01/52	03/31/52	6.66	0.12	0.00	0.12	0.04	12.84	0.08	0.00	0.01	0.00
04/01/52	06/30/52	6.22	0.12	0.00	0.11	0.04	11.99	0.08	0.00	0.01	0.00
07/01/52	09/30/52	5.77	0.11	0.00	0.11	0.04	11.14	0.07	0.00	0.01	0.00
10/01/52	12/31/52	5.33	0.10	0.00	0.10	0.04	10.27	0.07	0.00	0.01	0.00
01/01/53	03/31/53	4.88	0.09	0.00	0.09	0.03	9.42	0.06	0.00	0.01	0.00
04/01/53	06/30/53	4.44	0.09	0.00	0.08	0.03	8.57	0.06	0.00	0.01	0.00
07/01/53	09/30/53	4.00	0.08	0.00	0.08	0.03	7.71	0.05	0.00	0.01	0.00
10/01/53	12/31/53	3.55	0.07	0.00	0.07	0.02	6.85	0.05	0.00	0.00	0.00
01/01/54	03/31/54	3.11	0.06	0.00	0.06	0.02	5.99	0.04	0.00	0.00	0.00
04/01/54	06/30/54	2.67	0.05	0.00	0.05	0.02	5.14	0.04	0.00	0.00	0.00
07/01/54	09/30/54	2.22	0.05	0.00	0.05	0.02	4.28	0.03	0.00	0.00	0.00
10/01/54	12/31/54	1.78	0.04	0.00	0.04	0.01	3.42	0.03	0.00	0.00	0.00
01/01/55	03/31/55	1.33	0.03	0.00	0.03	0.01	2.57	0.02	0.00	0.00	0.00
04/01/55	06/30/55	0.89	0.02	0.00	0.02	0.01	1.72	0.02	0.00	0.00	0.00
07/01/55	09/30/55	0.51	0.02	0.00	0.02	0.01	0.98	0.01	0.00	0.00	0.00
10/01/55	12/31/55	0.22	0.01	0.00	0.01	0.00	0.42	0.01	0.00	0.00	0.00
01/01/56	03/31/56	0.05	0.00	0.00	0.00	0.00	0.10	0.00	(0.00)	0.00	0.00
04/01/56	06/30/56	0.00	0.00	0.00	0.00	0.00	(0.00)	0.00	0.00	0.00	0.00
TOTAL		6,966.39	121.40	1.38	120.02	42.24	11,231.62	68.10	13.79	4.11	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 7.15%
 (5) = $(3)_{t-1} \times [(1.0 + Debt Capital Cost)^{0.25} - 1.0] \times Debt Capital Share \times 0.21$,
 where Debt Capital Cost=2.56% and Debt Capital Share=15%, 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 07/01/19,
 where WACC is the weighted average cost of capital from Section VII-E, Exhibit 1 which is equal to 7.15%

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)												
07/01/19	09/30/19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/01/19	12/31/19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/20	03/31/20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/01/20	06/30/20	5.42	0.00	0.52	0.00	0.83	0.00	0.00	0.00	1.36	4.06	3.20	0.86
07/01/20	09/30/20	54.83	5.85	5.30	6.84	4.88	0.00	0.83	2.45	20.31	28.67	3.20	25.47
10/01/20	12/31/20	116.03	15.19	11.21	7.27	4.55	5.29	0.71	2.09	31.12	69.72	3.20	66.52
01/01/21	03/31/21	179.88	27.31	17.38	11.07	5.86	4.50	0.99	2.94	42.74	109.82	2.36	107.46
04/01/21	06/30/21	199.24	37.80	19.26	11.55	4.30	6.34	0.86	2.53	44.82	116.62	2.36	114.25
07/01/21	09/30/21	164.81	44.11	15.93	5.31	0.00	5.45	0.00	0.00	26.69	94.01	2.36	91.65
10/01/21	12/31/21	98.97	45.54	9.57	4.02	0.00	0.00	0.00	0.00	13.58	39.85	2.36	37.48
01/01/22	03/31/22	52.72	46.87	5.09	2.27	0.00	0.00	0.00	0.00	7.36	(1.52)	(1.07)	(0.45)
04/01/22	06/30/22	28.40	47.98	2.74	0.75	0.00	0.00	0.00	0.00	3.50	(23.08)	(1.07)	(22.02)
07/01/22	09/30/22	21.03	46.74	2.03	0.00	0.00	0.00	0.00	0.00	2.03	(27.74)	(1.07)	(26.67)
10/01/22	12/31/22	14.29	43.51	1.38	0.00	0.00	0.00	0.00	0.00	1.38	(30.60)	(1.07)	(29.53)
01/01/23	03/31/23	7.09	38.71	0.68	0.00	0.00	0.00	0.00	0.00	0.68	(32.31)	(0.87)	(31.44)
04/01/23	06/30/23	3.11	34.53	0.30	0.00	0.00	0.00	0.00	0.00	0.30	(31.72)	(0.87)	(30.85)
07/01/23	09/30/23	0.90	31.00	0.09	0.00	0.00	0.00	0.00	0.00	0.09	(30.19)	(0.87)	(29.31)
10/01/23	12/31/23	0.00	28.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(28.44)	(0.87)	(27.57)
01/01/24	03/31/24	0.00	24.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(24.71)	(0.53)	(24.18)
04/01/24	06/30/24	0.00	21.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(21.46)	(0.53)	(20.93)
07/01/24	09/30/24	0.00	18.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(18.51)	(0.53)	(17.98)
10/01/24	12/31/24	0.00	16.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(16.22)	(0.53)	(15.69)
01/01/25	03/31/25	0.00	13.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(13.00)	(0.28)	(12.72)
04/01/25	06/30/25	0.00	10.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(10.20)	(0.28)	(9.92)
07/01/25	09/30/25	0.00	8.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(8.25)	(0.28)	(7.97)
10/01/25	12/31/25	0.00	7.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(7.30)	(0.28)	(7.01)
01/01/26	03/31/26	0.00	5.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(5.94)	(0.14)	(5.80)
04/01/26	06/30/26	0.00	4.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(4.77)	(0.14)	(4.63)
07/01/26	09/30/26	0.00	3.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(3.95)	(0.14)	(3.81)
10/01/26	12/31/26	0.00	3.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(3.54)	(0.14)	(3.40)
01/01/27	03/31/27	0.00	2.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.96)	(0.10)	(2.85)
04/01/27	06/30/27	0.00	2.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.45)	(0.10)	(2.34)
07/01/27	09/30/27	0.00	2.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.17)	(0.10)	(2.07)
10/01/27	12/31/27	0.00	2.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.12)	(0.10)	(2.02)
01/01/28	03/31/28	0.00	2.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(2.03)	(0.10)	(1.92)
04/01/28	06/30/28	0.00	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.94)	(0.10)	(1.84)
07/01/28	09/30/28	0.00	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.82)	(0.10)	(1.71)
10/01/28	12/31/28	0.00	1.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.66)	(0.10)	(1.56)
01/01/29	03/31/29	0.00	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.44)	(0.08)	(1.37)
04/01/29	06/30/29	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.25)	(0.08)	(1.17)
07/01/29	09/30/29	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.12)	(0.08)	(1.05)
10/01/29	12/31/29	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.06)	(0.08)	(0.98)
01/01/30	03/31/30	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.97)	(0.10)	(0.87)
04/01/30	06/30/30	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.89)	(0.10)	(0.79)
07/01/30	09/30/30	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.88)	(0.10)	(0.78)
10/01/30	12/31/30	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.93)	(0.10)	(0.83)
01/01/31	03/31/31	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.99)	(0.08)	(0.91)
04/01/31	06/30/31	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.04)	(0.08)	(0.95)
07/01/31	09/30/31	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.06)	(0.08)	(0.97)
10/01/31	12/31/31	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.04)	(0.08)	(0.96)
01/01/32	03/31/32	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(1.01)	(0.07)	(0.94)
04/01/32	06/30/32	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.99)	(0.07)	(0.91)
07/01/32	09/30/32	0.00	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.94)	(0.07)	(0.87)
10/01/32	12/31/32	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.88)	(0.07)	(0.80)
01/01/33	03/31/33	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.78)	(0.06)	(0.72)
04/01/33	06/30/33	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.70)	(0.06)	(0.64)
07/01/33	09/30/33	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.65)	(0.06)	(0.59)
10/01/33	12/31/33	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.63)	(0.06)	(0.56)
01/01/34	03/31/34	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.59)	(0.06)	(0.53)
04/01/34	06/30/34	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.56)	(0.06)	(0.50)
07/01/34	09/30/34	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.54)	(0.06)	(0.48)
10/01/34	12/31/34	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.54)	(0.06)	(0.48)
01/01/35	03/31/35	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.53)	(0.05)	(0.48)
04/01/35	06/30/35	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.52)	(0.05)	(0.47)
07/01/35	09/30/35	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.53)	(0.05)	(0.48)
10/01/35	12/31/35	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.55)	(0.05)	(0.49)
01/01/36	03/31/36	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.56)	(0.05)	(0.51)
04/01/36	06/30/36	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.57)	(0.05)	(0.52)
07/01/36	09/30/36	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.57)	(0.05)	(0.52)
10/01/36	12/31/36	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.55)	(0.05)	(0.50)
01/01/37	03/31/37	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.52)	(0.05)	(0.47)
04/01/37	06/30/37	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.49)	(0.05)	(0.44)
07/01/37	09/30/37	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.52)	(0.05)	(0.47)
10/01/37	12/31/37	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.57)	(0.05)	(0.52)
01/01/38	03/31/38	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.63)	(0.05)	(0.59)
04/01/38	06/30/38	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.69)	(0.05)	(0.64)
07/01/38	09/30/38	0.00	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.71)	(0.05)	(0.67)
10/01/38	12/31/38	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.70)	(0.05)	(0.66)
01/01/39	03/31/39	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.68)	(0.04)	(0.64)
04/01/39	06/30/39	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.66)	(0.04)	(0.62)
07/01/39	09/30/39	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.63)	(0.04)	(0.59)
10/01/39	12/31/39	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.59)	(0.04)	(0.55)
01/01/40	03/31/40	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.53)	(0.01)	(0.51)
04/01/40	06/30/40	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.47)	(0.01)	(0.46)
07/01/40	09/30/40	0.00											

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)												
10/01/40	12/31/40	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.43)	(0.01)	(0.42)
01/01/41	03/31/41	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.41)	(0.00)	(0.41)
04/01/41	06/30/41	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.40)	(0.00)	(0.40)
07/01/41	09/30/41	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.46)	(0.00)	(0.46)
10/01/41	12/31/41	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.56)	(0.00)	(0.56)
01/01/42	03/31/42	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.69)	(0.00)	(0.68)
04/01/42	06/30/42	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.80)	(0.00)	(0.79)
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)	(0.85)
10/01/42	12/31/42	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/43	06/30/43	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/43	12/31/43	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/44	06/30/44	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/44	12/31/44	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/45	06/30/45	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/45	12/31/45	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/46	06/30/46	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/46	12/31/46	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/47	06/30/47	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/47	12/31/47	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/48	06/30/48	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/48	12/31/48	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/49	06/30/49	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/49	12/31/49	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/50	06/30/50	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/50	12/31/50	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/51	06/30/51	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/51	12/31/51	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/52	06/30/52	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
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)	(0.85)
10/01/52	12/31/52	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
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)	(0.85)
04/01/53	06/30/53	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
07/01/53	09/30/53	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.85)
10/01/53	12/31/53	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
01/01/54	03/31/54	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.85)
04/01/54	06/30/54	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
07/01/54	09/30/54	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.85)
10/01/54	12/31/54	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.86)
01/01/55	03/31/55	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.86)	(0.00)	(0.85)
04/01/55	06/30/55	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.85)	(0.00)	(0.85)
07/01/55	09/30/55	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.74)	(0.00)	(0.74)
10/01/55	12/31/55	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.56)	(0.00)	(0.56)
01/01/56	03/31/56	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.32)	(0.00)	(0.32)
04/01/56	06/30/56	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	(0.11)	(0.00)	(0.10)
TOTAL		946.69	733.28	91.49	49.07	20.42	21.58	3.39	10.00	195.96	17.45	3.67	13.79

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)						
01/01/19	12/31/19	0.00	0.00	0.00	0.00	0.00	0.00
01/01/20	12/31/20	429.62	312.98	312.98	250.39	62.60	179.23
01/01/21	12/31/21	517.08	114.46	(198.52)	(158.82)	(39.70)	675.90
01/01/22	12/31/22	0.00	0.00	(114.46)	(91.57)	(22.89)	91.57
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
01/01/55	12/31/55	0.00	0.00	0.00	0.00	0.00	0.00
01/01/56	12/31/56	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		946.69	427.44	0.00	(0.00)	(0.00)	946.69

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 2020									
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 (1)	TO (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
01/01/19	12/31/19	0.8742	0.00	75.93	75.93	0.00	66.38	66.38	14.41
01/01/20	12/31/20	0.8584	75.93	52.71	(23.22)	66.38	45.25	(21.13)	23.22
01/01/21	12/31/21	0.8470	52.71	33.99	(18.72)	45.25	28.79	(16.46)	18.72
01/01/22	12/31/22	0.8313	33.99	22.09	(11.90)	28.79	18.37	(10.42)	11.90
01/01/23	12/31/23	0.8255	22.09	15.93	(6.16)	18.37	13.15	(5.22)	6.16
01/01/24	12/31/24	0.8199	15.93	13.10	(2.83)	13.15	10.74	(2.41)	2.83
01/01/25	12/31/25	0.8237	13.10	11.69	(1.41)	10.74	9.63	(1.11)	1.41
01/01/26	12/31/26	0.8325	11.69	10.70	(0.99)	9.63	8.91	(0.72)	0.99
01/01/27	12/31/27	0.8389	10.70	10.00	(0.69)	8.91	8.39	(0.51)	0.69
01/01/28	12/31/28	0.8586	10.00	9.53	(0.47)	8.39	8.18	(0.21)	0.47
01/01/29	12/31/29	0.8713	9.53	9.04	(0.49)	8.18	7.88	(0.31)	0.49
01/01/30	12/31/30	0.8843	9.04	8.54	(0.50)	7.88	7.55	(0.32)	0.50
01/01/31	12/31/31	0.8975	8.54	8.16	(0.38)	7.55	7.33	(0.23)	0.38
01/01/32	12/31/32	0.9110	8.16	7.88	(0.29)	7.33	7.18	(0.15)	0.29
01/01/33	12/31/33	0.9248	7.88	7.62	(0.26)	7.18	7.04	(0.13)	0.26
01/01/34	12/31/34	0.9388	7.62	7.34	(0.28)	7.04	6.89	(0.15)	0.28
01/01/35	12/31/35	0.9531	7.34	7.08	(0.25)	6.89	6.75	(0.14)	0.25
01/01/36	12/31/36	0.9675	7.08	6.77	(0.32)	6.75	6.55	(0.20)	0.32
01/01/37	12/31/37	0.9819	6.77	6.43	(0.33)	6.55	6.31	(0.23)	0.33
01/01/38	12/31/38	0.9846	6.43	6.18	(0.25)	6.31	6.08	(0.23)	0.25
01/01/39	12/31/39	0.9846	6.18	5.97	(0.20)	6.08	5.88	(0.20)	0.20
01/01/40	12/31/40	0.9846	5.97	5.63	(0.35)	5.88	5.54	(0.34)	0.35
01/01/41	12/31/41	0.9846	5.63	5.20	(0.42)	5.54	5.12	(0.42)	0.42
01/01/42	12/31/42	0.9846	5.20	4.78	(0.42)	5.12	4.71	(0.42)	0.42
01/01/43	12/31/43	0.9846	4.78	4.36	(0.42)	4.71	4.29	(0.42)	0.42
01/01/44	12/31/44	0.9846	4.36	3.94	(0.42)	4.29	3.88	(0.42)	0.42
01/01/45	12/31/45	0.9846	3.94	3.51	(0.42)	3.88	3.46	(0.42)	0.42
01/01/46	12/31/46	0.9846	3.51	3.09	(0.42)	3.46	3.04	(0.42)	0.42
01/01/47	12/31/47	0.9846	3.09	2.67	(0.42)	3.04	2.63	(0.42)	0.42
01/01/48	12/31/48	0.9846	2.67	2.25	(0.42)	2.63	2.21	(0.42)	0.42
01/01/49	12/31/49	0.9846	2.25	1.83	(0.42)	2.21	1.80	(0.42)	0.42
01/01/50	12/31/50	0.9846	1.83	1.40	(0.42)	1.80	1.38	(0.42)	0.42
01/01/51	12/31/51	0.9846	1.40	0.98	(0.42)	1.38	0.97	(0.42)	0.42
01/01/52	12/31/52	0.9846	0.98	0.56	(0.42)	0.97	0.55	(0.42)	0.42
01/01/53	12/31/53	0.9846	0.56	0.14	(0.42)	0.55	0.14	(0.42)	0.42
01/01/54	12/31/54	0.9846	0.14	0.00	(0.14)	0.14	0.00	(0.14)	0.14
01/01/55	12/31/55	0.9846	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/56	12/31/56	0.9846	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL			377.03	377.03	0.00	332.95	332.95	0.00	90.34

- Notes:
- (3): Discount factors specified in IRS Internal Revenue Bulletin 2019-02.
 - (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									
2021									
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		(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	(2)	(3)							
01/01/19	12/31/19		0.00	0.00	0.00	0.00	0.00	0.00	
01/01/20	12/31/20		0.00	423.94	423.94	0.00	370.60	370.60	130.35
01/01/21	12/31/21	0.8742	0.00	276.08	(147.85)	370.60	237.00	(133.60)	147.85
01/01/22	12/31/22	0.8584	423.94	176.90	(99.18)	237.00	149.83	(87.16)	99.18
01/01/23	12/31/23	0.8470	276.08	116.18	(60.72)	149.83	96.59	(53.25)	60.72
01/01/24	12/31/24	0.8313	176.90	89.14	(27.05)	96.59	73.58	(23.01)	27.05
01/01/25	12/31/25	0.8255	116.18	76.31	(12.83)	73.58	62.57	(11.01)	12.83
01/01/26	12/31/26	0.8199	89.14	69.58	(6.73)	62.57	57.31	(5.26)	6.73
01/01/27	12/31/27	0.8237	76.31	63.78	(5.80)	57.31	53.10	(4.22)	5.80
01/01/28	12/31/28	0.8325	69.58	60.24	(3.53)	53.10	50.54	(2.56)	3.53
01/01/29	12/31/29	0.8389	63.78	57.66	(2.58)	50.54	49.51	(1.03)	2.58
01/01/30	12/31/30	0.8586	60.24	54.44	(3.23)	49.51	47.43	(2.08)	3.23
01/01/31	12/31/31	0.8713	57.66	51.47	(2.97)	47.43	45.51	(1.92)	2.97
01/01/32	12/31/32	0.8843	54.44	49.45	(2.02)	45.51	44.38	(1.13)	2.02
01/01/33	12/31/33	0.8975	51.47	47.81	(1.65)	44.38	43.55	(0.83)	1.65
01/01/34	12/31/34	0.9110	49.45	46.23	(1.58)	43.55	42.75	(0.80)	1.58
01/01/35	12/31/35	0.9248	47.81	44.46	(1.77)	42.75	41.74	(1.01)	1.77
01/01/36	12/31/36	0.9388	46.23	43.00	(1.46)	41.74	40.98	(0.76)	1.46
01/01/37	12/31/37	0.9531	44.46	40.81	(2.18)	40.98	39.49	(1.49)	2.18
01/01/38	12/31/38	0.9675	43.00	38.82	(1.99)	39.49	38.12	(1.37)	1.99
01/01/39	12/31/39	0.9819	40.81	37.46	(1.36)	38.12	36.89	(1.23)	1.36
01/01/40	12/31/40	0.9846	38.82	36.27	(1.20)	36.89	35.71	(1.18)	1.20
01/01/41	12/31/41	0.9846	37.46	33.69	(2.58)	35.71	33.17	(2.54)	2.58
01/01/42	12/31/42	0.9846	36.27	31.10	(2.59)	33.17	30.62	(2.55)	2.59
01/01/43	12/31/43	0.9846	33.69	28.51	(2.59)	30.62	28.07	(2.55)	2.59
01/01/44	12/31/44	0.9846	31.10	25.92	(2.59)	28.07	25.52	(2.55)	2.59
01/01/45	12/31/45	0.9846	28.51	23.33	(2.59)	25.52	22.97	(2.55)	2.59
01/01/46	12/31/46	0.9846	25.92	20.74	(2.59)	22.97	20.42	(2.55)	2.59
01/01/47	12/31/47	0.9846	23.33	18.15	(2.59)	20.42	17.87	(2.55)	2.59
01/01/48	12/31/48	0.9846	20.74	15.55	(2.59)	17.87	15.32	(2.55)	2.59
01/01/49	12/31/49	0.9846	18.15	12.96	(2.59)	15.32	12.77	(2.55)	2.59
01/01/50	12/31/50	0.9846	15.55	10.37	(2.59)	12.77	10.22	(2.55)	2.59
01/01/51	12/31/51	0.9846	12.96	7.78	(2.59)	10.22	7.67	(2.55)	2.59
01/01/52	12/31/52	0.9846	10.37	5.19	(2.59)	7.67	5.11	(2.55)	2.59
01/01/53	12/31/53	0.9846	7.78	2.60	(2.59)	5.11	2.56	(2.55)	2.59
01/01/54	12/31/54	0.9846	5.19	0.01	(2.59)	2.56	0.01	(2.55)	2.59
01/01/55	12/31/55	0.9846	2.60	0.00	(0.01)	0.01	0.00	(0.01)	0.01
01/01/56	12/31/56	0.9846	0.01	0.00					
TOTAL			2,135.92	2,135.92	0.00	1,889.44	1,889.44	0.00	554.28

Notes:

(3): Discount factors specified in IRS Internal Revenue Bulletin 2019-02.

(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 2022									
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		(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	(2)	(3)							
1/1/2019	12/31/2019								
1/1/2020	12/31/2020		0.00	0.00	0.00	0.00	0.00	0.00	
1/1/2021	12/31/2021		0.00	0.00	0.00	0.00	0.00	0.00	
1/1/2022	12/31/2022	0.8742	0.00	59.79	59.79	0.00	52.27	52.27	28.86
1/1/2023	12/31/2023	0.8584	59.79	38.75	(21.05)	52.27	33.26	(19.01)	21.05
1/1/2024	12/31/2024	0.8470	38.75	24.98	(13.77)	33.26	21.16	(12.11)	13.77
1/1/2025	12/31/2025	0.8313	24.98	17.10	(7.88)	21.16	14.21	(6.94)	7.88
1/1/2026	12/31/2026	0.8255	17.10	13.55	(3.54)	14.21	11.19	(3.02)	3.54
1/1/2027	12/31/2027	0.8199	13.55	11.84	(1.72)	11.19	9.70	(1.48)	1.72
1/1/2028	12/31/2028	0.8237	11.84	10.81	(1.02)	9.70	8.91	(0.80)	1.02
1/1/2029	12/31/2029	0.8325	10.81	10.01	(0.81)	8.91	8.33	(0.58)	0.81
1/1/2030	12/31/2030	0.8389	10.01	9.49	(0.51)	8.33	7.97	(0.37)	0.51
1/1/2031	12/31/2031	0.8586	9.49	9.05	(0.45)	7.97	7.77	(0.20)	0.45
1/1/2032	12/31/2032	0.8713	9.05	8.55	(0.50)	7.77	7.45	(0.32)	0.50
1/1/2033	12/31/2033	0.8843	8.55	8.12	(0.42)	7.45	7.18	(0.26)	0.42
1/1/2034	12/31/2034	0.8975	8.12	7.82	(0.30)	7.18	7.02	(0.16)	0.30
1/1/2035	12/31/2035	0.9110	7.82	7.56	(0.26)	7.02	6.89	(0.13)	0.26
1/1/2036	12/31/2036	0.9248	7.56	7.30	(0.26)	6.89	6.75	(0.14)	0.26
1/1/2037	12/31/2037	0.9388	7.30	7.03	(0.27)	6.75	6.60	(0.15)	0.27
1/1/2038	12/31/2038	0.9531	7.03	6.76	(0.27)	6.60	6.44	(0.16)	0.27
1/1/2039	12/31/2039	0.9675	6.76	6.42	(0.34)	6.44	6.21	(0.23)	0.34
1/1/2040	12/31/2040	0.9819	6.42	6.14	(0.28)	6.21	6.02	(0.19)	0.28
1/1/2041	12/31/2041	0.9846	6.14	5.93	(0.21)	6.02	5.84	(0.19)	0.21
1/1/2042	12/31/2042	0.9846	5.93	5.66	(0.27)	5.84	5.57	(0.26)	0.27
1/1/2043	12/31/2043	0.9846	5.66	5.25	(0.41)	5.57	5.17	(0.41)	0.41
1/1/2044	12/31/2044	0.9846	5.25	4.83	(0.41)	5.17	4.76	(0.41)	0.41
1/1/2045	12/31/2045	0.9846	4.83	4.42	(0.41)	4.76	4.35	(0.41)	0.41
1/1/2046	12/31/2046	0.9846	4.42	4.00	(0.41)	4.35	3.94	(0.41)	0.41
1/1/2047	12/31/2047	0.9846	4.00	3.59	(0.41)	3.94	3.54	(0.41)	0.41
1/1/2048	12/31/2048	0.9846	3.59	3.18	(0.41)	3.54	3.13	(0.41)	0.41
1/1/2049	12/31/2049	0.9846	3.18	2.76	(0.41)	3.13	2.72	(0.41)	0.41
1/1/2050	12/31/2050	0.9846	2.76	2.35	(0.41)	2.72	2.31	(0.41)	0.41
1/1/2051	12/31/2051	0.9846	2.35	1.93	(0.41)	2.31	1.90	(0.41)	0.41
1/1/2052	12/31/2052	0.9846	1.93	1.52	(0.41)	1.90	1.50	(0.41)	0.41
1/1/2053	12/31/2053	0.9846	1.52	1.10	(0.41)	1.50	1.09	(0.41)	0.41
1/1/2054	12/31/2054	0.9846	1.10	0.69	(0.41)	1.09	0.68	(0.41)	0.41
1/1/2055	12/31/2055	0.9846	0.69	0.28	(0.41)	0.68	0.27	(0.41)	0.41
1/1/2056	12/31/2056	0.9846	0.28	0.00	(0.28)	0.27	0.00	(0.27)	0.28
TOTAL			318.55	318.55	0.00	282.09	282.09	0.00	88.66

Notes:

(3): Discount factors specified in IRS Internal Revenue Bulletin 2019-02.

(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)
01/01/19	12/31/19	0.00	0.00	0.00	0.00	0.00
01/01/20	12/31/20	14.41	66.38	80.79	52.78	133.57
01/01/21	12/31/21	153.57	349.47	503.04	127.83	630.87
01/01/22	12/31/22	195.44	(97.79)	97.65	14.28	111.92
01/01/23	12/31/23	132.13	(116.60)	15.53	1.07	16.60
01/01/24	12/31/24	80.65	(70.57)	10.08	0.00	10.08
01/01/25	12/31/25	37.75	(32.36)	5.40	0.00	5.40
01/01/26	12/31/26	17.78	(15.15)	2.63	0.00	2.63
01/01/27	12/31/27	9.44	(7.46)	1.98	0.00	1.98
01/01/28	12/31/28	7.52	(5.53)	1.99	0.00	1.99
01/01/29	12/31/29	4.81	(3.34)	1.47	0.00	1.47
01/01/30	12/31/30	3.59	(1.70)	1.88	0.00	1.88
01/01/31	12/31/31	4.17	(2.60)	1.57	0.00	1.57
01/01/32	12/31/32	3.85	(2.47)	1.38	0.00	1.38
01/01/33	12/31/33	2.73	(1.55)	1.18	0.00	1.18
01/01/34	12/31/34	2.21	(1.13)	1.08	0.00	1.08
01/01/35	12/31/35	2.12	(1.09)	1.03	0.00	1.03
01/01/36	12/31/36	2.28	(1.29)	1.00	0.00	1.00
01/01/37	12/31/37	2.05	(1.11)	0.93	0.00	0.93
01/01/38	12/31/38	2.79	(1.88)	0.91	0.00	0.91
01/01/39	12/31/39	2.58	(1.83)	0.75	0.00	0.75
01/01/40	12/31/40	1.85	(1.62)	0.23	0.00	0.23
01/01/41	12/31/41	1.75	(1.71)	0.04	0.00	0.04
01/01/42	12/31/42	3.27	(3.22)	0.05	0.00	0.05
01/01/43	12/31/43	3.43	(3.37)	0.05	0.00	0.05
01/01/44	12/31/44	3.43	(3.37)	0.05	0.00	0.05
01/01/45	12/31/45	3.43	(3.37)	0.05	0.00	0.05
01/01/46	12/31/46	3.43	(3.37)	0.05	0.00	0.05
01/01/47	12/31/47	3.43	(3.37)	0.05	0.00	0.05
01/01/48	12/31/48	3.43	(3.37)	0.05	0.00	0.05
01/01/49	12/31/49	3.43	(3.37)	0.05	0.00	0.05
01/01/50	12/31/50	3.43	(3.37)	0.05	0.00	0.05
01/01/51	12/31/51	3.43	(3.37)	0.05	0.00	0.05
01/01/52	12/31/52	3.43	(3.37)	0.05	0.00	0.05
01/01/53	12/31/53	3.43	(3.37)	0.05	0.00	0.05
01/01/54	12/31/54	3.43	(3.37)	0.05	0.00	0.05
01/01/55	12/31/55	3.14	(3.09)	0.05	0.00	0.05
01/01/56	12/31/56	0.29	(0.29)	0.00	0.00	0.00
TOTAL		733.28	(0.00)	733.28	195.96	929.24

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)
01/01/19	12/31/19	0.00	0.00	0.00	0.00
01/01/20	12/31/20	179.23	133.57	45.66	9.59
01/01/21	12/31/21	675.90	630.87	45.03	9.46
01/01/22	12/31/22	91.57	111.92	(20.35)	(4.27)
01/01/23	12/31/23	0.00	16.60	(16.60)	(3.49)
01/01/24	12/31/24	0.00	10.08	(10.08)	(2.12)
01/01/25	12/31/25	0.00	5.40	(5.40)	(1.13)
01/01/26	12/31/26	0.00	2.63	(2.63)	(0.55)
01/01/27	12/31/27	0.00	1.98	(1.98)	(0.42)
01/01/28	12/31/28	0.00	1.99	(1.99)	(0.42)
01/01/29	12/31/29	0.00	1.47	(1.47)	(0.31)
01/01/30	12/31/30	0.00	1.88	(1.88)	(0.40)
01/01/31	12/31/31	0.00	1.57	(1.57)	(0.33)
01/01/32	12/31/32	0.00	1.38	(1.38)	(0.29)
01/01/33	12/31/33	0.00	1.18	(1.18)	(0.25)
01/01/34	12/31/34	0.00	1.08	(1.08)	(0.23)
01/01/35	12/31/35	0.00	1.03	(1.03)	(0.22)
01/01/36	12/31/36	0.00	1.00	(1.00)	(0.21)
01/01/37	12/31/37	0.00	0.93	(0.93)	(0.20)
01/01/38	12/31/38	0.00	0.91	(0.91)	(0.19)
01/01/39	12/31/39	0.00	0.75	(0.75)	(0.16)
01/01/40	12/31/40	0.00	0.23	(0.23)	(0.05)
01/01/41	12/31/41	0.00	0.04	(0.04)	(0.01)
01/01/42	12/31/42	0.00	0.05	(0.05)	(0.01)
01/01/43	12/31/43	0.00	0.05	(0.05)	(0.01)
01/01/44	12/31/44	0.00	0.05	(0.05)	(0.01)
01/01/45	12/31/45	0.00	0.05	(0.05)	(0.01)
01/01/46	12/31/46	0.00	0.05	(0.05)	(0.01)
01/01/47	12/31/47	0.00	0.05	(0.05)	(0.01)
01/01/48	12/31/48	0.00	0.05	(0.05)	(0.01)
01/01/49	12/31/49	0.00	0.05	(0.05)	(0.01)
01/01/50	12/31/50	0.00	0.05	(0.05)	(0.01)
01/01/51	12/31/51	0.00	0.05	(0.05)	(0.01)
01/01/52	12/31/52	0.00	0.05	(0.05)	(0.01)
01/01/53	12/31/53	0.00	0.05	(0.05)	(0.01)
01/01/54	12/31/54	0.00	0.05	(0.05)	(0.01)
01/01/55	12/31/55	0.00	0.05	(0.05)	(0.01)
01/01/56	12/31/56	0.00	0.00	(0.00)	(0.00)
TOTAL		946.69	929.24	17.45	3.67

Notes:

(3) = Table C2_1, (8)

(4) = Table C2_5, (7)

(5) = (3) - (4)

(6) = 0.21 x (5), where 0.21 is the Federal income tax rate.

TABLE C2_7: ADMITTED PREPAID TAX (DEFERRED TAX ASSET - DTA)

TIME INTERVAL		AY 2020		AY 2021		AY 2022		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)											
01/01/19	12/31/19							0.00	0.00			0.00
01/01/20	12/31/20							0.00	0.44	312.98	13.15	13.58
01/01/21	12/31/21	(21.13)	23.22					2.09	3.47	114.46	4.81	8.28
01/01/22	12/31/22	(16.46)	18.72	(133.60)	147.85			16.51	3.26	0.00	0.00	3.26
01/01/23	12/31/23	(10.42)	11.90	(87.16)	99.18	(19.01)	21.05	15.53	2.12	0.00	0.00	2.12
01/01/24	12/31/24	(5.22)	6.16	(53.25)	60.72	(12.11)	13.77	10.08	1.13	0.00	0.00	1.13
01/01/25	12/31/25	(2.41)	2.83	(23.01)	27.05	(6.94)	7.88	5.40	0.55	0.00	0.00	0.55
01/01/26	12/31/26	(1.11)	1.41	(11.01)	12.83	(3.02)	3.54	2.63	0.42	0.00	0.00	0.42
01/01/27	12/31/27	(0.72)	0.99	(5.26)	6.73	(1.48)	1.72	1.98	0.42	0.00	0.00	0.42
01/01/28	12/31/28	(0.51)	0.69	(4.22)	5.80	(0.80)	1.02	1.99	0.31	0.00	0.00	0.31
01/01/29	12/31/29	(0.21)	0.47	(2.56)	3.53	(0.58)	0.81	1.47	0.40	0.00	0.00	0.40
01/01/30	12/31/30	(0.31)	0.49	(1.03)	2.58	(0.37)	0.51	1.88	0.33	0.00	0.00	0.33
01/01/31	12/31/31	(0.32)	0.50	(2.08)	3.23	(0.20)	0.45	1.57	0.29	0.00	0.00	0.29
01/01/32	12/31/32	(0.23)	0.38	(1.92)	2.97	(0.32)	0.50	1.38	0.25	0.00	0.00	0.25
01/01/33	12/31/33	(0.15)	0.29	(1.13)	2.02	(0.26)	0.42	1.18	0.23	0.00	0.00	0.23
01/01/34	12/31/34	(0.13)	0.26	(0.83)	1.65	(0.16)	0.30	1.08	0.22	0.00	0.00	0.22
01/01/35	12/31/35	(0.15)	0.28	(0.80)	1.58	(0.13)	0.26	1.03	0.21	0.00	0.00	0.21
01/01/36	12/31/36	(0.14)	0.25	(1.01)	1.77	(0.14)	0.26	1.00	0.20	0.00	0.00	0.20
01/01/37	12/31/37	(0.20)	0.32	(0.76)	1.46	(0.15)	0.27	0.93	0.19	0.00	0.00	0.19
01/01/38	12/31/38	(0.23)	0.33	(1.49)	2.18	(0.16)	0.27	0.91	0.16	0.00	0.00	0.16
01/01/39	12/31/39	(0.23)	0.25	(1.37)	1.99	(0.23)	0.34	0.75	0.05	0.00	0.00	0.05
01/01/40	12/31/40	(0.20)	0.20	(1.23)	1.36	(0.19)	0.28	0.23	0.01	0.00	0.00	0.01
01/01/41	12/31/41	(0.34)	0.35	(1.18)	1.20	(0.19)	0.21	0.04	0.01	0.00	0.00	0.01
01/01/42	12/31/42	(0.42)	0.42	(2.54)	2.58	(0.26)	0.27	0.05	0.01	0.00	0.00	0.01
01/01/43	12/31/43	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/44	12/31/44	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/45	12/31/45	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/46	12/31/46	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/47	12/31/47	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/48	12/31/48	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/49	12/31/49	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/50	12/31/50	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/51	12/31/51	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/52	12/31/52	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/53	12/31/53	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/54	12/31/54	(0.42)	0.42	(2.55)	2.59	(0.41)	0.41	0.05	0.01	0.00	0.00	0.01
01/01/55	12/31/55	(0.14)	0.14	(2.55)	2.59	(0.41)	0.41	0.05	0.00	0.00	0.00	0.00
01/01/56	12/31/56	0.00	0.00	(0.01)	0.01	(0.27)	0.28	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) = 0.21 x (9)_{t-1}, where 0.21 is the Federal income tax rate.
 (11) = Table C2_1, (4)
 (12) = 0.2 x 0.21 x (11), 0.21 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)									
07/01/19	09/30/19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10/01/19	12/31/19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/20	03/31/20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
04/01/20	06/30/20	0.00	0.00	(5.42)	0.00	5.42	0.86	0.00	0.86	4.55
07/01/20	09/30/20	200.14	18.89	171.83	10.19	37.01	26.34	0.00	26.34	10.67
10/01/20	12/31/20	314.75	67.93	253.34	13.58	115.75	92.86	0.00	92.86	22.89
01/01/21	03/31/21	443.60	156.11	351.42	12.26	236.03	200.32	0.00	200.32	35.71
04/01/21	06/30/21	476.36	278.15	391.31	10.93	352.28	314.57	0.00	314.57	37.70
07/01/21	09/30/21	271.62	392.63	226.50	9.60	428.15	406.22	0.00	406.22	21.93
10/01/21	12/31/21	116.60	467.16	127.53	8.28	447.96	443.71	0.00	443.71	4.25
01/01/22	03/31/22	29.04	488.12	74.81	7.02	435.32	443.26	7.94	435.32	0.00
04/01/22	06/30/22	0.00	462.63	30.72	5.77	426.14	421.24	(7.94)	421.24	4.90
07/01/22	09/30/22	0.00	415.89	2.45	4.51	408.92	394.57	0.00	394.57	14.35
10/01/22	12/31/22	0.00	372.38	1.07	3.26	368.04	365.04	0.00	365.04	3.00
01/01/23	03/31/23	0.00	333.66	0.39	2.98	330.30	333.60	3.30	330.30	0.00
04/01/23	06/30/23	0.00	299.14	0.09	2.69	296.36	302.75	3.09	296.36	0.00
07/01/23	09/30/23	0.00	268.14	0.00	2.40	265.74	273.44	1.31	265.74	0.00
10/01/23	12/31/23	0.00	239.70	0.00	2.12	237.58	245.87	0.59	237.58	0.00
01/01/24	03/31/24	0.00	214.99	0.00	1.87	213.12	221.69	0.28	213.12	0.00
04/01/24	06/30/24	0.00	193.53	0.00	1.63	191.90	200.76	0.28	191.90	0.00
07/01/24	09/30/24	0.00	175.02	0.00	1.38	173.64	182.78	0.28	173.64	0.00
10/01/24	12/31/24	0.00	158.80	0.00	1.13	157.67	167.09	0.28	157.67	0.00
01/01/25	03/31/25	0.00	145.80	0.00	0.99	144.81	154.37	0.14	144.81	0.00
04/01/25	06/30/25	0.00	135.60	0.00	0.84	134.76	144.46	0.14	134.76	0.00
07/01/25	09/30/25	0.00	127.35	0.00	0.70	126.65	136.49	0.14	126.65	0.00
10/01/25	12/31/25	0.00	120.05	0.00	0.55	119.50	129.47	0.14	119.50	0.00
01/01/26	03/31/26	0.00	114.11	0.00	0.52	113.59	123.67	0.10	113.59	0.00
04/01/26	06/30/26	0.00	109.34	0.00	0.48	108.86	119.04	0.10	108.86	0.00
07/01/26	09/30/26	0.00	105.40	0.00	0.45	104.95	115.23	0.10	104.95	0.00
10/01/26	12/31/26	0.00	101.86	0.00	0.42	101.44	111.83	0.10	101.44	0.00
01/01/27	03/31/27	0.00	98.90	0.00	0.42	98.49	108.98	0.10	98.49	0.00
04/01/27	06/30/27	0.00	96.46	0.00	0.42	96.04	106.64	0.10	96.04	0.00
07/01/27	09/30/27	0.00	94.28	0.00	0.42	93.86	104.57	0.10	93.86	0.00
10/01/27	12/31/27	0.00	92.16	0.00	0.42	91.74	102.55	0.10	91.74	0.00
01/01/28	03/31/28	0.00	90.13	0.00	0.39	89.74	100.63	0.08	89.74	0.00
04/01/28	06/30/28	0.00	88.19	0.00	0.36	87.82	98.79	0.08	87.82	0.00
07/01/28	09/30/28	0.00	86.37	0.00	0.34	86.04	97.08	0.08	86.04	0.00
10/01/28	12/31/28	0.00	84.71	0.00	0.31	84.40	95.52	0.08	84.40	0.00
01/01/29	03/31/29	0.00	83.27	0.00	0.33	82.94	94.15	0.10	82.94	0.00
04/01/29	06/30/29	0.00	82.01	0.00	0.35	81.66	92.98	0.10	81.66	0.00
07/01/29	09/30/29	0.00	80.89	0.00	0.37	80.52	91.93	0.10	80.52	0.00
10/01/29	12/31/29	0.00	79.83	0.00	0.40	79.43	90.95	0.10	79.43	0.00
01/01/30	03/31/30	0.00	78.86	0.00	0.38	78.48	90.08	0.08	78.48	0.00
04/01/30	06/30/30	0.00	77.98	0.00	0.36	77.61	89.29	0.08	77.61	0.00
07/01/30	09/30/30	0.00	77.10	0.00	0.35	76.75	88.51	0.08	76.75	0.00
10/01/30	12/31/30	0.00	76.16	0.00	0.33	75.83	87.68	0.08	75.83	0.00
01/01/31	03/31/31	0.00	75.18	0.00	0.32	74.86	86.77	0.07	74.86	0.00
04/01/31	06/30/31	0.00	74.14	0.00	0.31	73.83	85.82	0.07	73.83	0.00
07/01/31	09/30/31	0.00	73.08	0.00	0.30	72.78	84.84	0.07	72.78	0.00
10/01/31	12/31/31	0.00	72.04	0.00	0.29	71.75	83.88	0.07	71.75	0.00
01/01/32	03/31/32	0.00	71.03	0.00	0.28	70.75	82.94	0.06	70.75	0.00
04/01/32	06/30/32	0.00	70.04	0.00	0.27	69.77	82.03	0.06	69.77	0.00
07/01/32	09/30/32	0.00	69.10	0.00	0.26	68.85	81.16	0.06	68.85	0.00
10/01/32	12/31/32	0.00	68.23	0.00	0.25	67.98	80.36	0.06	67.98	0.00
01/01/33	03/31/33	0.00	67.45	0.00	0.24	67.20	79.64	0.06	67.20	0.00
04/01/33	06/30/33	0.00	66.75	0.00	0.24	66.51	79.00	0.06	66.51	0.00
07/01/33	09/30/33	0.00	66.10	0.00	0.23	65.86	78.41	0.06	65.86	0.00
10/01/33	12/31/33	0.00	65.47	0.00	0.23	65.24	77.85	0.06	65.24	0.00
01/01/34	03/31/34	0.00	64.88	0.00	0.22	64.66	77.32	0.05	64.66	0.00
04/01/34	06/30/34	0.00	64.33	0.00	0.22	64.10	76.82	0.05	64.10	0.00
07/01/34	09/30/34	0.00	63.79	0.00	0.22	63.57	76.34	0.05	63.57	0.00
10/01/34	12/31/34	0.00	63.25	0.00	0.22	63.03	75.85	0.05	63.03	0.00
01/01/35	03/31/35	0.00	62.72	0.00	0.21	62.50	75.38	0.05	62.50	0.00
04/01/35	06/30/35	0.00	62.19	0.00	0.21	61.98	74.91	0.05	61.98	0.00
07/01/35	09/30/35	0.00	61.66	0.00	0.21	61.45	74.43	0.05	61.45	0.00
10/01/35	12/31/35	0.00	61.11	0.00	0.21	60.91	73.94	0.05	60.91	0.00
01/01/36	03/31/36	0.00	60.55	0.00	0.21	60.35	73.43	0.05	60.35	0.00
04/01/36	06/30/36	0.00	59.98	0.00	0.20	59.78	72.91	0.05	59.78	0.00
07/01/36	09/30/36	0.00	59.41	0.00	0.20	59.21	72.39	0.05	59.21	0.00
10/01/36	12/31/36	0.00	58.86	0.00	0.20	58.66	71.89	0.05	58.66	0.00
01/01/37	03/31/37	0.00	58.33	0.00	0.19	58.14	71.42	0.05	58.14	0.00
04/01/37	06/30/37	0.00	57.84	0.00	0.19	57.65	70.97	0.05	57.65	0.00
07/01/37	09/30/37	0.00	57.33	0.00	0.19	57.13	70.51	0.05	57.13	0.00
10/01/37	12/31/37	0.00	56.76	0.00	0.19	56.57	69.99	0.05	56.57	0.00
01/01/38	03/31/38	0.00	56.12	0.00	0.18	55.94	69.40	0.04	55.94	0.00
04/01/38	06/30/38	0.00	55.43	0.00	0.17	55.26	68.76	0.04	55.26	0.00
07/01/38	09/30/38	0.00	54.72	0.00	0.17	54.55	68.09	0.04	54.55	0.00
10/01/38	12/31/38	0.00	54.02	0.00	0.16	53.86	67.43	0.04	53.86	0.00
01/01/39	03/31/39	0.00	53.33	0.00	0.13	53.20	66.79	0.01	53.20	0.00
04/01/39	06/30/39	0.00	52.67	0.00	0.10	52.57	66.17	0.01	52.57	0.00
07/01/39	09/30/39	0.00	52.04	0.00	0.08	51.97	65.58	0.01	51.97	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)									
10/01/39	12/31/39	0.00	51.45	0.00	0.05	51.40	65.03	0.01	51.40	0.00
01/01/40	03/31/40	0.00	50.93	0.00	0.04	50.89	64.52	0.00	50.89	0.00
04/01/40	06/30/40	0.00	50.45	0.00	0.03	50.43	64.06	0.00	50.43	0.00
07/01/40	09/30/40	0.00	50.01	0.00	0.02	49.99	63.63	0.00	49.99	0.00
10/01/40	12/31/40	0.00	49.58	0.00	0.01	49.57	63.21	0.00	49.57	0.00
01/01/41	03/31/41	0.00	49.17	0.00	0.01	49.16	62.79	0.00	49.16	0.00
04/01/41	06/30/41	0.00	48.77	0.00	0.01	48.76	62.40	0.00	48.76	0.00
07/01/41	09/30/41	0.00	48.31	0.00	0.01	48.30	61.94	0.00	48.30	0.00
10/01/41	12/31/41	0.00	47.75	0.00	0.01	47.74	61.38	0.00	47.74	0.00
01/01/42	03/31/42	0.00	47.06	0.00	0.01	47.05	60.70	0.00	47.05	0.00
04/01/42	06/30/42	0.00	46.27	0.00	0.01	46.26	59.91	0.00	46.26	0.00
07/01/42	09/30/42	0.00	45.41	0.00	0.01	45.40	59.05	0.00	45.40	0.00
10/01/42	12/31/42	0.00	44.55	0.00	0.01	44.54	58.20	0.00	44.54	0.00
01/01/43	03/31/43	0.00	43.69	0.00	0.01	43.68	57.34	0.00	43.68	0.00
04/01/43	06/30/43	0.00	42.84	0.00	0.01	42.83	56.49	0.00	42.83	0.00
07/01/43	09/30/43	0.00	41.99	0.00	0.01	41.97	55.64	0.00	41.97	0.00
10/01/43	12/31/43	0.00	41.12	0.00	0.01	41.11	54.78	0.00	41.11	0.00
01/01/44	03/31/44	0.00	40.27	0.00	0.01	40.26	53.93	0.00	40.26	0.00
04/01/44	06/30/44	0.00	39.42	0.00	0.01	39.40	53.08	0.00	39.40	0.00
07/01/44	09/30/44	0.00	38.56	0.00	0.01	38.55	52.22	0.00	38.55	0.00
10/01/44	12/31/44	0.00	37.70	0.00	0.01	37.69	51.37	0.00	37.69	0.00
01/01/45	03/31/45	0.00	36.84	0.00	0.01	36.83	50.51	0.00	36.83	0.00
04/01/45	06/30/45	0.00	35.99	0.00	0.01	35.98	49.66	0.00	35.98	0.00
07/01/45	09/30/45	0.00	35.13	0.00	0.01	35.12	48.81	0.00	35.12	0.00
10/01/45	12/31/45	0.00	34.27	0.00	0.01	34.26	47.95	0.00	34.26	0.00
01/01/46	03/31/46	0.00	33.41	0.00	0.01	33.40	47.10	0.00	33.40	0.00
04/01/46	06/30/46	0.00	32.56	0.00	0.01	32.55	46.25	0.00	32.55	0.00
07/01/46	09/30/46	0.00	31.71	0.00	0.01	31.69	45.39	0.00	31.69	0.00
10/01/46	12/31/46	0.00	30.84	0.00	0.01	30.83	44.53	0.00	30.83	0.00
01/01/47	03/31/47	0.00	29.99	0.00	0.01	29.98	43.68	0.00	29.98	0.00
04/01/47	06/30/47	0.00	29.14	0.00	0.01	29.13	42.83	0.00	29.13	0.00
07/01/47	09/30/47	0.00	28.28	0.00	0.01	28.27	41.98	0.00	28.27	0.00
10/01/47	12/31/47	0.00	27.42	0.00	0.01	27.41	41.12	0.00	27.41	0.00
01/01/48	03/31/48	0.00	26.56	0.00	0.01	26.55	40.27	0.00	26.55	0.00
04/01/48	06/30/48	0.00	25.71	0.00	0.01	25.70	39.42	0.00	25.70	0.00
07/01/48	09/30/48	0.00	24.85	0.00	0.01	24.84	38.56	0.00	24.84	0.00
10/01/48	12/31/48	0.00	23.99	0.00	0.01	23.98	37.70	0.00	23.98	0.00
01/01/49	03/31/49	0.00	23.14	0.00	0.01	23.12	36.85	0.00	23.12	0.00
04/01/49	06/30/49	0.00	22.28	0.00	0.01	22.27	36.00	0.00	22.27	0.00
07/01/49	09/30/49	0.00	21.43	0.00	0.01	21.42	35.15	0.00	21.42	0.00
10/01/49	12/31/49	0.00	20.57	0.00	0.01	20.55	34.29	0.00	20.55	0.00
01/01/50	03/31/50	0.00	19.71	0.00	0.01	19.70	33.43	0.00	19.70	0.00
04/01/50	06/30/50	0.00	18.86	0.00	0.01	18.85	32.59	0.00	18.85	0.00
07/01/50	09/30/50	0.00	18.00	0.00	0.01	17.99	31.73	0.00	17.99	0.00
10/01/50	12/31/50	0.00	17.14	0.00	0.01	17.13	30.87	0.00	17.13	0.00
01/01/51	03/31/51	0.00	16.28	0.00	0.01	16.27	30.02	0.00	16.27	0.00
04/01/51	06/30/51	0.00	15.43	0.00	0.01	15.42	29.17	0.00	15.42	0.00
07/01/51	09/30/51	0.00	14.57	0.00	0.01	14.56	28.32	0.00	14.56	0.00
10/01/51	12/31/51	0.00	13.71	0.00	0.01	13.70	27.46	0.00	13.70	0.00
01/01/52	03/31/52	0.00	12.86	0.00	0.01	12.84	26.60	0.00	12.84	0.00
04/01/52	06/30/52	0.00	12.00	0.00	0.01	11.99	25.75	0.00	11.99	0.00
07/01/52	09/30/52	0.00	11.15	0.00	0.01	11.14	24.90	0.00	11.14	0.00
10/01/52	12/31/52	0.00	10.29	0.00	0.01	10.27	24.04	0.00	10.27	0.00
01/01/53	03/31/53	0.00	9.43	0.00	0.01	9.42	23.19	0.00	9.42	0.00
04/01/53	06/30/53	0.00	8.58	0.00	0.01	8.57	22.34	0.00	8.57	0.00
07/01/53	09/30/53	0.00	7.72	0.00	0.01	7.71	21.48	0.00	7.71	0.00
10/01/53	12/31/53	0.00	6.86	0.00	0.01	6.85	20.63	0.00	6.85	0.00
01/01/54	03/31/54	0.00	6.00	0.00	0.01	5.99	19.77	0.00	5.99	0.00
04/01/54	06/30/54	0.00	5.15	0.00	0.01	5.14	18.92	0.00	5.14	0.00
07/01/54	09/30/54	0.00	4.29	0.00	0.01	4.28	18.07	0.00	4.28	0.00
10/01/54	12/31/54	0.00	3.43	0.00	0.01	3.42	17.21	0.00	3.42	0.00
01/01/55	03/31/55	0.00	2.58	0.00	0.01	2.57	16.36	0.00	2.57	0.00
04/01/55	06/30/55	0.00	1.72	0.00	0.01	1.72	15.51	0.00	1.72	0.00
07/01/55	09/30/55	0.00	0.98	0.00	0.00	0.98	14.77	0.00	0.98	0.00
10/01/55	12/31/55	0.00	0.42	0.00	0.00	0.42	14.21	0.00	0.42	0.00
01/01/56	03/31/56	0.00	0.11	0.00	0.00	0.10	13.89	(0.00)	0.10	0.00
04/01/56	06/30/56	0.00	(0.00)	0.00	0.00	(0.00)	13.79	0.00	(0.00)	0.00
TOTAL		1,852.12	11,286.28	1,626.05	120.77	11,391.59	12,929.98	13.79	11,231.62	159.96

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) = 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)					
07/01/19	09/30/19	0.00	0.00	0.00	0.00	0.00
10/01/19	12/31/19	0.00	0.00	0.00	0.00	0.00
01/01/20	03/31/20	0.00	0.00	0.00	0.00	0.00
04/01/20	06/30/20	0.00	5.42	5.42	0.00	(5.42)
07/01/20	09/30/20	31.93	60.24	60.24	0.00	171.83
10/01/20	12/31/20	114.86	176.27	144.34	0.00	253.34
01/01/21	03/31/21	263.97	356.15	241.29	0.00	351.42
04/01/21	06/30/21	470.33	555.39	291.42	0.00	391.31
07/01/21	09/30/21	675.07	720.20	249.86	0.00	226.50
10/01/21	12/31/21	830.09	819.17	144.09	0.00	127.53
01/01/22	03/31/22	917.66	871.88	41.79	0.00	74.81
04/01/22	06/30/22	946.69	900.28	(17.38)	15.70	30.72
07/01/22	09/30/22	946.69	921.31	(25.38)	22.93	2.45
10/01/22	12/31/22	946.69	935.60	(11.09)	10.02	1.07
01/01/23	03/31/23	946.69	942.69	(4.01)	3.62	0.39
04/01/23	06/30/23	946.69	945.79	(0.90)	0.81	0.09
07/01/23	09/30/23	946.69	946.69	0.00	0.00	0.00
10/01/23	12/31/23	946.69	946.69	0.00	0.00	0.00
01/01/24	03/31/24	946.69	946.69	0.00	0.00	0.00
04/01/24	06/30/24	946.69	946.69	0.00	0.00	0.00
07/01/24	09/30/24	946.69	946.69	0.00	0.00	0.00
10/01/24	12/31/24	946.69	946.69	0.00	0.00	0.00
01/01/25	03/31/25	946.69	946.69	0.00	0.00	0.00
04/01/25	06/30/25	946.69	946.69	0.00	0.00	0.00
07/01/25	09/30/25	946.69	946.69	0.00	0.00	0.00
10/01/25	12/31/25	946.69	946.69	0.00	0.00	0.00
01/01/26	03/31/26	946.69	946.69	0.00	0.00	0.00
04/01/26	06/30/26	946.69	946.69	0.00	0.00	0.00
07/01/26	09/30/26	946.69	946.69	0.00	0.00	0.00
10/01/26	12/31/26	946.69	946.69	0.00	0.00	0.00
01/01/27	03/31/27	946.69	946.69	0.00	0.00	0.00
04/01/27	06/30/27	946.69	946.69	0.00	0.00	0.00
07/01/27	09/30/27	946.69	946.69	0.00	0.00	0.00
10/01/27	12/31/27	946.69	946.69	0.00	0.00	0.00
01/01/28	03/31/28	946.69	946.69	0.00	0.00	0.00
04/01/28	06/30/28	946.69	946.69	0.00	0.00	0.00
07/01/28	09/30/28	946.69	946.69	0.00	0.00	0.00
10/01/28	12/31/28	946.69	946.69	0.00	0.00	0.00
01/01/29	03/31/29	946.69	946.69	0.00	0.00	0.00
04/01/29	06/30/29	946.69	946.69	0.00	0.00	0.00
07/01/29	09/30/29	946.69	946.69	0.00	0.00	0.00
10/01/29	12/31/29	946.69	946.69	0.00	0.00	0.00
01/01/30	03/31/30	946.69	946.69	0.00	0.00	0.00
04/01/30	06/30/30	946.69	946.69	0.00	0.00	0.00
07/01/30	09/30/30	946.69	946.69	0.00	0.00	0.00
10/01/30	12/31/30	946.69	946.69	0.00	0.00	0.00
01/01/31	03/31/31	946.69	946.69	0.00	0.00	0.00
04/01/31	06/30/31	946.69	946.69	0.00	0.00	0.00
07/01/31	09/30/31	946.69	946.69	0.00	0.00	0.00
10/01/31	12/31/31	946.69	946.69	0.00	0.00	0.00
01/01/32	03/31/32	946.69	946.69	0.00	0.00	0.00
04/01/32	06/30/32	946.69	946.69	0.00	0.00	0.00
07/01/32	09/30/32	946.69	946.69	0.00	0.00	0.00
10/01/32	12/31/32	946.69	946.69	0.00	0.00	0.00
01/01/33	03/31/33	946.69	946.69	0.00	0.00	0.00
04/01/33	06/30/33	946.69	946.69	0.00	0.00	0.00
07/01/33	09/30/33	946.69	946.69	0.00	0.00	0.00
10/01/33	12/31/33	946.69	946.69	0.00	0.00	0.00
01/01/34	03/31/34	946.69	946.69	0.00	0.00	0.00
04/01/34	06/30/34	946.69	946.69	0.00	0.00	0.00
07/01/34	09/30/34	946.69	946.69	0.00	0.00	0.00
10/01/34	12/31/34	946.69	946.69	0.00	0.00	0.00
01/01/35	03/31/35	946.69	946.69	0.00	0.00	0.00
04/01/35	06/30/35	946.69	946.69	0.00	0.00	0.00
07/01/35	09/30/35	946.69	946.69	0.00	0.00	0.00
10/01/35	12/31/35	946.69	946.69	0.00	0.00	0.00
01/01/36	03/31/36	946.69	946.69	0.00	0.00	0.00
04/01/36	06/30/36	946.69	946.69	0.00	0.00	0.00
07/01/36	09/30/36	946.69	946.69	0.00	0.00	0.00
10/01/36	12/31/36	946.69	946.69	0.00	0.00	0.00
01/01/37	03/31/37	946.69	946.69	0.00	0.00	0.00
04/01/37	06/30/37	946.69	946.69	0.00	0.00	0.00
07/01/37	09/30/37	946.69	946.69	0.00	0.00	0.00
10/01/37	12/31/37	946.69	946.69	0.00	0.00	0.00
01/01/38	03/31/38	946.69	946.69	0.00	0.00	0.00
04/01/38	06/30/38	946.69	946.69	0.00	0.00	0.00
07/01/38	09/30/38	946.69	946.69	0.00	0.00	0.00
10/01/38	12/31/38	946.69	946.69	0.00	0.00	0.00
01/01/39	03/31/39	946.69	946.69	0.00	0.00	0.00
04/01/39	06/30/39	946.69	946.69	0.00	0.00	0.00
07/01/39	09/30/39	946.69	946.69	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)					
10/01/39	12/31/39	946.69	946.69	0.00	0.00	0.00
01/01/40	03/31/40	946.69	946.69	0.00	0.00	0.00
04/01/40	06/30/40	946.69	946.69	0.00	0.00	0.00
07/01/40	09/30/40	946.69	946.69	0.00	0.00	0.00
10/01/40	12/31/40	946.69	946.69	0.00	0.00	0.00
01/01/41	03/31/41	946.69	946.69	0.00	0.00	0.00
04/01/41	06/30/41	946.69	946.69	0.00	0.00	0.00
07/01/41	09/30/41	946.69	946.69	0.00	0.00	0.00
10/01/41	12/31/41	946.69	946.69	0.00	0.00	0.00
01/01/42	03/31/42	946.69	946.69	0.00	0.00	0.00
04/01/42	06/30/42	946.69	946.69	0.00	0.00	0.00
07/01/42	09/30/42	946.69	946.69	0.00	0.00	0.00
10/01/42	12/31/42	946.69	946.69	0.00	0.00	0.00
01/01/43	03/31/43	946.69	946.69	0.00	0.00	0.00
04/01/43	06/30/43	946.69	946.69	0.00	0.00	0.00
07/01/43	09/30/43	946.69	946.69	0.00	0.00	0.00
10/01/43	12/31/43	946.69	946.69	0.00	0.00	0.00
01/01/44	03/31/44	946.69	946.69	0.00	0.00	0.00
04/01/44	06/30/44	946.69	946.69	0.00	0.00	0.00
07/01/44	09/30/44	946.69	946.69	0.00	0.00	0.00
10/01/44	12/31/44	946.69	946.69	0.00	0.00	0.00
01/01/45	03/31/45	946.69	946.69	0.00	0.00	0.00
04/01/45	06/30/45	946.69	946.69	0.00	0.00	0.00
07/01/45	09/30/45	946.69	946.69	0.00	0.00	0.00
10/01/45	12/31/45	946.69	946.69	0.00	0.00	0.00
01/01/46	03/31/46	946.69	946.69	0.00	0.00	0.00
04/01/46	06/30/46	946.69	946.69	0.00	0.00	0.00
07/01/46	09/30/46	946.69	946.69	0.00	0.00	0.00
10/01/46	12/31/46	946.69	946.69	0.00	0.00	0.00
01/01/47	03/31/47	946.69	946.69	0.00	0.00	0.00
04/01/47	06/30/47	946.69	946.69	0.00	0.00	0.00
07/01/47	09/30/47	946.69	946.69	0.00	0.00	0.00
10/01/47	12/31/47	946.69	946.69	0.00	0.00	0.00
01/01/48	03/31/48	946.69	946.69	0.00	0.00	0.00
04/01/48	06/30/48	946.69	946.69	0.00	0.00	0.00
07/01/48	09/30/48	946.69	946.69	0.00	0.00	0.00
10/01/48	12/31/48	946.69	946.69	0.00	0.00	0.00
01/01/49	03/31/49	946.69	946.69	0.00	0.00	0.00
04/01/49	06/30/49	946.69	946.69	0.00	0.00	0.00
07/01/49	09/30/49	946.69	946.69	0.00	0.00	0.00
10/01/49	12/31/49	946.69	946.69	0.00	0.00	0.00
01/01/50	03/31/50	946.69	946.69	0.00	0.00	0.00
04/01/50	06/30/50	946.69	946.69	0.00	0.00	0.00
07/01/50	09/30/50	946.69	946.69	0.00	0.00	0.00
10/01/50	12/31/50	946.69	946.69	0.00	0.00	0.00
01/01/51	03/31/51	946.69	946.69	0.00	0.00	0.00
04/01/51	06/30/51	946.69	946.69	0.00	0.00	0.00
07/01/51	09/30/51	946.69	946.69	0.00	0.00	0.00
10/01/51	12/31/51	946.69	946.69	0.00	0.00	0.00
01/01/52	03/31/52	946.69	946.69	0.00	0.00	0.00
04/01/52	06/30/52	946.69	946.69	0.00	0.00	0.00
07/01/52	09/30/52	946.69	946.69	0.00	0.00	0.00
10/01/52	12/31/52	946.69	946.69	0.00	0.00	0.00
01/01/53	03/31/53	946.69	946.69	0.00	0.00	0.00
04/01/53	06/30/53	946.69	946.69	0.00	0.00	0.00
07/01/53	09/30/53	946.69	946.69	0.00	0.00	0.00
10/01/53	12/31/53	946.69	946.69	0.00	0.00	0.00
01/01/54	03/31/54	946.69	946.69	0.00	0.00	0.00
04/01/54	06/30/54	946.69	946.69	0.00	0.00	0.00
07/01/54	09/30/54	946.69	946.69	0.00	0.00	0.00
10/01/54	12/31/54	946.69	946.69	0.00	0.00	0.00
01/01/55	03/31/55	946.69	946.69	0.00	0.00	0.00
04/01/55	06/30/55	946.69	946.69	0.00	0.00	0.00
07/01/55	09/30/55	946.69	946.69	0.00	0.00	0.00
10/01/55	12/31/55	946.69	946.69	0.00	0.00	0.00
01/01/56	03/31/56	946.69	946.69	0.00	0.00	0.00
04/01/56	06/30/56	946.69	946.69	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)
07/01/19	09/30/19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
10/01/19	12/31/19	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
01/01/20	03/31/20	0.00%	0.00%	0.0000%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
04/01/20	06/30/20	0.57%	0.00%	0.5722%	0.00%	4.09%	0.00%	0.00%	0.00%	0.57%	0.57%	0.00%
07/01/20	09/30/20	5.79%	0.80%	5.7912%	13.94%	23.91%	0.00%	24.51%	24.51%	5.79%	6.36%	0.80%
10/01/20	12/31/20	12.26%	2.07%	12.2562%	14.81%	22.28%	24.51%	20.87%	20.87%	12.26%	18.62%	2.87%
01/01/21	03/31/21	19.00%	3.72%	19.0008%	22.56%	28.68%	20.87%	29.36%	29.36%	19.00%	37.62%	6.59%
04/01/21	06/30/21	21.05%	5.16%	21.0456%	23.53%	21.05%	29.36%	25.26%	25.26%	21.05%	58.67%	11.75%
07/01/21	09/30/21	17.41%	6.01%	17.4087%	10.81%	0.00%	25.26%	0.00%	0.00%	17.41%	76.07%	17.76%
10/01/21	12/31/21	10.45%	6.21%	10.4543%	8.19%	0.00%	0.00%	0.00%	0.00%	10.45%	86.53%	23.97%
01/01/22	03/31/22	5.57%	6.39%	5.5684%	4.62%	0.00%	0.00%	0.00%	0.00%	5.57%	92.10%	30.37%
04/01/22	06/30/22	3.00%	6.54%	2.9995%	1.53%	0.00%	0.00%	0.00%	0.00%	3.00%	95.10%	36.91%
07/01/22	09/30/22	2.22%	6.37%	2.2216%	0.00%	0.00%	0.00%	0.00%	0.00%	2.22%	97.32%	43.28%
10/01/22	12/31/22	1.51%	5.93%	1.5097%	0.00%	0.00%	0.00%	0.00%	0.00%	1.51%	98.83%	49.22%
01/01/23	03/31/23	0.75%	5.28%	0.7485%	0.00%	0.00%	0.00%	0.00%	0.00%	0.75%	99.58%	54.50%
04/01/23	06/30/23	0.33%	4.71%	0.3282%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	99.90%	59.21%
07/01/23	09/30/23	0.10%	4.23%	0.0950%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	100.00%	63.43%
10/01/23	12/31/23	0.00%	3.88%	0.0000%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	67.31%
01/01/24	03/31/24	0.00%	3.37%	0.0000%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	70.68%
04/01/24	06/30/24	0.00%	2.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	73.61%
07/01/24	09/30/24	0.00%	2.52%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	76.13%
10/01/24	12/31/24	0.00%	2.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	78.34%
01/01/25	03/31/25	0.00%	1.77%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	80.12%
04/01/25	06/30/25	0.00%	1.39%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	81.51%
07/01/25	09/30/25	0.00%	1.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	82.63%
10/01/25	12/31/25	0.00%	0.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	83.63%
01/01/26	03/31/26	0.00%	0.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	84.44%
04/01/26	06/30/26	0.00%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	85.09%
07/01/26	09/30/26	0.00%	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	85.63%
10/01/26	12/31/26	0.00%	0.48%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	86.11%
01/01/27	03/31/27	0.00%	0.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	86.51%
04/01/27	06/30/27	0.00%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	86.85%
07/01/27	09/30/27	0.00%	0.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.14%
10/01/27	12/31/27	0.00%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.43%
01/01/28	03/31/28	0.00%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.71%
04/01/28	06/30/28	0.00%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	87.97%
07/01/28	09/30/28	0.00%	0.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.22%
10/01/28	12/31/28	0.00%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.45%
01/01/29	03/31/29	0.00%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.64%
04/01/29	06/30/29	0.00%	0.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.82%
07/01/29	09/30/29	0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	88.97%
10/01/29	12/31/29	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.11%
01/01/30	03/31/30	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.25%
04/01/30	06/30/30	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.37%
07/01/30	09/30/30	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.49%
10/01/30	12/31/30	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.61%
01/01/31	03/31/31	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	89.75%
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%	89.89%
07/01/31	09/30/31	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.03%
10/01/31	12/31/31	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.18%
01/01/32	03/31/32	0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.31%
04/01/32	06/30/32	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.45%
07/01/32	09/30/32	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.58%
10/01/32	12/31/32	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.70%
01/01/33	03/31/33	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.80%
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%	90.90%
07/01/33	09/30/33	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	90.99%
10/01/33	12/31/33	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.07%
01/01/34	03/31/34	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.15%
04/01/34	06/30/34	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.23%
07/01/34	09/30/34	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.30%
10/01/34	12/31/34	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.37%
01/01/35	03/31/35	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.45%
04/01/35	06/30/35	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.52%
07/01/35	09/30/35	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.59%
10/01/35	12/31/35	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.67%
01/01/36	03/31/36	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.74%
04/01/36	06/30/36	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.82%
07/01/36	09/30/36	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.90%
10/01/36	12/31/36	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	91.97%
01/01/37	03/31/37	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.04%
04/01/37	06/30/37	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.11%
07/01/37	09/30/37	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.18%
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%	92.26%
01/01/38	03/31/38	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.35%
04/01/38	06/30/38	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.44%
07/01/38	09/30/38	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.54%
10/01/38	12/31/38	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.63%
01/01/39	03/31/39	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.73%
04/01/39	06/30/39	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.82%
07/01/39	09/30/39	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	92.90%
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%	92.98%
01/01/40	03/31/40	0.00%	0.07%	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)
04/01/40	06/30/40	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.12%
07/01/40	09/30/40	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.18%
10/01/40	12/31/40	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.24%
01/01/41	03/31/41	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.30%
04/01/41	06/30/41	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.35%
07/01/41	09/30/41	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.41%
10/01/41	12/31/41	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.49%
01/01/42	03/31/42	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	93.58%
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%	93.69%
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%	93.81%
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%	93.92%
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%	94.04%
04/01/43	06/30/43	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.16%
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%	94.27%
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%	94.39%
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%	94.51%
04/01/44	06/30/44	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	94.62%
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%	94.74%
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%	94.86%
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%	94.98%
04/01/45	06/30/45	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.09%
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%	95.21%
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%	95.33%
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%	95.44%
04/01/46	06/30/46	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	95.56%
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%	95.68%
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%	95.79%
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%	95.91%
04/01/47	06/30/47	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.03%
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%	96.14%
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%	96.26%
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%	96.38%
04/01/48	06/30/48	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.49%
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%	96.61%
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%	96.73%
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%	96.84%
04/01/49	06/30/49	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	96.96%
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%	97.08%
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%	97.20%
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%	97.31%
04/01/50	06/30/50	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.43%
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%	97.55%
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%	97.66%
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%	97.78%
04/01/51	06/30/51	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	97.90%
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%	98.01%
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%	98.13%
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%	98.25%
04/01/52	06/30/52	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.36%
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%	98.48%
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%	98.60%
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%	98.71%
04/01/53	06/30/53	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.83%
07/01/53	09/30/53	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	98.95%
10/01/53	12/31/53	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.06%
01/01/54	03/31/54	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.18%
04/01/54	06/30/54	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.30%
07/01/54	09/30/54	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.41%
10/01/54	12/31/54	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.53%
01/01/55	03/31/55	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.65%
04/01/55	06/30/55	0.00%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.76%
07/01/55	09/30/55	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.87%
10/01/55	12/31/55	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.94%
01/01/56	03/31/56	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	99.99%
04/01/56	06/30/56	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)
07/01/19	09/30/19		0.00%	0.00%	0.00%	0.00%	0.00%
10/01/19	12/31/19		0.00%	0.00%	0.00%	0.00%	0.00%
01/01/20	03/31/20		0.00%	0.00%	0.00%	0.00%	0.00%
04/01/20	06/30/20		0.00%	0.00%	0.00%	0.00%	0.00%
07/01/20	09/30/20	24.51%	3.37%	3.37%	24.51%	3.37%	3.37%
10/01/20	12/31/20	20.87%	8.76%	8.76%	45.38%	12.13%	12.13%
01/01/21	03/31/21	29.36%	15.75%	15.75%	74.74%	27.88%	27.88%
04/01/21	06/30/21	25.26%	21.80%	21.80%	100.00%	49.68%	49.68%
07/01/21	09/30/21		21.63%	21.63%	100.00%	71.31%	71.31%
10/01/21	12/31/21		16.37%	16.37%	100.00%	87.68%	87.68%
01/01/22	03/31/22		9.25%	9.25%	100.00%	96.93%	96.93%
04/01/22	06/30/22		3.07%	3.07%	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%
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%

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)
01/01/40	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%
07/01/54	09/30/54		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/54	12/31/54		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/55	03/31/55		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/55	06/30/55		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/55	09/30/55		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/55	12/31/55		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/56	03/31/56		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/56	06/30/56		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)							
07/01/19	09/30/19	0.00	0.00	0.00	1.93	0.00	0.00	0.00
10/01/19	12/31/19	0.00	0.00	0.00	1.93	0.00	0.00	0.00
01/01/20	03/31/20	0.00	0.00	0.00	1.93	0.00	0.00	0.00
04/01/20	06/30/20	0.00	0.00	0.00	1.93	0.00	4.55	4.55
07/01/20	09/30/20	200.14	18.89	219.03	1.93	113.47	10.67	124.14
10/01/20	12/31/20	314.75	67.93	382.68	1.93	198.25	22.89	221.14
01/01/21	03/31/21	443.60	156.11	599.71	1.93	310.68	35.71	346.40
04/01/21	06/30/21	476.36	278.15	754.51	1.93	390.88	37.70	428.58
07/01/21	09/30/21	271.62	392.63	664.25	1.93	344.12	21.93	366.05
10/01/21	12/31/21	116.60	467.16	583.76	1.93	302.42	4.25	306.68
01/01/22	03/31/22	29.04	488.12	517.16	1.93	267.92	0.00	267.92
04/01/22	06/30/22	0.00	462.63	462.63	1.93	239.67	4.90	244.57
07/01/22	09/30/22	0.00	415.89	415.89	1.93	215.45	14.35	229.80
10/01/22	12/31/22	0.00	372.38	372.38	1.93	192.91	3.00	195.91
01/01/23	03/31/23	0.00	333.66	333.66	1.93	172.86	0.00	172.86
04/01/23	06/30/23	0.00	299.14	299.14	1.93	154.97	0.00	154.97
07/01/23	09/30/23	0.00	268.14	268.14	1.93	138.91	0.00	138.91
10/01/23	12/31/23	0.00	239.70	239.70	1.93	124.18	0.00	124.18
01/01/24	03/31/24	0.00	214.99	214.99	1.93	111.38	0.00	111.38
04/01/24	06/30/24	0.00	193.53	193.53	1.93	100.26	0.00	100.26
07/01/24	09/30/24	0.00	175.02	175.02	1.93	90.67	0.00	90.67
10/01/24	12/31/24	0.00	158.80	158.80	1.93	82.27	0.00	82.27
01/01/25	03/31/25	0.00	145.80	145.80	1.93	75.53	0.00	75.53
04/01/25	06/30/25	0.00	135.60	135.60	1.93	70.25	0.00	70.25
07/01/25	09/30/25	0.00	127.35	127.35	1.93	65.97	0.00	65.97
10/01/25	12/31/25	0.00	120.05	120.05	1.93	62.19	0.00	62.19
01/01/26	03/31/26	0.00	114.11	114.11	1.93	59.12	0.00	59.12
04/01/26	06/30/26	0.00	109.34	109.34	1.93	56.65	0.00	56.65
07/01/26	09/30/26	0.00	105.40	105.40	1.93	54.60	0.00	54.60
10/01/26	12/31/26	0.00	101.86	101.86	1.93	52.77	0.00	52.77
01/01/27	03/31/27	0.00	98.90	98.90	1.93	51.24	0.00	51.24
04/01/27	06/30/27	0.00	96.46	96.46	1.93	49.97	0.00	49.97
07/01/27	09/30/27	0.00	94.28	94.28	1.93	48.84	0.00	48.84
10/01/27	12/31/27	0.00	92.16	92.16	1.93	47.74	0.00	47.74
01/01/28	03/31/28	0.00	90.13	90.13	1.93	46.69	0.00	46.69
04/01/28	06/30/28	0.00	88.19	88.19	1.93	45.69	0.00	45.69
07/01/28	09/30/28	0.00	86.37	86.37	1.93	44.75	0.00	44.75
10/01/28	12/31/28	0.00	84.71	84.71	1.93	43.88	0.00	43.88
01/01/29	03/31/29	0.00	83.27	83.27	1.93	43.14	0.00	43.14
04/01/29	06/30/29	0.00	82.01	82.01	1.93	42.49	0.00	42.49
07/01/29	09/30/29	0.00	80.89	80.89	1.93	41.91	0.00	41.91
10/01/29	12/31/29	0.00	79.83	79.83	1.93	41.36	0.00	41.36
01/01/30	03/31/30	0.00	78.86	78.86	1.93	40.86	0.00	40.86
04/01/30	06/30/30	0.00	77.98	77.98	1.93	40.40	0.00	40.40
07/01/30	09/30/30	0.00	77.10	77.10	1.93	39.94	0.00	39.94
10/01/30	12/31/30	0.00	76.16	76.16	1.93	39.46	0.00	39.46
01/01/31	03/31/31	0.00	75.18	75.18	1.93	38.95	0.00	38.95
04/01/31	06/30/31	0.00	74.14	74.14	1.93	38.41	0.00	38.41
07/01/31	09/30/31	0.00	73.08	73.08	1.93	37.86	0.00	37.86
10/01/31	12/31/31	0.00	72.04	72.04	1.93	37.32	0.00	37.32
01/01/32	03/31/32	0.00	71.03	71.03	1.93	36.80	0.00	36.80
04/01/32	06/30/32	0.00	70.04	70.04	1.93	36.29	0.00	36.29
07/01/32	09/30/32	0.00	69.10	69.10	1.93	35.80	0.00	35.80
10/01/32	12/31/32	0.00	68.23	68.23	1.93	35.35	0.00	35.35
01/01/33	03/31/33	0.00	67.45	67.45	1.93	34.94	0.00	34.94
04/01/33	06/30/33	0.00	66.75	66.75	1.93	34.58	0.00	34.58
07/01/33	09/30/33	0.00	66.10	66.10	1.93	34.24	0.00	34.24
10/01/33	12/31/33	0.00	65.47	65.47	1.93	33.92	0.00	33.92
01/01/34	03/31/34	0.00	64.88	64.88	1.93	33.61	0.00	33.61
04/01/34	06/30/34	0.00	64.33	64.33	1.93	33.32	0.00	33.32
07/01/34	09/30/34	0.00	63.79	63.79	1.93	33.04	0.00	33.04
10/01/34	12/31/34	0.00	63.25	63.25	1.93	32.77	0.00	32.77
01/01/35	03/31/35	0.00	62.72	62.72	1.93	32.49	0.00	32.49
04/01/35	06/30/35	0.00	62.19	62.19	1.93	32.22	0.00	32.22
07/01/35	09/30/35	0.00	61.66	61.66	1.93	31.94	0.00	31.94
10/01/35	12/31/35	0.00	61.11	61.11	1.93	31.66	0.00	31.66
01/01/36	03/31/36	0.00	60.55	60.55	1.93	31.37	0.00	31.37
04/01/36	06/30/36	0.00	59.98	59.98	1.93	31.07	0.00	31.07
07/01/36	09/30/36	0.00	59.41	59.41	1.93	30.78	0.00	30.78
10/01/36	12/31/36	0.00	58.86	58.86	1.93	30.49	0.00	30.49
01/01/37	03/31/37	0.00	58.33	58.33	1.93	30.22	0.00	30.22
04/01/37	06/30/37	0.00	57.84	57.84	1.93	29.97	0.00	29.97
07/01/37	09/30/37	0.00	57.33	57.33	1.93	29.70	0.00	29.70
10/01/37	12/31/37	0.00	56.76	56.76	1.93	29.40	0.00	29.40
01/01/38	03/31/38	0.00	56.12	56.12	1.93	29.07	0.00	29.07
04/01/38	06/30/38	0.00	55.43	55.43	1.93	28.72	0.00	28.72
07/01/38	09/30/38	0.00	54.72	54.72	1.93	28.35	0.00	28.35
10/01/38	12/31/38	0.00	54.02	54.02	1.93	27.98	0.00	27.98
01/01/39	03/31/39	0.00	53.33	53.33	1.93	27.63	0.00	27.63
04/01/39	06/30/39	0.00	52.67	52.67	1.93	27.29	0.00	27.29
07/01/39	09/30/39	0.00	52.04	52.04	1.93	26.96	0.00	26.96
10/01/39	12/31/39	0.00	51.45	51.45	1.93	26.66	0.00	26.66

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)							
01/01/40	03/31/40	0.00	50.93	50.93	1.93	26.38	0.00	26.38
04/01/40	06/30/40	0.00	50.45	50.45	1.93	26.14	0.00	26.14
07/01/40	09/30/40	0.00	50.01	50.01	1.93	25.91	0.00	25.91
10/01/40	12/31/40	0.00	49.58	49.58	1.93	25.69	0.00	25.69
01/01/41	03/31/41	0.00	49.17	49.17	1.93	25.47	0.00	25.47
04/01/41	06/30/41	0.00	48.77	48.77	1.93	25.26	0.00	25.26
07/01/41	09/30/41	0.00	48.31	48.31	1.93	25.03	0.00	25.03
10/01/41	12/31/41	0.00	47.75	47.75	1.93	24.74	0.00	24.74
01/01/42	03/31/42	0.00	47.06	47.06	1.93	24.38	0.00	24.38
04/01/42	06/30/42	0.00	46.27	46.27	1.93	23.97	0.00	23.97
07/01/42	09/30/42	0.00	45.41	45.41	1.93	23.53	0.00	23.53
10/01/42	12/31/42	0.00	44.55	44.55	1.93	23.08	0.00	23.08
01/01/43	03/31/43	0.00	43.69	43.69	1.93	22.64	0.00	22.64
04/01/43	06/30/43	0.00	42.84	42.84	1.93	22.19	0.00	22.19
07/01/43	09/30/43	0.00	41.99	41.99	1.93	21.75	0.00	21.75
10/01/43	12/31/43	0.00	41.12	41.12	1.93	21.30	0.00	21.30
01/01/44	03/31/44	0.00	40.27	40.27	1.93	20.86	0.00	20.86
04/01/44	06/30/44	0.00	39.42	39.42	1.93	20.42	0.00	20.42
07/01/44	09/30/44	0.00	38.56	38.56	1.93	19.98	0.00	19.98
10/01/44	12/31/44	0.00	37.70	37.70	1.93	19.53	0.00	19.53
01/01/45	03/31/45	0.00	36.84	36.84	1.93	19.09	0.00	19.09
04/01/45	06/30/45	0.00	35.99	35.99	1.93	18.64	0.00	18.64
07/01/45	09/30/45	0.00	35.13	35.13	1.93	18.20	0.00	18.20
10/01/45	12/31/45	0.00	34.27	34.27	1.93	17.75	0.00	17.75
01/01/46	03/31/46	0.00	33.41	33.41	1.93	17.31	0.00	17.31
04/01/46	06/30/46	0.00	32.56	32.56	1.93	16.87	0.00	16.87
07/01/46	09/30/46	0.00	31.71	31.71	1.93	16.43	0.00	16.43
10/01/46	12/31/46	0.00	30.84	30.84	1.93	15.98	0.00	15.98
01/01/47	03/31/47	0.00	29.99	29.99	1.93	15.54	0.00	15.54
04/01/47	06/30/47	0.00	29.14	29.14	1.93	15.09	0.00	15.09
07/01/47	09/30/47	0.00	28.28	28.28	1.93	14.65	0.00	14.65
10/01/47	12/31/47	0.00	27.42	27.42	1.93	14.20	0.00	14.20
01/01/48	03/31/48	0.00	26.56	26.56	1.93	13.76	0.00	13.76
04/01/48	06/30/48	0.00	25.71	25.71	1.93	13.32	0.00	13.32
07/01/48	09/30/48	0.00	24.85	24.85	1.93	12.88	0.00	12.88
10/01/48	12/31/48	0.00	23.99	23.99	1.93	12.43	0.00	12.43
01/01/49	03/31/49	0.00	23.14	23.14	1.93	11.99	0.00	11.99
04/01/49	06/30/49	0.00	22.28	22.28	1.93	11.54	0.00	11.54
07/01/49	09/30/49	0.00	21.43	21.43	1.93	11.10	0.00	11.10
10/01/49	12/31/49	0.00	20.57	20.57	1.93	10.65	0.00	10.65
01/01/50	03/31/50	0.00	19.71	19.71	1.93	10.21	0.00	10.21
04/01/50	06/30/50	0.00	18.86	18.86	1.93	9.77	0.00	9.77
07/01/50	09/30/50	0.00	18.00	18.00	1.93	9.33	0.00	9.33
10/01/50	12/31/50	0.00	17.14	17.14	1.93	8.88	0.00	8.88
01/01/51	03/31/51	0.00	16.28	16.28	1.93	8.44	0.00	8.44
04/01/51	06/30/51	0.00	15.43	15.43	1.93	7.99	0.00	7.99
07/01/51	09/30/51	0.00	14.57	14.57	1.93	7.55	0.00	7.55
10/01/51	12/31/51	0.00	13.71	13.71	1.93	7.10	0.00	7.10
01/01/52	03/31/52	0.00	12.86	12.86	1.93	6.66	0.00	6.66
04/01/52	06/30/52	0.00	12.00	12.00	1.93	6.22	0.00	6.22
07/01/52	09/30/52	0.00	11.15	11.15	1.93	5.77	0.00	5.77
10/01/52	12/31/52	0.00	10.29	10.29	1.93	5.33	0.00	5.33
01/01/53	03/31/53	0.00	9.43	9.43	1.93	4.88	0.00	4.88
04/01/53	06/30/53	0.00	8.58	8.58	1.93	4.44	0.00	4.44
07/01/53	09/30/53	0.00	7.72	7.72	1.93	4.00	0.00	4.00
10/01/53	12/31/53	0.00	6.86	6.86	1.93	3.55	0.00	3.55
01/01/54	03/31/54	0.00	6.00	6.00	1.93	3.11	0.00	3.11
04/01/54	06/30/54	0.00	5.15	5.15	1.93	2.67	0.00	2.67
07/01/54	09/30/54	0.00	4.29	4.29	1.93	2.22	0.00	2.22
10/01/54	12/31/54	0.00	3.43	3.43	1.93	1.78	0.00	1.78
01/01/55	03/31/55	0.00	2.58	2.58	1.93	1.33	0.00	1.33
04/01/55	06/30/55	0.00	1.72	1.72	1.93	0.89	0.00	0.89
07/01/55	09/30/55	0.00	0.98	0.98	1.93	0.51	0.00	0.51
10/01/55	12/31/55	0.00	0.42	0.42	1.93	0.22	0.00	0.22
01/01/56	03/31/56	0.00	0.11	0.11	1.93	0.05	0.00	0.05
04/01/56	06/30/56	0.00	0.00	0.00	1.93	0.00	0.00	0.00
TOTAL		1,852.12	11,286.28	13,138.40		6,806.43	159.96	6,966.39

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."

VII 000059

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 Discounted Cash Flow (DCF) model and the traditional, single factor Capital Asset Pricing Model (CAPM). 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. Since the 2016 filing the WCRIBMA has been using 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 filings since 2010, the WCRIBMA relied on a sample of large, publicly traded property/casualty insurers that was drawn from the Value Line Investment Survey, Part 3 – The Ratings and Report, the Value Line Investment Survey, Small & Mid Cap Edition and also all property and casualty companies in Standard & Poor's Compustat database (Research Insight) with SIC codes 6300 – 6399 and revenue in SIC codes 6331 or 6351. In June of 2019, Standard & Poor's discontinued the Research Insight database. In this filing the WCRIBMA therefore relied exclusively on

VII 000060

Value Line sample of companies. The sample includes data from Value Line Investment Survey, Part 3 – The Ratings and Report and from Value Line Investment Survey, Mid Cap Edition.

Based on these data, the cost of equity capital was calculated for the sample of 38 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, investors currently require a return on equity of at least 7.95% for bearing the risk of underwriting property/casualty insurance, as shown below.

DCF	7.30 %
CAPM	8.61%
Average	7.95%

Given these results, the WCRIBMA has used a cost of equity capital of 7.95% 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

VII 000061

capital structure. In prior filings, the WCRIBMA relied on the long term corporate bonds, the 30 year High Quality Market yield from the US Department of Treasury, as a proxy for the debt cost of capital. In this filing to be consistent with the CAPM analysis, we are using a three horizon yield rate instead. The result, 2.56%, is shown in Section VII-E, Exhibit 1. In calculating the debt/equity proportion, consistent with the filings since 2014 , the WCRIBMA uses the book value of capital (as opposed to market value).³ For this group of 38 insurers, the share of non-equity capital in the corporate capital structure is 15%, as shown in Section VII – E, Exhibit 4. Thus, the weighted average cost of capital is 7.15%, as shown below:

$$(15\% \times 2.56\%) + (85\% \times 7.95\%) = 7.15\%$$

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' compensation might be viewed as riskier than the average activity in which property/casualty insurers are engaged. Among them are these:

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.

VII 000062

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 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

VII 000063

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 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

VII 000065

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

VII 000066

firm must pay and investors expect to earn as a result of placing their capital at risk in the enterprise. For this reason, the WCRIBMA 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 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 CAPM.

DCF and CAPM approaches were used to obtain independent estimates of the cost of capital, so as not to place undue reliance on any single methodology. Moreover, we 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.

VII 000067

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

VII 000068

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 DCF model and a specific form of RPA known as the 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 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).

VII 000069

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 and 2018 filings, the WCRIBMA implemented 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:

VII 000070

$$\begin{aligned}
 V_0 &= D_0 \sum_{t=1}^{\infty} \left(\frac{1+g_t}{1+k} \right)^t = D_1 \sum_{t=1}^{\infty} \frac{(1+g_t)^{t-1}}{(1+k)^t} \\
 \frac{1}{\frac{D_1}{V_0}} &= \sum_{t=1}^5 \frac{(1+g_{ST})^{t-1}}{(1+k)^t} + (1+g_{ST})^4 \sum_{t=6}^9 \frac{\prod_{i=1}^{t-5} (1+g_{IT_i})}{(1+k)^t} \\
 &+ (1+g_{ST})^4 (1+g_{IT_1})(1+g_{IT_2})(1+g_{IT_3})(1+g_{IT_4}) \sum_{t=10}^{\infty} \frac{(1+g_{LT})^{t-9}}{(1+k)^t} \\
 \frac{1}{\frac{D_1}{V_0}} &= \left[\frac{1}{k-g_{ST}} \left(1 - \left(\frac{1+g_{ST}}{1+k} \right)^5 \right) + \frac{(1+g_{ST})^4 (1+g_{IT_1})}{(1+k)^6} + \frac{(1+g_{ST})^4 (1+g_{IT_1})(1+g_{IT_2})}{(1+k)^7} \right. \\
 &+ \frac{(1+g_{ST})^4 (1+g_{IT_1})(1+g_{IT_2})(1+g_{IT_3})}{(1+k)^8} \\
 &+ \frac{(1+g_{ST})^4 (1+g_{IT_1})(1+g_{IT_2})(1+g_{IT_3})(1+g_{IT_4})}{(1+k)^9} \\
 &\left. + \frac{(1+g_{ST})^4 (1+g_{IT_1})(1+g_{IT_2})(1+g_{IT_3})(1+g_{IT_4})(1+g_{LT})}{(k-g_{LT})} \frac{1}{(1+k)^9} \right]
 \end{aligned}$$

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 RPA known as the CAPM, it should be noted that RPA 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 capital directly, by looking at expected cash flows and market prices,

VII 000071

RPA 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 CAPM is one specific form of RPA, 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 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%.

VII 000072

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 - 2018 a diversified portfolio of common stocks earned an annual return which averaged 8.50 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 8.50 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 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 the WCRIBMA relied on financial data for a sample of publicly traded property/casualty insurers, drawn from the Value Line Investment Survey, 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 the WCRIBMA 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 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, the WCRIBMA utilized estimates for the expected first year dividend yield provided by Value Line. Since the annual DCF model requires an estimate of the dividends payable during the first year of the investment, and Value Line's

VII 000074

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 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 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, the WCRIBMA 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, the WCRIBMA 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, we averaged the results based on these three data sources.

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.

VII 000075

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 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

$v = (\text{market/book}) - 1.$

VII 000076

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, we first estimated the growth rate in real gross domestic product (real GDP) for the period 1929-2018. Second, we multiplied this by the rate of expected inflation, calculated by the spread between the yield on 10-year treasury notes and 10-year treasury inflation indexed securities. The resultant long-term rate of dividend growth equals 5.22% 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 1.80% the required rate of return (k) in this three-stage DCF model is equal to 7.30%.

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 2.48% higher, which would have resulted in a 1.5% higher profit provision, and a 1.8% 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

VII 000077

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, we relied on an average of three CAPM estimates, where the different 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 38 property/casualty insurers, the beta coefficient for this sample of companies ranges from 0.5 to 1.2, and averages 0.88. This is shown on Section VII-E, Exhibit 3, Page 2.

The WCRIBMA 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, we chose to average the yields on these securities for the period from July through September 2019. 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 2.07%, while the yields on 5-year and 20-year Treasuries averaged 1.63% and 2.08% respectively.

VII 000078

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, our best estimate of investors' required return on equity is 8.61%.

To illustrate this calculation, consider the results for the short term CAPM below:

$$K = r_f + (\beta \times r_d) , \text{ or}$$
$$9.51\% = 2.07\% + (0.88 \times 8.50\%)$$

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 8.61% CAPM cost of capital.

Based on all this information, our single best estimate of the cost of equity capital for property/casualty insurance is 7.95%, 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

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.

VII 000079

Section VII – Profit
Subsection E – Cost of Capital
7/1/2020

Section VII - E
Page 22

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 15% of insurer capital, while common equity accounts for 85% of capital.

Given the equity cost, as shown above, of 7.95%, and the debt cost of 2.56%, the weighted average cost of capital is 7.15%, as shown below:

$$(15\% \times 2.56\%) + (85\% \times 7.95\%) = 7.15\%$$

VII 000080

Section VII - Profit
Subsection E - Cost of Capital
7/1/2020

Section VII - E
Exhibit 2
Page 4

Discounted Cash Flow (DCF) Analysis: Short-Term Dividend Growth Rate

(1) Growth Forecast { = [(a) + (b)] / 2.0 }	7.76
(a) Dividend Component	8.31
(b) Earnings Component	7.20
(2) Fundamental Analysis [= (a) + (b)]	8.21
(a) Retention to book	8.20
(b) Stock issuance factor	0.01
(3) Short-Term Dividend Growth Rate { = [(1) + (2)] / 2.0 }	7.98

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			Past 10 Years (9)	Past 5 Years (10)	Forecast (11)	2019 Shares (12)	2022 - 2024 Shares (13)	2022 - 2024 Market/ Book (14)	Stock Issuance Adjustment Factor (15)
		Past 10 Years (3)	Past 5 Years (4)	Forecast (5)	Past 10 Years (6)	Past 5 Years (7)	Forecast (8)							
ALLEGHANY CORP	0.0	NA	NA	0.00	4.50	-1.50	24.50	5.26	4.12	6.50	14.00	14.00	1.18	0.00
ALLSTATE CORP	1.9	NA	11.50	7.00	1.00	11.50	10.50	8.00	9.35	10.50	330.00	320.00	1.90	-0.69
AMERICAN FINANCIAL GROUP INC	1.6	12.00	12.00	9.50	7.00	14.00	7.00	8.51	9.32	9.00	89.00	86.00	1.35	-0.30
AMERISAFE INC	1.6	NA	NA	NA	NA	14.50	10.00	7.53	3.60	NA	0.00	0.00	0.00	NA
ARCH CAPITAL GROUP LTD	0.0	NA	NA	0.00	6.00	3.50	15.00	11.85	9.00	10.50	405.00	400.00	1.36	-0.11
ATLAS FINANCIAL HOLDINGS INC	0.0	NA	NA	NA	NA	NA	NA	7.73	8.13	NA	0.00	0.00	0.00	NA
BERKLEY (W R) CORP	0.6	11.00	9.50	9.00	-0.50	5.00	12.00	8.08	7.72	8.00	182.00	180.00	1.45	-0.12
BERKSHIRE HATHAWAY	0.0	NA	NA	0.00	6.00	12.00	6.00	7.30	7.52	7.00	2475.00	2450.00	1.45	-0.11
CHUBB LTD	1.9	10.50	8.50	4.00	2.00	2.50	10.00	8.05	6.92	8.00	455.00	400.00	1.35	-1.11
CINCINNATI FINANCIAL CORP	2.0	5.50	7.00	3.00	NA	13.50	8.50	2.46	2.60	4.50	163.00	164.00	1.64	0.10
CNA FINANCIAL CORP	3.0	15.50	14.00	6.00	NA	3.00	11.00	5.01	4.16	8.50	270.00	270.00	1.75	0.00
DONEGAL GROUP INC	3.7	NA	3.00	NA	NA	-28.50	NA	1.94	1.87	NA	0.00	0.00	0.00	NA
EMPLOYERS HOLDINGS INC	2.2	NA	19.50	NA	NA	9.50	10.00	11.80	11.24	NA	0.00	0.00	0.00	NA
ERIE INDEMNITY CO -CL A	1.7	NA	NA	5.50	NA	NA	12.50	8.60	8.60	13.50	46.00	45.00	NA	NA
ESSENT GROUP LTD	1.4	NA	NA	NA	NA	39.50	10.41	14.75	15.88	NA	0.00	0.00	0.00	NA
FIRST AMERICAN FINANCIAL	2.9	NA	36.00	8.00	NA	14.00	7.50	6.71	6.92	8.50	112.00	112.00	1.68	0.00
GLOBAL INDEMNITY LTD	3.7	NA	NA	NA	NA	NA	10.00	6.89	6.20	NA	0.00	0.00	0.00	NA
HALLMARK FINANCIAL SERVICES	0.0	NA	NA	NA	NA	36.00	4.10	4.89	5.03	NA	0.00	0.00	0.00	NA
HANOVER INSURANCE GROUP INC	1.8	19.50	11.00	6.00	5.00	25.00	13.50	5.69	5.68	8.50	40.00	40.00	1.23	0.00
HCI GROUP INC	4.0	NA	12.50	NA	NA	-14.50	25.00	17.89	15.10	NA	0.00	0.00	0.00	NA
JAMES RIVER GROUP HLDGS LTD	2.5	NA	NA	NA	NA	NA	NA	5.55	5.55	NA	0.00	0.00	0.00	NA
MARKEL CORP	0.0	NA	NA	0.00	-3.50	-1.00	45.50	5.06	3.65	6.50	14.00	14.00	1.67	0.00
MERCURY GENERAL CORP	4.8	2.50	0.50	2.50	-7.50	-4.00	23.00	1.95	NA	8.00	55.00	55.00	2.12	0.00
NATIONAL GENERAL HOLDINGS CP	0.7	NA	NA	NA	NA	NA	NA	9.65	9.65	NA	0.00	0.00	0.00	NA
NMI HOLDINGS	0.0	NA	NA	0.00	NA	NA	23.00	11.17	11.17	14.00	66.50	67.00	1.70	0.13
OLD REPUBLIC INTL CORP	3.5	2.00	1.50	6.50	8.00	NA	14.50	4.08	4.02	8.50	304.00	310.00	1.95	0.47
PROASSURANCE CORP	3.3	NA	12.50	NA	NA	-16.50	27.30	8.55	3.40	NA	0.00	0.00	0.00	NA
PROGRESSIVE CORP-OHIO	0.5	31.50	20.00	-6.50	10.00	17.50	15.50	12.72	12.50	20.50	584.00	585.00	3.35	0.10
PROTECTIVE INSURANCE CORP	2.6	NA	1.50	NA	NA	-20.50	NA	3.29	2.40	NA	0.00	0.00	0.00	NA
RLI CORP	1.0	7.00	5.50	5.00	-3.00	-4.50	14.50	8.68	7.58	11.00	45.00	45.00	3.30	0.00
SAFETY INSURANCE GROUP INC	3.4	NA	6.50	NA	NA	9.50	15.00	3.69	3.33	NA	0.00	0.00	0.00	NA
SELECTIVE INS GROUP INC	1.0	3.50	3.50	7.50	2.50	30.50	8.50	6.47	8.66	10.00	59.00	65.00	1.61	1.49
STATE AUTO FINANCIAL CORP	1.2	NA	-5.00	NA	NA	NA	8.00	4.12	4.93	NA	0.00	0.00	0.00	NA
TRAVELERS COS INC	2.2	10.00	9.50	2.50	4.00	7.00	9.00	8.67	9.08	9.00	260.00	265.00	1.60	0.29
UNITED FIRE GROUP INC	3.0	NA	10.00	NA	NA	-3.50	10.00	4.61	4.25	NA	0.00	0.00	0.00	NA
UNITED INSURANCE HOLDINGS CO	2.0	NA	23.00	NA	NA	-28.50	20.00	9.31	7.15	NA	0.00	0.00	0.00	NA
UNIVERSAL INSURANCE HLDGS	2.5	NA	13.50	NA	NA	26.50	NA	17.62	22.58	NA	0.00	0.00	0.00	NA
WHITE MTNS INS GROUP LTD	0.1	NA	NA	NA	NA	-13.00	-7.70	6.37	6.15	NA	0.00	0.00	0.00	NA
Average	1.80	10.88	10.29	3.78	2.77	5.28	13.55	7.64	7.43	9.53				0.01

Notes:

Sources: Value Line Investment Survey, Part 3, The Ratings & Reports (VL), September 6, 2019
 Value Line Investment Survey, Part 2, Small and Mid Cap Edition (VLSM), August 30, 2019
<http://finance.yahoo.com> (data available in September 2019)

(2) The dividend yields needed for the DCF Analysis relate dividends at time 1, D₁, to stock prices at time 0, P₀. Dividend yields from VLIS, Small and Mid Cap Edition, must be adjusted because they are derived from the ratio of dividends at time 0, D₀, to stock price at time zero, P₀. D₁ is estimated from D₀ as follows:

$$D_1 = D_0 \times [1.0 + (0.5 \times \text{Dividend Growth Rate})] \quad \text{where Dividend Growth Rate} = 7.98\% \text{ from Page 4.}$$

(11) - (14): Data available only at Value Line Investment Survey, Part 3.

(12), (13): in millions.

(15) = [(14) - 1.0] x [(13) / (12)]^t - 1.0 } x 100, where t is 0.25 for the years between midyear 2020 and midyear 2024.

VII 000081

VII 000082

Section VII - Profit
Subsection E - Cost of Capital
7/1/2020

Section VII - E
Exhibit 3
Page 1

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	2.07	8.50	0.88	9.51
Intermediate-Term	1.63	7.49	0.88	8.18
Long-Term	2.08	6.91	0.88	8.13
Average	1.93	7.64	0.88	8.61

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)]

VII 000083

Section VII - Profit
Subsection E - Cost of Capital
7/1/2020

Section VII - E
Exhibit 3
Page 2

Capital Asset Pricing Model - Beta Coefficient

<u>Property/Casualty Insurance Companies</u>	<u>Beta Coefficients</u>
ALLEGHANY CORP	1.0
ALLSTATE CORP	0.9
AMERICAN FINANCIAL GROUP INC	0.9
AMERISAFE INC	0.8
ARCH CAPITAL GROUP LTD	0.8
ATLAS FINANCIAL HOLDINGS INC	1.2
BERKLEY (W R) CORP	0.9
BERKSHIRE HATHAWAY	1.0
CHUBB LTD	0.9
CINCINNATI FINANCIAL CORP	0.9
CNA FINANCIAL CORP	1.0
DONEGAL GROUP INC	0.5
EMPLOYERS HOLDINGS INC	1.0
ERIE INDEMNITY CO -CL A	0.8
ESSENT GROUP LTD	1.0
FIRST AMERICAN FINANCIAL	0.9
GLOBAL INDEMNITY LTD	0.8
HALLMARK FINANCIAL SERVICES	0.8
HANOVER INSURANCE GROUP INC	0.9
HCI GROUP INC	0.9
JAMES RIVER GROUP HLDGS LTD	0.8
MARKEL CORP	0.9
MERCURY GENERAL CORP	0.9
NATIONAL GENERAL HOLDINGS CP	1.0
NMI HOLDINGS	1.1
OLD REPUBLIC INTL CORP	1.0
PROASSURANCE CORP	0.7
PROGRESSIVE CORP-OHIO	0.9
PROTECTIVE INSURANCE CORP	0.6
RLI CORP	0.9
SAFETY INSURANCE GROUP INC	0.8
SELECTIVE INS GROUP INC	0.9
STATE AUTO FINANCIAL CORP	0.9
TRAVELERS COS INC	0.9
UNITED FIRE GROUP INC	0.8
UNITED INSURANCE HOLDINGS CO	1.1
UNIVERSAL INSURANCE HLDGS	1.2
WHITE MTNS INS GROUP LTD	0.7
Average	0.88

Notes:

Sources: Value Line Investment Survey, Part 3, The Ratings & Reports (VL), September 6, 2019
Value Line Investment Survey, Part 2, Small and Mid Cap Edition (VLSM), August 30, 2019
If no information for a specific company in the above sources, use 'Yahoo Finance'.

VII 000084

Section VII - Profit
Subsection E - Cost of Capital
7/1/2020

Section VII - E
Exhibit 4

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)
ALLEGHANY CORP	0.0	0.0	0.0	10,865.0
ALLSTATE CORP	6,628.0	1,930.0	8,558.0	34,012.1
AMERICAN FINANCIAL GROUP INC	1,423.0	0.0	1,423.0	9,081.4
AMERISAFE INC	0.0	0.0	0.0	1,394.1
ARCH CAPITAL GROUP LTD	2,224.9	780.0	3,004.9	16,083.6
ATLAS FINANCIAL HOLDINGS INC	0.0	0.0	0.0	4.8
BERKLEY (W R) CORP	2,781.7	0.0	2,781.7	13,145.1
BERKSHIRE HATHAWAY	93,117.0	0.0	93,117.0	491,510.9
CHUBB LTD	13,380.0	0.0	13,380.0	71,402.7
CINCINNATI FINANCIAL CORP	884.0	0.0	884.0	18,129.6
CNA FINANCIAL CORP	2,678.0	0.0	2,678.0	12,776.3
DONEGAL GROUP INC	5.0	0.0	5.0	373.4
EMPLOYERS HOLDINGS INC	20.0	0.0	20.0	1,400.5
ERIE INDEMNITY CO -CL A	0.0	0.0	0.0	10,045.6
ESSENT GROUP LTD	223.7	0.0	223.7	4,682.4
FIRST AMERICAN FINANCIAL	729.6	0.0	729.6	6,532.5
GLOBAL INDEMNITY LTD	288.6	0.0	288.6	377.2
HALLMARK FINANCIAL SERVICES	85.8	0.0	85.8	311.3
HANOVER INSURANCE GROUP INC	653.1	0.0	653.1	5,234.3
HCI GROUP INC	250.2	0.0	250.2	341.8
JAMES RIVER GROUP HLDGS LTD	222.4	0.0	222.4	1,478.3
MARKEL CORP	3,625.7	0.0	3,625.7	15,786.4
MERCURY GENERAL CORP	371.9	0.0	371.9	2,957.2
NATIONAL GENERAL HOLDINGS CP	675.4	450.0	1,125.4	2,672.0
NMI HOLDINGS	146.3	0.0	146.3	1,883.8
OLD REPUBLIC INTL CORP	975.4	0.0	975.4	6,865.2
PROASSURANCE CORP	287.8	0.0	287.8	2,076.4
PROGRESSIVE CORP-OHIO	4,406.0	0.0	4,406.0	44,798.3
PROTECTIVE INSURANCE CORP	0.0	0.0	0.0	238.0
RLI CORP	149.2	0.0	149.2	4,106.1
SAFETY INSURANCE GROUP INC	0.0	0.0	0.0	1,475.3
SELECTIVE INS GROUP INC	550.8	0.0	550.8	4,702.8
STATE AUTO FINANCIAL CORP	122.0	0.0	122.0	1,403.2
TRAVELERS COS INC	6,558.0	0.0	6,558.0	38,411.1
UNITED FIRE GROUP INC	0.0	0.0	0.0	1,142.6
UNITED INSURANCE HOLDINGS CO	160.1	0.0	160.1	525.9
UNIVERSAL INSURANCE HLDGS	11.4	0.0	11.4	923.5
WHITE MTNS INS GROUP LTD	0.0	0.0	0.0	3,410.8
Total	143,635.0	3,160.0	146,795.0	842,561.5
Capital Structure Ratios			0.15	0.85

Notes:

Sources: Value Line Investment Survey, Part 3, The Ratings & Reports (VL), September 6, 2019
Value Line Investment Survey, Part 2, Small and Mid Cap Edition (VLSM), August 30, 2019
If no information for a specific company in the above sources, use 'Yahoo Finance'.

(5) = (outstanding shares) * (one month average share price)

One month (Aug 10, 2019 - Sep 9, 2019) average share price from 'Yahoo Finance' and outstanding shares from Value Line.

Value Line doesn't have debt information for Berkshire Hathaway. 'Yahoo Finance' used instead.

VII 000085

Section VII - Profit
Subsection E - Cost of Capital
7/1/2020

Section VII - E
Exhibit 2
Page 1

Cost of Capital Estimate Using Discounted Cash Flow (DCF) Analysis

$$V_0 = D_0 \sum_{t=1}^{\infty} \left(\frac{1 + g_t}{1 + k} \right)^t = D_1 \sum_{t=1}^{\infty} \frac{(1 + g_t)^{t-1}}{(1 + k)^t}$$

$$\frac{1}{\frac{D_1}{V_0}} = \sum_{t=1}^5 \frac{(1 + g_{ST})^{t-1}}{(1 + k)^t} + (1 + g_{ST})^4 \sum_{t=6}^9 \frac{\prod_{i=1}^{t-5} (1 + g_{IT_i})}{(1 + k)^t}$$

$$+ (1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4}) \sum_{t=10}^{\infty} \frac{(1 + g_{LT})^{t-9}}{(1 + k)^t}$$

	Time (t) (1)	Dividend Growth Rate (g) (2)	Discounted Dividends (3)
Stage 1	1	7.98%	
	2	7.98%	
	3	7.98%	
	4	7.98%	
	5	7.98%	4.72
Stage 2	6	7.43%	0.96
	7	6.88%	0.95
	8	6.33%	0.94
	9	5.77%	0.93
Stage 3	≥10	5.22%	47.09
(4) Total Discounted Dividends			55.59
(5) Dividend Yield Rate (D ₁ /V ₀)			1.80%
(6) Cost of Capital (k)			7.30%

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 $[1.0 / (5)] - (4) = 0$.

VII 000086

Section VII - Profit
 Subsection E - Cost of Capital
 7/1/2020

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	1,109.4	
1930	1,015.1	-8.50%
1931	950.0	-6.41%
1932	827.5	-12.89%
1933	817.3	-1.23%
1934	905.6	10.80%
1935	986.2	8.90%
1936	1,113.3	12.89%
1937	1,170.3	5.12%
1938	1,131.6	-3.31%
1939	1,222.4	8.02%
1940	1,330.2	8.82%
1941	1,565.8	17.71%
1942	1,861.5	18.88%
1943	2,178.4	17.02%
1944	2,351.6	7.95%
1945	2,328.6	-0.98%
1946	2,058.4	-11.60%
1947	2,034.8	-1.15%
1948	2,118.5	4.11%
1949	2,106.6	-0.56%
1950	2,289.5	8.68%
1951	2,473.8	8.05%
1952	2,574.9	4.09%
1953	2,695.6	4.69%
1954	2,680.0	-0.58%
1955	2,871.2	7.13%
1956	2,932.4	2.13%
1957	2,994.1	2.10%
1958	2,972.0	-0.74%
1959	3,178.2	6.94%
1960	3,260.0	2.57%
1961	3,343.5	2.56%
1962	3,548.4	6.13%
1963	3,702.9	4.35%
1964	3,916.3	5.76%
1965	4,170.8	6.50%
1966	4,445.9	6.60%
1967	4,567.8	2.74%
1968	4,792.3	4.91%
1969	4,942.1	3.13%
1970	4,951.3	0.19%
1971	5,114.3	3.29%
1972	5,383.3	5.26%
1973	5,687.2	5.65%
1974	5,656.5	-0.54%
1975	5,644.8	-0.21%
1976	5,949.0	5.39%
1977	6,224.1	4.62%
1978	6,568.6	5.53%
1979	6,776.6	3.17%

VII 000087

Section VII - Profit
 Subsection E - Cost of Capital
 7/1/2020

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)
1980	6,759.2	-0.26%
1981	6,930.7	2.54%
1982	6,805.8	-1.80%
1983	7,117.7	4.58%
1984	7,632.8	7.24%
1985	7,951.1	4.17%
1986	8,226.4	3.46%
1987	8,511.0	3.46%
1988	8,866.5	4.18%
1989	9,192.1	3.67%
1990	9,365.5	1.89%
1991	9,355.4	-0.11%
1992	9,684.9	3.52%
1993	9,951.5	2.75%
1994	10,352.4	4.03%
1995	10,630.3	2.68%
1996	11,031.4	3.77%
1997	11,521.9	4.45%
1998	12,038.3	4.48%
1999	12,610.5	4.75%
2000	13,131.0	4.13%
2001	13,262.1	1.00%
2002	13,493.1	1.74%
2003	13,879.1	2.86%
2004	14,406.4	3.80%
2005	14,912.5	3.51%
2006	15,338.3	2.86%
2007	15,626.0	1.88%
2008	15,604.7	-0.14%
2009	15,208.8	-2.54%
2010	15,598.8	2.56%
2011	15,840.7	1.55%
2012	16,197.0	2.25%
2013	16,495.4	1.84%
2014	16,912.0	2.53%
2015	17,403.8	2.91%
2016	17,688.9	1.64%
2017	18,108.1	2.37%
2018	18,638.2	2.93%
(4) Average		3.34%
(5) Rate of Expected Inflation		1.83%
(6) Long-Term Dividend Growth Rate		5.22%

Notes:

(2): Bureau of Economic Analysis, Table 1.1.6.

(3) = $[(2)_t / (2)_{t-1}] - 1.0$

(5): Page 3

(6) = $\{ [1.0 + (4)] \times [1.0 + (5)] \} - 1.0$

VII 000088

Section VII - Profit
Subsection E - Cost of Capital
7/1/2020

Section VII - E
Exhibit 2
Page 3

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)
2018-10	3.15	1.04	2.11
2018-11	3.12	1.11	2.01
2018-12	2.83	1.02	1.81
2019-01	2.71	0.92	1.79
2019-02	2.68	0.8	1.88
2019-03	2.57	0.66	1.91
2019-04	2.53	0.6	1.93
2019-05	2.4	0.57	1.83
2019-06	2.07	0.37	1.70
2019-07	2.06	0.31	1.75
2019-08	1.63	0.04	1.59
2019-09	1.7	0.11	1.59
Average			1.83%

Source: Federal Reserve Statistical Release, H.15.

VII 000089

Section VII - Profit
Subsection E - Cost of Capital
7/1/2020

Section VII - E
Exhibit 1

Cost of Capital: Summary Exhibit for Property-Casualty Insurance Companies

(1) Discounted Cash Flow	7.30%
(2) Capital Asset Pricing Model	8.61%
(3) Equity Capital Cost	7.95%
(4) Debt Capital Cost	2.56%
(5) Capital Structure	
(a) Equity Capital Share	85%
(b) Debt Capital Share	15%
(6) Weighted Average Cost of Capital (WACC)	7.15%

Notes:

(1): Exhibit 2, page 1

(2): Exhibit 3, page 1

(3) = $[(1) + (2)] / 2.0$

(4): Average of three-horizons yields:

Short-Term = 2.14%, the average yield on 1-month Commercial Paper (line (1)' of Section VII-J, Exhibit 2, page 3)

Intermediate-Term = 2.27%, the average yield on 5-year HQM yield (line (15) of Section VII-J, Exhibit 2, page 3)

Long-Term = 3.28%, the average yield on 20-year industrial yield (Section VII-J, Exhibit 2, page 2)

(5): Exhibit 4

(6) = $[(3) \times (5a)] + [(4) \times (5b)]$

Loss & LAE and Unearned Premium Reserves to Surplus Ratio

Company	Loss & LAE and Unearned Premium Reserves (\$000)					Surplus (\$000)					Leverage Ratio				
	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014
(1)	(2)					(3)					(4) = (2) / (3)				
Travelers Group	51,786	50,125	48,359	47,493	47,904	20,207	19,903	20,249	19,970	20,312	2.56	2.52	2.39	2.38	2.36
A.I.M. Mutual Insurance Companies	336	332	325	313	300	258	237	215	194	181	1.30	1.40	1.51	1.61	1.66
Hartford Insurance Group	28,001	27,005	25,877	25,234	24,817	11,253	12,516	15,317	16,190	16,207	2.49	2.16	1.69	1.56	1.53
Liberty Mutual Insurance Companies	56,051	54,344	48,802	47,448	46,771	19,813	17,570	20,200	19,313	19,842	2.83	3.09	2.42	2.46	2.36
Chubb INA Group	34,027	30,970	32,596	34,547	33,946	18,647	17,691	17,837	19,347	21,516	1.82	1.75	1.83	1.79	1.58
American International Group	42,359	49,829	58,115	60,919	60,093	17,908	22,078	22,501	24,989	26,654	2.37	2.26	2.58	2.44	2.25
Berkshire Hathaway Insurance Group	78,905	72,444	61,701	57,789	54,295	160,938	171,554	137,180	124,827	130,750	0.49	0.42	0.45	0.46	0.42
Zurich Insurance US PC Group	17,696	18,429	18,558	18,738	18,591	6,873	7,272	7,872	8,509	8,673	2.57	2.53	2.36	2.20	2.14
Charter Insurance Group	107	117	124	122	120	69	68	65	60	59	1.56	1.74	1.92	2.04	2.03
W. R. Berkley Insurance Group	12,351	12,102	11,810	11,198	10,864	5,590	5,482	5,495	5,326	5,467	2.21	2.21	2.15	2.10	1.99
AmTrust Group	5,117	4,638	3,665	3,238	2,422	2,164	2,092	2,076	1,840	1,715	2.36	2.22	1.77	1.76	1.41
Old Republic Insurance Group	6,593	6,438	6,434	6,523	6,461	3,713	3,766	3,581	3,292	3,234	1.78	1.71	1.80	1.98	2.00
Hanover Insurance Grp Prop & Cas Cos	6,103	5,748	5,304	4,804	4,554	2,171	2,074	2,173	2,193	2,057	2.81	2.77	2.44	2.19	2.21
CNA Insurance Companies	32,209	32,250	32,449	32,212	32,026	10,392	10,700	10,748	10,723	11,155	3.10	3.01	3.02	3.00	2.87
Arbella Insurance Group	879	864	870	873	767	651	622	559	512	563	1.35	1.39	1.56	1.70	1.36
Fairfax Financial (USA) Group	13,105	12,179	11,793	11,935	12,084	6,670	6,942	6,853	7,206	7,294	1.96	1.75	1.72	1.66	1.66
Utica National Insurance Group	1,849	1,764	1,673	1,597	1,582	1,021	990	924	867	860	1.81	1.78	1.81	1.84	1.84
MEMIC Group	904	828	749	676	598	424	439	415	393	400	2.13	1.89	1.80	1.72	1.50
Norfolk & Dedham Group Pool	299	272	240	223	201	316	322	296	269	277	0.95	0.84	0.81	0.83	0.73
Sentry Insurance Group	4,510	4,271	4,109	3,924	3,793	5,450	5,174	4,752	4,441	4,211	0.83	0.83	0.86	0.88	0.90
Selective Insurance Group	4,610	4,364	4,179	3,981	3,841	1,768	1,673	1,584	1,426	1,308	2.61	2.61	2.64	2.79	2.94
AmeriTrust Group	1,231	1,261	1,273	1,147	1,140	580	564	508	488	511	2.12	2.24	2.50	2.35	2.23
Starr International Group	3,033	2,792	2,368	2,038	1,705	2,024	1,875	1,922	1,848	1,832	1.50	1.49	1.23	1.10	0.93
Markel Corporation Group	6,191	5,805	5,353	5,296	4,748	3,203	3,492	3,224	2,983	3,020	1.93	1.66	1.66	1.78	1.57
Arrow Mutual Liability Insurance Company	11	12	12	14	12	31	30	30	30	31	0.37	0.39	0.41	0.46	0.40
American National Prop & Cas Companies	1,532	1,433	1,352	1,285	1,266	1,184	1,163	1,075	1,034	984	1.29	1.23	1.26	1.24	1.29
American Family Insurance Group	11,519	10,200	9,684	8,918	8,445	7,739	8,490	8,755	8,247	7,590	1.49	1.20	1.11	1.08	1.11
EMC Insurance Companies	2,795	2,669	2,567	2,490	2,388	1,662	1,713	1,633	1,505	1,419	1.68	1.56	1.57	1.65	1.68
Arch Insurance Group	3,191	2,196	3,592	3,697	3,939	1,999	2,931	2,777	3,023	2,982	1.60	0.75	1.29	1.22	1.32
Federated Mutual Group	2,636	2,345	2,184	2,047	1,966	3,404	3,307	3,114	2,882	2,676	0.77	0.71	0.70	0.71	0.73
Tokio Marine US PC Group	15,402	14,342	13,213	12,155	11,286	8,129	7,624	7,349	6,842	7,030	1.89	1.88	1.80	1.78	1.61
Great American P & C Insurance Grp	8,038	7,646	7,050	6,731	6,476	2,865	2,725	2,941	2,634	2,426	2.81	2.81	2.40	2.56	2.67
Electric Insurance Company	828	874	873	899	889	405	491	534	546	538	2.05	1.78	1.63	1.65	1.65
QBE North America Insurance Group	3,128	2,831	2,822	3,270	3,710	1,741	1,640	1,844	1,859	1,824	1.80	1.73	1.53	1.76	2.03
AXA U.S. Group	6,984	5,718	4,777	4,439	4,431	2,512	2,480	2,480	2,505	2,712	2.78	2.31	1.93	1.77	1.63
Protective Insurance Corporation Group	540	410	338	323	327	395	420	398	389	397	1.37	0.97	0.85	0.83	0.82
Employers Insurance Group	2,017	2,031	2,016	2,015	1,997	928	892	829	706	635	2.17	2.28	2.43	2.85	3.14
ProSight Specialty Group	1,545	1,286	961	863	738	474	434	355	379	353	3.26	2.96	2.70	2.27	2.09
Argo Group	1,784	1,565	1,421	1,386	1,374	1,005	993	887	855	790	1.78	1.58	1.60	1.62	1.74
HDI/Talanx US PC Group	252	37	36	42	41	216	188	139	133	131	1.17	0.19	0.26	0.32	0.32
Merchants Insurance Group	420	408	393	393	389	225	203	190	173	162	1.87	2.00	2.06	2.27	2.40
Sompo Holdings US Group	3,187	2,340	2,030	1,876	1,809	1,941	1,681	1,581	1,422	1,390	1.64	1.39	1.28	1.32	1.30
Central Insurance Companies	863	790	756	744	719	809	822	743	706	640	1.07	0.96	1.02	1.05	1.12
Nationwide Group	23,992	24,855	24,183	23,063	21,865	14,478	14,741	15,538	15,095	14,869	1.66	1.69	1.56	1.53	1.47

VII 000090

Loss & LAE and Unearned Premium Reserves to Surplus Ratio

Company	Loss & LAE and Unearned Premium Reserves (\$000)					Surplus (\$000)					Leverage Ratio				
	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014	2018	2017	2016	2015	2014
(1)	(2)					(3)					(4) = (2) / (3)				
Everest Re U.S. Group	7,012	4,971	4,741	4,759	4,903	3,651	3,392	3,635	3,211	2,913	1.92	1.47	1.30	1.48	1.68
Work First Casualty Company	37	31	28	27	30	18	15	13	10	9	2.06	2.07	2.24	2.61	3.29
Church Mutual Insurance Group	1,118	947	887	886	844	619	704	695	642	583	1.80	1.35	1.28	1.38	1.45
OneBeacon Insurance Group	1,514	1,370	1,362	1,474	1,667	619	618	625	622	722	2.44	2.22	2.18	2.37	2.31
MS&AD US Insurance Group	729	713	698	677	636	559	545	498	484	480	1.30	1.31	1.40	1.40	1.32
Allianz of America Companies	5,833	6,134	6,599	7,815	9,118	3,094	2,669	2,751	2,716	3,082	1.89	2.30	2.40	2.88	2.96
Enstar Insurance Group	1,467	1,324	1,396	1,540	2,060	791	811	842	942	1,026	1.85	1.63	1.66	1.63	2.01
Farmers Insurance Group	14,687	14,631	15,373	15,491	15,274	5,697	5,567	5,558	5,951	6,344	2.58	2.63	2.77	2.60	2.41
AF Group	2,387	2,237	1,936	1,660	1,439	937	995	897	814	751	2.55	2.25	2.16	2.04	1.92
Amerisure Companies	1,787	1,754	1,691	1,610	1,554	984	983	938	875	843	1.82	1.79	1.80	1.84	1.84
Quincy Mutual Group	481	391	334	347	337	1,109	1,191	1,080	977	995	0.43	0.33	0.31	0.36	0.34
Pharmacists Mutual Insurance Group	167	159	159	147	145	138	131	115	106	98	1.22	1.21	1.38	1.39	1.48
HIIG Group	416	388	424	430	408	264	266	266	274	268	1.57	1.46	1.60	1.57	1.52
State Auto Insurance Companies	2,664	2,878	2,773	2,568	2,441	1,138	1,133	1,166	1,151	1,130	2.34	2.54	2.38	2.23	2.16
GuideOne Insurance Companies	870	963	914	874	851	433	442	516	562	538	2.01	2.18	1.77	1.55	1.58
IAT Insurance Group	1,007	860	750	691	655	730	909	753	683	725	1.38	0.95	1.00	1.01	0.90
Premier Group Insurance Company	17	17	17	16	16	40	39	35	35	34	0.43	0.43	0.48	0.47	0.48
The Cincinnati Insurance Companies	7,906	7,418	7,003	6,544	6,224	4,919	5,094	4,686	4,412	4,472	1.61	1.46	1.49	1.48	1.39
American Contractors Insurance Group	295	284	279	287	270	160	153	143	123	126	1.85	1.85	1.94	2.33	2.14
Brotherhood Mutual Insurance Company	397	314	294	264	240	241	266	245	229	189	1.65	1.18	1.20	1.15	1.27
James River Group	361	297	240	196	179	242	219	185	177	210	1.49	1.35	1.30	1.11	0.85
RLI Group	1,522	1,363	1,233	1,175	1,133	830	865	860	865	849	1.83	1.58	1.43	1.36	1.33
Cherokee Insurance Company	345	322	290	268	243	186	198	181	153	159	1.85	1.63	1.61	1.75	1.53
Munich-American Holding Corp Companies	11,496	9,933	8,203	8,091	8,257	5,001	5,247	6,191	6,393	6,574	2.30	1.89	1.32	1.27	1.26
AMERISAFE Insurance Group	840	844	827	821	797	384	382	394	371	378	2.19	2.21	2.10	2.21	2.11
WCF Insurance Group	1,142	1,117	1,095	1,062	1,039	946	935	882	852	794	1.21	1.20	1.24	1.25	1.31
ICW Pool	1,785	1,617	1,427	1,199	986	1,109	1,034	905	756	661	1.61	1.56	1.58	1.59	1.49
State Farm Group	65,541	66,480	62,613	59,550	58,517	100,778	97,027	87,591	82,660	80,019	0.65	0.69	0.71	0.72	0.73
Benchmark Insurance Group	114	96	79	68	61	123	107	96	73	62	0.93	0.89	0.83	0.93	0.98
Samsung F & M Insurance Co, Ltd USB	108	126	163	111	108	68	58	72	49	55	1.58	2.19	2.28	2.28	1.96
ProAssurance Group	1,931	1,880	1,891	1,949	2,025	1,031	1,165	1,393	1,496	1,682	1.87	1.61	1.36	1.30	1.20
Petroleum Casualty Company	7	9	10	10	8	24	23	24	23	23	0.30	0.40	0.40	0.43	0.34
Penn National Insurance Companies	1,056	1,043	1,007	979	963	591	587	624	581	567	1.79	1.78	1.61	1.69	1.70
Gray Insurance Group	189	178	172	182	181	128	119	113	105	111	1.47	1.50	1.52	1.73	1.63

	2018	2017	2016	2015	2014
(5): Premium Weighted Leverage Ratio	2.02	1.98	1.89	1.90	1.85
(6): Selected Leverage Ratio					1.93

Notes:
 Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies.
 (5): Premium Weighted Leverage Ratio use Direct Premiums Written from Section VII - J, Exhibit 5.
 (6): Selected Leverage Ratio is equal to five year average.

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)		
07/01/19	09/30/19	0.0%	0.0%	23.5%	0.1%	0.0%	49.9%	0.0%	0.0%	26.7%	0.0%
10/01/19	12/31/19	0.0%	0.0%	23.5%	0.0%	0.0%	49.9%	0.2%	0.0%	26.7%	0.0%
01/01/20	03/31/20	0.1%	0.0%	23.5%	0.1%	0.0%	49.9%	0.0%	0.0%	26.7%	0.0%
04/01/20	06/30/20	11.2%	11.2%	23.5%	2.7%	2.7%	49.9%	1.1%	1.0%	26.7%	4.2%
07/01/20	09/30/20	38.1%	38.1%	23.5%	34.5%	34.5%	49.9%	37.8%	37.8%	26.7%	36.2%
10/01/20	12/31/20	22.6%	22.6%	23.5%	26.0%	26.0%	49.9%	22.4%	22.4%	26.7%	24.2%
01/01/21	03/31/21	15.4%	15.4%	23.5%	20.5%	20.5%	49.9%	20.1%	20.1%	26.7%	19.2%
04/01/21	06/30/21	4.0%	4.0%	23.5%	5.7%	5.7%	49.9%	7.4%	7.5%	26.7%	5.8%
07/01/21	09/30/21	2.2%	2.2%	23.5%	1.8%	1.8%	49.9%	3.1%	3.0%	26.7%	2.2%
10/01/21	12/31/21	2.8%	2.8%	23.5%	4.0%	4.0%	49.9%	5.6%	5.6%	26.7%	4.1%
01/01/22	03/31/22	1.9%	1.9%	23.5%	2.2%	2.2%	49.9%	1.9%	1.9%	26.7%	2.0%
04/01/22	06/30/22	1.1%	1.1%	23.5%	1.2%	1.5%	49.9%	0.2%	0.5%	26.7%	1.1%
07/01/22	09/30/22	0.1%	0.7%	23.5%	0.2%	1.1%	49.9%	0.0%	0.2%	26.7%	0.8%
10/01/22	12/31/22	0.0%	0.0%	23.5%	0.1%	0.0%	49.9%	0.1%	0.0%	26.7%	0.0%
01/01/23	03/31/23	0.0%	0.0%	23.5%	0.0%	0.0%	49.9%	0.1%	0.0%	26.7%	0.0%
04/01/23	06/30/23	0.0%	0.0%	23.5%	0.0%	0.0%	49.9%	0.0%	0.0%	26.7%	0.0%
07/01/23	09/30/23	0.2%	0.0%	23.5%	0.2%	0.0%	49.9%	0.0%	0.0%	26.7%	0.0%
10/01/23	12/31/23	0.2%	0.0%	23.5%	0.4%	0.0%	49.9%	0.0%	0.0%	26.7%	0.0%
01/01/24	03/31/24	0.1%	0.0%	23.5%	0.3%	0.0%	49.9%	0.0%	0.0%	26.7%	0.0%
Total											100.0%

Notes:

(5), (8), (11) are calculated using Unit Statistical Plan data for PY 2017.

(3), (6), (9) are from the premium collection special call.

(12) = [(4) x (5)] + [(7) x (8)] + [(10) x (11)]

VII 000092

VII 000093

Section VII - Profit
Subsection H - Expense Weights
7/1/2020

Section VII - H
Exhibit 1

Cash Flow Weights

Item of Expense Allowance (% of Standard Premium plus ARAP)	Policy Year		Average
	2016	2017	
(1) Expected Losses	59.15%	59.64%	59.40%
(2) Expected Loss Adjustment Expense (LAE):	11.07%	11.16%	11.12%
(a) Defense and Cost Containment Expense	5.04%	5.08%	5.06%
(b) Adjusting and Other Expense	6.03%	6.08%	6.06%
(3) Expected Losses + Expected LAE [= (1) + (2)]	70.23%	70.81%	70.52%
(4) Fixed Expenses	5.10%	4.99%	5.04%
(a) General Expenses	4.77%	4.67%	4.72%
(b) Miscellaneous and Other Taxes	0.33%	0.32%	0.33%
(5) Variable Expenses [= (5a) + (5b) + (5c)]	19.68%	19.68%	19.68%
(a) Total Acquisition	12.19%	12.19%	12.19%
(i) Commissions	9.15%	9.15%	9.15%
(ii) Other Acquisition	2.04%	2.04%	2.04%
(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	5.33%	5.33%	5.33%
(6) Total Expenses [= (4) + (5)]	24.78%	24.68%	24.73%

Notes:

- (1): Policy Year 2016 and Policy Year 2017 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 0.187 where 0.187 is the LAE ratio calculated in VI-H, Exhibit 1.
- (2a), (2b): Loss Adjustment Expense split between DCC and AO is $0.455 = 0.085 / 0.187$ and $0.545 = 1 - 0.455$ where 0.085 is three year average ratio of DCC to loss from Section VI-H, Exhibit 1, line (4) and LAE ratio = 0.187 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 2016 Fixed Expenses split between General Expenses and Other Taxes based on \$34,042,674 General Expenses and \$2,350,596 Other Taxes. Policy Year 2017 General Expenses split based on \$35,634,733 General Expenses and \$2,460,525 Other Taxes. See VI-B, Exhibit 1, columns (12) & (13).
- (5a): Section VI-G, Exhibit 1.
- (5b), (5c): Section VI-A, Exhibit 1.

VII 000094

Section VII - Profit
 Subsection I - Loss & LAE Flow
 7/1/2020

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)					
07/01/19	09/30/19	0.0000	0.0000	0.0000	0.0000	0.0000
10/01/19	12/31/19	0.0000	0.0000	0.0000	0.0000	0.0000
01/01/20	03/31/20	0.0000	0.0000	0.0000	0.0000	0.0000
04/01/20	06/30/20	0.0000	0.0000	0.0000	0.0000	0.0000
07/01/20	09/30/20	0.2500	0.0506	0.0506	0.1503	0.0591
10/01/20	12/31/20	0.2500	0.0506	0.0506	0.1503	0.0591
01/01/21	03/31/21	0.2500	0.0506	0.0506	0.1503	0.0591
04/01/21	06/30/21	0.2500	0.0506	0.0506	0.1503	0.0591
07/01/21	09/30/21	0.0000	0.0697	0.0697	0.0349	0.0667
10/01/21	12/31/21	0.0000	0.0697	0.0697	0.0349	0.0667
01/01/22	03/31/22	0.0000	0.0697	0.0697	0.0349	0.0667
04/01/22	06/30/22	0.0000	0.0697	0.0697	0.0349	0.0667
07/01/22	09/30/22	0.0000	0.0466	0.0466	0.0233	0.0446
10/01/22	12/31/22	0.0000	0.0466	0.0466	0.0233	0.0446
01/01/23	03/31/23	0.0000	0.0466	0.0466	0.0233	0.0446
04/01/23	06/30/23	0.0000	0.0466	0.0466	0.0233	0.0446
07/01/23	09/30/23	0.0000	0.0285	0.0285	0.0143	0.0273
10/01/23	12/31/23	0.0000	0.0285	0.0285	0.0143	0.0273
01/01/24	03/31/24	0.0000	0.0285	0.0285	0.0143	0.0273
04/01/24	06/30/24	0.0000	0.0285	0.0285	0.0143	0.0273
07/01/24	09/30/24	0.0000	0.0127	0.0127	0.0063	0.0121
10/01/24	12/31/24	0.0000	0.0127	0.0127	0.0063	0.0121
01/01/25	03/31/25	0.0000	0.0127	0.0127	0.0063	0.0121
04/01/25	06/30/25	0.0000	0.0127	0.0127	0.0063	0.0121
07/01/25	09/30/25	0.0000	0.0060	0.0060	0.0030	0.0058
10/01/25	12/31/25	0.0000	0.0060	0.0060	0.0030	0.0058
01/01/26	03/31/26	0.0000	0.0060	0.0060	0.0030	0.0058
04/01/26	06/30/26	0.0000	0.0060	0.0060	0.0030	0.0058
07/01/26	09/30/26	0.0000	0.0032	0.0032	0.0016	0.0030
10/01/26	12/31/26	0.0000	0.0032	0.0032	0.0016	0.0030
01/01/27	03/31/27	0.0000	0.0032	0.0032	0.0016	0.0030
04/01/27	06/30/27	0.0000	0.0032	0.0032	0.0016	0.0030
07/01/27	09/30/27	0.0000	0.0027	0.0027	0.0014	0.0026
10/01/27	12/31/27	0.0000	0.0027	0.0027	0.0014	0.0026
01/01/28	03/31/28	0.0000	0.0027	0.0027	0.0014	0.0026
04/01/28	06/30/28	0.0000	0.0027	0.0027	0.0014	0.0026
07/01/28	09/30/28	0.0000	0.0017	0.0017	0.0008	0.0016
10/01/28	12/31/28	0.0000	0.0017	0.0017	0.0008	0.0016
01/01/29	03/31/29	0.0000	0.0017	0.0017	0.0008	0.0016
04/01/29	06/30/29	0.0000	0.0017	0.0017	0.0008	0.0016
07/01/29	09/30/29	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/29	12/31/29	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/30	03/31/30	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/30	06/30/30	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/30	09/30/30	0.0000	0.0015	0.0015	0.0008	0.0015
10/01/30	12/31/30	0.0000	0.0015	0.0015	0.0008	0.0015
01/01/31	03/31/31	0.0000	0.0015	0.0015	0.0008	0.0015
04/01/31	06/30/31	0.0000	0.0015	0.0015	0.0008	0.0015
07/01/31	09/30/31	0.0000	0.0014	0.0014	0.0007	0.0013
10/01/31	12/31/31	0.0000	0.0014	0.0014	0.0007	0.0013
01/01/32	03/31/32	0.0000	0.0014	0.0014	0.0007	0.0013
04/01/32	06/30/32	0.0000	0.0014	0.0014	0.0007	0.0013
07/01/32	09/30/32	0.0000	0.0009	0.0009	0.0005	0.0009
10/01/32	12/31/32	0.0000	0.0009	0.0009	0.0005	0.0009
01/01/33	03/31/33	0.0000	0.0009	0.0009	0.0005	0.0009
04/01/33	06/30/33	0.0000	0.0009	0.0009	0.0005	0.0009
07/01/33	09/30/33	0.0000	0.0008	0.0008	0.0004	0.0007
10/01/33	12/31/33	0.0000	0.0008	0.0008	0.0004	0.0007
01/01/34	03/31/34	0.0000	0.0008	0.0008	0.0004	0.0007
04/01/34	06/30/34	0.0000	0.0008	0.0008	0.0004	0.0007
07/01/34	09/30/34	0.0000	0.0007	0.0007	0.0004	0.0007
10/01/34	12/31/34	0.0000	0.0007	0.0007	0.0004	0.0007
01/01/35	03/31/35	0.0000	0.0007	0.0007	0.0004	0.0007
04/01/35	06/30/35	0.0000	0.0007	0.0007	0.0004	0.0007
07/01/35	09/30/35	0.0000	0.0008	0.0008	0.0004	0.0008
10/01/35	12/31/35	0.0000	0.0008	0.0008	0.0004	0.0008
01/01/36	03/31/36	0.0000	0.0008	0.0008	0.0004	0.0008
04/01/36	06/30/36	0.0000	0.0008	0.0008	0.0004	0.0008
07/01/36	09/30/36	0.0000	0.0007	0.0007	0.0003	0.0007
10/01/36	12/31/36	0.0000	0.0007	0.0007	0.0003	0.0007
01/01/37	03/31/37	0.0000	0.0007	0.0007	0.0003	0.0007
04/01/37	06/30/37	0.0000	0.0007	0.0007	0.0003	0.0007
07/01/37	09/30/37	0.0000	0.0010	0.0010	0.0005	0.0010
10/01/37	12/31/37	0.0000	0.0010	0.0010	0.0005	0.0010
01/01/38	03/31/38	0.0000	0.0010	0.0010	0.0005	0.0010
04/01/38	06/30/38	0.0000	0.0010	0.0010	0.0005	0.0010
07/01/38	09/30/38	0.0000	0.0009	0.0009	0.0005	0.0009
10/01/38	12/31/38	0.0000	0.0009	0.0009	0.0005	0.0009

VII 000095

Section VII - Profit
Subsection I - Loss & LAE Flow
7/1/2020

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)					
01/01/39	03/31/39	0.0000	0.0009	0.0009	0.0005	0.0009
04/01/39	06/30/39	0.0000	0.0009	0.0009	0.0005	0.0009
07/01/39	09/30/39	0.0000	0.0006	0.0006	0.0003	0.0006
10/01/39	12/31/39	0.0000	0.0006	0.0006	0.0003	0.0006
01/01/40	03/31/40	0.0000	0.0006	0.0006	0.0003	0.0006
04/01/40	06/30/40	0.0000	0.0006	0.0006	0.0003	0.0006
07/01/40	09/30/40	0.0000	0.0006	0.0006	0.0003	0.0005
10/01/40	12/31/40	0.0000	0.0006	0.0006	0.0003	0.0005
01/01/41	03/31/41	0.0000	0.0006	0.0006	0.0003	0.0005
04/01/41	06/30/41	0.0000	0.0006	0.0006	0.0003	0.0005
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
07/01/53	09/30/53	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/53	12/31/53	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/54	03/31/54	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/54	06/30/54	0.0000	0.0012	0.0012	0.0006	0.0012
07/01/54	09/30/54	0.0000	0.0012	0.0012	0.0006	0.0012
10/01/54	12/31/54	0.0000	0.0012	0.0012	0.0006	0.0012
01/01/55	03/31/55	0.0000	0.0012	0.0012	0.0006	0.0012
04/01/55	06/30/55	0.0000	0.0012	0.0012	0.0006	0.0012
(8) Relative Weights			1.0000	0.0852	0.1020	

Notes:

(3): Single policy earned premium is earned uniformly through the one year policy term.

(4): Exhibit 2, (8). Annual values divided by 4.0.

(7): Loss & LAE Payout = (1.000 x (4) + 0.0852 x (5) + 0.102 x (6)) / (1.000 + 0.0852 + 0.102)

(8): DCC relative weight = 1.000 x 0.187 x 0.455; AO relative weight = 1.000 x 0.187 x 0.545

where 0.187 is the LAE factor calculated in Section VI-H, Exhibit 1 and 0.455, 0.545 are the DCC and AO relative weights from Section VI-H, Exhibit 1.

VII 000096

Section VII - Profit
 Subsection I - Loss & LAE Flow
 7/1/2020

Section VII - I
 Exhibit 2

Loss Payment Pattern

Age In Months (1)	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)
12	7.500	13.33%	13.33%	2.916	34.29%	34.29%	20.22%
24	2.539	39.38%	26.05%	1.516	65.94%	31.65%	27.89%
36	1.599	62.53%	23.15%	1.326	75.39%	9.45%	18.64%
48	1.293	77.33%	14.81%	1.252	79.85%	4.46%	11.41%
60	1.191	83.95%	6.62%	1.223	81.74%	1.88%	5.06%
72	1.148	87.07%	3.12%	1.209	82.68%	0.94%	2.40%
84	1.129	88.56%	1.49%	1.198	83.48%	0.80%	1.26%
96	1.116	89.65%	1.08%	1.182	84.59%	1.12%	1.09%
108	1.108	90.26%	0.61%	1.172	85.36%	0.76%	0.66%
120	1.102	90.75%	0.49%	1.165	85.82%	0.47%	0.49%
132	1.096	91.26%	0.51%	1.154	86.64%	0.82%	0.61%
144	1.091	91.67%	0.41%	1.143	87.51%	0.87%	0.56%
156	1.088	91.92%	0.25%	1.134	88.15%	0.64%	0.38%
168	1.086	92.12%	0.20%	1.128	88.68%	0.54%	0.31%
180	1.084	92.27%	0.15%	1.120	89.29%	0.61%	0.30%
192	1.082	92.39%	0.12%	1.110	90.05%	0.76%	0.33%
204	1.081	92.51%	0.12%	1.103	90.65%	0.60%	0.28%
216	1.078	92.76%	0.25%	1.094	91.39%	0.73%	0.41%
228	1.076	92.94%	0.18%	1.085	92.17%	0.78%	0.38%
240	1.074	93.07%	0.13%	1.079	92.67%	0.51%	0.26%
252	1.073	93.20%	0.13%	1.074	93.08%	0.41%	0.23%
264			0.49%			0.49%	0.49%
276			0.49%			0.49%	0.49%
288			0.49%			0.49%	0.49%
300			0.49%			0.49%	0.49%
312			0.49%			0.49%	0.49%
324			0.49%			0.49%	0.49%
336			0.49%			0.49%	0.49%
348			0.49%			0.49%	0.49%
360			0.49%			0.49%	0.49%
372			0.49%			0.49%	0.49%
384			0.49%			0.49%	0.49%
396			0.49%			0.49%	0.49%
408			0.49%			0.49%	0.49%
420			0.49%			0.49%	0.49%
Total			100.00%			100.00%	100.00%

Notes:

(2), (5): Section II - E, Exhibit 1, Page 1.

(8) = (4) x 67.12% + (7) x 32.88%, where 67.12% and 32.88% are indemnity and medical estimated ultimate losses respectively, from Section II - A, Exhibit 1, Page 2.

VII 000097

Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2020

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	3.67%	2.07%	21.00%	1.64%
Governments	12.01%	1.83%	21.00%	1.45%
States & Territories	7.81%	1.25%	5.25%	1.18%
Special Revenue	20.55%	1.52%	5.25%	1.44%
Industrials	36.03%	2.37%	21.00%	1.87%
Common Stocks	11.50%	9.56%	14.89%	8.14%
Real Estate	0.91%	5.96%	21.00%	4.71%
Preferred Stocks	0.22%	5.17%	13.13%	4.49%
Other Invested Assets	7.29%	5.17%	13.13%	4.49%
(6) Total	100.00%	3.10%	15.77%	2.61%
(7) Investment Expenses		0.21%	21.00%	0.16%
(8) Portfolio Rate of Return		2.89%		2.45%

Notes:

(2): Page 2

(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.

9.56% = average (8.5% + 2.07%, 7.49% + 1.63%, 6.91% + 2.08%)

Pretax return for Real Estate: 3 month treasury rate, 2.02% 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 0.21.

Tax rate for Tax Exempt Bonds = 0.25×0.21

Tax rate for Preferred stock = $(0.50 \times 0.21) + (0.50 \times 0.25 \times 0.21)$

Tax rate for Common Stocks from Exhibit 6, page 1.

Tax rate for Other Assets = Tax rate for Preferred stock = $(0.50 \times 0.21) + (0.50 \times 0.25 \times 0.21)$

(5) = (3) x [1.0 - (4)]

(7): Exhibit 5, page 1.

(8) = (6) - (7)

VII 000098

Section VII - Profit
Subsection J - Portfolio Rate of Return
7/1/2020

Section VII - J
Exhibit 1
Page 2

Asset Distribution for MA Workers' Compensation Group Companies

Asset Class (1)	Proportion (2)
Cash and Short Term Investments	3.67%
Bonds:	76.41%
Governments	12.01%
States & Territories	7.81%
Special Revenue	20.55%
Industrials	36.03%
Common Stocks	11.50%
Real Estate	0.91%
Preferred Stocks	0.22%
Other Invested Assets	7.29%
(3) Total	100.00%

Notes:

Proportion of each asset class is from page 2. The Bond share in total is 76.41%.

This is allocated to the following subcategories:

Governments, States & Territories, Special Revenue and Industrials
by multiplying 76.41% by the adjusted bond weights from Exhibit 3, page 1.

Asset Distribution for MA Workers' Compensation Group Companies

Companies	Bonds	Preferred Stocks	Common Stocks	Real Estate	Cash and Short Term Investments	Other Invested Assets	Total Cash and Invested Assets	% Bonds	% Preferred Stocks	% Common Stocks	% Real Estate	% Cash and Short Term Investments	% Other Invested Assets
(1)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	= (2) / (8)	= (3) / (8)	= (4) / (8)	= (5) / (8)	= (6) / (8)	= (7) / (8)
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Travelers Group	58,873	58	1,459	1,145	1,871	3,178	66,585	88.42%	0.09%	2.19%	1.72%	2.81%	4.77%
A.I.M. Mutual Insurance Companies	519	0	58	0	5	2	585	88.70%	0.00%	9.96%	0.00%	0.92%	0.42%
Hartford Insurance Group	26,956	257	1,135	332	672	3,914	33,266	81.03%	0.77%	3.41%	1.00%	2.02%	11.77%
Liberty Mutual Insurance Companies	43,771	68	8,988	281	696	9,507	63,311	69.14%	0.11%	14.20%	0.44%	1.10%	15.02%
Chubb INA Group	47,418	35	607	214	1,353	1,775	51,402	92.25%	0.07%	1.18%	0.42%	2.63%	3.45%
American International Group	44,374	56	1,188	0	410	7,343	53,371	83.14%	0.11%	2.23%	0.00%	0.77%	13.76%
Berkshire Hathaway Insurance Group	10,994	196	175,337	169	49,543	57,753	293,993	3.74%	0.07%	59.64%	0.06%	16.85%	19.64%
Zurich Insurance US PC Group	19,135	0	1,164	1,373	90	1,113	22,875	83.65%	0.00%	5.09%	6.00%	0.39%	4.87%
Charter Insurance Group	106	0	42	0	15	0	164	64.78%	0.00%	25.88%	0.00%	9.34%	0.00%
W. R. Berkley Insurance Group	10,948	105	1,740	505	763	2,522	16,583	66.02%	0.63%	10.49%	3.04%	4.60%	15.21%
AmTrust Group	4,259	30	115	5	164	296	4,870	87.46%	0.61%	2.37%	0.11%	3.38%	6.07%
Old Republic Insurance Group	7,629	1	2,175	0	212	6	10,024	76.11%	0.01%	21.70%	0.00%	2.12%	0.06%
Hanover Insurance Grp Prop & Cas Cos	5,886	3	543	48	40	617	7,138	82.47%	0.05%	7.61%	0.68%	0.56%	8.64%
CNA Insurance Companies	35,125	630	817	0	679	1,993	39,244	89.50%	1.61%	2.08%	0.00%	1.73%	5.08%
Arbella Insurance Group	1,168	0	155	0	21	3	1,346	86.72%	0.00%	11.54%	0.00%	1.54%	0.19%
Fairfax Financial (USA) Group	9,323	59	3,546	268	2,176	2,199	17,571	53.06%	0.34%	20.18%	1.53%	12.38%	12.51%
Utica National Insurance Group	2,200	0	293	14	24	8	2,539	86.64%	0.00%	11.56%	0.57%	0.93%	0.31%
MEMIC Group	959	0	216	0	29	25	1,229	78.02%	0.00%	17.61%	0.00%	2.35%	2.02%
Norfolk & Dedham Group Pool	424	0	128	2	26	29	608	69.68%	0.00%	20.99%	0.32%	4.32%	4.70%
Sentry Insurance Group	6,673	0	1,507	164	56	1,262	9,662	69.06%	0.00%	15.60%	1.70%	0.58%	13.06%
Selective Insurance Group	5,173	18	150	0	266	218	5,825	88.81%	0.31%	2.58%	0.00%	4.56%	3.75%
Ameritrust Group	1,397	0	99	7	76	34	1,613	86.59%	0.00%	6.16%	0.43%	4.69%	2.13%
Starr International Group	2,497	17	1,463	0	479	187	4,643	53.78%	0.36%	31.50%	0.00%	10.32%	4.04%
Markel Corporation Group	5,364	0	2,615	15	719	435	9,148	58.64%	0.00%	28.59%	0.16%	7.86%	4.75%
Arrow Mutual Liability Insurance Company	33	0	9	0	2	0	45	74.55%	0.00%	20.11%	0.04%	0.35%	0.35%
American National Prop & Cas Companies	2,355	2	281	14	13	7	2,672	88.14%	0.08%	10.50%	0.52%	0.48%	0.27%
American Family Insurance Group	13,338	0	3,219	271	438	1,276	18,543	71.93%	0.00%	17.36%	1.46%	2.36%	6.88%
EMC Insurance Companies	2,695	76	775	142	134	78	3,899	69.11%	1.95%	19.88%	3.64%	3.43%	2.00%
Arch Insurance Group	6,747	0	147	1	324	21	7,241	93.18%	0.00%	2.03%	0.02%	4.47%	0.29%
Federated Mutual Group	4,006	2	1,123	63	152	288	5,634	71.10%	0.04%	19.93%	1.12%	2.71%	5.11%
Tokio Marine US PC Group	18,522	299	903	37	446	560	20,767	89.19%	1.44%	4.35%	0.18%	2.15%	2.69%
Great American P & C Insurance Grp	7,581	438	611	98	661	615	10,005	75.78%	4.38%	6.11%	0.98%	6.60%	6.15%
Electric Insurance Company	794	0	21	14	9	5	842	94.30%	0.00%	2.47%	1.68%	1.02%	0.54%
QBE North America Insurance Group	2,428	0	252	50	76	565	3,371	72.04%	0.00%	7.47%	1.48%	2.25%	16.76%
AXA U.S. Group	7,408	0	43	3	980	349	8,783	84.35%	0.00%	0.49%	0.03%	11.16%	3.97%
Protective Insurance Corporation Group	556	2	65	28	131	55	836	66.46%	0.23%	7.81%	3.32%	15.62%	6.55%
Employers Insurance Group	2,484	0	168	0	63	1	2,716	91.49%	0.00%	6.17%	0.00%	2.32%	0.02%
ProSight Specialty Group	1,726	0	0	0	64	69	1,859	92.83%	0.00%	0.00%	0.00%	3.45%	3.72%
Argo Group	2,347	3	360	0	264	212	3,185	73.68%	0.09%	11.29%	0.01%	8.29%	6.65%
HDI/Talanx US PC Group	318	0	26	0	178	0	522	60.85%	0.00%	5.05%	0.05%	34.01%	0.04%
Merchants Insurance Group	513	10	34	0	33	0	591	86.78%	1.77%	5.77%	0.00%	5.66%	0.03%
Sompo Holdings US Group	3,692	0	21	14	839	47	4,613	80.04%	0.00%	0.45%	0.30%	18.19%	1.02%
Central Insurance Companies	988	0	293	39	143	0	1,463	67.51%	0.00%	20.00%	2.70%	9.79%	0.00%
Nationwide Group	20,598	6	5,911	561	567	4,380	32,024	64.32%	0.02%	18.46%	1.75%	1.77%	13.68%
Everest Re U.S. Group	6,143	0	187	0	416	2,139	8,885	69.14%	0.00%	2.11%	0.00%	4.68%	24.07%
Work First Casualty Company	41	0	0	3	8	3	55	73.74%	0.00%	5.51%	5.51%	14.54%	6.21%
Church Mutual Insurance Group	1,206	11	219	13	53	112	1,614	74.71%	0.70%	13.60%	0.79%	3.29%	6.92%

VII 000099

Asset Distribution for MA Workers' Compensation Group Companies

Companies	Bonds	Preferred Stocks	Common Stocks	Real Estate	Cash and Short Term Investments	Other Invested Assets	Total Cash and Invested Assets	% Bonds	% Preferred Stocks	% Common Stocks	% Real Estate	% Cash and Short Term Investments	% Other Invested Assets
(1)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	(\$000)	= (2) / (8)	= (3) / (8)	= (4) / (8)	= (5) / (8)	= (6) / (8)	= (7) / (8)
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
OneBeacon Insurance Group	1,335	0	549	0	73	36	1,993	66.98%	0.00%	27.57%	0.00%	3.64%	1.80%
MS&AD US Insurance Group	961	0	114	20	80	0	1,176	81.75%	0.02%	9.72%	1.69%	6.82%	0.00%
Allianz of America Companies	8,476	0	115	0	828	456	9,875	85.83%	0.00%	1.17%	0.00%	8.38%	4.62%
Enstar Insurance Group	2,280	0	0	0	177	109	2,566	88.87%	0.00%	0.01%	0.00%	6.88%	4.24%
Farmers Insurance Group	16,642	0	390	797	649	41	18,518	89.87%	0.00%	2.11%	4.30%	3.51%	0.22%
AF Group	2,418	1	223	0	177	73	2,892	83.61%	0.03%	7.71%	0.00%	6.11%	2.54%
Amerisure Companies	1,907	19	151	12	120	265	2,475	77.07%	0.79%	6.12%	0.48%	4.85%	10.69%
Quincy Mutual Group	691	5	523	20	57	230	1,525	45.33%	0.35%	34.26%	1.28%	3.73%	15.05%
Pharmacists Mutual Insurance Group	215	0	29	6	5	0	255	84.16%	0.00%	11.31%	2.39%	2.15%	0.00%
HIIG Group	280	0	55	0	129	55	519	53.98%	0.00%	10.66%	0.00%	24.80%	10.56%
State Auto Insurance Companies	2,870	0	445	20	118	188	3,641	78.82%	0.00%	12.23%	0.55%	3.25%	5.15%
GuideOne Insurance Companies	914	0	48	13	50	41	1,066	85.74%	0.00%	4.49%	1.23%	4.66%	3.88%
IAT Insurance Group	650	80	829	0	114	21	1,695	38.38%	4.73%	48.92%	0.00%	6.71%	1.27%
Premier Group Insurance Company	52	0	0	0	6	0	58	89.45%	0.00%	0.00%	0.00%	10.55%	0.00%
The Cincinnati Insurance Companies	7,150	167	3,679	9	537	165	11,706	61.08%	1.43%	31.43%	0.07%	4.59%	1.41%
American Contractors Insurance Group	287	0	55	0	40	84	466	61.49%	0.00%	11.87%	0.00%	8.64%	18.01%
Brotherhood Mutual Insurance Company	231	0	163	25	42	46	507	45.52%	0.07%	32.16%	4.90%	8.36%	9.00%
James River Group	253	54	16	0	152	26	502	50.41%	10.83%	3.15%	0.00%	30.39%	5.22%
RLI Group	1,712	0	517	30	32	35	2,326	73.61%	0.00%	22.24%	1.28%	1.36%	1.50%
Cherokee Insurance Company	233	59	134	0	-4	32	454	51.29%	13.04%	29.58%	0.00%	-0.86%	6.95%
Munich-American Holding Corp Companies	13,788	5	188	191	1,043	609	15,824	87.13%	0.03%	1.19%	1.21%	6.59%	3.85%
AMERISAFE Insurance Group	1,094	0	9	5	49	0	1,156	94.61%	0.00%	0.77%	0.41%	4.22%	0.00%
WCF Insurance Group	1,439	0	163	60	124	110	1,895	75.92%	0.00%	8.58%	3.15%	6.57%	5.78%
ICW Pool	2,250	22	548	0	92	29	2,941	76.51%	0.76%	18.62%	0.00%	3.12%	0.99%
State Farm Group	99,468	329	67,779	436	3,861	2,806	174,680	56.94%	0.19%	38.80%	0.25%	2.21%	1.61%
Benchmark Insurance Group	314	0	0	6	44	0	365	86.01%	0.09%	0.00%	1.77%	12.13%	0.00%
Samsung F & M Insurance Co, Ltd USB	71	0	0	0	18	0	89	79.86%	0.00%	0.00%	0.00%	20.14%	0.00%
ProAssurance Group	1,838	6	353	-2	193	370	2,759	66.63%	0.20%	12.80%	-0.07%	7.01%	13.42%
Petroleum Casualty Company	0	0	0	0	17	0	17	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%
Penn National Insurance Companies	1,277	1	137	0	45	0	1,460	87.47%	0.05%	9.40%	0.00%	3.08%	0.00%
Gray Insurance Group	104	0	89	21	26	36	276	37.84%	0.00%	32.13%	7.56%	9.51%	12.96%

VII 000100

	% Bonds	% Preferred Stocks	% Common Stocks	% Real Estate	% Cash and Short Term Investments	% Other Invested Assets
(15): Premium Weighted Asset Distribution	76.41%	0.22%	11.50%	0.91%	3.67%	7.29%

Notes:
 Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies, 2018 Exhibit of Assets.
 (5): Real estate is sum of: properties occupied by the company, properties held for the production of income and properties held for sale.
 (8) = (2) + (3) + (4) + (5) + (6) + (7)
 (15): Premium Weighted Asset Distribution use Direct Premiums Written from Exhibit 5, page 2.

VII 000101

Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2020

Section VII - J
 Exhibit 2
 Page 1

Calculation of Pretax Returns on Bonds

% of Bonds (adjusted for removal of Other Bonds category) by Class, by Maturity				
Term to Maturity in years	Governments	States and Territories	Special Revenue	Industrials
0.5	7.50%	0.66%	2.21%	4.28%
3	5.34%	3.08%	8.47%	22.50%
7	1.80%	3.26%	8.85%	17.57%
15	0.56%	3.02%	5.17%	1.87%
25	0.52%	0.21%	2.21%	0.94%
Total	15.71%	10.23%	26.90%	47.16%

As of	Term to Maturity in years	Yield Data			
		Governments	States and Territories	Special Revenue	Industrials
Jul-19	0.5	2.08%	1.24%	1.23%	2.21%
	3	1.80%	1.05%	1.12%	2.31%
	7	1.93%	1.32%	1.53%	2.72%
	15	2.21%	1.74%	2.37%	3.32%
	25	2.47%	2.07%	3.32%	3.64%
Aug-19	0.5	1.93%	1.07%	1.06%	2.06%
	3	1.51%	0.78%	0.83%	2.07%
	7	1.55%	1.02%	1.19%	2.42%
	15	1.77%	1.43%	2.03%	2.96%
	25	2.02%	1.74%	3.06%	3.27%
Sep-19	0.5	1.89%	1.23%	1.22%	2.04%
	3	1.59%	1.03%	1.06%	2.12%
	7	1.64%	1.24%	1.34%	2.50%
	15	1.84%	1.57%	1.99%	3.04%
	25	2.07%	1.85%	2.79%	3.33%
Jul-19 Aug-19 Sep-19 Average	All	Weighted Yields			
	All	1.99%	1.37%	1.68%	2.52%
	All	1.74%	1.09%	1.38%	2.26%
	All	1.76%	1.28%	1.49%	2.31%
Average	1.83%	1.25%	1.52%	2.37%	

Notes:

% of Bonds by Class and by Maturity for MA WC Group Companies are from Exhibit 3, page 1.

Yield Data are from Page 2.

Example of Weighted Yield calculation for Jul-19, States and Territories:

$$1.37 = (1.24 \times 0.66 + 1.05 \times 3.08 + 1.32 \times 3.26 + 1.74 \times 3.02 + 2.07 \times 0.21) / 10.23$$

VII 000102

Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2020

Section VII - J
 Exhibit 2
 Page 2

Calculation of Yield Data

Term to Maturity in Years	Jul-19	Aug-19	Sep-19	Formulas used to derive the yields (reference to data on page 3)
Governments				
0.5	2.08%	1.93%	1.89%	=(4)
3	1.80%	1.51%	1.59%	=(7)
7	1.93%	1.55%	1.64%	=(9)
10	2.06%	1.63%	1.70%	=(10)
20	2.36%	1.91%	1.97%	=(11)
30	2.57%	2.12%	2.16%	=(12)
States and Territories				
0.5	1.24%	1.07%	1.23%	=(4) + 9.5/9.0 x [(20) - (5)] - 0.5/9.0 x [(21) - (10)]
3	1.05%	0.78%	1.03%	=(7) + 7.0/9.0 x [(20) - (5)] + 2.0/9.0 x [(21) - (10)]
7	1.32%	1.02%	1.24%	=(9) + 1.0/3.0 x [(20) - (5)] + 2.0/3.0 x [(21) - (10)]
10	1.55%	1.26%	1.41%	=(21)
20	1.93%	1.60%	1.73%	=(11) + 0.5 x [(21) - (10)] + 0.5 x [(22) - (12)]
30	2.22%	1.87%	1.97%	=(22)
Special Revenue				
0.5	1.23%	1.06%	1.22%	=(4) + 29.5/29.0 x [(20) - (5)] - 0.5/29.0 x [(19) - (12)]
3	1.12%	0.83%	1.06%	=(7) + 27.0/29.0 x [(20) - (5)] + 2.0/29.0 x [(19) - (12)]
7	1.53%	1.19%	1.34%	=(9) + 23.0/29.0 x [(20) - (5)] + 6.0/29.0 x [(19) - (12)]
10	1.87%	1.50%	1.57%	=(10) + 20.0/29.0 x [(20) - (5)] + 9.0/29.0 x [(19) - (12)]
20	2.87%	2.56%	2.41%	=(11) + 10.0/29.0 x [(20) - (5)] + 19.0/29.0 x [(19) - (12)]
30	3.77%	3.55%	3.17%	=(19)
Industrial				
0.5	2.21%	2.06%	2.04%	=(4) + 18.0/21.0 x [(1) - (3)] + 3.0/21.0 x [(14) - (6)]
3	2.31%	2.07%	2.12%	=(7) + 2.0/3.0 x [(14) - (6)] + 1.0/3.0 x [(15) - (8)]
7	2.72%	2.42%	2.50%	=(9) + 3.0/5.0 x [(15) - (8)] + 2.0/5.0 x [(16) - (10)]
10	3.14%	2.79%	2.87%	=(16)
20	3.51%	3.14%	3.21%	=(11) + 1.0/2.0 x [(16) - (10)] + 1.0/2.0 x [(17) - (12)]
30	3.78%	3.41%	3.46%	=(17)

VII 000103

Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2020

Section VII - J
 Exhibit 2
 Page 3

Yield Data

	Jul-19	Aug-19	Sep-19	Average
FEDERAL RESERVE STATISTICAL RELEASE				
Commercial Paper				
(1) 1-month	2.30%	2.09%	2.02%	2.14%
(1) 3-month	2.22%	2.06%	2.03%	2.10%
U.S. Govt Securities - Secondary Market				
Treasury Constant Maturities				
(2) 1-month	2.15%	2.07%	1.99%	2.07%
(3) 3-month	2.15%	1.99%	1.93%	2.02%
(4) 6-month	2.08%	1.93%	1.89%	1.97%
(5) 1-year	1.96%	1.77%	1.80%	1.84%
(6) 2-year	1.84%	1.57%	1.65%	1.69%
(7) 3-year	1.80%	1.51%	1.59%	1.63%
(8) 5-year	1.83%	1.49%	1.57%	1.63%
(9) 7-year	1.93%	1.55%	1.64%	1.71%
(10) 10-year	2.06%	1.63%	1.70%	1.80%
(11) 20-year	2.36%	1.91%	1.97%	2.08%
(12) 30-year	2.57%	2.12%	2.16%	2.28%
YAHOO				
(13) Preferred Stock	5.30%	5.13%	5.08%	5.17%
US DEPARTMENT OF THE TREASURY				
HQM Corporate Bond Yield Curve Par Yields				
(14) 2-year	2.31%	2.08%	2.11%	2.17%
(15) 5-year	2.43%	2.16%	2.23%	2.27%
(16) 10-year	3.14%	2.79%	2.87%	2.93%
(17) 30-year	3.78%	3.41%	3.46%	3.55%
VALUE LINE INVESTMENT SURVEY (Part II)				
Bond Buyer Indexes				
(18) 20-Bond Index (GOs)	3.47%	3.20%	2.89%	3.19%
(19) Calculated 30-Bond Index (= (18) x [(12) / (11)])	3.77%	3.55%	3.17%	3.50%
General Obligation Bonds (GOs)				
(20) 1-year Aaa	1.14%	0.94%	1.16%	1.08%
(21) 10-year Aaa	1.55%	1.26%	1.41%	1.41%
(22) 25/30-year Aaa	2.22%	1.87%	1.97%	2.02%

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.

VII 000104

Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2020

Section VII - J
 Exhibit 3
 Page 1

Premium Weighted Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Term to Maturity in Years	Governments	States & Territories	Special Revenue	Industrials	Other Bonds	Total Bonds
0.5	7.43%	0.65%	2.19%	4.24%	0.02%	14.52%
3	5.29%	3.05%	8.39%	22.29%	0.57%	39.59%
7.5	1.78%	3.23%	8.76%	17.40%	0.21%	31.38%
15	0.55%	2.99%	5.12%	1.85%	0.01%	10.53%
25	0.51%	0.20%	2.18%	0.93%	0.13%	3.96%
Total	15.57%	10.13%	26.65%	46.72%	0.94%	100.00%

% of Bonds (adjusted for removal of Other Bonds category) by Class, by Maturity

Term to Maturity in Years	Governments	States & Territories	Special Revenue	Industrials	Total Bonds
0.5	7.50%	0.66%	2.21%	4.28%	14.64%
3	5.34%	3.08%	8.47%	22.50%	39.39%
7.5	1.80%	3.26%	8.85%	17.57%	31.47%
15	0.56%	3.02%	5.17%	1.87%	10.62%
25	0.52%	0.21%	2.21%	0.94%	3.87%
Total	15.71%	10.23%	26.90%	47.16%	100.00%

Notes:

- Bond Distribution from pages 2 and 3.
- Premium Weighted Bond Distribution use Direct Premiums Written from Exhibit 5, page 2.

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Governments					States & Territories					Special Revenue				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25	0.5	3	7.5	15	25
	(2)					(3)					(4)				
Travelers Group	1.48%	3.86%	1.22%	0.42%	0.04%	1.48%	2.69%	3.83%	19.56%	0.44%	1.36%	2.45%	2.68%	12.17%	1.05%
A.I.M. Mutual Insurance Companies	0.26%	2.24%	0.19%	0.18%	0.01%	0.20%	2.66%	2.81%	0.00%	0.00%	2.77%	15.04%	16.74%	3.55%	1.25%
Hartford Insurance Group	1.31%	3.33%	1.82%	1.09%	3.36%	0.14%	1.02%	1.26%	1.51%	0.62%	0.98%	3.69%	4.65%	9.38%	12.25%
Liberty Mutual Insurance Companies	2.45%	12.93%	4.07%	2.39%	0.54%	0.36%	2.03%	6.29%	1.02%	0.32%	0.36%	2.63%	8.30%	6.70%	1.87%
Chubb INA Group	0.72%	3.45%	1.55%	0.77%	0.17%	0.80%	5.18%	3.90%	0.04%	0.06%	5.07%	16.93%	15.17%	4.17%	1.58%
American International Group	0.56%	2.66%	1.42%	0.24%	0.34%	0.83%	2.77%	2.07%	0.63%	0.00%	1.92%	7.67%	8.24%	2.27%	0.66%
Berkshire Hathaway Insurance Group	85.27%	1.96%	0.17%	0.03%	0.10%	0.02%	0.06%	0.00%	0.00%	0.00%	0.08%	0.17%	0.09%	0.09%	0.04%
Zurich Insurance US PC Group	5.96%	18.37%	6.29%	0.15%	0.85%	0.01%	1.05%	2.57%	0.24%	0.35%	1.61%	6.38%	8.75%	3.76%	3.65%
Charter Insurance Group	4.75%	1.09%	0.05%	0.00%	0.00%	2.51%	19.40%	7.23%	0.47%	0.00%	8.20%	22.27%	7.49%	2.78%	0.00%
W. R. Berkley Insurance Group	0.80%	4.37%	0.58%	0.09%	0.01%	0.23%	1.46%	2.62%	0.83%	0.00%	4.65%	17.35%	13.03%	2.22%	0.90%
AmTrust Group	4.46%	2.08%	0.89%	0.29%	0.00%	0.32%	1.49%	0.47%	0.61%	0.00%	1.92%	5.97%	10.25%	4.72%	0.62%
Old Republic Insurance Group	1.04%	4.23%	5.18%	0.00%	0.00%	0.00%	1.41%	6.99%	0.00%	0.00%	0.46%	3.82%	5.61%	0.00%	0.00%
Hanover Insurance Grp Prop & Cas Cos	0.25%	1.15%	1.07%	0.03%	0.27%	0.94%	2.54%	2.11%	0.55%	0.04%	1.68%	6.45%	9.59%	3.57%	0.82%
CNA Insurance Companies	0.41%	0.24%	0.59%	0.02%	0.09%	0.38%	2.19%	2.07%	1.49%	1.34%	2.69%	12.76%	8.82%	4.86%	2.60%
Arbella Insurance Group	0.36%	3.92%	1.03%	0.71%	0.00%	0.26%	0.98%	1.87%	0.00%	0.00%	2.19%	7.66%	21.22%	0.15%	0.00%
Fairfax Financial (USA) Group	47.22%	19.51%	0.58%	0.01%	3.54%	0.00%	0.00%	0.00%	0.00%	0.17%	0.18%	0.15%	0.00%	1.75%	0.73%
Utica National Insurance Group	0.48%	3.18%	1.17%	0.17%	0.05%	0.04%	0.66%	1.46%	0.00%	0.00%	3.01%	10.41%	12.38%	5.96%	1.17%
MEMIC Group	0.32%	3.26%	2.55%	0.66%	0.10%	0.57%	1.90%	5.77%	0.53%	0.26%	2.90%	16.42%	14.72%	5.88%	2.18%
Norfolk & Dedham Group Pool	2.86%	4.07%	1.26%	0.10%	0.03%	0.63%	0.50%	0.47%	0.00%	0.00%	2.38%	22.84%	24.79%	3.52%	0.60%
Sentry Insurance Group	1.58%	7.01%	4.23%	6.09%	0.28%	0.81%	1.94%	3.14%	0.35%	0.02%	1.12%	7.02%	11.29%	4.27%	0.39%
Selective Insurance Group	0.90%	1.53%	0.35%	0.06%	0.09%	0.34%	2.28%	2.62%	0.01%	0.00%	2.11%	12.46%	18.39%	4.55%	1.19%
AmeriTrust Group	0.26%	2.81%	0.05%	0.03%	0.00%	0.57%	1.45%	1.67%	0.00%	0.00%	1.78%	3.90%	1.22%	0.52%	0.06%
Starr International Group	5.71%	0.72%	0.98%	0.00%	0.00%	2.36%	5.76%	4.10%	0.00%	0.00%	1.08%	17.08%	10.87%	0.29%	0.00%
Markel Corporation Group	5.47%	4.56%	4.89%	0.16%	0.00%	4.19%	7.34%	19.07%	1.68%	1.20%	1.74%	6.05%	21.42%	4.21%	3.45%
Arrow Mutual Liability Insurance Company	5.98%	62.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
American National Prop & Cas Companies	0.00%	0.57%	0.00%	0.00%	0.00%	0.20%	2.77%	14.24%	4.94%	0.01%	0.33%	1.12%	5.39%	1.20%	0.00%
American Family Insurance Group	1.33%	5.87%	3.83%	0.22%	0.33%	1.42%	5.54%	6.52%	0.74%	0.07%	3.41%	16.46%	16.01%	3.65%	0.53%
EMC Insurance Companies	0.67%	3.94%	1.49%	0.72%	0.03%	1.99%	3.71%	5.70%	0.20%	0.00%	3.47%	7.52%	8.63%	17.78%	0.63%
Arch Insurance Group	0.72%	12.80%	5.83%	0.07%	0.00%	0.09%	1.29%	3.18%	0.00%	0.00%	0.53%	3.72%	6.35%	0.85%	0.16%
Federated Mutual Group	0.31%	1.57%	1.26%	0.55%	0.00%	2.84%	10.32%	4.91%	0.42%	0.25%	1.85%	13.63%	10.57%	1.63%	0.01%
Tokio Marine US PC Group	0.34%	1.15%	0.55%	0.85%	0.81%	0.35%	2.27%	3.13%	2.66%	1.54%	1.44%	11.10%	12.10%	10.27%	9.09%
Great American P & C Insurance Grp	2.12%	1.98%	0.07%	0.02%	0.00%	0.12%	0.68%	1.02%	1.34%	0.08%	2.22%	9.76%	7.06%	10.82%	2.99%
Electric Insurance Company	1.06%	2.18%	0.38%	0.00%	0.00%	0.00%	3.43%	0.01%	0.00%	0.00%	1.35%	6.68%	5.02%	2.21%	0.60%
QBE North America Insurance Group	2.32%	11.46%	18.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.55%	0.00%	0.00%	0.00%
AXA U.S. Group	7.24%	16.60%	3.24%	0.57%	0.07%	0.41%	1.37%	1.18%	0.20%	0.06%	3.36%	11.07%	9.24%	6.17%	2.24%
Protective Insurance Corporation Group	2.20%	23.97%	7.73%	0.00%	0.00%	0.40%	1.83%	0.52%	0.00%	0.00%	1.70%	4.78%	2.84%	1.21%	0.43%
Employers Insurance Group	0.92%	3.55%	0.34%	0.02%	0.00%	1.19%	3.47%	3.82%	0.00%	0.00%	3.56%	10.36%	13.75%	4.52%	1.08%
ProSight Specialty Group	3.02%	2.18%	1.92%	0.00%	0.03%	0.00%	0.16%	0.00%	0.19%	0.00%	0.20%	0.84%	0.66%	0.06%	0.01%
Argo Group	2.65%	3.15%	2.30%	0.22%	0.54%	0.69%	1.98%	1.30%	0.00%	0.00%	1.55%	7.76%	6.02%	2.33%	0.45%
HDI/Talanx US PC Group	19.55%	15.73%	1.70%	0.69%	0.17%	0.00%	0.47%	3.98%	0.19%	0.00%	0.64%	2.69%	13.07%	1.72%	0.28%
Merchants Insurance Group	1.38%	4.92%	3.61%	0.67%	0.18%	1.05%	7.88%	0.21%	0.00%	0.00%	1.38%	25.79%	5.73%	13.03%	5.71%
Sompo Holdings US Group	2.01%	9.79%	3.77%	0.29%	0.07%	0.01%	0.29%	0.74%	0.08%	0.00%	3.39%	11.05%	11.02%	5.07%	1.15%

VII 000105

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Governments					States & Territories					Special Revenue				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25	0.5	3	7.5	15	25
	(2)					(3)					(4)				
Central Insurance Companies	0.45%	1.19%	0.74%	0.00%	0.00%	1.69%	5.11%	10.44%	0.13%	0.00%	5.34%	11.24%	13.29%	0.78%	0.26%
Nationwide Group	1.11%	3.77%	8.21%	0.01%	1.79%	1.19%	1.80%	1.98%	0.58%	0.00%	2.31%	4.63%	7.35%	3.18%	0.93%
Everest Re U.S. Group	4.09%	42.43%	3.89%	0.07%	0.00%	0.02%	0.25%	0.35%	0.03%	0.01%	0.40%	3.66%	3.32%	1.30%	1.10%
Work First Casualty Company	1.27%	1.52%	0.00%	0.00%	1.81%	0.82%	2.78%	0.00%	0.00%	0.00%	0.86%	2.32%	2.07%	0.87%	0.00%
Church Mutual Insurance Group	5.14%	11.19%	5.99%	0.77%	0.51%	0.29%	3.55%	2.82%	0.27%	0.00%	2.38%	15.43%	13.07%	3.40%	0.99%
OneBeacon Insurance Group	4.06%	9.28%	12.11%	2.06%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.69%	2.93%	2.90%	0.30%	0.05%
MS&AD US Insurance Group	3.78%	22.43%	8.12%	2.04%	0.00%	0.37%	1.80%	3.19%	0.00%	0.07%	0.73%	4.57%	4.46%	0.45%	0.25%
Allianz of America Companies	0.95%	12.70%	2.57%	0.14%	0.27%	0.20%	1.28%	0.58%	0.06%	0.06%	1.08%	6.93%	7.71%	3.03%	2.45%
Enstar Insurance Group	1.49%	4.25%	1.24%	0.11%	0.02%	0.02%	0.01%	0.62%	0.00%	0.03%	2.99%	10.17%	3.39%	0.44%	0.14%
Farmers Insurance Group	6.49%	22.54%	2.54%	0.47%	0.29%	0.33%	1.55%	2.51%	0.46%	0.66%	2.14%	7.78%	8.73%	3.19%	3.24%
AF Group	2.42%	15.46%	12.20%	0.41%	5.18%	0.00%	0.00%	0.00%	0.00%	0.00%	2.12%	6.58%	5.75%	6.70%	4.64%
Amerisure Companies	0.81%	4.32%	6.90%	2.05%	2.63%	0.00%	0.42%	4.41%	0.00%	0.00%	1.62%	5.61%	6.87%	1.02%	0.08%
Quincy Mutual Group	0.13%	5.48%	6.76%	0.26%	2.04%	0.36%	0.60%	1.52%	0.00%	0.00%	3.38%	10.68%	15.45%	4.23%	0.81%
Pharmacists Mutual Insurance Group	0.69%	1.25%	0.91%	2.46%	0.00%	1.85%	5.46%	3.49%	0.00%	0.00%	3.38%	14.11%	25.03%	4.43%	0.62%
Hill Group	18.25%	22.76%	4.43%	3.20%	0.65%	0.26%	0.76%	0.24%	0.00%	1.20%	1.87%	8.49%	7.38%	3.88%	3.45%
State Auto Insurance Companies	4.07%	7.99%	5.36%	3.04%	7.16%	0.54%	2.81%	2.11%	0.17%	0.00%	4.72%	19.09%	10.44%	5.43%	3.19%
GuideOne Insurance Companies	1.38%	3.12%	0.81%	0.01%	0.00%	0.60%	1.33%	2.95%	0.00%	0.00%	2.31%	4.11%	9.95%	0.03%	0.05%
IAT Insurance Group	2.49%	4.88%	0.09%	0.16%	0.03%	0.02%	0.06%	0.00%	0.00%	0.00%	0.27%	2.54%	1.67%	0.24%	0.02%
Premier Group Insurance Company	2.58%	5.78%	3.84%	0.00%	0.00%	0.00%	0.00%	4.23%	0.00%	0.00%	0.84%	6.82%	6.55%	2.10%	0.40%
The Cincinnati Insurance Companies	0.01%	0.68%	0.38%	0.00%	0.00%	1.48%	9.31%	15.70%	5.32%	0.01%	1.23%	3.77%	14.03%	4.08%	0.08%
American Contractors Insurance Group	0.28%	3.94%	0.37%	0.12%	0.01%	0.35%	2.11%	2.41%	0.00%	0.00%	2.86%	15.79%	16.66%	1.62%	0.28%
Brotherhood Mutual Insurance Company	0.00%	2.02%	0.00%	0.00%	0.00%	1.49%	14.44%	13.31%	0.25%	0.00%	4.74%	22.57%	29.35%	0.79%	0.56%
James River Group	21.98%	15.38%	0.78%	0.38%	0.07%	0.00%	0.98%	3.83%	0.18%	0.00%	1.19%	5.74%	9.72%	6.00%	2.29%
RLI Group	1.58%	7.18%	7.69%	1.90%	0.67%	0.36%	3.27%	2.22%	0.29%	0.00%	1.08%	7.25%	7.89%	3.13%	8.47%
Cherokee Insurance Company	0.00%	1.90%	1.22%	0.00%	0.00%	1.95%	3.41%	2.09%	3.76%	0.31%	2.36%	28.41%	7.90%	12.81%	7.39%
Munich-American Holding Corp Companies	5.74%	26.54%	15.05%	0.77%	3.85%	0.01%	0.07%	0.00%	0.00%	0.00%	1.11%	3.30%	2.21%	0.76%	0.19%
AMERISAFE Insurance Group	0.13%	5.46%	0.94%	0.08%	0.00%	3.26%	10.60%	9.02%	1.54%	0.22%	4.43%	15.40%	20.84%	2.78%	0.03%
WCF Insurance Group	3.36%	11.83%	8.32%	4.75%	0.39%	1.01%	5.38%	6.89%	6.65%	0.00%	3.43%	11.14%	8.81%	3.61%	0.00%
ICW Pool	13.22%	31.13%	0.70%	1.56%	0.07%	0.10%	2.76%	6.86%	20.00%	8.57%	0.00%	0.42%	1.40%	0.19%	0.00%
State Farm Group	2.30%	7.89%	5.66%	0.28%	0.00%	1.00%	10.47%	24.50%	1.36%	0.02%	0.98%	6.86%	18.09%	0.79%	0.13%
Benchmark Insurance Group	1.44%	6.03%	1.02%	0.37%	0.06%	1.25%	4.35%	4.15%	0.30%	0.14%	2.65%	9.87%	12.13%	3.04%	0.22%
Samsung F & M Insurance Co, Ltd USB	3.08%	27.29%	0.63%	0.00%	0.00%	0.03%	0.17%	0.00%	0.00%	0.00%	0.54%	4.05%	0.43%	0.00%	0.00%
ProAssurance Group	1.71%	4.73%	1.70%	0.24%	0.02%	0.44%	1.25%	2.19%	0.07%	0.00%	2.37%	10.99%	7.28%	1.84%	0.31%
Petroleum Casualty Company	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Penn National Insurance Companies	0.05%	1.46%	0.32%	0.02%	0.00%	1.57%	0.33%	0.99%	0.32%	0.00%	5.78%	10.54%	8.65%	6.36%	1.52%
Gray Insurance Group	28.60%	13.49%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.73%	1.88%	3.31%	34.87%	0.32%

VII 000106

Notes:
 Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies, 2018 Schedule D, Part 1A.

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Industrials					Other Bonds				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25
	(2)					(3)				
Travelers Group	6.76%	17.17%	20.34%	0.86%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%
A.I.M. Mutual Insurance Companies	1.81%	24.95%	22.37%	2.57%	0.40%	0.00%	0.00%	0.00%	0.00%	0.00%
Hartford Insurance Group	6.23%	19.57%	18.22%	4.40%	4.58%	0.02%	0.18%	0.34%	0.00%	0.05%
Liberty Mutual Insurance Companies	2.90%	27.52%	15.57%	1.00%	0.75%	0.00%	0.00%	0.00%	0.00%	0.00%
Chubb INA Group	2.53%	22.72%	13.59%	1.00%	0.51%	0.00%	0.00%	0.00%	0.00%	0.11%
American International Group	10.64%	33.21%	18.07%	2.54%	1.11%	0.01%	1.89%	0.11%	0.04%	0.11%
Berkshire Hathaway Insurance Group	0.89%	3.11%	0.21%	0.62%	0.05%	0.00%	5.11%	1.91%	0.00%	0.01%
Zurich Insurance US PC Group	3.16%	16.91%	17.03%	2.20%	0.60%	0.00%	0.00%	0.00%	0.06%	0.04%
Charter Insurance Group	1.77%	19.82%	0.63%	0.00%	0.00%	0.22%	1.12%	0.00%	0.00%	0.19%
W. R. Berkley Insurance Group	6.77%	23.74%	13.28%	3.10%	0.17%	0.18%	0.77%	0.88%	0.00%	1.99%
AmTrust Group	0.86%	20.03%	44.61%	0.39%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
Old Republic Insurance Group	5.48%	42.02%	22.96%	0.60%	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%
Hanover Insurance Grp Prop & Cas Cos	2.84%	27.83%	37.36%	0.33%	0.56%	0.00%	0.03%	0.00%	0.00%	0.00%
CNA Insurance Companies	3.92%	14.61%	26.56%	8.21%	4.90%	0.00%	0.04%	0.11%	0.30%	0.80%
Arbella Insurance Group	5.85%	33.75%	20.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Fairfax Financial (USA) Group	1.62%	19.41%	1.03%	0.17%	1.45%	0.00%	1.41%	1.09%	0.00%	0.00%
Utica National Insurance Group	4.82%	26.53%	25.05%	3.24%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%
MEMIC Group	2.89%	17.89%	16.25%	2.57%	2.39%	0.00%	0.00%	0.00%	0.00%	0.00%
Norfolk & Dedham Group Pool	1.37%	16.82%	17.52%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sentry Insurance Group	2.60%	26.69%	19.20%	1.86%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%
Selective Insurance Group	5.54%	27.91%	17.41%	0.73%	0.18%	0.00%	0.00%	0.02%	0.00%	1.33%
AmeriTrust Group	4.99%	43.58%	35.45%	1.06%	0.61%	0.00%	0.00%	0.00%	0.00%	0.00%
Starr International Group	6.83%	8.35%	32.38%	2.26%	0.98%	0.00%	0.05%	0.00%	0.00%	0.22%
Markel Corporation Group	0.84%	3.24%	8.57%	1.01%	0.93%	0.00%	0.01%	0.00%	0.00%	0.00%
Arrow Mutual Liability Insurance Company	3.29%	25.08%	3.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
American National Prop & Cas Companies	1.34%	33.63%	33.01%	0.72%	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%
American Family Insurance Group	6.31%	16.74%	9.94%	0.63%	0.44%	0.00%	0.00%	0.01%	0.00%	0.00%
EMC Insurance Companies	2.38%	19.05%	20.77%	1.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Arch Insurance Group	2.65%	47.79%	12.89%	0.42%	0.66%	0.00%	0.00%	0.00%	0.00%	0.00%
Federated Mutual Group	3.17%	14.04%	15.40%	15.82%	1.44%	0.00%	0.00%	0.00%	0.00%	0.00%

VII 000107

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Industrials					Other Bonds				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25
	(2)					(3)				
Tokio Marine US PC Group	1.50%	13.69%	20.47%	2.73%	2.29%	0.13%	0.13%	0.47%	0.09%	0.85%
Great American P & C Insurance Grp	6.73%	32.66%	17.74%	2.21%	0.24%	0.00%	0.00%	0.00%	0.00%	0.15%
Electric Insurance Company	4.71%	39.34%	33.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
QBE North America Insurance Group	1.59%	60.28%	5.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AXA U.S. Group	1.25%	23.65%	11.36%	0.27%	0.42%	0.00%	0.00%	0.00%	0.01%	0.00%
Protective Insurance Corporation Group	9.46%	26.36%	16.46%	0.09%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%
Employers Insurance Group	4.10%	28.12%	20.32%	0.60%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%
ProSight Specialty Group	7.11%	45.99%	31.30%	2.34%	3.99%	0.00%	0.00%	0.00%	0.00%	0.00%
Argo Group	7.80%	41.07%	18.42%	1.20%	0.46%	0.00%	0.11%	0.00%	0.00%	0.00%
HDI/Talanx US PC Group	2.13%	18.44%	17.31%	0.75%	0.00%	0.21%	0.28%	0.00%	0.00%	0.00%
Merchants Insurance Group	4.54%	15.07%	5.72%	0.41%	0.67%	0.00%	0.23%	1.67%	0.00%	0.14%
Sompo Holdings US Group	7.74%	32.02%	11.18%	0.31%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%
Central Insurance Companies	1.65%	15.25%	21.15%	3.04%	8.25%	0.00%	0.00%	0.00%	0.00%	0.00%
Nationwide Group	4.82%	27.73%	24.05%	2.92%	1.62%	0.00%	0.00%	0.00%	0.00%	0.01%
Everest Re U.S. Group	4.53%	23.96%	8.58%	1.32%	0.38%	0.00%	0.00%	0.00%	0.00%	0.29%
Work First Casualty Company	0.61%	51.84%	18.56%	9.53%	5.14%	0.00%	0.00%	0.00%	0.00%	0.00%
Church Mutual Insurance Group	3.85%	20.71%	8.48%	0.95%	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%
OneBeacon Insurance Group	5.18%	34.14%	12.78%	9.72%	3.49%	0.00%	0.00%	0.00%	0.00%	0.00%
MS&AD US Insurance Group	5.03%	25.24%	17.35%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Allianz of America Companies	3.06%	30.72%	20.55%	1.67%	3.95%	0.00%	0.00%	0.00%	0.04%	0.00%
Enstar Insurance Group	6.72%	30.57%	32.94%	1.79%	3.07%	0.00%	0.00%	0.00%	0.00%	0.00%
Farmers Insurance Group	2.25%	18.69%	14.78%	0.92%	0.43%	0.00%	0.00%	0.00%	0.00%	0.00%
AF Group	5.28%	14.96%	12.85%	1.48%	3.96%	0.00%	0.00%	0.03%	0.00%	0.00%
Amerisure Companies	6.97%	26.82%	19.30%	9.64%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%
Quincy Mutual Group	2.12%	26.11%	16.45%	0.54%	2.35%	0.00%	0.14%	0.00%	0.59%	0.00%
Pharmacists Mutual Insurance Group	0.50%	11.39%	16.32%	2.77%	5.33%	0.00%	0.00%	0.00%	0.00%	0.00%
HIIG Group	3.30%	12.41%	7.15%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%
State Auto Insurance Companies	2.98%	17.39%	2.68%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
GuideOne Insurance Companies	6.80%	29.11%	37.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
IAT Insurance Group	6.49%	25.54%	39.17%	11.91%	3.38%	0.00%	0.00%	0.00%	0.29%	0.76%

VII 000108

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Industrials					Other Bonds				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25
	(2)					(3)				
Premier Group Insurance Company	7.11%	40.21%	18.83%	0.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
The Cincinnati Insurance Companies	3.99%	20.82%	18.40%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
American Contractors Insurance Group	12.02%	31.66%	9.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Brotherhood Mutual Insurance Company	1.00%	6.48%	3.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
James River Group	1.04%	17.97%	8.06%	0.00%	0.00%	3.12%	1.28%	0.00%	0.00%	0.00%
RLI Group	1.10%	19.75%	21.68%	2.82%	1.67%	0.00%	0.00%	0.00%	0.00%	0.00%
Cherokee Insurance Company	3.32%	19.66%	2.87%	0.40%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%
Munich-American Holding Corp Companies	2.84%	22.55%	10.76%	1.92%	1.82%	0.00%	0.03%	0.22%	0.00%	0.29%
AMERISAFE Insurance Group	8.16%	14.38%	2.64%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
WCF Insurance Group	0.10%	9.67%	8.98%	1.76%	3.91%	0.00%	0.00%	0.00%	0.00%	0.00%
ICW Pool	0.50%	6.11%	4.73%	0.58%	1.08%	0.00%	0.00%	0.00%	0.00%	0.00%
State Farm Group	0.39%	5.99%	13.21%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benchmark Insurance Group	6.90%	34.74%	11.14%	0.09%	0.00%	0.08%	0.00%	0.03%	0.00%	0.00%
Samsung F & M Insurance Co, Ltd USB	24.77%	19.31%	18.45%	0.00%	1.26%	0.00%	0.00%	0.00%	0.00%	0.00%
ProAssurance Group	8.33%	39.88%	15.62%	0.80%	0.21%	0.00%	0.00%	0.00%	0.00%	0.02%
Petroleum Casualty Company	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Penn National Insurance Companies	3.15%	26.41%	30.43%	1.87%	0.18%	0.00%	0.08%	0.00%	0.00%	0.00%
Gray Insurance Group	1.67%	14.42%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Notes:

Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies, 2018 Schedule D, Part 1A.

VII 000109

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

VII 000110

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
2017	21.83	2.67	1.93	0.80	19.16	19.90	21.03
2018	-4.38	2.82	2.65	1.81	-7.20	-7.03	-6.19
Average	11.88	4.97	4.39	3.38	6.91	7.49	8.50

Notes:

Source: 2019 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.

Investment Expense to Invested Assets Ratio

Companies	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Travelers Group	0.23%	0.22%	0.22%	0.23%	0.22%	0.23%	0.20%	0.21%	0.23%	0.19%
A.I.M. Mutual Insurance Companies	0.14%	0.13%	0.14%	0.15%	0.16%	0.16%	0.16%	0.23%	0.16%	0.17%
Hartford Insurance Group	0.25%	0.24%	0.20%	0.19%	0.19%	0.18%	0.19%	0.19%	0.17%	0.17%
Liberty Mutual Insurance Companies	0.29%	0.27%	0.25%	0.26%	0.26%	0.26%	0.25%	0.31%	0.43%	0.34%
Chubb INA Group	0.13%	0.13%	0.16%	0.16%	0.18%	0.17%	0.14%	0.15%	0.15%	0.15%
American International Group	0.17%	0.19%	0.15%	0.16%	0.13%	0.15%	0.16%	0.16%	0.10%	0.10%
Berkshire Hathaway Insurance Group	0.13%	0.09%	0.12%	0.12%	0.12%	0.06%	0.08%	0.08%	0.09%	0.12%
Zurich Insurance US PC Group	0.30%	0.25%	0.24%	0.14%	0.15%	0.09%	0.09%	0.10%	0.09%	0.03%
Charter Insurance Group	0.28%	0.27%	0.24%	0.26%	0.25%	0.25%	0.26%	0.22%	0.23%	0.15%
W. R. Berkley Insurance Group	0.23%	0.25%	0.29%	0.30%	0.26%	0.26%	0.28%	0.30%	0.32%	0.35%
AmTrust Group	0.11%	0.25%	0.18%	0.16%	0.16%	0.19%	0.23%	0.25%	0.25%	0.23%
Old Republic Insurance Group	0.08%	0.07%	0.09%	0.12%	0.12%	0.13%	0.15%	0.18%	0.18%	0.17%
Hanover Insurance Grp Prop & Cas Cos	0.21%	0.24%	0.25%	0.26%	0.15%	0.15%	0.16%	0.14%	0.15%	0.15%
CNA Insurance Companies	0.14%	0.14%	0.15%	0.23%	0.20%	0.19%	0.20%	0.19%	0.19%	0.10%
Arbella Insurance Group	0.11%	0.11%	0.11%	0.10%	0.11%	0.24%	0.23%	0.21%	0.23%	0.22%
Fairfax Financial (USA) Group	0.46%	0.40%	0.62%	0.62%	0.77%	0.97%	1.10%	0.97%	0.79%	0.43%
Utica National Insurance Group	0.27%	0.27%	0.26%	0.29%	0.30%	0.28%	0.30%	0.29%	0.27%	0.27%
MEMIC Group	0.18%	0.19%	0.19%	0.19%	0.22%	0.22%	0.23%	0.23%	0.24%	0.32%
Norfolk & Dedham Group Pool	0.63%	0.58%	0.60%	0.58%	0.61%	0.50%	0.54%	0.52%	0.50%	0.67%
Sentry Insurance Group	0.29%	0.25%	0.25%	0.25%	0.25%	0.25%	0.27%	0.26%	0.27%	0.28%
Selective Insurance Group	0.20%	0.22%	0.18%	0.19%	0.19%	0.18%	0.20%	0.19%	0.21%	0.16%
AmeriTrust Group	0.29%	0.12%	0.14%	0.16%	0.13%	0.12%	0.11%	0.12%	0.11%	0.11%
Starr International Group	0.12%	0.14%	0.13%	0.13%	0.11%	0.10%	0.14%	0.48%	0.32%	0.44%
Markel Corporation Group	0.47%	0.43%	0.42%	0.43%	0.39%	0.37%	0.36%	0.31%	0.31%	0.27%
Arrow Mutual Liability Insurance Company	0.31%	0.33%	0.31%	0.31%	0.41%	0.32%	0.31%	0.36%	0.35%	0.36%
American National Prop & Cas Companies	0.13%	0.14%	0.15%	0.13%	0.13%	0.15%	0.13%	0.14%	0.14%	0.15%
American Family Insurance Group	0.56%	0.54%	0.49%	0.48%	0.46%	0.46%	0.59%	0.63%	0.73%	0.69%
EMC Insurance Companies	0.79%	0.67%	0.69%	0.63%	0.58%	0.56%	0.52%	0.51%	0.44%	0.46%
Arch Insurance Group	0.22%	0.22%	0.15%	0.14%	0.11%	0.11%	0.11%	0.10%	0.09%	0.08%
Federated Mutual Group	0.23%	0.21%	0.20%	0.18%	0.18%	0.20%	0.19%	0.18%	0.21%	0.21%
Tokio Marine US PC Group	0.40%	0.41%	0.30%	0.25%	0.19%	0.17%	0.16%	0.17%	0.19%	0.22%
Great American P & C Insurance Grp	0.30%	0.29%	0.32%	0.32%	0.34%	0.41%	0.39%	0.40%	0.35%	0.39%
Electric Insurance Company	0.43%	0.44%	0.38%	0.38%	0.36%	0.35%	0.34%	0.32%	0.30%	0.35%

VII 000112

Investment Expense to Invested Assets Ratio

Companies	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
QBE North America Insurance Group	0.28%	0.29%	0.25%	0.33%	0.29%	0.29%	0.30%	0.32%	0.39%	0.37%
AXA U.S. Group	0.22%	0.24%	0.23%	0.25%	0.25%	0.25%	0.25%	0.25%	0.21%	0.15%
Protective Insurance Corporation Group	0.53%	0.51%	0.56%	0.62%	0.54%	0.46%	0.29%	0.27%	0.26%	0.22%
Employers Insurance Group	0.10%	0.10%	0.10%	0.10%	0.10%	0.11%	0.11%	0.12%	0.12%	0.11%
ProSight Specialty Group	0.12%	0.12%	0.14%	0.14%	0.14%	0.16%	0.13%	0.11%	0.27%	0.36%
Argo Group	0.51%	0.49%	0.39%	0.41%	0.42%	0.37%	0.36%	0.34%	0.27%	0.15%
HDI/Talanx US PC Group	0.10%	0.12%	0.14%	0.11%	0.12%	0.13%	0.09%	0.10%	0.10%	0.09%
Merchants Insurance Group	0.15%	0.12%	0.12%	0.14%	0.14%	0.13%	0.15%	0.16%	0.16%	0.17%
Sompo Holdings US Group	0.12%	0.12%	0.13%	0.17%	0.15%	0.17%	0.17%	0.17%	0.19%	0.14%
Central Insurance Companies	0.38%	0.28%	0.26%	0.27%	0.28%	0.29%	0.28%	0.28%	0.25%	0.27%
Nationwide Group	0.37%	0.35%	0.35%	0.25%	0.35%	0.37%	0.33%	0.41%	0.40%	0.37%
Everest Re U.S. Group	0.09%	0.11%	0.10%	0.09%	0.10%	0.11%	0.09%	0.07%	0.06%	0.05%
Work First Casualty Company	0.48%	0.54%	0.82%	0.42%	0.44%	0.53%	0.57%	0.65%	0.60%	0.53%
Church Mutual Insurance Group	0.27%	0.31%	0.32%	0.28%	0.29%	0.30%	0.33%	0.36%	0.36%	0.33%
OneBeacon Insurance Group	0.34%	0.19%	0.20%	0.21%	0.40%	0.42%	0.04%	0.17%	0.28%	0.18%
MS&AD US Insurance Group	0.35%	0.35%	0.41%	0.36%	0.36%	0.35%	0.35%	0.37%	0.35%	0.35%
Allianz of America Companies	0.08%	0.09%	0.09%	0.06%	0.07%	0.06%	0.06%	0.08%	0.09%	0.13%
Enstar Insurance Group	0.16%	0.17%	0.20%	0.13%	0.17%	0.22%	0.20%	0.22%	0.29%	0.18%
Farmers Insurance Group	0.18%	0.19%	0.13%	0.11%	0.12%	0.16%	0.15%	0.09%	0.08%	0.14%
AF Group	0.20%	0.12%	0.12%	0.15%	0.13%	0.12%	0.12%	0.16%	0.15%	0.32%
Amerisure Companies	0.14%	0.15%	0.15%	0.14%	0.16%	0.17%	0.19%	0.18%	0.33%	0.34%
Quincy Mutual Group	0.44%	0.91%	0.70%	0.39%	0.54%	0.43%	0.41%	0.40%	0.39%	0.39%
Pharmacists Mutual Insurance Group	0.52%	0.52%	0.45%	0.54%	0.66%	0.66%	0.61%	0.62%	0.63%	0.64%
HIIG Group	0.66%	0.39%	0.24%	0.17%	0.13%	0.19%	0.24%	0.16%	0.25%	0.28%
State Auto Insurance Companies	0.40%	0.40%	0.42%	0.49%	0.48%	0.49%	0.73%	0.74%	0.64%	0.68%
GuideOne Insurance Companies	0.69%	0.63%	0.56%	0.53%	0.53%	0.49%	0.55%	0.56%	0.58%	0.59%
IAT Insurance Group	0.42%	0.32%	0.34%	0.39%	0.34%	0.34%	0.34%	0.37%	0.35%	0.43%
Premier Group Insurance Company	0.26%	0.29%	0.29%	0.29%	0.32%	0.26%	0.31%	0.31%	0.29%	0.32%
The Cincinnati Insurance Companies	0.06%	0.06%	0.05%	0.07%	0.06%	0.07%	0.06%	0.06%	0.06%	0.06%
American Contractors Insurance Group	0.22%	0.27%	0.29%	0.33%	0.33%	0.33%	0.44%	0.41%	0.44%	0.43%
Brotherhood Mutual Insurance Company	0.77%	0.78%	0.83%	0.90%	0.98%	0.82%	0.86%	0.93%	0.81%	0.75%
James River Group	0.30%	0.31%	0.37%	0.41%	0.39%	0.36%	0.33%	0.29%	0.28%	0.37%
RLI Group	0.30%	0.31%	0.32%	0.32%	0.33%	0.32%	0.32%	0.22%	0.21%	0.19%

VII 000113

Investment Expense to Invested Assets Ratio

Companies	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Cherokee Insurance Company	0.07%	0.07%	0.07%	0.08%	0.09%	0.08%	0.11%	0.11%	0.08%	0.06%
Munich-American Holding Corp Companies	0.24%	0.25%	0.24%	0.24%	0.24%	0.17%	0.18%	0.19%	0.17%	0.22%
AMERISAFE Insurance Group	0.14%	0.14%	0.16%	0.16%	0.19%	0.20%	0.21%	0.24%	0.23%	0.26%
WCF Insurance Group	0.31%	0.31%	0.30%	0.27%	0.28%	0.26%	0.24%	0.31%	0.20%	0.16%
ICW Pool	0.50%	0.80%	0.65%	0.69%	0.30%	0.24%	0.37%	0.35%	0.21%	0.15%
State Farm Group	0.14%	0.15%	0.20%	0.28%	0.19%	0.24%	0.28%	0.27%	0.29%	0.31%
Benchmark Insurance Group	0.93%	0.55%	0.65%	0.77%	0.82%	0.76%	0.68%	0.43%	0.33%	0.57%
Samsung F & M Insurance Co, Ltd USB	0.33%	0.57%	0.18%	0.31%	0.25%	0.34%	0.39%	0.49%	0.19%	0.19%
ProAssurance Group	0.29%	0.29%	0.26%	0.26%	0.31%	0.27%	0.28%	0.25%	0.25%	0.28%
Petroleum Casualty Company	0.07%	0.08%	0.08%	0.09%	0.11%	0.10%	0.10%	0.11%	0.13%	0.20%
Penn National Insurance Companies	0.19%	0.18%	0.17%	0.18%	0.20%	0.21%	0.19%	0.18%	0.19%	0.21%
Gray Insurance Group	0.58%	0.53%	0.45%	0.46%	0.37%	0.11%	0.11%	0.10%	0.09%	0.07%

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Premium Weighted Investment Expense to Asset Ratio	0.22%	0.21%	0.21%	0.20%	0.20%	0.20%	0.20%	0.22%	0.22%	0.20%

Selected Ratio	0.21%
----------------	--------------

Notes:

Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies.

- Investment Expenses is the sum of Total Investment Expenses Incurred and Investment Tax, Licences & Fees and Aggregate Write Ins, from Exhibit of Net Investment Income.
- Total Cash and Invested Assets from Exhibit of Assets.
- Premium Weighted Investment Expense to Asset Ratio use Direct Premiums Written from page 2.
- Selected Ratio is equal to ten year average.

VII 000114

Direct Premiums Written for MA Workers' Compensation Group Companies

Companies	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Travelers Group	165,699	165,917	170,238	159,479	151,076	142,948	124,857	106,025	90,462	84,286
A.I.M. Mutual Insurance Companies	155,688	158,179	156,921	149,530	144,469	138,172	122,474	104,109	81,952	84,258
Hartford Insurance Group	116,964	115,136	106,794	100,625	95,680	93,792	92,384	86,307	77,079	78,197
Liberty Mutual Insurance Companies	106,490	100,744	93,621	96,358	93,316	108,341	109,499	105,520	108,375	112,336
Chubb INA Group	93,797	88,015	85,214	70,148	62,298	56,332	43,831	64,397	51,134	37,038
American International Group	93,630	84,054	91,871	106,329	105,983	99,753	192,817	155,996	144,199	129,955
Berkshire Hathaway Insurance Group	79,674	77,020	75,380	66,402	53,226	39,037	36,961	30,976	23,973	22,310
Zurich Insurance US PC Group	61,930	60,851	63,002	61,220	53,484	43,096	39,237	32,940	35,079	40,945
Charter Insurance Group	60,790	64,004	61,617	58,394	57,349	53,707	48,975	43,363	40,843	40,757
W. R. Berkley Insurance Group	42,470	46,425	41,191	35,083	33,183	30,140	33,958	27,722	21,486	18,539
AmTrust Group	32,669	36,819	40,042	36,955	30,874	28,174	23,387	21,076	10,242	9,533
Old Republic Insurance Group	25,785	26,755	21,483	19,474	21,366	20,020	13,221	9,924	7,652	5,756
Hanover Insurance Grp Prop & Cas Cos	21,394	20,360	17,429	16,309	12,945	12,871	12,258	11,761	8,325	7,987
CNA Insurance Companies	21,127	20,840	18,238	16,003	15,858	15,740	16,328	19,077	18,794	21,164
Arbella Insurance Group	14,367	15,091	14,935	13,905	13,389	13,312	10,894	10,856	10,852	12,900
Fairfax Financial (USA) Group	12,424	11,527	10,596	9,840	7,808	5,967	7,094	5,561	5,197	6,458
Utica National Insurance Group	11,778	10,704	9,921	9,731	9,239	8,962	7,759	7,410	6,246	5,880
MEMIC Group	11,239	9,658	8,147	6,500	6,470	6,535	6,472	6,273	4,998	4,411
Norfolk & Dedham Group Pool	8,552	8,692	8,848	7,859	7,323	7,235	7,207	6,888	6,795	6,772
Sentry Insurance Group	8,263	7,293	7,197	5,974	7,166	7,496	7,191	6,979	5,731	7,039
Selective Insurance Group	8,189	7,060	6,254	5,646	5,225	4,938	5,061	3,777	3,080	2,500
AmeriTrust Group	7,717	9,674	12,187	9,267	9,227	12,037	12,170	7,452	5,639	6,555
Starr International Group	7,458	4,833	4,455	4,196	2,914	1,759	102	0	0	0
Markel Corporation Group	7,294	5,507	1,455	1,319	1,314	1,074	1,734	2,126	2,588	2,523
Arrow Mutual Liability Insurance Company	6,671	5,757	5,180	5,589	5,414	5,419	4,588	4,999	2,949	3,662
American National Prop & Cas Companies	6,612	6,545	6,400	6,034	5,677	5,296	5,299	5,384	4,901	4,838
American Family Insurance Group	6,426	6,652	7,607	6,649	5,855	5,874	5,970	5,614	5,310	5,229
EMC Insurance Companies	6,326	4,285	4,012	3,246	1,095	593	495	237	267	191
Arch Insurance Group	6,148	5,889	6,417	4,136	5,364	5,021	4,588	2,717	2,428	1,675
Federated Mutual Group	6,117	5,898	5,082	3,335	3,071	2,381	2,182	2,125	1,594	1,806
Tokio Marine US PC Group	5,089	4,708	4,273	3,783	2,686	2,518	2,395	1,950	1,940	1,890

VII 000115

Direct Premiums Written for MA Workers' Compensation Group Companies

Companies	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Great American P & C Insurance Grp	4,819	5,786	4,303	3,896	3,493	2,674	3,247	3,825	4,319	3,957
Electric Insurance Company	4,451	3,278	4,408	4,164	3,850	4,097	4,240	4,131	5,450	3,812
QBE North America Insurance Group	4,218	6,333	5,862	3,483	2,990	2,924	1,987	1,445	861	282
AXA U.S. Group	3,765	4,457	3,265	1,356	1,304	2,650	1,178	1,520	903	1,126
Protective Insurance Corporation Group	3,499	3,560	2,387	2,337	2,074	1,341	1,493	1,266	706	508
Employers Insurance Group	3,125	1,583	110	0	0	0	0	0	0	0
ProSight Specialty Group	2,976	2,056	1,681	1,047	730	387	171	63	0	0
Argo Group	2,766	2,854	2,870	2,732	3,120	3,328	3,107	5,286	7,969	5,869
HDI/Talanx US PC Group	2,716	5,579	8,710	6,821	5,300	4,242	2,161	1,099	0	0
Merchants Insurance Group	2,603	2,602	2,345	2,058	1,946	1,560	1,460	1,248	1,137	1,207
Sompo Holdings US Group	2,301	1,406	899	585	579	415	578	555	375	389
Central Insurance Companies	2,116	1,914	2,029	2,334	2,006	1,819	2,009	2,630	4,015	5,583
Nationwide Group	2,072	2,462	2,506	3,402	3,282	3,222	2,304	2,138	2,480	2,883
Everest Re U.S. Group	1,727	1,759	616	489	799	709	422	345	218	241
Work First Casualty Company	1,414	900	0	0	0	0	0	0	0	0
Church Mutual Insurance Group	1,363	1,287	1,175	1,006	925	919	806	660	703	724
OneBeacon Insurance Group	1,298	1,306	1,352	1,515	1,632	1,903	226	0	0	4
MS&AD US Insurance Group	1,284	1,315	2,075	1,706	1,628	1,999	1,860	1,157	981	855
Allianz of America Companies	1,065	1,034	581	397	457	446	1,210	1,623	1,411	1,520
Enstar Insurance Group	997	641	0	0	0	0	-66	0	0	-1
Farmers Insurance Group	987	2,205	2,660	2,671	3,310	1,187	41	32	22	29
AF Group	980	421	361	179	111	139	161	132	108	96
Amerisure Companies	804	708	777	1,059	550	306	494	245	88	22
Quincy Mutual Group	690	731	735	785	770	810	765	756	708	595
Pharmacists Mutual Insurance Group	650	573	536	342	409	364	570	549	509	644
HIIG Group	634	195	34	41	62	11	3	41	57	0
State Auto Insurance Companies	612	663	623	505	321	198	195	32	-9	0
GuideOne Insurance Companies	477	557	509	316	59	49	51	58	47	43
IAT Insurance Group	430	414	496	345	335	479	470	356	379	596
Premier Group Insurance Company	367	382	347	322	317	384	341	358	363	340
The Cincinnati Insurance Companies	367	252	227	294	313	279	271	170	180	201

VII 000116

Direct Premiums Written for MA Workers' Compensation Group Companies

Companies	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
American Contractors Insurance Group	187	80	47	3	-10	-12	63	30	26	-14
Brotherhood Mutual Insurance Company	139	66	36	5	0	0	0	0	0	0
James River Group	126	4	0	0	0	0	0	0	0	0
RLI Group	114	111	88	62	45	19	0	0	0	0
Cherokee Insurance Company	109	118	117	99	81	79	91	81	77	104
Munich-American Holding Corp Companies	92	679	134	72	698	1,636	1,151	127	77	-86
AMERISAFE Insurance Group	60	103	125	45	50	111	91	53	70	9
WCF Insurance Group	55	65	30	25	18	18	23	88	65	11
ICW Pool	44	329	490	65	2	0	0	0	0	0
State Farm Group	35	35	24	50	19	30	43	41	37	41
Benchmark Insurance Group	26	92	31	0	0	0	0	0	0	0
Samsung F & M Insurance Co, Ltd USB	16	36	31	42	17	14	0	0	0	0
ProAssurance Group	12	0	0	0	0	0	0	0	0	0
Petroleum Casualty Company	6	4	-24	21	3	3	-8	5	64	28
Penn National Insurance Companies	2	3	1	6	3	2	1	7	3	0
Gray Insurance Group	1	0	0	0	0	0	0	0	0	0

Notes:

Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies.

VII 000117

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
1985	4.72	26.33

Calculation of Common Stock Total Return Tax Rate

Year (1)	Income Returns (2)	Capital Appreciation Returns (3)
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
2017	2.21	19.42
2018	2.01	-6.24
Average	3.96	7.69

	Dividend	Capital Gains
(4) Weights	33.98%	66.02%
(5) Tax Rate	13.13%	15.80%
(6) Common Stock Tax Rate		14.89%

Notes:

Source: 2019 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 = $0.5 \times 0.21 + 0.5 \times 0.21 \times 0.25$

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	7.15%
(3) Marginal Tax Rate	21.00%
(4) Annual Expected Capital Gains Rate	7.69%

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	1,076,854.84	387,667.74	27,667.74	5,810.23	5,612.90
1	640,000.00	689,187.10	742,154.46	267,175.61	36,775.61	7,722.88	6,962.45
2	409,600.00	474,978.85	511,483.28	184,133.98	36,677.98	7,702.38	6,480.32
3	262,144.00	327,349.30	352,507.68	126,902.76	32,530.92	6,831.49	5,363.84
4	167,772.16	225,604.91	242,943.74	87,459.75	27,061.77	5,682.97	4,164.13
5	107,374.18	155,483.99	167,433.69	60,276.13	21,621.42	4,540.50	3,104.86
6	68,719.48	107,157.56	115,393.14	41,541.53	16,802.52	3,528.53	2,251.75
7	43,980.47	73,851.61	79,527.46	28,629.89	12,796.92	2,687.35	1,600.44
8	28,147.50	50,897.58	54,809.30	19,731.35	9,598.25	2,015.63	1,120.25
9	18,014.40	35,077.95	37,773.86	13,598.59	7,113.41	1,493.82	774.80
10	11,529.22	24,175.27	26,033.26	9,371.97	5,221.46	1,096.51	530.75
11	7,378.70	16,661.29	17,941.79	6,459.04	3,802.71	798.57	360.73
12	4,722.37	11,482.74	12,365.25	4,451.49	2,751.44	577.80	243.58
13	3,022.31	7,913.76	8,521.97	3,067.91	1,979.88	415.77	163.57
14	1,934.28	5,454.06	5,873.23	2,114.36	1,418.02	297.78	109.33
15	1,237.94	3,758.87	4,047.76	1,457.19	1,011.53	212.42	72.78
16	792.28	2,590.56	2,789.66	1,004.28	719.06	151.00	48.28
17	507.06	1,785.38	1,922.60	692.14	509.59	107.01	31.93
18	324.52	1,230.46	1,325.03	477.01	360.18	75.64	21.06
19	207.69	848.02	913.19	328.75	253.98	53.34	13.86
20	132.92	584.44	629.36	629.36	496.44	104.25	25.28
Total					247,170.83	51,905.87	39,056.92

(13) Implied Tax Rate on Capital Gains 15.80%

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

VII 000120

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	12.39%	11.45%	10.64%	9.96%	9.37%	8.87%	8.43%	8.06%	7.73%	7.44%	7.19%	6.97%
	0.15	13.37%	12.53%	11.80%	11.17%	10.61%	10.12%	9.69%	9.31%	8.97%	8.66%	8.39%	8.15%
	0.20	14.28%	13.55%	12.91%	12.33%	11.82%	11.36%	10.94%	10.56%	10.22%	9.92%	9.63%	9.38%
	0.25	15.04%	14.42%	13.85%	13.34%	12.88%	12.45%	12.06%	11.71%	11.38%	11.08%	10.80%	10.54%
	0.30	15.64%	15.11%	14.62%	14.17%	13.76%	13.37%	13.01%	12.68%	12.37%	12.08%	11.82%	11.56%
	0.35	16.11%	15.65%	15.23%	14.83%	14.46%	14.12%	13.80%	13.49%	13.21%	12.94%	12.68%	12.44%
	0.40	16.47%	16.08%	15.71%	15.36%	15.04%	14.73%	14.44%	14.16%	13.90%	13.65%	13.42%	13.19%
	0.45	16.76%	16.42%	16.10%	15.79%	15.50%	15.23%	14.97%	14.72%	14.48%	14.26%	14.04%	13.83%
	0.50	16.99%	16.70%	16.42%	16.15%	15.89%	15.65%	15.42%	15.19%	14.98%	14.77%	14.58%	14.39%
	0.55	17.18%	16.92%	16.68%	16.44%	16.22%	16.00%	15.79%	15.59%	15.40%	15.22%	15.04%	14.87%
	0.60	17.34%	17.12%	16.90%	16.70%	16.50%	16.31%	16.12%	15.94%	15.77%	15.60%	15.44%	15.29%
	0.65	17.48%	17.28%	17.09%	16.91%	16.74%	16.57%	16.40%	16.25%	16.09%	15.94%	15.80%	15.66%
	0.70	17.59%	17.42%	17.26%	17.10%	16.95%	16.80%	16.65%	16.51%	16.38%	16.24%	16.11%	15.99%

VII 000121

MASSACHUSETTS WORKERS' COMPENSATION

VOLUME II: INDEX 7/1/20

	Page
Section VIII	F-Class Recommendation
A. Summary	VIII 001
B. Adjusted Premium.....	VIII 011
C. Adjusted Losses.....	VIII 012
D. Proposed Rates	VIII 016
E. Conversion/Excess Loss Factors	VIII 017
F. Proposed Pure Premium Relativities	VIII 020
G. Class Relativities.....	VIII 025
H. Proposed Rates	VIII 032
I. Pricing Example	VIII 036
J. U.S.L. & H.W. Coverage Percentage	VIII 045
K. Federal Tax Multiplier	VIII 046
Section IX	Classification Pricing
A. Summary	IX 001
B. Conversion/Excess Loss Factors.....	IX 023
C. Losses by Injury Type	IX 032
D. Credibility/Countrywide Data.....	IX 044
E. Pure Premium Factors	IX 052
F. Calculation of Underlying Pure Premiums	IX 053
G. Class Relativities (A-Sheets).....	IX 065
H. Industry Group Rate Change and Rate Level Factors.....	IX 262
I. Calculation of Average Uncapped Rates	IX 264
J. Average Rates and Proposed Premium Change.....	IX 274
K. Adjustments to Derive Final Manual Rates.....	IX 284
L. Pricing Example	IX 292
Section X	Experience Rating
A. Summary and Expected Loss Rates.....	X 001
B. Calculation of "D" Ratios	X 023
C. Expected Loss Rates for F-Class.....	X 026
D. State Reference Point	X 029
E. Manual Pages	X 030

Section XI		Miscellaneous Rating Values	
A.	Summary		XI 001
B.	Massachusetts Benefits Deductible Program		XI 002
C.	Massachusetts Benefits Claim and Aggregate Deductible Program Credits		XI 005
Section XII		Retrospective Rating Plans	
A.	Summary, Manual Pages, and Expenses		XII 001
B.	Calculation of the Provision for the Residual Market Subsidy		XII 007
C.	Expense Ratios		XII 008
D.	NCCI's Item R-1413		XII 012
E.	State Hazard Group Relativities		XII 013
F.	Excess Loss Factors		XII 014
Section XIII		Data	

INDEX
07/01/20

VIII 000001

F-CLASS RATE RECOMMENDATION

Background and Summary

The United States Longshore and Harbor Workers Compensation (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 7.0% for the policy period beginning July 1, 2020.

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

VIII 000002

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 12% 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.

VIII 000003

Calculation of Adjusted Standard Earned Premium

To derive an indicated loss ratio, the premiums for policy years 2013-2017 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 2013-2017 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

VIII 000004

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

VIII 000005

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 18.7% 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.

VIII 000006

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

VIII 000007

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 7/1/2018 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.

VIII 000008

Section VIII – Rate Recommendation
Subsection A – F-Class Rate Recommendation
7/1/2020

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 1.065. The calculation is shown in Section VIII-K.

VIII 000009

Section VIII - F-Class Recommendation
Subsection A - Indicated Rate Change
7/1/2020

Section VIII-A
Exhibit 1

F-Class Rate Review Overall Indicated Rate Change

(1)	5-Year Adjusted Standard Plus ARAP Earned Premium	7,685,005
(2)	5-Year Adjusted Losses, LAE, and LBA	3,824,290
(3)	5-Year Adjusted Loss, LAE, and LBA Ratio = (2) / (1)	49.8%
(4)	Fixed Expense Ratio	5.0%
(5)	Indicated Policy Year 7/1/2020 Loss, LAE, Fixed Expense Ratio = (3) + (4)	54.8%
(6)	Variable Expense Ratio	19.7%
(7)	Profit and Contingencies	1.7%
(8)	Permissible Loss, LAE, LBA, and Fixed Expense Ratio = 1.000 - [(6) + (7)]	78.6%
(9)	Indicated Average Rate Change = [(5) / (8)] - 1.000	-30.2%
(10)	Rate Changed based on Trended On-Level Expected Loss Ratio	-1.1%
(11)	5-Year Total Claim Count	162
(12)	Credibility of the Indicated Average Rate Change = [(11) / 4,000] ^{0.5}	20.1%
(13)	Credibility Weighted Average Rate Change = [(9) x (12)] + { (10) x [100% - (12)] }	-7.0%

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.

VIII 000010

Section VIII - F-Class Recommendation
 Subsection A - Indicated Rate Change
 7/1/2020

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		76.6%
(2)	Loss Adjustment Expense Ratio from Prior Revision		0.185
(3)	Special Fund Assessment Rate as a % of Federal Indemnity Losses from Prior Revision		11.9%
		<u>Indemnity</u>	<u>Medical</u>
(4)	Federal Indemnity/Medical Losses as % of Total Federal Losses	57.6%	42.4%
(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	1.009	1.000
(7)	Net Indemnity/Medical Trend	-2.7%	-3.3%
(8)	Years since Prior Revision	2.0	2.0
(9)	Trended On-Level Loss Ratio	33.6%	24.2%
	= (4) x (5) x (6) x [1.000 + (7)] ^ (8)		
(10)	Special Fund Assessment Rate as a % of Federal Indemnity Losses		12.0%
(11)	Loss Adjustment Expense Factor		1.187
(12)	Trended Loss, LAE and LBA Ratio		72.6%
	= [(9) for indemnity x (10)] + [(9) Total x (11)]		
(13)	Fixed Expense Ratio		5.0%
(14)	Trended Loss, LAE and Fixed Expense Ratio		77.7%
	= (12) + (13)		
(15)	Variable Expense Ratio		19.7%
(16)	Underwriting Profit Provision		1.7%
(17)	Permissible Loss, LAE, LBA, and Fixed Expense Ratio		78.6%
	= 1.000 - [(15) + (16)]		
(18)	Rate Changed based on Trended On-Level Expected Loss Ratio from Prior Revision		-1.1%
	= [(14) / (17)] - 1.000		

Notes:

- (1): Section VI-J, Exhibit 1 of 07/01/2018 Stipulation.
 (2), (3), (4): Section VIII-J, Exhibit 1 of 07/01/2018 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.

VIII 000011

Section VIII - F-Class Recommendation
Subsection B - Adjusted Premium
7/1/2020

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)
2013	1,414,597	1.000	0.997	1.051	1,482,281
2014	1,309,738	1.000	0.997	1.051	1,372,005
2015	1,644,170	1.000	0.997	1.051	1,722,116
2016	1,580,814	0.999	0.997	1.051	1,655,451
2017	1,387,870	0.999	0.997	1.051	1,453,153
Total	7,337,188				7,685,005

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 07/01/2018 Stipulation.

(5): The offset for ARAP from the 07/01/2018 Stipulation.

(6) = (2) x (3) x (4) x (5)

VIII 000012

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2020

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				
	2013	2014	2015	2016	2017
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	143,946	442,086	203,890	112,273	7,003
Temporary Total	154,123	62,061	99,040	31,076	62,632
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	226,668	169,359	113,136	67,193	36,613
Temporary Total	75,956	94,556	126,899	63,066	86,733
Medical Only	17,342	29,814	21,360	28,610	14,838

(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				
	2013	2014	2015	2016	2017
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	209,866	623,674	370,079	202,445	21,122
Temporary Total	231,476	93,332	170,674	57,477	168,806
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	329,098	263,199	220,870	113,145	63,348
Temporary Total	120,304	136,632	206,042	100,140	153,141
Medical Only	18,713	36,106	27,206	39,574	22,105

Note:

(B): Section VIII-G.

VIII 000013

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2020

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	0.799
Permanent Total	0.744
Permanent Partial	1.041
Temporary Total	1.051
Medical	
Fatal	1.000
Permanent Total	0.749
Permanent Partial	1.047
Temporary Total	1.057
Medical Only	1.000

(D). Adjusted Losses

Indemnity	Policy Year				
	2013	2014	2015	2016	2017
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	201,656	599,276	355,602	194,526	20,296
Temporary Total	220,278	88,818	162,417	54,697	160,641
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	314,253	251,327	210,907	108,041	60,490
Temporary Total	113,771	129,212	194,853	94,702	144,824
Medical Only	18,713	36,106	27,206	39,574	22,105
Adjusted Losses, LAE, LBA	3,824,290				

Notes:

(C): Section IX-B, Exhibit 4.

(D) = (B) / (C)

VIII 000014

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2020

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				
	2013	2014	2015	2016	2017
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				
	2013	2014	2015	2016	2017
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
 7/1/2020

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	0.799
Permanent Total	0.744
Permanent Partial	1.041
Temporary Total	1.051
Medical	
Fatal	1.000
Permanent Total	0.749
Permanent Partial	1.047
Temporary Total	1.057
Medical Only	1.000

(D). Adjusted Losses

Indemnity	Policy Year				
	2013	2014	2015	2016	2017
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
7/1/2020

Section VIII-D
Exhibit 1

Proposed Rates and Rating Values to be Effective 7/1/2020

Class Code (1)	Manual Rate (2)	Minimum Premium (3)	Loss Constant (4)	Expected Loss Rate (5)	D-Ratio (6)
6801	6.99	495	0	2.94	0.15
6824	10.63	500	0	4.12	0.17
6826	5.93	458	0	2.50	0.16
6843	10.38	500	0	3.66	0.16
6872	14.54	500	0	5.13	0.16
6874	15.89	500	0	5.60	0.15
7309	10.86	500	0	3.83	0.16
7313	13.17	500	0	4.64	0.13
7317	17.13	500	0	6.04	0.16
7327	24.55	500	0	8.65	0.16
7350	20.28	500	0	7.85	0.14
8709	5.09	337	0	1.80	0.16
8726	4.39	313	0	1.85	0.18
9077	5.59	355	0	2.50	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
 7/1/2020

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				
	2013	2014	2015	2016	2017
Fatal	1.036	1.032	1.028	1.024	1.019
Permanent Total	1.029	1.026	1.022	1.019	1.015
Permanent Partial	1.013	1.012	1.010	1.009	1.008
Temporary Total	1.029	1.026	1.022	1.019	1.015
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				
	2013	2014	2015	2016	2017
Likely	1.096	1.141	1.329	1.528	2.480
Not Likely	1.034	1.045	1.095	1.241	1.785
Medical					
Likely	1.192	1.237	1.288	1.435	1.703
Not Likely	1.025	1.020	1.044	1.071	1.136

(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				
	2013	2014	2015	2016	2017
All Injury Types	0.856	0.810	0.883	0.901	0.907
Medical					
Lost Time Medical	0.851	0.796	0.874	0.908	0.897
Medical Only	0.702	0.775	0.813	0.855	0.830

(D). Primary Conversion Factors (PCF)

Indemnity	Policy Year				
	2013	2014	2015	2016	2017
Fatal - LD	0.972	0.955	1.207	1.411	2.293
Fatal - NLD	0.917	0.874	0.995	1.146	1.650
Permanent Total	0.965	0.948	1.200	1.404	2.284
Permanent Partial - LD	0.950	0.936	1.186	1.390	2.267
Permanent Partial - NLD	0.897	0.857	0.977	1.129	1.631
Temporary Total - LD	0.965	0.948	1.200	1.404	2.284
Temporary Total - NLD	0.911	0.869	0.989	1.140	1.644
Medical					
Lost Time Medical -LD	1.014	0.985	1.126	1.303	1.528
Lost Time Medical -NLD	0.872	0.812	0.913	0.972	1.019
Medical - NLD	0.720	0.790	0.849	0.915	0.942

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

Section VIII - F-Class Recommendation
 Subsection E - Conversion/Excess Loss Factors
 7/1/2020

Section VIII-E
 Exhibit 1
 Page 2

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	1.187	1.187

(B). Loss Based Assessments (Special Fund Assessment)

	Indemnity	Medical
Loss Based Assessments	0.120	0.000

(C). Investment Income Offset Factor

The following factor is applied to adjust for investment income.

	Investment Income Offset Factor
Indemnity	
Fatal	0.799
Permanent Total	0.744
Permanent Partial	1.041
Temporary Total	1.051
Medical	
Fatal	1.000
Permanent Total	0.749
Permanent Partial	1.047
Temporary Total	1.057
Medical Only	1.000

(D). Secondary Conversion Factors (SCF)

Indemnity	
Fatal	1.045
Permanent Total	0.973
Permanent Partial	1.360
Temporary Total	1.374
Medical	
Fatal	1.187
Permanent Total	0.889
Permanent Partial	1.243
Temporary Total	1.255
Medical Only	1.187

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
 7/1/2020

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				
	2013	2014	2015	2016	2017
Indemnity					
Fatal - LD	0.925	0.886	1.010	1.173	1.756
Fatal - NLD	0.921	0.885	1.003	1.145	1.543
Permanent Total	0.926	0.888	1.018	1.181	1.766
Permanent Partial - LD	0.953	0.912	1.041	1.203	1.791
Permanent Partial - NLD	0.949	0.911	1.033	1.174	1.574
Temporary Total - LD	0.909	0.873	1.004	1.167	1.749
Temporary Total - NLD	0.905	0.873	0.996	1.139	1.536
Medical					
Lost Time Medical - LD	0.800	0.744	0.822	0.886	0.935
Lost Time Medical - NLD	0.843	0.785	0.865	0.900	0.911
Medical - NLD	0.695	0.763	0.805	0.847	0.843

(B). Secondary State Conversion Factors

Indemnity	
Fatal	0.949
Permanent Total	0.883
Permanent Partial	1.235
Temporary Total	1.247
Medical	
Fatal	1.187
Permanent Total	0.889
Permanent Partial	1.243
Temporary Total	1.255
Medical Only	1.187

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)	
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	129,075	0	197,694	326,769
	5	0	154,123	0	75,956	230,079	0	140,376	0	66,247	206,623
	6	0	0	0	17,342	17,342	0	0	0	12,482	12,482
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	442,086	0	169,359	611,445	0	378,805	0	137,580	516,385
	5	23,610	38,451	16,251	78,305	156,617	22,393	33,401	16,010	63,612	135,416
	6	0	0	0	29,814	29,814	0	0	0	23,563	23,563
2015	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	60,230	143,660	14,627	98,509	317,026	71,444	140,403	16,470	89,910	318,227
	5	22,912	76,128	14,400	112,499	225,939	27,496	75,274	16,215	102,679	221,664
	6	0	0	0	21,360	21,360	0	0	0	18,133	18,133
2016	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	0	112,273	0	67,193	179,466	0	126,768	0	65,328	192,096
	5	0	31,076	0	63,066	94,142	0	35,430	0	61,316	96,746
	6	0	0	0	28,610	28,610	0	0	0	26,190	26,190
2017	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	2,500	4,503	2,500	34,113	43,616	5,667	7,347	3,821	34,777	51,612
	5	0	62,632	0	86,733	149,365	0	102,963	0	88,421	191,384
	6	0	0	0	14,838	14,838	0	0	0	13,983	13,983
All Years, All Injury		109,252	1,208,878	47,778	1,124,365	2,490,273	127,000	1,169,842	52,516	1,001,915	2,351,273

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	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)	
2013	1	0	0	0	0	0	0	0	0	0	0	172,600
	2	0	0	0	0	0	0	0	0	0		
	9	0	25,193	0	67,012	92,205	0	209,866	0	329,098	538,964	
	5	0	28,138	0	29,586	57,724	0	231,476	0	120,304	351,780	
	6	0	0	0	3,281	3,281	0	0	0	18,713	18,713	
2014	1	0	0	0	0	0	0	0	0	0	0	166,923
	2	0	0	0	0	0	0	0	0	0		
	9	0	79,645	0	74,121	153,766	0	623,674	0	263,199	886,873	
	5	3,894	8,257	5,647	23,571	41,369	36,110	57,223	27,187	109,445	229,965	
	6	0	0	0	6,850	6,850	0	0	0	36,106	36,106	
2015	1	0	0	0	0	0	0	0	0	0	0	196,085
	2	0	0	0	0	0	0	0	0	0		
	9	12,425	47,766	9,417	61,857	131,465	114,095	255,985	32,184	188,685	590,949	
	5	6,605	14,874	11,136	34,101	66,716	46,843	123,831	34,335	171,707	376,716	
	6	0	0	0	4,783	4,783	0	0	0	27,206	27,206	
2016	1	0	0	0	0	0	0	0	0	0	0	193,244
	2	0	0	0	0	0	0	0	0	0		
	9	0	22,046	0	25,678	47,724	0	202,445	0	113,145	315,590	
	5	0	6,414	0	18,455	24,869	0	57,477	0	100,140	157,617	
	6	0	0	0	7,145	7,145	0	0	0	39,574	39,574	
2017	1	0	0	0	0	0	0	0	0	0	0	171,754
	2	0	0	0	0	0	0	0	0	0		
	9	986	1,527	1,372	10,984	14,869	9,050	12,072	6,455	56,892	84,469	
	5	0	19,928	0	33,570	53,498	0	168,806	0	153,141	321,947	
	6	0	0	0	4,636	4,636	0	0	0	22,105	22,105	
(14) All Years and Injury Types		23,910	253,788	27,572	405,630	710,900	206,098	1,942,855	100,161	1,749,460	3,998,574	900,606
(15) Pure Premium							0.229	2.157	0.111	1.943	4.440	

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					
	2013	2014	2015	2016	2017	Total		2013	2014	2015	2016	2017	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	0	0	0	0	0	0	6.25	0	0	0	0	0	0
6824	49,827	51,022	52,497	45,902	36,701	235,949	9.70	483,322	494,913	509,221	445,249	356,000	2,288,705
6826	612	100	0	19,475	0	20,187	7.47	4,572	747	0	145,478	0	150,797
6843	6,561	100	18,335	6,497	7,410	38,903	12.46	81,750	1,246	228,454	80,953	92,329	484,731
6872	7,712	7,107	7,445	8,885	11,081	42,230	16.38	126,323	116,413	121,949	145,536	181,507	691,727
6874	383	94	10	10	0	497	15.00	5,745	1,410	150	150	0	7,455
7309	13,835	7,342	12,589	13,523	11,782	59,071	14.69	203,236	107,854	184,932	198,653	173,078	867,753
7313	0	0	0	0	0	0	15.48	0	0	0	0	0	0
7317	1,559	5,260	4,441	4,059	3,162	18,481	15.31	23,868	80,531	67,992	62,143	48,410	282,944
7327	113	126	88	157	91	575	27.64	3,123	3,483	2,432	4,339	2,515	15,893
7350	0	0	0	0	0	0	18.12	0	0	0	0	0	0
8709	3,682	1,820	1,581	0	0	7,083	4.92	18,115	8,954	7,779	0	0	34,848
8726	88,316	93,952	99,099	94,736	101,527	477,630	5.26	464,542	494,188	521,261	498,311	534,032	2,512,334
9077	0	0	0	0	0	0	5.00	0	0	0	0	0	0
Total	172,600	166,923	196,085	193,244	171,754	900,606		1,414,597	1,309,738	1,644,170	1,580,814	1,387,870	7,337,188

Notes:
 (2) - (7): Unit Statistical Plan data.
 (8): Section VIII-D, Exhibit 1 of the 7/1/2018 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	8.848	2.846	0.607	0.766	0.996	1.000	1.009	0.946	3.908
	Medical	8.848	1.841	0.393	0.766	0.996	1.000	1.000	0.935	2.478
	Total		4.687							

Notes:

- (3): Section VIII-H, Exhibit 1 of the 7/1/2018 Stipulation.
- (4): Section VIII-G of the 7/1/2018 Stipulation.
- (6): Section VI-J, Exhibit 1 of the 7/1/2018 Stipulation.
- (7): Change in load from Section VIII-K, Exhibit 1 and the 7/1/2018 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.

VIII 000023

VIII 000024

Section VIII - F-Class Recommendation
 Subsection F - Proposed Pure Premium Relativities
 7/1/2020

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	0.657	0.766	2.567	1.898	4.466
6824	1.148	1.201	4.488	2.975	7.463
6826	0.986	0.769	3.852	1.905	5.758
6843	1.695	1.205	6.624	2.985	9.609
6872	1.944	2.023	7.595	5.013	12.609
6874	2.128	1.312	8.318	3.250	11.568
7309	1.181	0.934	4.614	2.315	6.929
7313	2.596	0.738	10.147	1.829	11.976
7317	2.878	2.050	11.248	5.081	16.329
7327	3.560	2.979	13.912	7.381	21.293
7350	3.426	1.993	13.389	4.938	18.327
8709	0.607	0.571	2.373	1.414	3.787
8726	0.577	0.722	2.255	1.790	4.045
9077	0.891	1.927	3.483	4.776	8.259

Notes:

(2), (3): Section VIII-H, Exhibit 2 of the 07/01/2018 Stipulation.

(4), (5) = (2),(3) x Pure Premium Underlying Present Rate Factors from Exhibit 2.

VIII 000025

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2020

Section VIII - G
 Exhibit 1

Calculation of Class Relativities

Class(es): 6801 BOAT BUILDING - WOOD - NOC & DRIVERS: US ACT									Effective: 7/1/2020			Federal Class Codes		
Converted Unlimited Losses														
Amount														
Claim Count				Indemnity		Medical		Total	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)			
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			
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000			
2017	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:	9.898	1.018	10.916
(16) Countrywide Indicated Relativity:	5.044	0.700	.
(17) Countrywide Credibility:	0.140	0.140	.
(18) Countrywide Lost-Time Claims:	8.000	.	.
(19) Pure Premium Underlying Present Rate:	2.567	1.898	4.466
(20) Relativity to Underlying Present Rate:	0.700	0.788	.
(21) Credibility to Underlying Relativity:	0.860	0.860	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	1.308	0.776	.
(24) Balanced Formula Relativity:	1.224	0.733	0.997

Class(es): 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT									Effective: 7/1/2020			Federal Class Codes		
Converted Unlimited Losses														
Amount														
Claim Count				Indemnity		Medical		Total	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)			
2013	49.827	0	7	0	289.077	0	276.937	566.014	5.802	5.558	11.360			
2014	51.022	0	7	0	500.031	0	232.788	732.820	9.800	4.563	14.363			
2015	52.497	0	6	0	60.373	0	73.333	133.706	1.150	1.397	2.547			
2016	45.902	0	5	0	4.260	0	24.204	28.464	0.093	0.527	0.620			
2017	36.701	0	7	0	110.718	0	172.715	283.433	3.017	4.706	7.723			
MA Total:	235.949	0	32	0	964.459	0	779.977	1,744.436	4.088	3.306	7.393			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.713	1.610	.
(14) Massachusetts Credibility:	0.270	0.420	.
(15) Countrywide Pure Premium:	2.746	2.852	5.598
(16) Countrywide Indicated Relativity:	1.399	1.961	.
(17) Countrywide Credibility:	0.340	0.290	.
(18) Countrywide Lost-Time Claims:	75.000	.	.
(19) Pure Premium Underlying Present Rate:	4.488	2.975	7.463
(20) Relativity to Underlying Present Rate:	1.224	1.235	.
(21) Credibility to Underlying Relativity:	0.390	0.290	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	1.416	1.603	.
(24) Balanced Formula Relativity:	1.325	1.515	1.413

VIII 000026

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2020

Section VIII - G
 Exhibit 2

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
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
2016	19,475	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	20,187	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:	0.100	0.130	.
(15) Countrywide Pure Premium:	2.014	1.382	3.396
(16) Countrywide Indicated Relativity:	1.026	0.951	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	19.000	.	.
(19) Pure Premium Underlying Present Rate:	3.852	1.905	5.758
(20) Relativity to Underlying Present Rate:	1.051	0.791	.
(21) Credibility to Underlying Relativity:	0.710	0.670	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	0.941	0.720	.
(24) Balanced Formula Relativity:	0.881	0.680	0.788

Class(es):		Effective: 7/1/2020							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)
2013	6,561	0	3	0	5,138	0	4,507	9,645	0.783	0.687	1.470
2014	100	0	9	0	41,955	0	16,756	58,711	419.55	167.56	587.11
2015	18,335	1	3	17,986	5,387	31,955	2,762	58,090	1.275	1.893	3.168
2016	6,497	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	7,410	0	3	0	0	0	906	906	0.000	0.122	0.122
MA Total:	38,903	1	18	17,986	52,480	31,955	24,931	127,352	1.811	1.462	3.274

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.759	0.712	.
(14) Massachusetts Credibility:	0.160	0.210	.
(15) Countrywide Pure Premium:	3.925	1.976	5.902
(16) Countrywide Indicated Relativity:	2.000	1.359	.
(17) Countrywide Credibility:	0.420	0.400	.
(18) Countrywide Lost-Time Claims:	152.00	.	.
(19) Pure Premium Underlying Present Rate:	6.624	2.985	9.609
(20) Relativity to Underlying Present Rate:	1.807	1.239	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	1.721	1.176	.
(24) Balanced Formula Relativity:	1.610	1.112	1.380

VIII 000027

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2020

Section VIII - G
 Exhibit 3

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	7,712	0	1	0	0	0	174	174	0.000	0.023	0.023
2014	7,107	0	4	0	11,543	0	19,549	31,091	1.624	2.751	4.375
2015	7,445	0	1	0	0	0	282	282	0.000	0.038	0.038
2016	8,885	0	1	0	782	0	998	1,780	0.088	0.112	0.200
2017	11,081	0	3	0	0	0	4,679	4,679	0.000	0.422	0.422
MA Total:	42,230	0	10	0	12,325	0	25,682	38,006	0.292	0.608	0.900

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.122	0.296	.
(14) Massachusetts Credibility:	0.170	0.260	.
(15) Countrywide Pure Premium:	6.930	3.405	10.335
(16) Countrywide Indicated Relativity:	3.532	2.341	.
(17) Countrywide Credibility:	0.420	0.370	.
(18) Countrywide Lost-Time Claims:	200.00	.	.
(19) Pure Premium Underlying Present Rate:	7.595	5.013	12.609
(20) Relativity to Underlying Present Rate:	2.072	2.081	.
(21) Credibility to Underlying Relativity:	0.410	0.370	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	2.354	1.713	.
(24) Balanced Formula Relativity:	2.202	1.619	1.933

Class(es):		Effective: 7/1/2020							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)
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
2016	10	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	496	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:	0.030	0.040	.
(15) Countrywide Pure Premium:	10.677	3.854	14.531
(16) Countrywide Indicated Relativity:	5.441	2.650	.
(17) Countrywide Credibility:	0.200	0.210	.
(18) Countrywide Lost-Time Claims:	21.000	.	.
(19) Pure Premium Underlying Present Rate:	8.318	3.250	11.568
(20) Relativity to Underlying Present Rate:	2.269	1.349	.
(21) Credibility to Underlying Relativity:	0.770	0.750	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	2.835	1.568	.
(24) Balanced Formula Relativity:	2.653	1.482	2.112

VIII 000028

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2020

Section VIII - G
 Exhibit 4

Calculation of Class Relativities

Class(es): 7309 STEVEDORING: NOC - US ACT		Effective: 7/1/2020							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)
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	50,348	0	30,097	80,445	3,999	2,391	6,390
2016	13.523	0	1	0	844	0	1,728	2,572	0.062	0.128	0.190
2017	11.782	0	1	0	0	0	772	772	0.000	0.066	0.066
MA Total:	59,071	0	4	0	51,191	0	32,597	83,788	0.867	0.552	1.418

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.363	0.269	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	5,687	2,957	8,644
(16) Countrywide Indicated Relativity:	2,898	2,033	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	137.00	.	.
(19) Pure Premium Underlying Present Rate:	4.614	2.315	6,929
(20) Relativity to Underlying Present Rate:	1.259	0.961	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	2,386	2,054	4,440
(23) Formula Relativity:	1.804	1.227	.
(24) Balanced Formula Relativity:	1.688	1.160	1.444

Class(es): 7313 COAL DOCK OPERATION & STEVEDORING: US ACT		Effective: 7/1/2020							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)
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
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	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:	4,765	1,963	6,728
(16) Countrywide Indicated Relativity:	2,428	1,350	.
(17) Countrywide Credibility:	0.240	0.260	.
(18) Countrywide Lost-Time Claims:	34.000	.	.
(19) Pure Premium Underlying Present Rate:	10.147	1.829	11,976
(20) Relativity to Underlying Present Rate:	2.768	0.759	.
(21) Credibility to Underlying Relativity:	0.760	0.740	.
(22) Industry Group Converted Pure Premium:	2,386	2,054	4,440
(23) Formula Relativity:	2.686	0.913	.
(24) Balanced Formula Relativity:	2.514	0.863	1.750

VIII 000029

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2020

Section VIII - G
 Exhibit 5

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	1,559	0	0	0	0	0	0	0	0.000	0.000	0.000	
2014	5,260	0	1	0	4,067	0	4,746	8,813	0.773	0.902	1.675	
2015	4,441	0	1	0	177,744	0	126,815	304,559	40.022	28.555	68.577	
2016	4,059	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	3,162	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	18,481	0	2	0	181,811	0	131,561	313,372	9.838	7.119	16.956	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.123	3.466	.
(14) Massachusetts Credibility:	0.140	0.190	.
(15) Countrywide Pure Premium:	5.097	1.928	7.024
(16) Countrywide Indicated Relativity:	2.598	1.325	.
(17) Countrywide Credibility:	0.390	0.410	.
(18) Countrywide Lost-Time Claims:	112.00	.	.
(19) Pure Premium Underlying Present Rate:	11.248	5.081	16.329
(20) Relativity to Underlying Present Rate:	3.068	2.109	.
(21) Credibility to Underlying Relativity:	0.470	0.400	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	3.032	2.046	.
(24) Balanced Formula Relativity:	2.838	1.933	2.419

Class(es):		Effective: 7/1/2020							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)	
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	
2016	157	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	91	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	575	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:	11.209	4.526	15.735
(16) Countrywide Indicated Relativity:	5.712	3.112	.
(17) Countrywide Credibility:	0.160	0.170	.
(18) Countrywide Lost-Time Claims:	12.000	.	.
(19) Pure Premium Underlying Present Rate:	13.912	7.381	21.293
(20) Relativity to Underlying Present Rate:	3.795	3.064	.
(21) Credibility to Underlying Relativity:	0.800	0.780	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	3.950	2.919	.
(24) Balanced Formula Relativity:	3.696	2.759	3.263

VIII 000030

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2020

Section VIII - G
 Exhibit 6

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Federal Class Codes		
7350 FREIGHT HANDLING 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)
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
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	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:	8.460	2.047	10.506
(16) Countrywide Indicated Relativity:	4.311	1.407	.
(17) Countrywide Credibility:	0.340	0.360	.
(18) Countrywide Lost-Time Claims:	76.000	.	.
(19) Pure Premium Underlying Present Rate:	13.389	4.938	18.327
(20) Relativity to Underlying Present Rate:	3.652	2.050	.
(21) Credibility to Underlying Relativity:	0.660	0.640	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	3.876	1.818	.
(24) Balanced Formula Relativity:	3.627	1.719	2.744

Class(es):		Effective: 7/1/2020							Federal Class Codes		
8709 STEVEDORING:TALLIERS & CHECKING CLERKS: 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)
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
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	7,083	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:	3.417	1.554	4.970
(16) Countrywide Indicated Relativity:	1.741	1.068	.
(17) Countrywide Credibility:	0.170	0.180	.
(18) Countrywide Lost-Time Claims:	14.000	.	.
(19) Pure Premium Underlying Present Rate:	2.373	1.414	3.787
(20) Relativity to Underlying Present Rate:	0.647	0.587	.
(21) Credibility to Underlying Relativity:	0.780	0.740	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	0.801	0.627	.
(24) Balanced Formula Relativity:	0.750	0.592	0.677

VIII 000031

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2020

Section VIII - G
 Exhibit 7

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Federal Class Codes			
8726 STEAMSHIP LINE OR AGENCY-PORT EMP: SPRVSR, CAPTNS, ENGRS, STWR												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		Total	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)	
2013	88.316	0	25	0	147.127	0	186.497	333.624	1.666	2.112	3.778	
2014	93.952	1	24	36.110	123.300	27.187	134.912	321.509	1.697	1.725	3.422	
2015	99.099	2	17	142.952	85.963	34.565	154.310	417.790	2.310	1.906	4.216	
2016	94.736	0	14	0	254.037	0	225.930	479.967	2.682	2.385	5.066	
2017	101.527	1	11	9.050	70.161	6.455	53.066	138.732	0.780	0.586	1.366	
MA Total:	477.631	4	91	188.111	680.588	68.207	754.715	1,691.621	1.819	1.723	3.542	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.762	0.839	.
(14) Massachusetts Credibility:	0.270	0.460	.
(15) Countrywide Pure Premium:	0.350	0.340	0.690
(16) Countrywide Indicated Relativity:	0.178	0.234	.
(17) Countrywide Credibility:	0.200	0.210	.
(18) Countrywide Lost-Time Claims:	20.000	.	.
(19) Pure Premium Underlying Present Rate:	2.255	1.790	4.045
(20) Relativity to Underlying Present Rate:	0.615	0.743	.
(21) Credibility to Underlying Relativity:	0.530	0.330	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	0.568	0.680	.
(24) Balanced Formula Relativity:	0.531	0.643	0.583

Class(es):		Effective: 7/1/2020							Federal Class Codes			
9077 UNITED STATES ARMED SERVICE RISK-ALL EMPLOYEES & DRIVERS												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		Total	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)	
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	
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	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:	0.950	1.982	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	3.483	4.776	8.259
(20) Relativity to Underlying Present Rate:	0.950	1.982	.
(21) Credibility to Underlying Relativity:	1.000	1.000	.
(22) Industry Group Converted Pure Premium:	2.386	2.054	4.440
(23) Formula Relativity:	0.950	1.982	.
(24) Balanced Formula Relativity:	0.889	1.874	1.345

VIII 000032

Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2020

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	-7.0%
(3) Target Rate Change = (1) x [1.000 + (2)] - 1.000	-7.0%
(4) Maximum Rate Change = (3) + 20.0%	13.0%
(5) Minimum Rate Change = (3) - 20.0%	-27.0%
(6) Present Average Rate	8.514
(7) Uncapped Rate Level Factor = [1.000 + (3)] x (6)	7.918
(8) Capped Rate Level Factor	7.942

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 07/01/18 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.

VIII 000033

Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2020

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	1.224	0.733	0.997	7.918	7.90
6824	1.325	1.515	1.413	7.918	11.19
6826	0.881	0.680	0.788	7.918	6.24
6843	1.610	1.112	1.380	7.918	10.92
6872	2.202	1.619	1.933	7.918	15.30
6874	2.653	1.482	2.112	7.918	16.72
7309	1.688	1.160	1.444	7.918	11.43
7313	2.514	0.863	1.750	7.918	13.86
7317	2.838	1.933	2.419	7.918	19.16
7327	3.696	2.759	3.263	7.918	25.83
7350	3.627	1.719	2.744	7.918	21.73
8709	0.750	0.592	0.677	7.918	5.36
8726	0.531	0.643	0.583	7.918	4.61
9077	0.889	1.874	1.345	7.918	10.65

Notes:

(2),(3),(4): Section VIII-G.

(5): Exhibit 1.

VIII 000034

Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2020

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	6.53	7.90	7.38
6824	10.13	11.19	11.22
6826	7.81	6.24	6.26
6843	13.03	10.92	10.96
6872	17.12	15.30	15.35
6874	15.67	16.72	16.77
7309	15.36	11.43	11.46
7313	16.18	13.86	13.90
7317	16.00	19.16	18.08
7327	28.89	25.83	25.91
7350	18.94	21.73	21.40
8709	5.14	5.36	5.37
8726	5.50	4.61	4.63
9077	5.22	10.65	5.90

Notes:

(2): from Section VIII-H, Exhibit 3 of the 07/01/18 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).

VIII 000035

Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2020

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	7,668,190	7,131,413	-7.0%	-7.0%	7.94

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)							
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2013	0	0	0	0	90,071	0	103,465	
	2014	0	0	0	0	352,860	0	2,218	
	2015	0	0	0	0	0	0	36,799	
	2016	0	0	0	0	0	0	2,252	
	2017	0	0	0	0	4,503	0	36,165	
Medical	2013	0	0	0	0	167,573	0	13,922	1,807
	2014	0	0	0	0	147,140	0	2,059	2,965
	2015	0	0	0	0	0	0	44,617	2,263
	2016	0	0	0	0	0	0	2,322	14,360
	2017	0	0	0	0	34,113	0	61,834	4,503

		(B). Federal Benefits Primary Conversion Factors (Section VIII-E, Exhibit 1, Page 1)							
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2013	0.972	0.917	0.965	0.950	0.897	0.965	0.911	
	2014	0.955	0.874	0.948	0.936	0.857	0.948	0.869	
	2015	1.207	0.995	1.200	1.186	0.977	1.200	0.989	
	2016	1.411	1.146	1.404	1.390	1.129	1.404	1.140	
	2017	2.293	1.650	2.284	2.267	1.631	2.284	1.644	
Medical	2013	1.014	0.872	1.014	1.014	0.872	1.014	0.872	0.720
	2014	0.985	0.812	0.985	0.985	0.812	0.985	0.812	0.790
	2015	1.126	0.913	1.126	1.126	0.913	1.126	0.913	0.849
	2016	1.303	0.972	1.303	1.303	0.972	1.303	0.972	0.915
	2017	1.528	1.019	1.528	1.528	1.019	1.528	1.019	0.942

		(C). Federal Converted Limited Losses [(A) x (B)]							
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2013	0	0	0	0	80,766	0	94,237	
	2014	0	0	0	0	302,351	0	1,927	
	2015	0	0	0	0	0	0	36,386	
	2016	0	0	0	0	0	0	2,567	
	2017	0	0	0	0	7,347	0	59,453	
Medical	2013	0	0	0	0	146,153	0	12,142	1,301
	2014	0	0	0	0	119,531	0	1,673	2,343
	2015	0	0	0	0	0	0	40,722	1,921
	2016	0	0	0	0	0	0	2,258	13,145
	2017	0	0	0	0	34,777	0	63,037	4,244

VIII 000037

Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
 7/1/2020

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	2013	0	0	0	0	23,989	0	27,990	
	2014	0	0	0	0	89,803	0	572	
	2015	0	0	0	0	0	0	10,807	
	2016	0	0	0	0	0	0	763	
	2017	0	0	0	0	2,182	0	17,659	
Medical	2013	0	0	0	0	43,410	0	3,606	386
	2014	0	0	0	0	35,503	0	497	696
	2015	0	0	0	0	0	0	12,095	571
	2016	0	0	0	0	0	0	671	3,904
	2017	0	0	0	0	10,329	0	18,723	1,260

		(E). Federal Adjusted Excess Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2013	0	0	0	0	16,792	0	19,593	
	2014	0	0	0	0	62,862	0	401	
	2015	0	0	0	0	0	0	7,565	
	2016	0	0	0	0	0	0	534	
	2017	0	0	0	0	1,527	0	12,361	
Medical	2013	0	0	0	0	50,606	0	12,003	386
	2014	0	0	0	0	62,444	0	668	696
	2015	0	0	0	0	0	0	15,337	571
	2016	0	0	0	0	0	0	899	3,904
	2017	0	0	0	0	10,984	0	24,021	1,260

		(F). Federal Secondary Conversion Factors					
		Fatal		Permanent Total	Permanent Partial	Temporary Total	Medical Only
		LD	NLD				
Indemnity		1.045		0.973	1.360	1.374	
Medical		1.187		0.889	1.243	1.255	1.187

		(G). Federal Converted Unlimited Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2013	0	0	0	0	132,717	0	156,359	
	2014	0	0	0	0	496,835	0	3,197	
	2015	0	0	0	0	0	0	60,373	
	2016	0	0	0	0	0	0	4,260	
	2017	0	0	0	0	12,072	0	98,646	
Medical	2013	0	0	0	0	244,623	0	30,312	2,003
	2014	0	0	0	0	226,241	0	2,939	3,608
	2015	0	0	0	0	0	0	70,375	2,958
	2016	0	0	0	0	0	0	3,963	20,241
	2017	0	0	0	0	56,892	0	109,288	6,534

		(H). Total Federal Converted Unlimited Losses			
Policy Year		Indemnity		Medical	
		LD	NLD	LD	NLD
	2013	0	289,077	0	276,937
	2014	0	500,032	0	232,788
	2015	0	60,373	0	73,333
	2016	0	4,260	0	24,204
	2017	0	110,718	0	172,715
	Total	0	964,459	0	779,977

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)

VIII 000039

Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
 7/1/2020

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	2013	0	0	0	0	0	0	0	
	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
	2016	0	0	0	0	0	0	0	
	2017	0	0	0	0	0	0	0	
Medical	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
	2016	0	0	0	0	0	0	0	0
	2017	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	2013	0	0	0	0	0	0	0	
	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
	2016	0	0	0	0	0	0	0	
	2017	0	0	0	0	0	0	0	
Medical	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
	2016	0	0	0	0	0	0	0	0
	2017	0	0	0	0	0	0	0	0

		(F). State Secondary Conversion Factors					
		Fatal		Permanent Total	Permanent Partial	Temporary Total	Medical Only
		0.949	1.187				
Indemnity		0.949		0.883	1.235	1.247	
Medical		1.187		0.889	1.243	1.255	1.187

		(G). State Converted Unlimited Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2013	0	0	0	0	0	0	0	
	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
	2016	0	0	0	0	0	0	0	
	2017	0	0	0	0	0	0	0	
Medical	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
	2016	0	0	0	0	0	0	0	0
	2017	0	0	0	0	0	0	0	0

		(H). Total State Converted Unlimited Losses			
Policy Year		Indemnity		Medical	
		LD	NLD	LD	NLD
2013		0	0	0	0
2014		0	0	0	0
2015		0	0	0	0
2016		0	0	0	0
2017		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)

VIII 000040

Section VIII - F-Class Recommendation
Subsection I - Pricing Example
7/1/2020

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)
2013	49,827	289,077	276,937
2014	51,022	500,032	232,788
2015	52,497	60,373	73,333
2016	45,902	4,260	24,204
2017	36,701	110,718	172,715
Total	235,949	964,459	779,977
(5)	Indicated Pure Premium	4.088	3.306
(6)	Federal Class Codes Industry Group Pure Premium	2.386	2.054
(7)	MA Indicated Relativity	1.713	1.610

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)

VIII 000041

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	8,376	0	38,558	0	1	2,564,500
Arizona	2	0	0	0	0	0	0	163,299
Arkansas	3	0	0	0	0	0	0	85,415
Colorado	5	0	0	0	0	0	0	4,829
Connecticut	6	0	69,370	0	56,476	0	1	1,001,648
D.C.	8	0	0	0	0	0	0	0
Florida	9	56,040	273,422	51,899	507,516	4	12	14,004,304
Georgia	10	0	0	0	0	0	0	264,047
Idaho	11	0	0	0	0	0	0	1,506
Illinois	12	0	0	0	2,073	0	0	698,080
Indiana	13	0	0	0	0	0	0	2,093
Iowa	14	0	0	0	9,886	0	0	1,281,931
Kansas	15	0	0	0	0	0	0	0
Kentucky	16	0	0	0	0	0	0	694,765
Louisiana	17	195,137	73,915	526,781	219,607	1	9	6,653,114
Maine	18	0	6,766	0	36,726	0	5	13,063,476
Maryland	19	0	0	0	1,543	0	0	561,054
Michigan	21	0	0	0	0	0	0	0
Minnesota	22	0	0	0	0	0	0	0
Mississippi	23	398,995	148,646	319,201	570,972	3	10	23,351,152
Missouri	24	0	0	0	0	0	0	281,256
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	10,033	0	0	1,232,322
New Mexico	30	0	0	0	0	0	0	0
North Carolina	32	0	118,807	0	127,823	0	2	5,097,779
Oklahoma	35	35,465	0	41,364	630	2	0	736,518
Oregon	36	0	99,660	0	141,550	0	7	7,806,846
Rhode Island	38	0	1,210	0	5,713	0	1	3,416,262
South Carolina	39	0	46,504	0	82,630	0	2	1,904,133
South Dakota	40	0	0	0	0	0	0	0
Tennessee	41	0	0	0	0	0	0	197,278
Utah	43	0	0	0	0	0	0	0
Vermont	44	0	0	0	0	0	0	31,200
Virginia	45	0	44,486	0	207,403	0	2	12,478,201
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	2,695,335
Alaska	54	449,795	203,208	477,557	864,078	1	12	12,285,499
Total		1,135,432	1,094,370	1,416,802	2,883,217	11	64	112,557,842

Notes:

(3) - (9): Data are total for latest three policy years. See Section IX-D, Exhibit 3.
 (7), (8): Used in calculating countrywide credibilities.

VIII 000042

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	2.355	0.979	0.769	1.471	
Arizona	2	0.000	0.000	0.000	0.000	
Arkansas	3	5.950	1.153	0.000	0.000	
Colorado	5	0.000	0.000	0.000	0.000	
Connecticut	6	0.799	0.597	5.535	3.368	
D.C.	8	0.000	0.000	0.000	0.000	
Florida	9	1.487	0.969	3.497	3.872	
Georgia	10	0.142	0.187	0.000	0.000	
Idaho	11	0.000	0.000	0.000	0.000	
Illinois	12	5.116	1.624	0.000	0.482	
Indiana	13	1.954	0.887	0.000	0.000	
Iowa	14	2.838	1.571	0.000	1.212	
Kansas	15	0.000	0.000	0.000	0.000	
Kentucky	16	4.065	1.736	0.000	0.000	
Louisiana	17	1.393	0.538	5.634	6.040	
Maine	18	2.596	1.328	0.134	0.373	
Maryland	19	1.244	0.870	0.000	0.239	
Michigan	21	0.000	0.000	0.000	0.000	
Minnesota	22	0.000	0.000	0.000	0.000	
Mississippi	23	1.374	0.758	3.223	2.891	
Missouri	24	0.475	0.220	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	3.960	0.000	3.224	
New Mexico	30	0.000	0.000	0.000	0.000	
North Carolina	32	1.834	1.370	4.274	3.436	
Oklahoma	35	1.068	0.682	5.145	3.886	
Oregon	36	2.108	1.393	2.691	2.525	
Rhode Island	38	29.539	3.530	1.046	0.590	
South Carolina	39	1.517	0.715	3.705	3.103	
South Dakota	40	0.000	0.000	0.000	0.000	
Tennessee	41	1.374	0.765	0.000	0.000	
Utah	43	0.000	0.000	0.000	0.000	
Vermont	44	0.000	0.000	0.000	0.000	
Virginia	45	3.812	1.442	1.359	2.397	
West Virginia	47	1.758	0.454	0.000	0.000	
Wisconsin	48	0.000	0.000	0.000	0.000	
Hawaii	52	0.236	0.021	0.000	0.000	
Alaska	54	0.979	0.471	5.203	5.139	
(8)				2.746	2.852	5.598
(9)				1.962	1.454	3.417
(10)				1.399	1.961	1.638
(11)				1.399	1.961	

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.

VIII 000043

Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
 7/1/2020

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
1.713	1.610
1.399	1.961
1.224	1.235

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
1.148	1.201
3.908	2.478
4.488	2.975
1,058,924	702,005
27,200,000	6,000,000
27%	42%

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
75	75
1,150	1,000
34%	29%
39%	29%
1.416	1.603
1.069	1.058

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
1.325	1.515	1.413

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.

VIII 000044

Section VIII - F-Class Recommendation
Subsection I - Pricing Example
7/1/2020

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	10.13
(2) Total Balanced Formula Relativity	1.413
(3) Capped Rate Level Factor	7.942
(4) Maximum Average Rate	11.45
(5) Minimum Average Rate	7.40
(6) Proposed Average Capped Rate = (2) x (3), Subject to Caps (4), (5)	11.22
(7) Offset for Merit Rating	0.997
(8) Offset for ARAP	1.053
(9) Offset for Construction Classification Premium Adjustment Program	1.000
(10) Provision for Insolvency Fund Assessment Recoupment	-0.0053
(11) Proposed Manual Rate = { (6) / [(7) x (8) x (9)] } x { 1.000 / [1.000 - (10)] }	10.63
(12) Minimum Premium	500
(13) Loss Constant	0
(14) Expected Loss Rate	4.12
(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 prog

(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.

VIII 000045

Section VIII - F-Class Recommendation
Subsection J - U.S.L.H. & H.W. Coverage Percentage
7/1/2020

Section VIII-J
Exhibit 1

Calculation of USLH & HW Compensation Coverage Percentage

(1)	Benefits Differential Underlying Current USLH & HW Coverage Percentage	1.171
(2)	State Benefit Level Adjustments Since Last Approval	1.014
(3)	Federal Benefit Level Adjustments Since Last Approval	1.007
(4)	Revised Benefits Differential = (1) x [(3) / (2)]	1.162
(5)	Federal Indemnity Losses as % of Total Federal Losses	52.9%
(6)	Expected Loss Ratio for State Classes	61.8%
(7)	Fixed Expense Ratio	5.0%
(8)	Special Fund Assessment Rate as % of Federal Indemnity Losses	0.120
(9)	Loss Adjustment Expense Factor (Applies to Losses)	1.187
(10)	USLH & HW Coverage Percentage for Manual Rates	1.210
(11)	USLH & HW Coverage Percentage for Expected Loss Rates	1.152

Notes:

(1): Section VIII-J, Exhibit 1 of 7/1/2018 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) }

VIII 000046

Section VIII - F-Class Recommendation
Subsection K - Federal Tax Multiplier
7/1/2020

Section VIII-K
Exhibit 1

Calculation of Federal Tax Multiplier

(1)	State Tax Multiplier	1.023
(2)	Loading for Taxes and Residual Market Subsidy = $1.0 - [1.0 / (1)]$	2.2%
(3)	Expected Loss Ratio (no LAE)	62.0%
(4)	Federal Special Funds Assessment	12.0%
(5)	Federal Indemnity Losses as % of Total Losses	52.9%
(6)	Loading for Federal Funds Assessment = $(3) \times (4) \times (5)$	3.9%
(7)	Federal Tax Multiplier = $1.0 / [1.0 - (2) - (6)]$	1.065

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 2013 through 2017.

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 selected five year average paid plus case loss development factors. Section IX-B, Exhibit 1, Page 1 shows the development factors 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 methodology, 30% of the unadjusted indemnity excess losses are reassigned to medical excess losses. The resulting quantities are termed the adjusted excess losses.

IX 000004

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 level that would occur if the employers in that state were located in Massachusetts.

IX 000005

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

IX 000008

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:

$$\begin{aligned}\text{Maximum Allowable Rate Change} &= (100\% \times \text{EC}) + (100\% \times \text{BC}) + 20\% \\ &= \text{IGC} + 20\%\end{aligned}$$

IX 000011

$$\begin{aligned}\text{Minimum Allowable Rate Change} &= (100\% \times \text{EC}) + (100\% \times \text{BC}) - 20\% \\ &= \text{IGC} - 20\%\end{aligned}$$

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.

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 1.053.

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. Eligible risks receive the following adjustments to their premium, based on the number of lost-time claims over the most recent three policy years.

IX 000013

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 provides that these assessments can be recouped from policyholders. Beginning in 1988,

IX 000014

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 27, 2018 meeting reviewed the financial position of the Fund and voted to not have an assessment or refund of assessment in 2018. The Board of Directors of the Fund at its 2019 meeting reviewed the financial position of the Fund and voted to have a refund in 2019. The loading in the 7/1/2018 rates was 0.0026 and was intended to apply to policies effective during the 7/1/2018 to 6/30/2019 policy period. The loading shown in this filing offsets the unanticipated impact to the policy period from 7/1/2019

IX 000015

to 6/30/20120 and the 2019 refund. The proposed factor is a loading of -0.0053 (Section IX-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.

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.

- Scopes update effective 7/1/2018
- 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.
- See Circular Letter No. 2331, released 3/29/2018.

6811, 6854, 6882, 6884: State Act Classes comparable to F-Class Codes

- Established 1/1/1990.

IX 000016

- The manual rates for 6811, 6854, 6882, and 6884 are set at 82.66¹% 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.
- The ELRs for 6811, 6854, 6882, and 6884 are set at 86.84%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.

Code 9044 - Casino Gambling – Hotel - All Employees & Clerical, Salespersons,

Drivers

- Approved Effective 2/1/2016.
- 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.

¹ 82.66% = 1.0 / Proposed USLH&HW Coverage Percentage for Manual Rates. Coverage Percentage from Section VIII – J, Exhibit 1.

² 86.84% = 1.0 / Proposed USLH&HW Coverage Percentage for ELRs. Coverage Percentage from Section VIII – J, Exhibit 1.

IX 000017

Section IX - Classification Pricing
Subsection A - Summary
7/1/2020

Section IX - A
Page 17

- 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.

IX 000018

MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL **RATES**

Draft *Proposed Effective July 1, 2020* Page RA-1

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	2.12	253.	20.	1924	2.03	230.	--	2501	1.77	221.	--	3082D	4.46	315.	--
0008	2.34	261.	20.	1925	5.44	349.	--	2503	1.07	196.	--	3085D	4.03	300.	--
0016	3.20	291.	20.	2003	3.29	274.	--	2570	4.03	300.	--	3110	7.23	500.	--
0034	2.81	277.	20.	2014	3.42	279.	--	2576	1.88	225.	--	3111	1.67	217.	--
0035	1.69	238.	20.	2021	2.14	234.	--	2585	2.49	246.	--	3113	1.42	209.	--
0036	2.81	277.	20.	2039	3.25	273.	--	2586	1.73	220.	--	3114	2.81	257.	--
0042	3.25	293.	20.	2041	2.19	236.	--	2587	2.49	266.	20.	3118	1.48	211.	--
0046	1.97	248.	20.	2070	3.22	272.	--	2623	4.40	313.	--	3119	0.68	183.	--
0050	3.75	340.	50.	2081	2.46	245.	--	2651	1.38	207.	--	3120	1.15	199.	--
0059D	0.24	.	.	2089	2.42	244.	--	2660	1.90	226.	--	3122	2.07	231.	--
0065D	0.10	.	.	2095	2.68	253.	--	2683	1.92	226.	--	3127	1.11	198.	--
0066D	0.09	.	.	2101	2.42	244.	--	2688	1.68	218.	--	3131	1.27	203.	--
0067D	0.09	.	.	2105	(a)	(a)	(a)	2702	11.30	500.	20.	3132	2.30	240.	--
0079	2.37	262.	20.	2111	1.96	228.	--	2710	5.47	350.	--	3145	1.46	210.	--
0083	3.17	290.	20.	2114	2.42	244.	--	2731	2.71	254.	--	3146	2.00	229.	--
0106	8.98	500.	20.	2115	4.76	326.	--	2747	4.97	333.	--	3169	2.44	244.	--
0113	2.81	277.	20.	2121	1.28	204.	--	2790	1.49	211.	--	3179	1.03	195.	--
0170	2.81	277.	20.	2130	1.31	205.	--	2802	3.30	275.	--	3180	2.01	229.	--
0771b	0.61	.	.	2131	2.61	250.	--	2835	1.29	204.	--	3188	2.13	234.	--
0908	73.00	137.	--	2143	2.04	230.	--	2836	1.85	224.	--	3200	1.83	223.	--
0909	167.00	231.	--	2150	3.49	281.	--	2841	3.40	278.	--	3220	2.67	252.	--
0912	334.00	398.	--	2156	3.88	295.	--	2883	2.96	263.	--	3223	(a)	(a)	(a)
0913	146.00	210.	--	2157	3.57	284.	--	2923	1.45	210.	--	3255	1.76	221.	--
0917	2.31	260.	20.	2172	1.58	214.	--	2942	1.53	213.	--	3257	2.00	229.	--
0918	0.43	194.	20.	2211	5.35	346.	--	3018	2.27	238.	--	3270	2.09	232.	--
1430	4.77	326.	--	2220	2.02	230.	--	3022	3.13	269.	--	3300	2.89	260.	--
1438	3.02	265.	--	2260	4.85	329.	--	3027	3.69	288.	--	3305	(a)	(a)	(a)
1463	10.19	500.	--	2288	3.11	268.	--	3028	2.56	249.	--	3315	2.56	249.	--
1624D	3.39	298.	20.	2305	3.11	268.	--	3030	5.36	347.	--	3336	2.73	255.	--
1655	2.56	269.	20.	2362	1.46	210.	--	3040	4.21	306.	--	3365	4.58	460.	50.
1701	2.04	230.	--	2380	1.90	226.	--	3041	2.60	250.	--	3372	1.82	223.	--
1710D	3.39	298.	20.	2402	2.01	229.	--	3042	4.09	302.	--	3373	3.27	273.	--
1747	2.63	251.	--	2413	2.98	263.	--	3066	2.05	231.	--	3381	1.82	223.	--
1748	2.77	256.	--	2416	2.24	237.	--	3076	1.86	224.	--	3383	1.47	210.	--
1853	1.20	201.	--	2417	1.96	228.	--	3081D	4.46	315.	--	3385	0.61	180.	--

Non-Ratable Code and Rate to be used with the following classifications:

b 4771

IX 000019

MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL **RATES**

Draft Proposed Effective July 1, 2020 Page RA-2

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
3400	2.44	244.	--	4150	0.68	183.	--	4771c	4.12	325.	--	5507	5.37	488.	50.
3507	2.41	243.	--	4239	1.87	224.	--	4777	2.34	241.	--	5508D	3.87	344.	50.
3515	2.52	247.	--	4243	2.59	250.	--	4825	0.42	174.	--	5509	4.36	453.	50.
3558	0.71	184.	--	4244	2.27	238.	--	4828	0.84	188.	--	5538	4.02	350.	50.
3571	0.65	182.	--	4250	1.55	213.	--	4829	0.84	188.	--	5545	38.94	500.	50.
3574	1.47	210.	--	4251	1.83	223.	--	4902	1.53	213.	--	5547	10.33	500.	50.
3612	1.24	202.	--	4273	2.69	253.	--	4923	0.54	178.	--	5606	1.26	253.	50.
3620	3.31	275.	--	4279	1.90	226.	--	5020	4.19	356.	50.	5610	4.21	356.	50.
3629	1.47	210.	--	4283	1.54	213.	--	5022	9.22	500.	50.	5645	6.56	500.	50.
3632	1.47	210.	--	4299	1.59	215.	--	5037	15.83	500.	50.	5701	19.24	500.	50.
3634	1.25	203.	--	4304	3.99	299.	--	5040	20.50	500.	50.	5703	10.84	500.	50.
3635	2.62	251.	--	4307	1.38	207.	--	5057	21.65	500.	50.	5705	9.78	500.	50.
3638	1.47	210.	--	4308	1.50	212.	--	5059	19.03	500.	50.	6003	8.07	500.	50.
3642	0.99	194.	--	4351	0.80	187.	--	5102	6.32	500.	50.	6005	3.87	344.	50.
3643	1.35	206.	--	4352	1.15	199.	--	5146	6.71	500.	50.	6204	4.94	473.	50.
3647	1.90	226.	--	4360	0.54	178.	--	5160	2.35	291.	50.	6217	4.09	352.	50.
3648	1.07	196.	--	4361	0.64	201.	20.	5183	2.91	311.	50.	6229	3.68	338.	50.
3681	0.60	180.	--	4362	0.46	195.	20.	5188	3.77	341.	50.	6233	2.14	284.	50.
3685	0.57	179.	--	4410	2.65	252.	--	5190	2.12	283.	50.	6251D	4.26	358.	50.
3724	4.75	466.	50.	4432	0.65	182.	--	5191	0.72	204.	20.	6252D	6.16	500.	50.
3726	6.26	500.	50.	4439	3.86	294.	--	5192	2.41	263.	20.	6306	6.93	500.	50.
3807	2.44	244.	--	4452	2.38	242.	--	5213	10.76	500.	50.	6319	2.90	311.	50.
3808	2.95	262.	--	4459	2.43	244.	--	5215	3.88	345.	50.	6325	2.64	301.	50.
3821	4.57	339.	20.	4470	1.82	223.	--	5221	6.32	500.	50.	6400	4.56	460.	50.
3826	3.82	293.	--	4484	1.79	222.	--	5222	9.51	500.	50.	6504	2.42	244.	--
3830	1.47	210.	--	4493	1.70	219.	--	5223	3.77	341.	50.	6702M	(a)	.	--
3841	1.24	202.	--	4511	0.25	188.	20.	5348	3.98	348.	50.	6703M	(a)	.	--
4000	4.69	343.	20.	4512	0.08	182.	20.	5402	5.66	498.	50.	6704M	(a)	.	--
4021	3.19	271.	--	4557	1.51	212.	--	5403	8.02	500.	50.	6801F	6.99	495.	--
4024	2.93	262.	--	4558	1.34	206.	--	5437	3.97	348.	50.	6811	5.78	472.	20.
4034	4.93	332.	--	4583	2.34	241.	--	5443	3.40	328.	50.	6824F	10.63	500.	--
4036	1.81	222.	--	4611	0.66	182.	--	5445	5.78	500.	50.	6826F	5.93	458.	--
4038	2.70	254.	--	4635	4.37	312.	--	5462	5.36	488.	50.	6834	2.26	258.	20.
4053	2.00	229.	--	4653	1.54	213.	--	5472	7.75	500.	50.	6836	3.33	296.	20.
4062	1.62	216.	--	4665	7.82	500.	--	5473	9.61	500.	50.	6843F	10.38	500.	--
4112	0.36	172.	--	4692	0.45	175.	--	5474	3.83	343.	50.	6854	8.58	500.	20.
4113	2.00	229.	--	4693	0.75	185.	--	5478	3.75	340.	50.	6872F	14.54	500.	--
4114	2.24	237.	--	4720	1.55	213.	--	5479	5.15	480.	50.	6874F	15.89	500.	--
4130	2.64	251.	--	4740	0.82	188.	--	5480	4.60	461.	50.	6882	12.02	500.	20.
4133	1.28	204.	--	4741	1.89	225.	--	5506	4.47	456.	50.	6884	13.13	500.	20.

For Non-Ratable portion of Rate, refer to:
 c 0771

IX 000020

MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL **RATES**

Draft Proposed Effective July 1, 2020 Page RA-3

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	1.61	235.	20.	8232	5.26	454.	20.	8829	1.99	249.	20.
7024M	2.35	.	--	7515	2.67	272.	20.	8233	5.17	451.	20.	8831	0.92	211.	20.
7038M	3.55	.	--	7520	2.72	274.	20.	8235	3.68	308.	20.	8832	0.26	188.	20.
7046M	5.06	.	--	7538	6.02	500.	50.	8263	4.12	323.	20.	8833	1.04	215.	20.
7047M	2.95	.	--	7539	1.13	219.	20.	8264	4.45	335.	20.	8835	1.69	238.	20.
7050M	5.57	.	--	7580	2.97	283.	20.	8265	5.17	451.	20.	8837	(a)	(a)	(a)
7090M	4.44	.	--	7590	4.09	322.	20.	8279	3.66	307.	20.	8868	0.66	202.	20.
7098M	5.95	.	--	7600	3.28	294.	20.	8291	3.54	303.	20.	8901	0.06	181.	20.
7099M	7.46	.	--	7601	5.43	490.	50.	8292	3.27	293.	20.	9014	2.07	251.	20.
7133	(a)	(a)	(a)	7610	0.28	189.	20.	8293	7.37	500.	20.	9015	2.78	276.	20.
7151M	8.26	.	--	7704	2.83	278.	20.	8350	6.03	481.	20.	9016	1.65	237.	20.
7152M	12.95	.	--	7720	1.32	225.	20.	8380	2.41	263.	20.	9019	3.01	284.	20.
7153M	10.33	.	--	7855	3.37	327.	50.	8381	1.66	237.	20.	9033	2.31	260.	20.
7219	7.81	500.	20.	8001	1.52	232.	20.	8385	2.85	279.	20.	9040	2.65	272.	20.
7230	8.72	500.	20.	8002	1.56	234.	20.	8392	1.37	227.	20.	9044	1.23	222.	20.
7231	9.94	500.	20.	8006	1.12	218.	20.	8393	1.20	221.	20.	9052	1.37	227.	20.
7309F	10.86	500.	--	8008	0.67	202.	20.	8500	5.17	451.	20.	9058	1.30	225.	20.
7313F	13.17	500.	--	8010	1.53	233.	20.	8601	0.19	186.	20.	9060	0.93	212.	20.
7317F	17.13	500.	--	8013	0.32	190.	20.	8709F	5.09	337.	--	9061	0.88	210.	20.
7327F	24.55	500.	--	8017	0.87	209.	20.	8710	2.90	281.	20.	9062	0.88	210.	20.
7333M	7.53	.	--	8018	3.26	293.	20.	8719	2.90	281.	20.	9063	0.55	198.	20.
7335M	8.85	.	--	8021	3.11	288.	20.	8720	0.73	205.	20.	9077F	5.59	355.	--
7337M	11.10	.	--	8031	1.60	235.	20.	8721	0.25	188.	20.	9079	0.95	212.	20.
7350F	20.28	500.	--	8032	1.12	218.	20.	8726F	4.39	313.	--	9089	0.76	206.	20.
7360	3.60	305.	20.	8033	1.40	228.	20.	8734M	0.44	.	--	9093	1.05	216.	20.
7370	3.61	305.	20.	8034	2.71	274.	20.	8737M	0.35	.	--	9101	3.23	292.	20.
7380	5.49	462.	20.	8039	1.17	220.	20.	8738M	0.55	.	--	9102	2.08	252.	20.
7382	3.36	297.	20.	8044	2.61	270.	20.	8742	0.10	183.	20.	9154	1.33	226.	20.
7394M	9.68	.	--	8046	1.85	244.	20.	8745	5.15	450.	20.	9156	1.62	236.	20.
7395M	12.37	.	--	8048	2.38	262.	20.	8747	0.71	204.	20.	9178	12.72	500.	20.
7398M	15.51	.	--	8058	2.06	251.	20.	8748	0.61	200.	20.	9179	33.32	500.	20.
7403	3.66	307.	20.	8103	2.28	259.	20.	8800	0.93	212.	20.	9180	4.13	324.	20.
7405d	0.83	218.	20.	8105	6.37	493.	20.	8803	0.04	180.	20.	9182	2.94	282.	20.
7420	7.45	500.	20.	8106	5.15	450.	20.	8805M	0.18	.	--	9186	4.13	324.	20.
7421	1.12	218.	20.	8107	2.54	268.	20.	8810	0.06	181.	20.	9220	2.96	283.	20.
7422	1.12	218.	20.	8111	2.60	270.	20.	8814M	0.14	.	--	9402	3.72	309.	20.
7425	2.24	257.	20.	8203	5.67	468.	20.	8815M	0.23	.	--	9403	9.05	500.	20.
7431e	0.84	218.	20.	8204	5.19	452.	20.	8820	0.07	181.	20.	9410	3.02	285.	20.
7445f	0.28	.	.	8215	3.29	294.	20.	8824	1.68	238.	20.	9501	1.88	225.	--
7453g	0.28	.	.	8227	4.40	454.	50.	8826	1.34	226.	20.	9505	1.88	225.	--

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

IX 000021

Section IX - Classification Pricing
 Subsection A - Summary
 7/1/2020

Section IX - A
 Exhibit 1
 Page 4

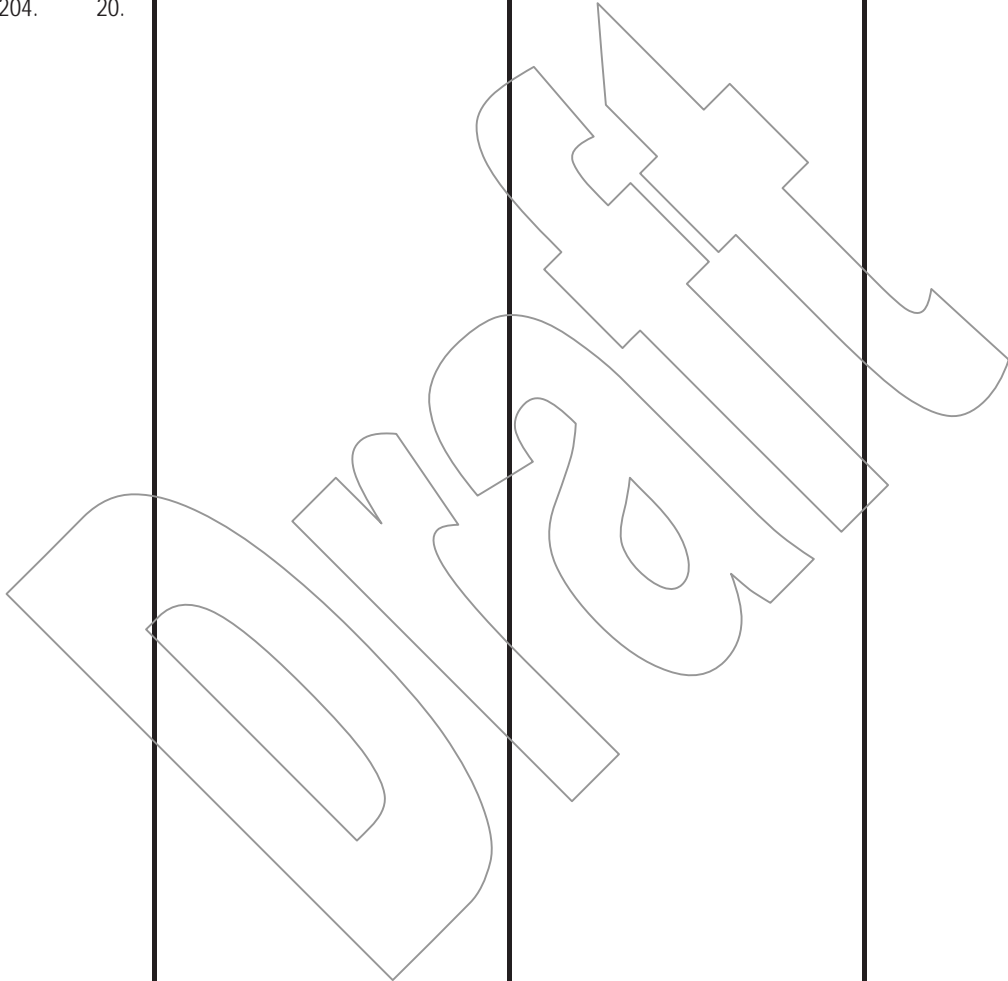
**MASSACHUSETTS WORKERS COMPENSATION
 AND EMPLOYERS LIABILITY INSURANCE MANUAL**

RATES

Draft Proposed Effective July 1, 2020 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	2.52	267.	20.												
9521	2.73	255.	--												
9522	1.47	210.	--												
9533	12.97	500.	50.												
9534	5.14	480.	50.												
9549	4.00	349.	50.												
9552	6.89	500.	50.												
9586	0.28	189.	20.												
9620	0.70	204.	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	1.762	0.971	0.655	0.733	0.846
	Medical	1.762	0.512	0.345	0.733	0.446
	Total		1.482			
Construction	Indemnity	4.511	2.604	0.687	0.733	2.271
	Medical	4.511	1.187	0.313	0.733	1.036
	Total		3.791			
Office and Clerical	Indemnity	0.135	0.069	0.620	0.733	0.061
	Medical	0.135	0.043	0.380	0.733	0.038
	Total		0.112			
Goods and Services	Indemnity	1.540	0.825	0.639	0.733	0.721
	Medical	1.540	0.466	0.361	0.733	0.408
	Total		1.291			
Miscellaneous	Indemnity	4.336	2.408	0.660	0.733	2.098
	Medical	4.336	1.241	0.340	0.733	1.081
	Total		3.650			

Notes:

- (3): Section IX - H, Exhibit 1.
- (4): Section IX - C, Exhibits 1-5, page 2.
- (6): Section VI - J, Exhibit 1.

IX 000022

IX 000023

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.

Indemnity	Policy Year				
	2013	2014	2015	2016	2017
Fatal	1.053	1.047	1.036	1.030	1.023
Permanent Total	1.054	1.050	1.043	1.037	1.029
Permanent Partial	1.085	1.078	1.067	1.056	1.044
Temporary Total	1.034	1.032	1.029	1.024	1.019
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				
	2013	2014	2015	2016	2017
Likely	1.027	1.044	1.105	1.264	1.892
Not Likely	1.022	1.043	1.096	1.234	1.662
Medical					
Likely	0.941	0.934	0.940	0.976	1.042
Not Likely	0.990	0.985	0.989	0.991	1.016

(C). Trend Factors

The following factors trend the reported pure premiums from the reported period to the proposed effective period for new rates.

Indemnity	Policy Year				
	2013	2014	2015	2016	2017
All Injury Types	0.856	0.810	0.883	0.901	0.907
Medical					
Lost Time Medical	0.851	0.796	0.874	0.908	0.897
Medical Only	0.702	0.775	0.813	0.855	0.830

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

IX 000024

Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
7/1/2020

Section IX - B
Exhibit 1
Page 2

Calculation of Indemnity and Medical Conversion Factors

(D). Primary Conversion Factors (PCF)

Indemnity	Policy Year				
	2013	2014	2015	2016	2017
Fatal - LD	0.925	0.886	1.010	1.173	1.756
Fatal - NLD	0.921	0.885	1.003	1.145	1.543
Permanent Total	0.926	0.888	1.018	1.181	1.766
Permanent Partial - LD	0.953	0.912	1.041	1.203	1.791
Permanent Partial - NLD	0.949	0.911	1.033	1.174	1.574
Temporary Total - LD	0.909	0.873	1.004	1.167	1.749
Temporary Total - NLD	0.905	0.873	0.996	1.139	1.536
Medical					
Lost Time Medical -LD	0.800	0.744	0.822	0.886	0.935
Lost Time Medical -NLD	0.843	0.785	0.865	0.900	0.911
Medical - NLD	0.695	0.763	0.805	0.847	0.843

Notes:

$$(D) = (A) \times (B) \times (C)$$

IX 000025

Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
7/1/2020

Section IX - B
Exhibit 1
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	1.187	1.187

(B). Investment Income Offset Factor

The following factor is applied to adjust for investment income.

	Investment Income Offset Factor
Indemnity	
Fatal	0.799
Permanent Total	0.744
Permanent Partial	1.041
Temporary Total	1.051
Medical	
Fatal	1.000
Permanent Total	0.749
Permanent Partial	1.047
Temporary Total	1.057
Medical Only	1.000

(C). Secondary Conversion Factors

The factors above are combined multiplicatively, resulting in the following conversion factors.

Indemnity	
Fatal	0.949
Permanent Total	0.883
Permanent Partial	1.235
Temporary Total	1.247
Medical	
Fatal	1.187
Permanent Total	0.889
Permanent Partial	1.243
Temporary Total	1.255
Medical Only	1.187

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 000026

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2020

Section IX - B
 Exhibit 2
 Page 1

Summary of Development Factors

		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 Losses</u>								
5Yr Weighted Average		1.497	1.144	1.058	1.017	1.005	1.001	1.001	1.003	1.001
Cumulative		1.864	1.246	1.088	1.029	1.012	1.007	1.006	1.005	1.001
		<u>(2) Medical Losses</u>								
5Yr Weighted Average		1.067	1.039	1.006	0.993	0.988	0.995	0.992	0.994	0.997
Cumulative		1.071	1.004	0.966	0.961	0.967	0.978	0.983	0.991	0.997
		<u>(3) Claim Counts</u>								
2Yr Weighted Average		1.012	1.009	1.005	1.002	1.002	1.000	0.999	1.002	1.001
Cumulative		1.031	1.019	1.010	1.005	1.003	1.001	1.001	1.002	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
		<u>(4) Indemnity Losses</u>								
5Yr Weighted Average		1.347	1.125	1.051	1.021	1.011	1.002	1.003	1.000	1.002
Cumulative		1.656	1.229	1.092	1.040	1.018	1.008	1.006	1.003	1.002
		<u>(5) Medical Losses</u>								
5Yr Weighted Average		1.025	1.002	1.004	0.995	0.996	0.999	0.999	1.000	1.000
Cumulative		1.020	0.995	0.994	0.989	0.995	0.998	0.999	1.000	1.000
		<u>(6) Claim Counts</u>								
2Yr Weighted Average		1.015	1.005	1.003	1.001	1.000	1.000	1.000	1.000	1.000
Cumulative		1.026	1.011	1.005	1.003	1.001	1.001	1.001	1.001	1.000

Notes:

(1), (2), (3): Page 3.
 (4), (5), (6): Page 5.

IX 000027

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2020

Section IX - B
 Exhibit 2
 Page 2

Calculation of Likely to Develop Development Factors

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		
2012	69,437,461	104,273,604	1.502	43,976,785	50,268,357	1.143	1,569	1,611	1.027
2013	69,309,357	102,093,156	1.473	42,723,810	44,591,629	1.044	1,539	1,561	1.014
2014	81,235,037	120,529,255	1.484	54,262,050	55,597,278	1.025	1,627	1,661	1.021
2015	78,126,580	117,253,379	1.501	48,556,960	51,803,141	1.067	1,543	1,557	1.009
2016	74,232,422	113,119,206	1.524	46,344,876	49,428,214	1.067	1,498	1,520	1.015
	5yr Weighted Average		1.497	5yr Weighted Average		1.067	2yr Weighted Average		1.012
	30	42		30	42		30	42	
2011	106,030,842	124,431,773	1.174	50,301,923	55,284,412	1.099	1,667	1,687	1.012
2012	109,859,529	124,763,361	1.136	51,979,501	52,500,556	1.010	1,663	1,663	1.000
2013	108,929,528	122,244,106	1.122	46,563,895	47,367,047	1.017	1,619	1,635	1.010
2014	128,995,426	148,035,020	1.148	58,849,726	60,276,709	1.024	1,742	1,748	1.003
2015	122,562,197	140,119,842	1.143	53,379,811	55,764,002	1.045	1,600	1,623	1.014
	5yr Weighted Average		1.144	5yr Weighted Average		1.039	2yr Weighted Average		1.009
	42	54		42	54		42	54	
2010	121,447,612	126,916,880	1.045	51,567,420	52,484,379	1.018	1,766	1,782	1.009
2011	129,140,611	138,671,017	1.074	56,847,267	57,300,444	1.008	1,714	1,725	1.006
2012	132,187,346	139,916,716	1.058	55,124,124	55,778,005	1.012	1,699	1,710	1.006
2013	128,231,457	136,255,297	1.063	49,068,257	48,679,231	0.992	1,668	1,675	1.004
2014	154,621,374	162,195,725	1.049	62,634,401	62,665,708	1.000	1,782	1,793	1.006
	5yr Weighted Average		1.058	5yr Weighted Average		1.006	2yr Weighted Average		1.005
	54	66		54	66		54	66	
2009	130,042,053	132,771,120	1.021	53,207,371	53,166,202	0.999	1,573	1,575	1.001
2010	130,027,271	133,366,013	1.026	53,624,711	52,865,942	0.986	1,800	1,801	1.001
2011	144,619,420	146,071,863	1.010	59,938,760	58,721,468	0.980	1,751	1,759	1.005
2012	147,633,044	151,048,677	1.023	57,822,929	57,725,069	0.998	1,741	1,745	1.002
2013	142,509,897	143,607,658	1.008	50,311,862	50,588,559	1.005	1,698	1,702	1.002
	5yr Weighted Average		1.017	5yr Weighted Average		0.993	2yr Weighted Average		1.002
	66	78		66	78		66	78	
2008	136,346,471	137,636,446	1.009	54,601,834	53,449,942	0.979	1,721	1,721	1.000
2009	133,826,285	134,480,068	1.005	53,464,643	52,484,692	0.982	1,582	1,582	1.000
2010	134,838,147	133,609,523	0.991	53,350,569	53,399,824	1.001	1,807	1,812	1.003
2011	148,854,606	150,271,162	1.010	59,916,231	61,442,436	1.025	1,772	1,777	1.003
2012	157,597,649	158,902,885	1.008	59,368,142	56,643,025	0.954	1,770	1,771	1.001
	5yr Weighted Average		1.005	5yr Weighted Average		0.988	2yr Weighted Average		1.002
	78	90		78	90		78	90	
2007	152,351,751	152,753,595	1.003	61,129,808	60,827,537	0.995	2,002	2,003	1.000
2008	138,835,094	138,685,765	0.999	53,762,704	53,561,084	0.996	1,727	1,723	0.998
2009	135,761,401	135,361,898	0.997	52,841,459	53,125,439	1.005	1,592	1,593	1.001
2010	135,675,142	135,617,824	1.000	53,910,680	53,897,415	1.000	1,821	1,823	1.001
2011	151,787,766	152,767,091	1.006	61,728,693	60,610,013	0.982	1,783	1,780	0.998
	5yr Weighted Average		1.001	5yr Weighted Average		0.995	2yr Weighted Average		1.000
	90	102		90	102		90	102	
2006	162,457,536	162,872,594	1.003	68,275,014	68,055,983	0.997	2,241	2,240	1.000
2007	153,063,595	153,045,131	1.000	61,011,756	60,583,473	0.993	2,005	2,008	1.001
2008	139,337,626	139,310,614	1.000	53,948,922	52,857,869	0.980	1,728	1,728	1.000
2009	138,721,910	138,736,716	1.000	53,850,935	53,535,439	0.994	1,605	1,603	0.999
2010	135,434,510	135,810,306	1.003	53,591,194	53,195,932	0.993	1,823	1,822	0.999
	5yr Weighted Average		1.001	5yr Weighted Average		0.992	2yr Weighted Average		0.999
	102	114		102	114		102	114	
2005	165,687,225	166,308,356	1.004	71,576,269	71,088,329	0.993	2,437	2,443	1.002
2006	163,972,076	164,512,037	1.003	68,346,050	68,909,481	1.008	2,243	2,250	1.003
2007	153,382,793	154,002,727	1.004	60,604,380	60,393,949	0.997	2,009	2,019	1.005
2008	138,950,462	139,328,204	1.003	52,583,369	52,082,398	0.990	1,728	1,731	1.002
2009	138,907,436	139,342,843	1.003	53,479,822	52,407,760	0.980	1,604	1,607	1.002
	5yr Weighted Average		1.003	5yr Weighted Average		0.994	2yr Weighted Average		1.002
	114	126		114	126		114	126	
2004	178,627,918	178,719,924	1.001	72,032,401	72,133,817	1.001	2,694	2,696	1.001
2005	166,308,356	166,306,920	1.000	71,088,329	71,335,711	1.003	2,443	2,444	1.000
2006	163,781,853	164,071,230	1.002	68,677,665	67,780,098	0.987	2,248	2,249	1.000
2007	154,002,727	154,130,843	1.001	60,393,949	59,952,045	0.993	2,019	2,017	0.999
2008	139,588,204	140,044,115	1.003	52,107,398	52,137,270	1.001	1,732	1,736	1.002
	5yr Weighted Average		1.001	5yr Weighted Average		0.997	2yr Weighted Average		1.001

Note:
 Unit Statistical Plan data, excluding Large Deductibles.

IX 000028

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2020

Section IX - B
 Exhibit 2
 Page 3

Calculation of Not-Likely to Develop Development Factors

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		18	30		
2012	135,106,186	183,123,712	1.355	126,889,768	131,734,307	1.038	12,646	12,858	1.017
2013	148,411,265	194,499,075	1.311	134,703,826	137,352,691	1.020	12,884	13,125	1.019
2014	155,371,898	209,655,233	1.349	139,400,462	141,763,772	1.017	13,183	13,421	1.018
2015	162,561,884	218,419,661	1.344	137,556,110	141,060,186	1.025	13,316	13,517	1.015
2016	161,276,536	221,996,028	1.376	141,629,459	145,029,352	1.024	13,146	13,336	1.014
	5yr Weighted Average		1.347	5yr Weighted Average		1.025	2yr Weighted Average		1.015
	30	42		30	42		30	42	
2011	181,000,527	203,907,162	1.127	131,776,373	132,146,481	1.003	13,029	13,103	1.006
2012	177,537,787	199,964,007	1.126	130,023,163	130,727,379	1.005	12,806	12,876	1.005
2013	187,662,703	210,288,981	1.121	135,380,425	134,653,623	0.995	13,067	13,127	1.005
2014	201,189,062	226,958,540	1.128	138,511,324	139,042,065	1.004	13,340	13,418	1.006
2015	213,110,842	239,773,271	1.125	139,483,517	139,899,256	1.003	13,474	13,534	1.004
	5yr Weighted Average		1.125	5yr Weighted Average		1.002	2yr Weighted Average		1.005
	42	54		42	54		42	54	
2010	185,018,347	194,646,186	1.052	125,487,708	126,053,785	1.005	12,969	13,002	1.003
2011	199,198,325	209,058,649	1.050	130,583,625	131,540,578	1.007	13,076	13,105	1.002
2012	192,540,022	202,765,142	1.053	128,103,811	128,282,278	1.001	12,840	12,859	1.001
2013	204,301,630	214,540,509	1.050	132,952,413	133,539,928	1.004	13,094	13,137	1.003
2014	220,372,186	231,040,024	1.048	136,684,373	137,112,866	1.003	13,384	13,409	1.002
	5yr Weighted Average		1.051	5yr Weighted Average		1.004	2yr Weighted Average		1.003
	54	66		54	66		54	66	
2009	174,449,980	177,038,472	1.015	118,767,663	118,051,022	0.994	11,737	11,747	1.001
2010	191,535,795	195,269,010	1.019	124,913,453	124,685,445	0.998	12,984	13,009	1.002
2011	203,110,246	207,955,439	1.024	128,902,262	128,525,563	0.997	13,079	13,107	1.002
2012	195,048,814	200,131,853	1.026	126,237,354	124,071,826	0.983	12,828	12,849	1.002
2013	208,285,909	212,407,687	1.020	131,907,297	132,171,471	1.002	13,114	13,130	1.001
	5yr Weighted Average		1.021	5yr Weighted Average		0.995	2yr Weighted Average		1.001
	66	78		66	78		66	78	
2008	183,663,021	185,274,812	1.009	117,049,959	115,577,156	0.987	12,639	12,652	1.001
2009	175,983,307	178,838,879	1.016	117,752,581	118,084,020	1.003	11,740	11,750	1.001
2010	193,750,826	195,946,000	1.011	124,142,285	123,463,876	0.995	13,002	13,013	1.001
2011	205,172,696	206,076,701	1.004	127,330,800	126,735,858	0.995	13,094	13,102	1.001
2012	193,582,882	196,067,311	1.013	122,428,752	122,431,690	1.000	12,824	12,826	1.000
	5yr Weighted Average		1.011	5yr Weighted Average		0.996	2yr Weighted Average		1.000
	78	90		78	90		78	90	
2007	174,690,816	175,414,763	1.004	119,610,986	119,160,843	0.996	13,736	13,739	1.000
2008	184,076,164	183,908,795	0.999	115,264,394	115,497,299	1.002	12,646	12,652	1.000
2009	177,557,546	178,437,540	1.005	117,727,253	117,565,245	0.999	11,740	11,746	1.001
2010	193,880,381	193,191,523	0.996	122,953,020	122,740,990	0.998	13,004	13,006	1.000
2011	204,560,097	205,502,241	1.005	126,449,601	126,491,430	1.000	13,096	13,099	1.000
	5yr Weighted Average		1.002	5yr Weighted Average		0.999	2yr Weighted Average		1.000
	90	102		90	102		90	102	
2006	166,332,007	167,339,898	1.006	111,829,647	111,543,343	0.997	13,715	13,716	1.000
2007	175,104,763	175,894,499	1.005	118,976,624	119,090,351	1.001	13,737	13,741	1.000
2008	183,256,934	183,491,033	1.001	115,109,461	114,634,132	0.996	12,647	12,654	1.001
2009	175,077,528	175,289,694	1.001	116,839,749	116,924,297	1.001	11,734	11,738	1.000
2010	193,374,837	194,177,059	1.004	123,047,211	123,038,023	1.000	13,006	13,006	1.000
	5yr Weighted Average		1.003	5yr Weighted Average		0.999	2yr Weighted Average		1.000
	102	114		102	114		102	114	
2005	169,888,407	169,866,675	1.000	111,840,772	111,960,222	1.001	14,801	14,807	1.000
2006	166,240,416	166,222,192	1.000	111,253,276	111,384,351	1.001	13,713	13,725	1.001
2007	175,556,837	175,638,522	1.000	119,069,444	118,748,284	0.997	13,740	13,742	1.000
2008	183,851,185	184,177,810	1.002	114,908,632	115,152,372	1.002	12,654	12,658	1.000
2009	175,118,974	174,958,753	0.999	116,979,914	116,920,104	0.999	11,737	11,744	1.001
	5yr Weighted Average		1.000	5yr Weighted Average		1.000	2yr Weighted Average		1.000
	114	126		114	126		114	126	
2004	170,265,182	170,926,690	1.004	111,201,658	111,346,254	1.001	15,194	15,194	1.000
2005	169,866,675	170,008,512	1.001	111,960,222	112,084,942	1.001	14,807	14,813	1.000
2006	166,952,376	167,607,085	1.004	111,616,167	111,537,875	0.999	13,727	13,732	1.000
2007	175,638,522	176,056,330	1.002	118,748,284	118,649,937	0.999	13,742	13,748	1.000
2008	183,917,810	184,034,222	1.001	115,127,372	115,122,644	1.000	12,657	12,659	1.000
	5yr Weighted Average		1.002	5yr Weighted Average		1.000	2yr Weighted Average		1.000

Note:
 Unit Statistical Plan data, excluding Large Deductibles.

IX 000029

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2020

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						
2013	1,225.60	27,410	10,532	866	179.16	353.54
2014	1,265.09	30,203	11,742	850	177.22	336.97
2015	1,303.66	29,773	11,494	887	169.96	317.22
2016	1,349.36	30,644	11,625	906	167.50	305.91
2017	1,395.56	30,789	11,890	949	171.34	311.10

(2) Trend to PY 2017						
2013	1.139	1.123	1.129	1.095	0.956	0.880
2014	1.103	1.019	1.013	1.116	0.967	0.923
2015	1.070	1.034	1.034	1.070	1.008	0.981
2016	1.034	1.005	1.023	1.048	1.023	1.017
2017	1.000	1.000	1.000	1.000	1.000	1.000

(3) Projected Trend from PY 2017 to Prospective Effective Period						
Selected Annual Trend	3.4%	2.6%	2.3%	2.3%	-2.0%	-4.2%
Trend Factor	1.122	1.093	1.081	1.082	0.932	0.860

(4) Trend Factors from PY 2017 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
2013	1.278	1.228	1.221	1.185	0.891	0.757
2014	1.238	1.114	1.095	1.208	0.901	0.794
2015	1.201	1.130	1.118	1.158	0.939	0.844
2016	1.161	1.098	1.106	1.134	0.953	0.875
2017	1.122	1.093	1.081	1.082	0.932	0.860

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 2017

(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 2017 to midpoint of policy effective period 7/1/2020 - 6/30/2021, which is 3.5 years.

(4) = (2) x (3)

IX 000030

Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
7/1/2020

Section IX - B
Exhibit 4

Calculation of Investment Income Offset Factor

Indemnity

Injury Type (1)	Loss Flow Discounted at 1.54% Post-Chapter 398 (2)	Injury Type Weights At Ultimate (3)	Investment Income Offset Factor (4)
Fatal	0.742	1.50%	0.799
Permanent Total	0.691	8.44%	0.744
Permanent Partial	0.967	37.86%	1.041
Temporary Total	0.976	18.06%	1.051
Total Indemnity			0.929

Medical

Injury Type (5)	Loss Flow Discounted at 1.54% Post-Chapter 398 (6)	Injury Type Weights At Ultimate (7)	Investment Income Offset Factor (8)
Fatal	0.742	0.10%	1.000
Permanent Total	0.691	5.12%	0.749
Permanent Partial	0.967	13.56%	1.047
Temporary Total	0.976	11.22%	1.057
Medical Only		4.14%	1.000
Total Medical			0.923

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) $[1.83\% \times (1.000 - 15.77\%)] = 1.54\%$

(3): Section IV - E, Exhibit 2, Page 1.

(4)= (2) / 0.929, which is the weighted average of (2) and (3).

(7): Section IV - E, Exhibit 2, Page 2.

(8)= (6) / 0.923, 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 000031

Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
7/1/2020

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	0.100	1.111
B	0.113	1.127
C	0.140	1.163
D	0.182	1.222
E	0.199	1.248
F	0.229	1.297
G	0.342	1.520

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)	
2013	Fatal	8,000	1,000,000	0	0	1,008,000	7,398	920,555	0	0	927,953
	Permanent Total	2,749,197	0	684,427	0	3,433,624	2,545,160	0	547,836	0	3,092,996
	Permanent Partial	7,227,153	16,739,365	3,001,159	6,303,288	33,270,965	6,888,335	15,881,961	2,402,218	5,311,559	30,484,073
	Temporary Total	4,034,517	12,495,195	1,494,595	8,878,332	26,902,639	3,666,462	11,303,602	1,196,319	7,481,458	23,647,841
	Medical Only	0	0	0	3,932,159	3,932,159	0	0	0	2,734,377	2,734,377
2014	Fatal	0	350,790	0	0	350,790	0	310,577	0	0	310,577
	Permanent Total	5,567,769	0	2,512,494	0	8,080,263	4,946,609	0	1,869,750	0	6,816,359
	Permanent Partial	8,803,169	15,251,056	3,528,859	5,523,631	33,106,715	8,029,444	13,896,699	2,626,110	4,334,348	28,886,601
	Temporary Total	5,454,193	12,998,023	1,506,745	9,489,339	29,448,300	4,763,991	11,341,825	1,121,291	7,446,206	24,673,313
	Medical Only	0	0	0	3,089,931	3,089,931	0	0	0	2,358,897	2,358,897
2015	Fatal	0	469,098	0	30,902	500,000	0	470,375	0	26,729	497,104
	Permanent Total	3,645,668	0	1,432,822	0	5,078,490	3,711,830	0	1,177,542	0	4,889,372
	Permanent Partial	9,204,230	16,566,343	2,814,035	6,141,334	34,725,942	9,580,881	17,112,452	2,312,669	5,311,870	34,317,872
	Temporary Total	4,098,593	14,246,379	1,293,749	10,016,403	29,655,124	4,113,441	14,188,699	1,063,247	8,663,563	28,028,950
	Medical Only	0	0	0	3,159,919	3,159,919	0	0	0	2,542,187	2,542,187
2016	Fatal	0	500,000	0	0	500,000	0	572,441	0	0	572,441
	Permanent Total	1,575,044	0	387,818	0	1,962,862	1,860,476	0	343,780	0	2,204,256
	Permanent Partial	6,157,954	16,600,323	3,100,903	6,685,324	32,544,504	7,408,790	19,489,904	2,748,783	6,015,809	35,663,286
	Temporary Total	4,636,235	12,173,173	2,184,381	9,301,879	28,295,668	5,411,293	13,865,059	1,936,335	8,370,323	29,583,010
	Medical Only	0	0	0	2,991,014	2,991,014	0	0	0	2,534,115	2,534,115
2017	Fatal	0	632,210	0	41,885	674,095	0	975,268	0	38,177	1,013,445
	Permanent Total	0	0	0	0	0	0	0	0	0	0
	Permanent Partial	1,888,280	8,277,559	1,287,776	4,654,881	16,108,496	3,382,102	13,024,923	1,204,194	4,242,824	21,854,043
	Temporary Total	3,836,570	11,342,886	2,337,470	9,631,055	27,147,981	6,709,967	17,428,236	2,185,759	8,778,500	35,102,462
	Medical Only	0	0	0	3,200,325	3,200,325	0	0	0	2,696,564	2,696,564
(13) All Years, All Injury Types		68,886,572	139,642,400	27,567,233	93,071,601	329,167,806	73,026,179	150,782,576	22,735,833	78,887,506	325,432,094

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 000032

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		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)	
2013	Fatal	660	121,092	283	51,897	173,932	7,646	988,412	336	61,601	1,057,995	60,232,926
	Permanent Total	282,322	0	206,347	0	488,669	2,497,584	0	670,367	0	3,167,951	
	Permanent Partial	788,793	1,952,421	717,109	1,808,937	5,267,260	9,483,749	22,031,261	3,877,552	8,851,297	44,243,859	
	Temporary Total	455,246	1,314,435	401,056	1,854,861	4,025,598	5,141,171	15,738,978	2,004,966	11,718,602	34,603,717	
	Medical Only	0	0	0	459,909	459,909	0	0	0	3,791,618	3,791,618	
2014	Fatal	0	35,391	0	15,168	50,559	0	328,287	0	18,004	346,291	61,795,808
	Permanent Total	590,307	0	592,896	0	1,183,203	4,890,895	0	2,188,959	0	7,079,854	
	Permanent Partial	1,005,672	1,681,363	910,951	1,464,381	5,062,367	11,161,307	19,243,972	4,396,825	7,208,244	42,010,348	
	Temporary Total	545,246	1,345,264	423,198	1,857,970	4,171,678	6,622,421	15,825,109	1,938,584	11,678,258	36,064,372	
	Medical Only	0	0	0	396,542	396,542	0	0	0	3,270,706	3,270,706	
2015	Fatal	0	73,259	0	37,344	110,603	0	515,851	0	76,054	591,905	64,407,242
	Permanent Total	491,828	0	399,397	0	891,225	3,713,194	0	1,401,685	0	5,114,879	
	Permanent Partial	1,118,456	2,190,136	861,131	1,931,710	6,101,433	13,217,161	23,844,972	3,945,266	9,004,300	50,011,699	
	Temporary Total	477,337	1,610,085	380,359	2,136,015	4,603,796	5,726,259	19,706,449	1,811,961	13,555,231	40,799,900	
	Medical Only	0	0	0	423,157	423,157	0	0	0	3,519,863	3,519,863	
2016	Fatal	0	51,049	0	21,878	72,927	0	591,625	0	25,969	617,594	64,152,211
	Permanent Total	241,247	0	156,711	0	397,958	1,856,503	0	444,869	0	2,301,372	
	Permanent Partial	991,062	2,266,435	1,035,185	1,992,038	6,284,720	10,376,548	26,876,153	4,703,749	9,954,340	51,910,790	
	Temporary Total	628,205	1,677,313	600,392	2,173,418	5,079,328	7,533,305	19,386,618	3,184,006	13,234,114	43,338,043	
	Medical Only	0	0	0	432,476	432,476	0	0	0	3,521,344	3,521,344	
2017	Fatal	0	115,952	0	54,721	170,673	0	1,035,451	0	110,270	1,145,721	63,352,307
	Permanent Total	0	0	0	0	0	0	0	0	0	0	
	Permanent Partial	383,253	1,592,030	380,457	1,476,974	3,832,714	4,651,438	18,056,689	1,969,837	7,110,128	31,788,092	
	Temporary Total	773,373	2,103,994	700,118	2,386,228	5,963,713	9,334,266	24,363,325	3,622,247	14,013,555	51,333,393	
	Medical Only	0	0	0	455,988	455,988	0	0	0	3,742,079	3,742,079	
(14) All Years, All Injury Types		8,773,007	18,130,219	7,765,590	21,431,612	56,100,428	96,213,447	208,533,152	36,161,209	124,465,577	465,373,385	313,940,494
(15) Pure Premium							0.306	0.664	0.115	0.396	1.482	

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 000033

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)	Not-Likely (11)	
2013	Fatal	0	2,516,752	0	227,604	2,744,356	0	2,316,809	0	191,794	2,508,603
	Permanent Total	20,180,410	0	5,825,305	0	26,005,715	18,682,677	0	4,662,751	0	23,345,428
	Permanent Partial	17,641,909	39,874,908	5,934,569	12,427,640	75,879,026	16,814,833	37,832,482	4,750,209	10,472,335	69,869,859
	Temporary Total	6,612,225	21,404,412	2,291,739	13,364,905	43,673,281	6,009,015	19,363,200	1,834,377	11,262,134	38,468,726
	Medical Only	0	0	0	3,303,047	3,303,047	0	0	0	2,296,900	2,296,900
2014	Fatal	901,514	463,733	12,897	56,018	1,434,162	798,969	410,573	9,598	43,957	1,263,097
	Permanent Total	21,188,802	0	8,265,965	0	29,454,767	18,824,904	0	6,151,373	0	24,976,277
	Permanent Partial	31,280,410	49,428,755	9,838,227	14,800,414	105,347,806	28,531,126	45,039,277	7,321,420	11,613,763	92,505,586
	Temporary Total	9,486,365	19,742,133	3,526,866	12,150,809	44,906,173	8,285,910	17,226,605	2,624,626	9,534,640	37,671,781
	Medical Only	0	0	0	3,801,786	3,801,786	0	0	0	2,902,337	2,902,337
2015	Fatal	475,714	5,728,518	0	298,455	6,502,687	480,684	5,744,121	0	258,145	6,482,950
	Permanent Total	13,141,659	0	5,792,455	0	18,934,114	13,380,156	0	4,760,435	0	18,140,591
	Permanent Partial	30,416,682	46,590,066	9,196,888	13,998,485	100,202,121	31,661,381	48,125,906	7,558,313	12,107,815	99,453,415
	Temporary Total	9,517,849	22,290,450	3,728,045	14,984,956	50,521,300	9,552,330	22,200,202	3,063,833	12,961,050	47,777,415
	Medical Only	0	0	0	3,590,285	3,590,285	0	0	0	2,888,421	2,888,421
2016	Fatal	130,094	3,511,522	0	86,759	3,728,375	152,629	4,020,279	0	78,071	4,250,979
	Permanent Total	7,204,292	0	2,755,306	0	9,959,598	8,509,863	0	2,442,430	0	10,952,293
	Permanent Partial	21,736,711	43,446,269	8,777,405	15,377,295	89,337,680	26,151,985	51,008,865	7,780,695	13,837,305	98,778,850
	Temporary Total	10,625,173	26,549,067	4,934,813	16,526,991	58,636,044	12,401,425	30,238,984	4,374,445	14,871,862	61,886,716
	Medical Only	0	0	0	3,601,100	3,601,100	0	0	0	3,051,006	3,051,006
2017	Fatal	0	2,575,729	0	613,366	3,189,095	0	3,973,405	0	559,070	4,532,475
	Permanent Total	1,909,328	0	1,744,975	0	3,654,303	3,370,984	0	1,631,720	0	5,002,704
	Permanent Partial	11,921,531	25,675,222	6,518,528	11,817,704	55,932,985	21,352,675	40,400,533	6,095,450	10,771,584	78,620,242
	Temporary Total	10,392,439	29,174,272	7,797,205	21,169,474	68,533,390	18,175,849	44,825,990	7,291,136	19,295,522	89,588,497
	Medical Only	0	0	0	3,838,194	3,838,194	0	0	0	3,234,027	3,234,027
(13) All Years, All Injury Types		224,763,107	338,971,808	86,941,188	166,035,287	816,711,390	243,137,395	372,727,231	72,352,811	142,231,738	830,449,175

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 000034

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		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)	
2013	Fatal	0	576,530	0	333,182	909,712	0	2,745,470	0	623,147	3,368,617	55,922,767
	Permanent Total	4,121,263	0	3,146,502	0	7,267,765	20,143,280	0	6,941,370	0	27,084,650	
	Permanent Partial	3,504,197	8,066,762	2,903,530	6,689,471	21,163,960	25,100,609	56,700,490	9,514,157	21,333,380	112,648,636	
	Temporary Total	1,179,676	3,961,570	1,020,242	5,007,311	11,168,799	8,966,740	29,093,911	3,583,013	20,420,807	62,064,471	
	Medical Only	0	0	0	673,177	673,177	0	0	0	3,525,481	3,525,481	
2014	Fatal	153,626	78,612	68,691	46,503	347,432	903,911	464,184	92,928	107,376	1,568,399	63,096,796
	Permanent Total	3,981,560	0	3,732,889	0	7,714,449	20,145,510	0	8,785,773	0	28,931,283	
	Permanent Partial	6,276,625	9,389,809	5,008,417	7,525,265	28,200,116	42,998,890	67,237,617	15,326,889	23,791,212	149,354,608	
	Temporary Total	1,659,623	3,522,249	1,536,522	4,345,657	11,064,051	12,405,457	25,880,869	5,222,920	17,422,036	60,931,282	
	Medical Only	0	0	0	843,826	843,826	0	0	0	4,446,695	4,446,695	
2015	Fatal	174,887	1,297,857	74,952	634,500	2,182,196	622,067	6,682,086	88,968	1,059,570	8,452,691	70,034,565
	Permanent Total	2,932,135	0	2,968,418	0	5,900,553	14,409,047	0	6,869,906	0	21,278,953	
	Permanent Partial	7,088,304	10,387,263	5,539,121	8,202,465	31,217,153	47,868,459	72,282,788	16,281,069	25,247,164	161,679,480	
	Temporary Total	2,077,274	4,525,751	1,909,445	5,698,397	14,210,867	14,506,066	33,336,342	6,242,275	23,420,649	77,505,332	
	Medical Only	0	0	0	828,739	828,739	0	0	0	4,412,268	4,412,268	
2016	Fatal	33,477	995,344	14,347	449,094	1,492,262	176,595	4,759,291	17,030	625,744	5,578,660	73,996,939
	Permanent Total	1,901,997	0	1,657,091	0	3,559,088	9,197,052	0	3,643,919	0	12,840,971	
	Permanent Partial	5,397,738	11,017,518	4,692,733	8,901,020	30,009,009	38,974,166	76,622,749	15,505,383	28,265,400	159,367,698	
	Temporary Total	2,633,633	6,394,180	2,463,324	7,234,027	18,725,164	18,753,824	45,693,999	8,582,515	27,746,495	100,776,833	
	Medical Only	0	0	0	879,488	879,488	0	0	0	4,665,497	4,665,497	
2017	Fatal	0	864,380	0	528,219	1,392,599	0	4,590,542	0	1,290,612	5,881,154	79,732,807
	Permanent Total	740,537	0	790,522	0	1,531,059	3,631,808	0	2,153,045	0	5,784,853	
	Permanent Partial	4,823,955	8,558,652	3,992,461	6,997,068	24,372,136	32,336,650	60,480,512	12,540,012	22,087,735	127,444,909	
	Temporary Total	3,795,816	9,196,509	3,841,794	9,541,882	26,376,001	27,406,129	67,384,407	13,973,643	36,195,644	144,959,823	
	Medical Only	0	0	0	930,055	930,055	0	0	0	4,942,765	4,942,765	
(14) All Years, All Injury Types		52,476,323	78,832,986	45,361,001	76,289,346	252,959,656	338,546,260	553,955,257	135,364,815	271,629,677	1,299,496,009	342,783,873
(15) Pure Premium							0.988	1.616	0.395	0.792	3.791	

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 000035

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)	
2013	Fatal	742,170	844,618	266	9,804	1,596,858	686,333	777,518	213	8,261	1,472,325
	Permanent Total	3,736,660	0	1,071,284	0	4,807,944	3,459,335	0	857,488	0	4,316,823
	Permanent Partial	7,320,341	11,623,345	3,148,903	5,440,118	27,532,707	6,977,154	11,027,988	2,520,477	4,584,196	25,109,815
	Temporary Total	5,414,112	9,518,099	2,386,226	8,456,884	25,775,321	4,920,202	8,610,414	1,910,008	7,126,318	22,566,942
	Medical Only	0	0	0	5,623,632	5,623,632	0	0	0	3,910,608	3,910,608
2014	Fatal	53,753	614,406	41,145	2,244	711,548	47,639	543,974	30,619	1,761	623,993
	Permanent Total	2,919,476	0	792,510	0	3,711,986	2,593,769	0	589,771	0	3,183,540
	Permanent Partial	10,874,494	12,682,831	3,445,326	5,781,960	32,784,611	9,918,718	11,556,543	2,563,945	4,537,056	28,576,262
	Temporary Total	6,778,201	11,308,341	3,696,330	9,096,638	30,879,510	5,920,452	9,867,441	2,750,738	7,138,057	25,676,688
	Medical Only	0	0	0	5,381,909	5,381,909	0	0	0	4,108,625	4,108,625
2015	Fatal	250,000	374,064	0	51,137	675,201	252,612	375,083	0	44,230	671,925
	Permanent Total	3,057,487	0	1,440,341	0	4,497,828	3,112,975	0	1,183,721	0	4,296,696
	Permanent Partial	8,724,382	13,069,741	3,366,172	5,787,199	30,947,494	9,081,397	13,500,584	2,766,434	5,005,566	30,353,981
	Temporary Total	4,008,858	10,394,710	2,367,377	8,324,470	25,095,415	4,023,381	10,352,624	1,945,590	7,200,146	23,521,741
	Medical Only	0	0	0	5,590,530	5,590,530	0	0	0	4,497,638	4,497,638
2016	Fatal	0	644,530	0	20,345	664,875	0	737,911	0	18,308	756,219
	Permanent Total	680,912	0	639,785	0	1,320,697	804,307	0	567,135	0	1,371,442
	Permanent Partial	7,402,610	10,859,948	2,819,174	4,472,093	25,553,825	8,906,267	12,750,315	2,499,045	4,024,226	28,179,853
	Temporary Total	7,203,431	11,230,551	2,931,995	8,802,028	30,168,005	8,407,657	12,791,427	2,599,055	7,920,531	31,718,670
	Medical Only	0	0	0	5,811,899	5,811,899	0	0	0	4,924,089	4,924,089
2017	Fatal	0	503,108	0	85,000	588,108	0	776,111	0	77,476	853,587
	Permanent Total	0	0	0	0	0	0	0	0	0	0
	Permanent Partial	3,061,287	6,468,445	1,794,832	3,362,404	14,686,968	5,483,077	10,178,242	1,678,340	3,064,759	20,404,418
	Temporary Total	6,190,194	11,669,259	3,547,049	11,259,443	32,665,945	10,826,336	17,929,705	3,316,832	10,262,741	42,335,614
	Medical Only	0	0	0	6,895,834	6,895,834	0	0	0	5,810,365	5,810,365
(13) All Years, All Injury Types		78,418,368	111,805,996	33,488,715	100,255,571	323,968,650	85,421,611	121,775,880	27,779,411	84,264,957	319,241,859

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 000036

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		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)	
2013	Fatal	105,932	93,869	45,434	41,574	286,809	751,775	826,852	54,183	59,155	1,691,965	732,755,741
	Permanent Total	361,462	0	278,288	0	639,750	3,375,004	0	1,009,551	0	4,384,555	
	Permanent Partial	845,449	1,337,503	800,016	1,346,685	4,329,653	9,663,458	15,275,402	4,127,616	7,372,518	36,438,994	
	Temporary Total	633,733	1,002,102	585,271	1,573,061	3,794,167	6,927,644	11,990,072	3,131,982	10,919,140	32,968,838	
	Medical Only	0	0	0	640,704	640,704	0	0	0	5,402,407	5,402,407	
2014	Fatal	4,248	56,223	5,721	24,533	90,725	49,235	569,523	43,137	31,211	693,106	769,793,466
	Permanent Total	299,390	0	218,845	0	518,235	2,555,599	0	718,750	0	3,274,349	
	Permanent Partial	1,227,882	1,464,647	1,005,523	1,432,955	5,131,007	13,769,676	16,085,403	4,437,110	7,421,161	41,713,350	
	Temporary Total	742,484	1,151,724	814,202	1,664,201	4,372,611	8,310,944	13,744,641	4,474,580	11,048,269	37,578,434	
	Medical Only	0	0	0	679,892	679,892	0	0	0	5,683,969	5,683,969	
2015	Fatal	28,786	39,871	12,337	22,722	103,716	267,017	393,747	14,644	79,473	754,881	823,889,380
	Permanent Total	370,606	0	357,539	0	728,145	3,077,133	0	1,369,971	0	4,447,104	
	Permanent Partial	1,047,766	1,705,410	917,403	1,636,462	5,307,041	12,512,810	18,784,347	4,579,279	8,256,526	44,132,962	
	Temporary Total	471,073	1,224,065	530,140	1,684,152	3,909,430	5,606,111	14,440,065	3,107,446	11,151,243	34,304,865	
	Medical Only	0	0	0	752,065	752,065	0	0	0	6,231,397	6,231,397	
2016	Fatal	0	106,740	0	49,728	156,468	0	801,483	0	80,758	882,241	852,080,851
	Permanent Total	86,964	0	115,340	0	202,304	787,282	0	606,628	0	1,393,910	
	Permanent Partial	983,076	1,536,096	810,441	1,334,973	4,664,586	12,216,553	17,648,362	4,113,934	6,661,877	40,640,726	
	Temporary Total	988,917	1,532,630	856,568	1,971,437	5,349,552	11,720,720	17,866,965	4,337,370	12,416,033	46,341,088	
	Medical Only	0	0	0	822,265	822,265	0	0	0	6,820,922	6,820,922	
2017	Fatal	0	120,876	0	69,042	189,918	0	851,145	0	173,916	1,025,061	892,880,238
	Permanent Total	0	0	0	0	0	0	0	0	0	0	
	Permanent Partial	612,476	1,123,378	534,196	972,989	3,243,039	7,529,991	13,961,176	2,750,344	5,019,216	29,260,727	
	Temporary Total	1,239,843	2,039,321	1,071,555	2,550,524	6,901,243	15,050,624	24,908,158	5,508,140	16,082,737	61,549,659	
	Medical Only	0	0	0	966,303	966,303	0	0	0	8,043,906	8,043,906	
(14) All Years, All Injury Types		10,050,087	14,534,455	8,958,819	20,236,267	53,779,628	114,171,576	168,147,341	44,384,665	128,955,834	455,659,416	4,071,399,675
(15) Pure Premium							0.028	0.041	0.011	0.032	0.112	

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 000037

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)	
2013	Fatal	513,995	1,276,969	277,046	51,855	2,119,865	475,325	1,175,520	221,756	43,697	1,916,298
	Permanent Total	10,694,207	0	3,903,454	0	14,597,661	9,900,513	0	3,124,443	0	13,024,956
	Permanent Partial	22,763,713	32,887,893	8,075,792	13,909,335	77,636,733	21,696,521	31,203,348	6,464,109	11,720,907	71,084,885
	Temporary Total	10,815,579	27,814,932	4,369,009	21,085,655	64,085,175	9,828,912	25,162,386	3,497,087	17,768,139	56,256,524
	Medical Only	0	0	0	10,146,527	10,146,527	0	0	0	7,055,776	7,055,776
2014	Fatal	946,884	805,897	31,728	19,797	1,804,306	839,178	713,514	23,612	15,534	1,591,838
	Permanent Total	9,100,017	0	3,082,848	0	12,182,865	8,084,787	0	2,294,197	0	10,378,984
	Permanent Partial	23,412,753	40,882,308	10,163,355	17,162,543	91,620,959	21,354,970	37,251,790	7,563,373	13,467,306	79,637,439
	Temporary Total	14,535,190	30,309,749	6,769,315	23,110,709	74,724,963	12,695,829	26,447,704	5,037,595	18,134,784	62,315,912
	Medical Only	0	0	0	9,679,922	9,679,922	0	0	0	7,389,788	7,389,788
2015	Fatal	3,076	795,786	0	6,725	805,587	3,108	797,954	0	5,817	806,879
	Permanent Total	4,739,539	0	1,727,712	0	6,467,251	4,825,553	0	1,419,892	0	6,245,445
	Permanent Partial	23,821,409	41,350,382	10,473,458	16,460,251	92,105,500	24,796,218	42,713,496	8,607,442	14,237,089	90,354,245
	Temporary Total	14,246,776	29,098,519	6,256,183	21,956,476	71,557,954	14,298,389	28,980,707	5,141,543	18,990,980	67,411,619
	Medical Only	0	0	0	10,100,430	10,100,430	0	0	0	8,125,898	8,125,898
2016	Fatal	0	1,928,198	0	185,484	2,113,682	0	2,207,560	0	166,909	2,374,469
	Permanent Total	1,874,119	0	694,464	0	2,568,583	2,213,749	0	615,605	0	2,829,354
	Permanent Partial	19,513,045	31,619,177	6,933,764	15,477,149	73,543,135	23,476,636	37,123,057	6,146,407	13,927,159	80,673,259
	Temporary Total	12,093,800	28,342,936	6,121,864	23,762,669	70,321,269	14,115,568	32,292,071	5,426,701	21,382,947	73,217,287
	Medical Only	0	0	0	9,791,572	9,791,572	0	0	0	8,295,838	8,295,838
2017	Fatal	0	549,297	0	11,763	561,060	0	847,363	0	10,722	858,085
	Permanent Total	296,428	0	347,938	0	644,366	523,354	0	325,356	0	848,710
	Permanent Partial	11,931,534	22,891,933	6,738,770	14,107,818	55,670,055	21,370,592	36,020,967	6,301,398	12,858,974	76,551,931
	Temporary Total	11,915,251	32,284,612	8,384,254	28,277,962	80,862,079	20,839,172	49,604,997	7,840,083	25,774,757	104,059,009
	Medical Only	0	0	0	10,704,154	10,704,154	0	0	0	9,019,220	9,019,220
(13) All Years, All Injury Types		193,217,315	322,838,588	84,350,954	246,008,796	846,415,653	211,338,374	352,542,434	70,050,599	208,392,241	842,323,648

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 000038

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)	Indemnity		Adjusted Excess Losses Medical		Total (7)	Indemnity		Converted Unlimited Losses Medical		Total (12)	Exposure (13)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)		Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)		
2013	Fatal	82,428	136,287	84,665	67,365	370,745	529,248	1,244,765	363,722	131,830	2,269,565	166,677,740
	Permanent Total	1,152,408	0	990,797	0	2,143,205	9,763,317	0	3,657,892	0	13,421,209	
	Permanent Partial	2,594,293	3,702,459	2,232,589	3,578,679	12,108,020	30,007,052	43,120,020	10,810,631	19,018,505	102,956,208	
	Temporary Total	1,216,253	3,011,926	1,131,176	4,333,408	9,692,763	13,777,072	35,142,937	5,809,225	27,741,045	82,470,279	
	Medical Only	0	0	0	1,106,802	1,106,802	0	0	0	9,688,980	9,688,980	
2014	Fatal	121,058	81,307	55,726	37,375	295,466	911,162	754,200	94,173	62,803	1,822,338	178,774,787
	Permanent Total	1,040,333	0	850,099	0	1,890,432	8,060,442	0	2,794,854	0	10,855,296	
	Permanent Partial	2,523,433	4,400,522	2,317,942	4,116,496	13,358,393	29,497,592	51,454,148	12,283,198	21,857,952	115,092,890	
	Temporary Total	1,517,096	3,237,170	1,497,766	4,466,764	10,718,796	17,728,345	37,027,120	8,202,943	28,368,628	91,327,036	
	Medical Only	0	0	0	1,157,781	1,157,781	0	0	0	10,145,965	10,145,965	
2015	Fatal	484	83,987	207	36,893	121,571	3,409	836,868	246	50,696	891,219	188,176,300
	Permanent Total	642,829	0	548,233	0	1,191,062	4,830,355	0	1,749,397	0	6,579,752	
	Permanent Partial	3,163,040	5,166,259	2,897,334	4,633,207	15,859,840	34,538,775	59,147,065	14,301,278	23,457,157	131,444,275	
	Temporary Total	1,818,873	3,350,780	1,624,278	4,545,924	11,339,855	20,103,700	40,328,345	8,492,209	29,542,652	98,466,906	
	Medical Only	0	0	0	1,274,815	1,274,815	0	0	0	11,158,647	11,158,647	
2016	Fatal	0	279,324	0	150,190	429,514	0	2,359,787	0	376,396	2,736,183	194,558,544
	Permanent Total	308,006	0	264,931	0	572,937	2,227,529	0	782,677	0	3,010,206	
	Permanent Partial	3,015,468	4,428,422	2,429,479	4,261,710	14,135,079	32,726,361	51,329,587	10,660,454	22,610,095	117,326,497	
	Temporary Total	1,575,267	3,699,558	1,588,779	5,065,211	11,928,815	19,571,802	44,893,787	8,805,572	33,196,750	106,467,911	
	Medical Only	0	0	0	1,315,698	1,315,698	0	0	0	11,408,893	11,408,893	
2017	Fatal	0	99,291	0	44,567	143,858	0	898,274	0	65,628	963,902	206,202,618
	Permanent Total	88,482	0	133,262	0	221,744	540,449	0	407,649	0	948,098	
	Permanent Partial	2,558,474	4,326,796	2,185,597	4,065,144	13,136,011	29,560,176	49,842,605	10,549,955	21,037,916	110,990,652	
	Temporary Total	2,427,212	5,795,885	2,372,701	6,761,301	17,357,099	29,021,084	69,103,718	12,818,709	40,838,057	151,781,568	
	Medical Only	0	0	0	1,427,520	1,427,520	0	0	0	12,400,280	12,400,280	
(14) All Years, All Injury Types		25,845,437	41,799,973	23,205,561	52,446,850	143,297,821	283,397,870	487,483,226	112,584,784	323,158,875	1,206,624,755	934,389,988
(15) Pure Premium							0.303	0.522	0.120	0.346	1.291	

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 000039

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)	
2013	Fatal	0	811,931	0	71,227	883,158	0	747,427	0	60,020	807,447
	Permanent Total	7,091,646	0	2,095,951	0	9,187,597	6,565,324	0	1,677,663	0	8,242,987
	Permanent Partial	14,761,842	19,793,749	4,935,644	8,114,989	47,606,224	14,069,788	18,779,897	3,950,639	6,838,216	43,638,540
	Temporary Total	4,456,136	10,308,652	2,206,760	6,682,632	23,654,180	4,049,618	9,325,577	1,766,358	5,631,219	20,772,772
	Medical Only	0	0	0	2,594,191	2,594,191	0	0	0	1,803,970	1,803,970
2014	Fatal	103,800	512,777	152,618	125,247	894,442	91,993	453,995	113,575	98,280	757,843
	Permanent Total	3,666,254	0	1,471,210	0	5,137,464	3,257,234	0	1,094,846	0	4,352,080
	Permanent Partial	10,178,649	15,533,188	3,565,341	5,726,734	35,003,912	9,284,032	14,153,777	2,653,258	4,493,721	30,584,788
	Temporary Total	4,930,213	11,419,293	2,175,918	7,054,329	25,579,753	4,306,318	9,964,255	1,619,276	5,535,474	21,425,323
	Medical Only	0	0	0	2,671,770	2,671,770	0	0	0	2,039,667	2,039,667
2015	Fatal	262,617	2,355,969	137,161	335,972	3,091,719	265,361	2,362,387	112,724	290,595	3,031,067
	Permanent Total	2,121,222	0	961,026	0	3,082,248	2,159,718	0	789,804	0	2,949,522
	Permanent Partial	12,527,591	18,044,361	5,659,277	6,860,033	43,091,262	13,040,239	18,639,193	4,650,985	5,933,500	42,263,917
	Temporary Total	3,913,518	9,936,520	1,542,843	6,422,561	21,815,442	3,927,696	9,896,290	1,267,961	5,555,114	20,647,061
	Medical Only	0	0	0	2,902,763	2,902,763	0	0	0	2,335,302	2,335,302
2016	Fatal	0	557,162	0	2,188	559,350	0	637,885	0	1,969	639,854
	Permanent Total	331,326	0	1,168,674	0	1,500,000	391,369	0	1,035,966	0	1,427,335
	Permanent Partial	10,241,506	11,134,259	4,257,605	6,095,315	31,728,685	12,321,813	13,072,374	3,774,137	5,484,888	34,653,212
	Temporary Total	8,814,675	15,281,344	5,063,532	9,449,142	38,608,693	10,288,259	17,405,219	4,488,547	8,502,838	40,684,863
	Medical Only	0	0	0	2,906,637	2,906,637	0	0	0	2,462,627	2,462,627
2017	Fatal	0	601,553	0	6,029	607,582	0	927,976	0	5,495	933,471
	Permanent Total	230,872	0	31,418	0	262,290	407,613	0	29,379	0	436,992
	Permanent Partial	4,473,997	8,326,520	2,198,145	4,607,385	19,606,047	8,013,384	13,101,964	2,055,477	4,199,533	27,370,358
	Temporary Total	6,207,742	16,138,424	4,151,312	11,363,494	37,860,972	10,857,027	24,796,534	3,881,876	10,357,581	49,893,018
	Medical Only	0	0	0	3,078,298	3,078,298	0	0	0	2,593,745	2,593,745
(13) All Years, All Injury Types		94,313,606	140,755,702	41,774,435	87,070,936	363,914,679	103,296,786	154,264,750	34,962,471	74,223,754	366,747,761

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 000040

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)	Indemnity		Adjusted Excess Losses Medical			Converted Unlimited Losses					Exposure (13)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Total (7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	Total (12)	
2013	Fatal	0	139,032	0	77,120	216,152	0	841,155	0	162,785	1,003,940	27,539,485
	Permanent Total	1,172,171	0	941,846	0	2,114,017	6,834,719	0	2,328,390	0	9,163,109	
	Permanent Partial	2,413,977	3,273,338	1,984,341	3,131,999	10,803,655	20,362,809	27,242,915	7,377,614	12,393,706	67,377,044	
	Temporary Total	689,308	1,571,891	713,063	2,002,639	4,976,901	5,911,051	13,592,844	3,112,077	9,581,736	32,197,708	
	Medical Only	0	0	0	369,788	369,788	0	0	0	2,580,251	2,580,251	
2014	Fatal	16,119	75,914	37,438	54,754	184,225	102,587	502,827	179,253	181,652	966,319	28,295,790
	Permanent Total	526,284	0	463,393	0	989,677	3,342,074	0	1,385,064	0	4,727,138	
	Permanent Partial	1,631,230	2,437,965	1,365,848	2,160,676	7,595,719	13,483,897	20,496,196	4,996,043	8,271,903	47,248,039	
	Temporary Total	691,448	1,696,918	650,745	2,048,713	5,087,824	6,233,911	14,545,444	2,849,247	9,519,391	33,147,993	
	Medical Only	0	0	0	410,146	410,146	0	0	0	2,907,927	2,907,927	
2015	Fatal	34,154	454,683	39,718	277,693	806,248	284,207	2,673,098	180,948	674,558	3,812,811	30,876,935
	Permanent Total	384,220	0	356,035	0	740,255	2,247,123	0	1,018,496	0	3,265,619	
	Permanent Partial	2,270,421	3,129,212	2,084,546	2,767,700	10,251,879	18,913,644	26,891,058	8,372,758	10,816,228	64,993,688	
	Temporary Total	720,857	1,686,090	629,334	2,055,111	5,091,392	5,798,324	14,447,162	2,381,414	9,552,073	32,178,973	
	Medical Only	0	0	0	469,342	469,342	0	0	0	3,329,113	3,329,113	
2016	Fatal	0	95,830	0	41,390	137,220	0	696,217	0	51,467	747,684	31,926,926
	Permanent Total	72,981	0	314,941	0	387,922	410,172	0	1,200,774	0	1,610,946	
	Permanent Partial	2,045,201	2,278,188	1,855,423	2,321,670	8,500,482	17,747,934	18,962,936	6,997,955	9,704,122	53,412,947	
	Temporary Total	1,746,181	2,934,529	1,846,934	3,252,221	9,779,865	15,011,034	25,370,574	7,952,062	14,754,516	63,088,186	
	Medical Only	0	0	0	479,457	479,457	0	0	0	3,492,254	3,492,254	
2017	Fatal	0	226,220	0	98,539	324,759	0	1,095,208	0	123,488	1,218,696	33,703,883
	Permanent Total	84,747	0	45,046	0	129,793	434,914	0	66,154	0	501,068	
	Permanent Partial	1,212,425	2,276,249	967,403	2,002,725	6,458,802	11,396,874	18,997,093	3,757,661	7,709,860	41,861,488	
	Temporary Total	1,926,110	4,131,732	1,791,470	4,227,176	12,076,488	15,944,913	36,083,374	7,120,974	18,306,248	77,455,509	
	Medical Only	0	0	0	519,159	519,159	0	0	0	3,695,018	3,695,018	
(14) All Years, All Injury Types		17,637,834	26,407,791	16,087,524	28,768,018	88,901,167	144,460,187	222,438,101	61,276,884	127,808,296	555,983,468	152,343,019
(15) Pure Premium							0.948	1.460	0.402	0.839	3.650	

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 000041

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)	
2013	Fatal	1,264,165	6,450,270	277,312	360,490	8,352,237	1,169,056	5,937,829	221,969	303,772	7,632,626
	Permanent Total	44,452,120	0	13,580,421	0	58,032,541	41,153,009	0	10,870,181	0	52,023,190
	Permanent Partial	69,714,958	120,919,260	25,096,067	46,195,370	261,925,655	66,446,631	114,725,676	20,087,652	38,927,213	240,187,172
	Temporary Total	31,332,569	81,541,290	12,748,329	58,468,408	184,090,596	28,474,209	73,765,179	10,204,149	49,269,268	161,712,805
	Medical Only	0	0	0	25,599,556	25,599,556	0	0	0	17,801,631	17,801,631
2014	Fatal	2,005,951	2,747,603	238,388	203,306	5,195,248	1,777,779	2,432,633	177,404	159,532	4,547,348
	Permanent Total	42,442,318	0	16,125,027	0	58,567,345	37,707,303	0	11,999,937	0	49,707,240
	Permanent Partial	84,549,475	133,778,138	30,541,108	48,995,282	297,864,003	77,118,290	121,898,086	22,728,106	38,446,194	260,190,676
	Temporary Total	41,184,162	85,777,539	17,675,174	60,901,824	205,538,699	35,972,500	74,847,830	13,153,526	47,789,161	171,763,017
	Medical Only	0	0	0	24,625,318	24,625,318	0	0	0	18,799,314	18,799,314
2015	Fatal	991,407	9,723,435	137,161	723,191	11,575,194	1,001,765	9,749,920	112,724	625,516	11,489,925
	Permanent Total	26,705,575	0	11,354,356	0	38,059,931	27,190,232	0	9,331,394	0	36,521,626
	Permanent Partial	84,694,294	135,620,893	31,509,830	49,247,302	301,072,319	88,160,116	140,091,631	25,895,843	42,595,840	296,743,430
	Temporary Total	35,785,594	85,966,578	15,188,197	61,704,866	198,645,235	35,915,237	85,618,522	12,482,174	53,370,853	187,386,786
	Medical Only	0	0	0	25,343,927	25,343,927	0	0	0	20,389,446	20,389,446
2016	Fatal	130,094	7,141,412	0	294,776	7,566,282	152,629	8,176,076	0	265,257	8,593,962
	Permanent Total	11,665,693	0	5,646,047	0	17,311,740	13,779,764	0	5,004,916	0	18,784,680
	Permanent Partial	65,051,826	113,659,976	25,888,851	48,107,176	252,707,829	78,265,491	133,444,515	22,949,067	43,289,387	277,948,460
	Temporary Total	43,373,314	93,577,071	21,236,585	67,842,709	226,029,679	50,624,202	106,592,760	18,825,083	61,048,501	237,090,546
	Medical Only	0	0	0	25,102,222	25,102,222	0	0	0	21,267,675	21,267,675
2017	Fatal	0	4,861,897	0	758,043	5,619,940	0	7,500,123	0	690,940	8,191,063
	Permanent Total	2,436,628	0	2,124,331	0	4,560,959	4,301,951	0	1,986,455	0	6,288,406
	Permanent Partial	33,276,629	71,639,679	18,538,051	38,550,192	162,004,551	59,601,830	112,726,629	17,334,859	35,137,674	224,800,992
	Temporary Total	38,542,196	100,609,453	26,217,290	81,701,428	247,070,367	67,408,351	154,585,462	24,515,686	74,469,101	320,978,600
	Medical Only	0	0	0	27,716,805	27,716,805	0	0	0	23,353,921	23,353,921
(13) All Years, All Injury Types		659,598,968	1,054,014,494	274,122,525	692,442,191	2,680,178,178	716,220,345	1,152,092,871	227,881,125	588,000,196	2,684,194,537

Notes:
 (3) - (12): Total of Section IX - C, Page 1 of Exhibits 1 through 5.

IX 000042

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)	
2013	Fatal	189,020	1,066,810	130,382	571,138	1,957,350	1,288,669	6,646,654	418,241	1,038,518	9,392,082	1,043,128,658
	Permanent Total	7,089,626	0	5,563,780	0	12,653,406	42,613,904	0	14,607,570	0	57,221,474	
	Permanent Partial	10,146,709	18,332,483	8,637,585	16,555,771	53,672,548	94,617,677	164,370,088	35,707,570	68,969,406	363,664,741	
	Temporary Total	4,174,216	10,861,924	3,850,808	14,771,280	33,658,228	40,723,678	105,558,742	17,641,263	80,381,330	244,305,013	
	Medical Only	0	0	0	3,250,380	3,250,380	0	0	0	24,988,737	24,988,737	
2014	Fatal	295,051	327,447	167,576	178,333	968,407	1,966,895	2,619,021	409,491	401,046	5,396,453	1,101,756,647
	Permanent Total	6,437,874	0	5,858,122	0	12,295,996	38,994,520	0	15,873,400	0	54,867,920	
	Permanent Partial	12,664,842	19,374,306	10,608,681	16,699,773	59,347,602	110,911,362	174,517,336	41,440,065	68,550,472	395,419,235	
	Temporary Total	5,155,897	10,953,325	4,922,433	14,383,305	35,414,960	51,301,078	107,023,183	22,688,274	78,036,582	259,049,117	
	Medical Only	0	0	0	3,488,187	3,488,187	0	0	0	26,455,262	26,455,262	
2015	Fatal	238,311	1,949,657	127,214	1,009,152	3,324,334	1,176,700	11,101,650	284,806	1,940,351	14,503,507	1,177,384,421
	Permanent Total	4,821,618	0	4,629,622	0	9,451,240	28,276,852	0	12,409,455	0	40,686,307	
	Permanent Partial	14,687,987	22,578,280	12,299,535	19,171,544	68,737,346	127,050,849	200,950,230	47,479,650	76,781,375	452,262,104	
	Temporary Total	5,565,414	12,396,771	5,073,556	16,119,599	39,155,340	51,740,460	122,258,363	22,035,305	87,221,848	283,255,976	
	Medical Only	0	0	0	3,748,118	3,748,118	0	0	0	28,651,288	28,651,288	
2016	Fatal	33,477	1,528,287	14,347	712,280	2,288,391	176,595	9,208,403	17,030	1,160,334	10,562,362	1,216,715,471
	Permanent Total	2,611,195	0	2,509,014	0	5,120,209	14,478,538	0	6,678,867	0	21,157,405	
	Permanent Partial	12,432,545	21,526,659	10,823,261	18,811,411	63,593,876	112,041,562	191,439,787	41,981,475	77,195,834	422,658,658	
	Temporary Total	7,572,203	16,238,210	7,355,997	19,696,314	50,862,724	72,590,685	153,211,943	32,861,525	101,347,908	360,012,061	
	Medical Only	0	0	0	3,929,384	3,929,384	0	0	0	29,908,910	29,908,910	
2017	Fatal	0	1,426,719	0	795,088	2,221,807	0	8,470,620	0	1,763,914	10,234,534	1,275,871,852
	Permanent Total	913,766	0	968,830	0	1,882,596	4,607,171	0	2,626,848	0	7,234,019	
	Permanent Partial	9,590,583	17,877,105	8,060,114	15,514,900	51,042,702	85,475,129	161,338,075	31,567,809	62,964,855	341,345,868	
	Temporary Total	10,162,354	23,267,441	9,777,638	25,467,111	68,674,544	96,757,016	221,842,982	43,043,713	125,436,241	487,079,952	
	Medical Only	0	0	0	4,299,025	4,299,025	0	0	0	32,824,048	32,824,048	
(14) All Years, All Injury Types		114,782,688	179,705,424	101,378,495	199,172,093	595,038,700	976,789,340	1,640,557,077	389,772,357	976,018,259	3,983,137,033	5,814,857,049
(15) Pure Premium							0.168	0.282	0.067	0.168	0.685	

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.

IX 000043

IX 000044

Section IX - Classification Pricing
Subsection D - Credibility/Countrywide Data
7/1/2020

Section IX - D
Exhibit 1
Page 1

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.

IX 000045

Selection of Average Massachusetts Claim Costs

Policy Year 2017

	Injury Type				
	1	2	9	5	6
	Indemnity				
(1) Losses Developed to Ultimate	9,156,769	11,239,885	202,157,349	264,476,732	
(2) On-Level Factor	1.023	1.029	1.044	1.019	
(3) On-Level Ultimate Losses = (1) x (2)	9,369,673	11,564,058	210,999,757	269,548,465	
	Medical				
(4) Losses Developed to Ultimate	1,123,458	8,854,166	69,478,171	127,952,678	29,375,168
(5) On-Level Factor	1.000	1.000	1.000	1.000	1.000
(6) On-Level Ultimate Losses = (4) x (5)	1,123,458	8,854,166	69,478,171	127,952,678	29,375,168
	Claim Count				
(7) Claim Count Developed to Fifth Report	28	16	2,079	13,612	
Summary:					
(8) Ultimate Losses			Indemnity 501,481,952		
(9) Ultimate Claim Count			15,735		
(10) Average Claim Cost = (8) / (9)			31,871		
(11) Selected Average Claim Cost			32,000		
(12) Ultimate Losses			Medical 236,783,641		
(13) Ultimate Claim Count			15,735		
(14) Average Claim Cost = (12) / (13)			15,048		
(15) Selected Average Claim Cost			15,000		

Notes:

- (1), (4) : Unit Statistical Plan Data, developed to Ultimate using development factors from Section X-A, Exhibit 5, Pages 2 and 5.
- (2), (5): Section IV-A, Exhibit 1.
- (7) : Unit Statistical Plan Data, developed to fifth report using development factors from Section IX-B, Exhibit 2, Page 1.
- (8) = Sum of (3)
- (9), (13) = Sum of (7)
- (12) = Sum of (6)

IX 000046

Section IX - Classification Pricing
 Subsection D - Credibility/Countrywide Data
 7/1/2020

Section IX - D
 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	2.311	0.610
		Construction	2	2.686	0.521
		Office and Clerical	3	1.748	0.421
		Goods and Services	9	2.118	0.492
		Miscellaneous	0	2.560	0.642
Arizona	2	Manufacturing	1	3.368	0.499
		Construction	2	3.065	0.460
		Office and Clerical	3	2.764	0.441
		Goods and Services	9	2.875	0.508
		Miscellaneous	0	3.061	0.581
Arkansas	3	Manufacturing	1	3.860	1.170
		Construction	2	3.653	1.140
		Office and Clerical	3	2.031	0.847
		Goods and Services	9	3.592	1.080
		Miscellaneous	0	4.032	1.023
Colorado	5	Manufacturing	1	1.913	0.626
		Construction	2	1.906	0.647
		Office and Clerical	3	1.658	0.585
		Goods and Services	9	1.576	0.537
		Miscellaneous	0	1.968	0.789
Connecticut	6	Manufacturing	1	0.979	0.497
		Construction	2	0.932	0.440
		Office and Clerical	3	0.581	0.429
		Goods and Services	9	0.830	0.429
		Miscellaneous	0	1.101	0.575
D.C.	8	Manufacturing	1	0.791	0.483
		Construction	2	1.123	0.615
		Office and Clerical	3	0.826	0.565
		Goods and Services	9	1.449	1.023
		Miscellaneous	0	0.552	0.416
Florida	9	Manufacturing	1	1.967	0.421
		Construction	2	1.781	0.350
		Office and Clerical	3	1.191	0.292
		Goods and Services	9	1.746	0.406
		Miscellaneous	0	1.896	0.530
Georgia	10	Manufacturing	1	1.461	0.707
		Construction	2	0.855	0.397
		Office and Clerical	3	1.358	0.701
		Goods and Services	9	1.163	0.635
		Miscellaneous	0	1.409	0.788
Idaho	11	Manufacturing	1	1.474	0.408
		Construction	2	1.419	0.396
		Office and Clerical	3	0.688	0.207
		Goods and Services	9	1.234	0.373
		Miscellaneous	0	2.085	0.612

IX 000047

Section IX - Classification Pricing
 Subsection D - Credibility/Countrywide Data
 7/1/2020

Section IX - D
 Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Illinois	12	Manufacturing	1	1.052	0.480
		Construction	2	1.003	0.548
		Office and Clerical	3	0.936	0.553
		Goods and Services	9	1.083	0.520
		Miscellaneous	0	1.050	0.603
Indiana	13	Manufacturing	1	4.022	0.710
		Construction	2	4.925	0.961
		Office and Clerical	3	2.093	0.452
		Goods and Services	9	3.805	0.684
		Miscellaneous	0	4.009	0.892
Iowa	14	Manufacturing	1	1.136	0.386
		Construction	2	1.643	0.573
		Office and Clerical	3	0.836	0.337
		Goods and Services	9	1.376	0.485
		Miscellaneous	0	1.630	0.642
Kansas	15	Manufacturing	1	2.411	0.610
		Construction	2	3.086	0.719
		Office and Clerical	3	2.630	0.665
		Goods and Services	9	2.597	0.657
		Miscellaneous	0	2.788	0.719
Kentucky	16	Manufacturing	1	1.988	0.816
		Construction	2	1.891	0.559
		Office and Clerical	3	1.009	0.506
		Goods and Services	9	1.975	0.903
		Miscellaneous	0	1.975	1.034
Louisiana	17	Manufacturing	1	1.943	0.576
		Construction	2	1.856	0.561
		Office and Clerical	3	1.151	0.397
		Goods and Services	9	1.455	0.475
		Miscellaneous	0	1.496	0.563
Maine	18	Manufacturing	1	1.319	0.601
		Construction	2	1.512	0.605
		Office and Clerical	3	0.571	0.269
		Goods and Services	9	1.089	0.490
		Miscellaneous	0	1.173	0.717
Maryland	19	Manufacturing	1	1.482	0.734
		Construction	2	1.794	0.746
		Office and Clerical	3	1.426	0.899
		Goods and Services	9	1.643	0.850
		Miscellaneous	0	1.400	0.820
Michigan	21	Manufacturing	1	2.321	0.832
		Construction	2	2.515	1.029
		Office and Clerical	3	2.290	0.964
		Goods and Services	9	2.274	0.865
		Miscellaneous	0	2.267	1.131
Minnesota	22	Manufacturing	1	1.585	0.705
		Construction	2	1.969	0.874
		Office and Clerical	3	1.826	0.764
		Goods and Services	9	1.615	0.694
		Miscellaneous	0	1.699	0.886

IX 000048

Section IX - Classification Pricing
 Subsection D - Credibility/Countrywide Data
 7/1/2020

Section IX - D
 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	1.783	0.698
		Construction	2	2.086	0.660
		Office and Clerical	3	0.810	0.323
		Goods and Services	9	1.745	0.595
		Miscellaneous	0	1.979	0.766
Missouri	24	Manufacturing	1	1.351	0.528
		Construction	2	1.770	0.613
		Office and Clerical	3	0.769	0.345
		Goods and Services	9	1.493	0.502
		Miscellaneous	0	1.538	0.601
Montana	25	Manufacturing	1	1.399	0.393
		Construction	2	1.762	0.482
		Office and Clerical	3	0.504	0.206
		Goods and Services	9	1.444	0.417
		Miscellaneous	0	2.289	0.695
Nebraska	26	Manufacturing	1	1.967	0.493
		Construction	2	2.129	0.558
		Office and Clerical	3	0.835	0.225
		Goods and Services	9	1.893	0.521
		Miscellaneous	0	2.312	0.734
Nevada	27	Manufacturing	1	1.071	0.554
		Construction	2	1.561	0.644
		Office and Clerical	3	0.541	0.257
		Goods and Services	9	1.419	0.565
		Miscellaneous	0	1.137	0.575
New Hampshire	28	Manufacturing	1	2.280	0.530
		Construction	2	1.482	0.412
		Office and Clerical	3	1.808	0.432
		Goods and Services	9	1.533	0.397
		Miscellaneous	0	1.900	0.572
New Mexico	30	Manufacturing	1	0.931	0.356
		Construction	2	1.909	0.608
		Office and Clerical	3	0.471	0.222
		Goods and Services	9	1.637	0.575
		Miscellaneous	0	1.732	0.743
North Carolina	32	Manufacturing	1	1.675	0.972
		Construction	2	1.337	0.615
		Office and Clerical	3	1.221	0.770
		Goods and Services	9	1.556	0.815
		Miscellaneous	0	1.449	0.883
Oklahoma	35	Manufacturing	1	1.307	0.529
		Construction	2	1.798	0.636
		Office and Clerical	3	0.468	0.247
		Goods and Services	9	1.297	0.511
		Miscellaneous	0	1.717	0.660
Oregon	36	Manufacturing	1	2.231	0.896
		Construction	2	2.059	0.888
		Office and Clerical	3	1.152	0.498
		Goods and Services	9	1.709	0.704
		Miscellaneous	0	2.046	0.953

IX 000049

Section IX - Classification Pricing
 Subsection D - Credibility/Countrywide Data
 7/1/2020

Section IX - D
 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	0.633	0.613
		Construction	2	0.966	0.951
		Office and Clerical	3	0.356	0.477
		Goods and Services	9	0.653	0.654
		Miscellaneous	0	0.830	0.913
South Carolina	39	Manufacturing	1	0.938	0.667
		Construction	2	1.020	0.515
		Office and Clerical	3	0.543	0.387
		Goods and Services	9	0.927	0.615
		Miscellaneous	0	1.084	0.700
South Dakota	40	Manufacturing	1	3.275	0.579
		Construction	2	2.489	0.543
		Office and Clerical	3	1.196	0.294
		Goods and Services	9	2.712	0.505
		Miscellaneous	0	3.286	0.822
Tennessee	41	Manufacturing	1	3.204	0.757
		Construction	2	3.276	0.622
		Office and Clerical	3	1.860	0.572
		Goods and Services	9	3.371	0.749
		Miscellaneous	0	3.032	0.745
Utah	43	Manufacturing	1	4.331	0.790
		Construction	2	3.599	0.612
		Office and Clerical	3	3.155	0.622
		Goods and Services	9	3.898	0.707
		Miscellaneous	0	2.646	0.747
Vermont	44	Manufacturing	1	0.818	0.368
		Construction	2	1.012	0.443
		Office and Clerical	3	0.473	0.272
		Goods and Services	9	0.820	0.402
		Miscellaneous	0	1.052	0.557
Virginia	45	Manufacturing	1	2.459	0.536
		Construction	2	2.279	0.469
		Office and Clerical	3	2.385	0.534
		Goods and Services	9	2.284	0.514
		Miscellaneous	0	2.289	0.615
West Virginia	47	Manufacturing	1	2.706	0.826
		Construction	2	3.286	1.170
		Office and Clerical	3	1.823	0.762
		Goods and Services	9	2.926	1.020
		Miscellaneous	0	3.287	1.412
Wisconsin	48	Manufacturing	1	2.182	0.448
		Construction	2	1.733	0.418
		Office and Clerical	3	1.128	0.296
		Goods and Services	9	1.609	0.377
		Miscellaneous	0	1.938	0.507
Hawaii	52	Manufacturing	1	0.869	0.397
		Construction	2	1.646	0.794
		Office and Clerical	3	0.509	0.283
		Goods and Services	9	0.931	0.443
		Miscellaneous	0	1.198	0.592

IX 000050

Section IX - Classification Pricing
Subsection D - Credibility/Countrywide Data
7/1/2020

Section IX - D
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	1.279	0.202
		Construction	2	2.326	0.456
		Office and Clerical	3	1.126	0.193
		Goods and Services	9	1.794	0.305
		Miscellaneous	0	2.980	0.501

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.

IX 00051

Section IX - Classification Pricing
 Subsection D - Credibility/Countrywide Data
 7/1/2020

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	5/1/2015	- 4/30/2016	5/1/2014	- 4/30/2015	5/1/2013	- 4/30/2014
Arizona	2	3/1/2015	- 2/29/2016	3/1/2014	- 2/28/2015	3/1/2013	- 2/28/2014
Arkansas	3	2/1/2016	- 1/31/2017	2/1/2015	- 1/31/2016	2/1/2014	- 1/31/2015
Colorado	5	3/1/2015	- 2/29/2016	3/1/2014	- 2/28/2015	3/1/2013	- 2/28/2014
Connecticut	6	8/1/2015	- 7/31/2016	8/1/2014	- 7/31/2015	8/1/2013	- 7/31/2014
D.C.	8	2/1/2015	- 1/31/2016	2/1/2014	- 1/31/2015	2/1/2013	- 1/31/2014
Florida	9	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013
Georgia	10	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
Idaho	11	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
Illinois	12	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015	4/1/2013	- 3/31/2014
Indiana	13	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
Iowa	14	3/1/2015	- 2/29/2016	3/1/2014	- 2/28/2015	3/1/2013	- 2/28/2014
Kansas	15	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
Kentucky	16	5/1/2015	- 4/30/2016	5/1/2014	- 4/30/2015	5/1/2013	- 4/30/2014
Louisiana	17	9/1/2015	- 8/31/2016	9/1/2014	- 8/31/2015	9/1/2013	- 8/31/2014
Maine	18	6/1/2015	- 5/31/2016	6/1/2014	- 5/31/2015	6/1/2013	- 5/31/2014
Maryland	19	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015	4/1/2013	- 3/31/2014
Michigan	21	4/1/2016	- 3/31/2017	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015
Minnesota	22	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
Mississippi	23	9/1/2015	- 8/31/2016	9/1/2014	- 8/31/2015	9/1/2013	- 8/31/2014
Missouri	24	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
Montana	25	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
Nebraska	26	8/1/2015	- 7/31/2016	8/1/2014	- 7/31/2015	8/1/2013	- 7/31/2014
Nevada	27	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013
New Hampshire	28	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015	4/1/2013	- 3/31/2014
New Mexico	30	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
North Carolina	32	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013
Oklahoma	35	6/1/2015	- 5/31/2016	6/1/2014	- 5/31/2015	6/1/2013	- 5/31/2014
Oregon	36	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013
Rhode Island	38	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014	1/1/2013	- 12/31/2013
South Carolina	39	5/1/2015	- 4/30/2016	5/1/2014	- 4/30/2015	5/1/2013	- 4/30/2014
South Dakota	40	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
Tennessee	41	6/1/2015	- 5/31/2016	6/1/2014	- 5/31/2015	6/1/2013	- 5/31/2014
Utah	43	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
Vermont	44	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
Virginia	45	2/1/2015	- 1/31/2016	2/1/2014	- 1/31/2015	2/1/2013	- 1/31/2014
West Virginia	47	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015	7/1/2013	- 6/30/2014
Wisconsin	48	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
Hawaii	52	6/1/2015	- 5/31/2016	6/1/2014	- 5/31/2015	6/1/2013	- 5/31/2014
Alaska	54	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015	4/1/2013	- 3/31/2014

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	1.801	0.978	0.655	0.766	1.021	0.946	0.873
	Medical	1.801	0.514	0.345	0.766	1.000	0.935	0.444
	Total		1.492					
Construction	Indemnity	4.755	2.624	0.689	0.766	1.021	0.946	2.426
	Medical	4.755	1.182	0.311	0.766	1.000	0.935	1.058
	Total		3.806					
Office and Clerical	Indemnity	0.143	0.071	0.617	0.766	1.021	0.946	0.065
	Medical	0.143	0.044	0.383	0.766	1.000	0.935	0.039
	Total		0.115					
Goods and Services	Indemnity	1.600	0.837	0.637	0.766	1.021	0.946	0.755
	Medical	1.600	0.476	0.363	0.766	1.000	0.935	0.415
	Total		1.313					
Miscellaneous	Indemnity	4.432	2.400	0.668	0.766	1.021	0.946	2.189
	Medical	4.432	1.195	0.332	0.766	1.000	0.935	1.055
	Total		3.595					

Notes:

- (3): Section IX - H, Exhibit 1 of 07/01/18 stipulation.
- (4): Section IX - G of 07/01/18 stipulation.
- (6): Section VI - J, Exhibit 1 of 07/01/18 stipulation.
- (7): Section IV - A, Exhibit 1.
- (8): Net Indemnity and Medical Trends from Section V - A, Exhibit 1.

IX 000052

IX 000053

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2020

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	2.772	2.177	2.420	0.967	3.386
1438	1.684	1.610	1.470	0.715	2.185
1463	4.668	5.406	4.075	2.400	6.475
1701	1.477	1.211	1.289	0.538	1.827
1747	1.710	1.499	1.493	0.665	2.159
1748	1.367	1.840	1.193	0.817	2.010
1853	0.878	0.520	0.766	0.231	0.997
1924	1.139	1.083	0.994	0.481	1.475
1925	1.867	14.933	1.630	6.630	8.260
2003	1.956	1.861	1.708	0.826	2.534
2014	1.815	1.596	1.584	0.708	2.293
2021	1.230	1.224	1.074	0.544	1.617
2039	1.814	2.077	1.583	0.922	2.505
2041	1.497	1.332	1.307	0.591	1.898
2070	2.118	1.964	1.849	0.872	2.722
2081	1.450	2.124	1.266	0.943	2.209
2089	1.703	1.378	1.487	0.612	2.099
2095	1.904	1.561	1.662	0.693	2.356
2101	1.703	1.378	1.487	0.612	2.099
2111	1.092	1.052	0.953	0.467	1.420
2114	1.703	1.378	1.487	0.612	2.099
2115	2.657	2.341	2.320	1.039	3.359
2121	0.619	0.671	0.540	0.298	0.838
2130	0.957	0.813	0.835	0.361	1.197
2131	1.313	1.396	1.146	0.620	1.766
2143	0.968	1.014	0.845	0.450	1.295
2150	2.299	2.317	2.007	1.029	3.036
2156	2.475	2.321	2.160	1.030	3.191
2157	2.064	1.741	1.802	0.773	2.575
2172	1.134	0.726	0.990	0.323	1.312
2211	3.274	3.445	2.858	1.530	4.387
2220	1.226	1.359	1.070	0.603	1.674
2260	3.242	2.670	2.830	1.186	4.016
2288	1.622	1.469	1.416	0.652	2.068
2305	2.271	2.057	1.983	0.914	2.896
2362	0.754	0.975	0.659	0.433	1.091
2380	1.240	1.277	1.082	0.567	1.649
2402	1.166	1.221	1.018	0.542	1.560
2413	1.676	1.903	1.463	0.845	2.308
2416	1.442	1.232	1.259	0.547	1.806
2417	1.574	1.187	1.374	0.527	1.902
2501	1.023	0.942	0.893	0.418	1.311
2503	0.757	0.612	0.661	0.272	0.932
2570	3.324	2.693	2.902	1.196	4.098
2576	0.864	0.957	0.754	0.425	1.179
2585	1.527	1.562	1.333	0.694	2.026
2586	0.900	0.894	0.785	0.397	1.183
2623	2.629	2.438	2.295	1.082	3.377

IX 000054

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2020

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)
2651	0.791	0.715	0.691	0.318	1.008
2660	0.925	1.081	0.808	0.480	1.288
2683	0.854	1.088	0.745	0.483	1.228
2688	1.190	1.126	1.039	0.500	1.539
2710	3.321	4.050	2.899	1.798	4.697
2731	1.554	1.806	1.356	0.802	2.158
2747	3.070	2.822	2.680	1.253	3.934
2790	0.874	0.823	0.763	0.366	1.128
2802	2.068	2.027	1.806	0.900	2.706
2835	0.922	0.990	0.805	0.439	1.244
2836	1.008	0.966	0.880	0.429	1.309
2841	1.872	1.610	1.634	0.715	2.349
2883	1.681	1.504	1.468	0.668	2.136
2923	0.875	0.870	0.764	0.386	1.150
2942	0.969	1.013	0.846	0.450	1.296
3018	1.470	1.226	1.283	0.544	1.828
3022	1.830	1.939	1.598	0.861	2.459
3027	2.263	3.545	1.976	1.574	3.550
3028	1.412	1.546	1.233	0.687	1.919
3030	3.178	2.847	2.774	1.264	4.038
3040	2.762	2.091	2.411	0.928	3.339
3041	1.696	2.199	1.481	0.977	2.457
3042	3.266	2.500	2.851	1.110	3.962
3066	1.171	1.290	1.023	0.573	1.595
3076	1.156	1.162	1.010	0.516	1.525
3081	2.429	2.829	2.120	1.256	3.377
3082	2.429	2.829	2.120	1.256	3.377
3085	2.508	2.492	2.189	1.107	3.296
3110	4.576	4.853	3.995	2.155	6.149
3111	0.989	1.059	0.863	0.470	1.333
3113	0.767	0.780	0.669	0.346	1.015
3114	1.295	1.504	1.131	0.668	1.799
3118	1.111	0.641	0.970	0.284	1.255
3119	0.346	0.487	0.302	0.216	0.518
3120	0.819	0.620	0.715	0.275	0.990
3122	1.007	1.208	0.880	0.536	1.416
3127	0.659	0.806	0.575	0.358	0.933
3131	0.754	0.815	0.658	0.362	1.020
3132	1.516	1.732	1.324	0.769	2.093
3145	0.815	0.814	0.712	0.361	1.073
3146	1.082	1.240	0.945	0.551	1.495
3169	1.226	1.617	1.070	0.718	1.788
3179	0.654	0.511	0.571	0.227	0.798
3180	1.459	1.359	1.274	0.603	1.877
3188	1.044	1.023	0.911	0.454	1.366
3200	1.031	1.059	0.900	0.470	1.370
3220	2.243	1.696	1.958	0.753	2.711
3255	1.151	1.104	1.005	0.490	1.495

IX 000055

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2020

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)
3257	1.324	1.381	1.156	0.613	1.769
3270	1.044	1.031	0.911	0.458	1.369
3300	1.729	2.128	1.509	0.945	2.454
3315	1.660	1.469	1.450	0.652	2.102
3336	2.009	1.447	1.754	0.643	2.397
3372	1.076	1.314	0.939	0.583	1.522
3373	2.143	1.620	1.871	0.719	2.590
3381	1.205	1.141	1.052	0.506	1.558
3383	0.881	1.032	0.769	0.458	1.227
3385	0.356	0.363	0.311	0.161	0.472
3400	1.226	1.617	1.070	0.718	1.788
3507	1.413	1.252	1.234	0.556	1.790
3515	1.434	1.633	1.252	0.725	1.976
3558	0.362	0.606	0.316	0.269	0.586
3571	0.437	0.401	0.382	0.178	0.560
3574	0.865	0.822	0.755	0.365	1.120
3612	0.847	0.972	0.739	0.432	1.171
3620	2.045	3.157	1.785	1.402	3.187
3629	0.865	0.822	0.755	0.365	1.120
3632	0.865	0.822	0.755	0.365	1.120
3634	0.771	0.709	0.673	0.315	0.988
3635	1.403	1.442	1.225	0.640	1.865
3638	0.865	0.822	0.755	0.365	1.120
3642	0.617	0.531	0.539	0.236	0.774
3643	0.809	0.752	0.706	0.334	1.040
3647	1.047	0.935	0.914	0.415	1.329
3648	0.640	0.723	0.559	0.321	0.879
3681	0.376	0.328	0.329	0.146	0.474
3685	0.341	0.295	0.298	0.131	0.429
3807	1.226	1.617	1.070	0.718	1.788
3808	1.393	1.513	1.216	0.672	1.888
3826	2.609	3.450	2.278	1.532	3.809
3830	0.865	0.822	0.755	0.365	1.120
3841	0.661	0.728	0.577	0.323	0.901
4021	1.904	2.011	1.662	0.893	2.555
4024	1.576	1.466	1.376	0.651	2.027
4034	3.030	3.711	2.645	1.648	4.293
4036	1.288	1.106	1.124	0.491	1.615
4038	1.564	1.314	1.365	0.583	1.948
4053	1.101	1.296	0.961	0.575	1.536
4062	0.860	0.910	0.751	0.404	1.155
4112	0.252	0.233	0.220	0.104	0.324
4113	1.101	1.296	0.961	0.575	1.536
4114	1.263	0.952	1.102	0.423	1.525
4130	1.570	1.542	1.371	0.685	2.055
4133	0.873	0.757	0.762	0.336	1.098
4150	0.341	0.301	0.298	0.134	0.431
4239	1.199	1.190	1.047	0.528	1.575

IX 000056

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2020

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)
4243	1.706	1.540	1.489	0.684	2.173
4244	1.278	1.088	1.116	0.483	1.599
4250	0.927	1.020	0.809	0.453	1.262
4251	1.285	0.925	1.122	0.411	1.533
4273	1.362	1.308	1.189	0.581	1.770
4279	1.003	1.003	0.876	0.445	1.321
4283	1.063	1.031	0.928	0.458	1.386
4299	0.940	0.982	0.821	0.436	1.257
4304	2.429	2.918	2.120	1.296	3.416
4307	0.792	0.881	0.692	0.391	1.083
4308	1.610	0.396	1.406	0.176	1.582
4351	0.482	0.442	0.421	0.196	0.617
4352	0.807	0.588	0.704	0.261	0.966
4360	0.327	0.290	0.285	0.129	0.414
4410	1.328	1.402	1.159	0.623	1.782
4432	0.428	0.513	0.374	0.228	0.601
4439	2.207	2.848	1.927	1.264	3.191
4452	1.587	1.447	1.385	0.642	2.028
4459	1.340	1.348	1.169	0.599	1.768
4470	1.133	0.904	0.989	0.401	1.390
4484	0.982	1.097	0.857	0.487	1.344
4493	1.102	1.061	0.962	0.471	1.433
4557	0.863	0.948	0.753	0.421	1.174
4558	0.663	0.760	0.578	0.337	0.916
4583	1.784	1.398	1.557	0.621	2.178
4611	0.307	0.266	0.268	0.118	0.386
4635	2.435	2.814	2.126	1.250	3.375
4653	0.897	0.757	0.783	0.336	1.119
4665	4.204	4.191	3.670	1.861	5.531
4692	0.318	0.294	0.278	0.131	0.408
4693	0.468	0.459	0.409	0.204	0.612
4720	0.961	1.015	0.839	0.451	1.290
4740	0.607	0.594	0.530	0.264	0.794
4741	1.307	0.937	1.141	0.416	1.557
4771	2.745	1.113	2.396	0.494	2.891
4777	1.784	1.398	1.557	0.621	2.178
4825	0.298	0.238	0.260	0.106	0.366
4828	0.567	0.532	0.495	0.236	0.731
4829	0.567	0.532	0.495	0.236	0.731
4902	0.969	1.013	0.846	0.450	1.296
4923	0.327	0.290	0.285	0.129	0.414
6504	1.703	1.378	1.487	0.612	2.099
9501	1.062	1.193	0.927	0.530	1.457
9505	1.062	1.193	0.927	0.530	1.457
9521	1.578	1.444	1.378	0.641	2.019
9522	0.974	0.883	0.851	0.392	1.243

IX 000057

Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2020

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)

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2018 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 = 0.873, Medical = 0.444).

IX 000058

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2020

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	0.990	0.884	2.401	0.935	3.336
3365	1.221	1.204	2.961	1.274	4.235
3724	1.085	1.065	2.632	1.127	3.759
3726	1.109	0.748	2.690	0.791	3.481
5020	0.958	0.754	2.324	0.798	3.122
5022	2.088	1.928	5.064	2.040	7.104
5037	3.825	3.037	9.279	3.213	12.492
5040	5.503	4.182	13.349	4.425	17.774
5057	4.231	5.376	10.264	5.687	15.951
5059	3.401	3.857	8.251	4.080	12.331
5102	1.410	1.053	3.420	1.114	4.534
5146	1.489	1.391	3.612	1.472	5.084
5160	0.600	0.547	1.456	0.578	2.035
5183	0.634	0.594	1.537	0.628	2.166
5188	0.962	0.819	2.334	0.866	3.200
5190	0.440	0.505	1.067	0.534	1.601
5213	2.680	2.228	6.502	2.357	8.859
5215	0.980	0.783	2.377	0.828	3.204
5221	1.565	1.303	3.796	1.379	5.175
5222	1.977	1.476	4.797	1.562	6.359
5223	0.858	0.957	2.081	1.012	3.093
5348	0.960	0.706	2.328	0.747	3.075
5402	1.059	1.338	2.569	1.415	3.984
5403	1.705	1.435	4.137	1.518	5.655
5437	0.984	0.882	2.388	0.933	3.321
5443	0.679	0.705	1.647	0.745	2.392
5445	1.383	1.087	3.354	1.150	4.505
5462	1.396	1.122	3.387	1.187	4.574
5472	1.965	1.619	4.767	1.713	6.480
5473	2.339	2.715	5.675	2.873	8.547
5474	0.874	0.965	2.120	1.021	3.141
5478	0.964	0.715	2.340	0.757	3.096
5479	1.480	1.445	3.591	1.528	5.119
5480	0.903	0.752	2.192	0.796	2.988
5506	1.121	1.064	2.719	1.125	3.844
5507	1.175	1.218	2.850	1.288	4.138
5508	0.990	0.884	2.401	0.935	3.336
5509	0.776	1.066	1.883	1.127	3.010
5538	0.805	0.820	1.954	0.868	2.822
5545	6.642	9.633	16.113	10.192	26.305
5547	2.120	3.112	5.144	3.293	8.437
5606	0.301	0.336	0.731	0.355	1.086
5610	1.341	0.892	3.254	0.944	4.198
5645	1.405	1.733	3.410	1.834	5.243
5701	3.999	6.153	9.702	6.510	16.212
5703	2.455	2.199	5.955	2.326	8.281
5705	2.730	2.770	6.624	2.931	9.555
6003	2.045	1.712	4.960	1.811	6.771

IX 000059

Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2020

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)
6005	0.990	0.884	2.401	0.935	3.336
6204	1.296	1.120	3.144	1.185	4.329
6217	0.853	0.862	2.069	0.912	2.980
6229	0.825	0.748	2.001	0.791	2.793
6233	0.588	0.436	1.425	0.462	1.887
6251	1.283	0.721	3.111	0.763	3.875
6252	1.816	1.627	4.406	1.722	6.128
6306	1.777	1.586	4.310	1.678	5.989
6319	0.731	0.805	1.773	0.852	2.625
6325	0.748	0.671	1.815	0.710	2.525
6400	0.986	1.032	2.392	1.092	3.484
7538	1.286	1.306	3.119	1.382	4.501
7601	1.316	1.676	3.193	1.773	4.966
7855	0.936	0.820	2.270	0.868	3.138
8227	0.995	1.064	2.413	1.126	3.539
9533	2.858	2.800	6.934	2.963	9.896
9534	1.110	1.151	2.693	1.217	3.910
9549	1.169	0.887	2.837	0.938	3.775
9552	1.498	1.705	3.634	1.804	5.438

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2018 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 = 2.426, Medical = 1.058).

IX 000060

Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2020

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	4.699	5.127	0.305	0.200	0.505
7610	3.915	2.453	0.254	0.096	0.350
8601	1.550	1.516	0.101	0.059	0.160
8721	2.336	3.945	0.152	0.154	0.306
8742	0.848	0.892	0.055	0.035	0.090
8748	4.759	4.258	0.309	0.166	0.475
8800	7.944	6.627	0.516	0.258	0.775
8803	0.295	0.284	0.019	0.011	0.030
8810	0.484	0.472	0.031	0.018	0.050
8820	0.593	0.543	0.039	0.021	0.060
8832	1.994	1.842	0.130	0.072	0.201
8833	8.633	7.077	0.561	0.276	0.837
8868	4.571	5.365	0.297	0.209	0.506
8901	0.484	0.472	0.031	0.018	0.050
9156	9.077	12.424	0.590	0.485	1.075

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2018 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 = 0.065, Medical = 0.039).

IX 000061

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2020

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	1.345	1.291	1.016	0.536	1.552
0008	1.314	1.549	0.992	0.643	1.635
0016	2.372	2.224	1.791	0.923	2.714
0034	2.061	2.656	1.556	1.102	2.658
0035	1.180	1.369	0.891	0.568	1.459
0036	2.061	2.656	1.556	1.102	2.658
0042	2.232	2.463	1.685	1.022	2.707
0046	1.071	1.178	0.808	0.489	1.297
0079	1.668	2.677	1.260	1.111	2.370
0083	2.024	2.130	1.528	0.884	2.412
0113	2.061	2.656	1.556	1.102	2.658
0170	2.061	2.656	1.556	1.102	2.658
0908	105.766	81.332	79.853	33.753	113.606
0909	159.337	280.769	120.299	116.519	236.819
0912	159.337	280.769	120.299	116.519	236.819
0913	105.766	81.332	79.853	33.753	113.606
0917	1.762	1.844	1.330	0.765	2.095
0918	0.389	0.224	0.294	0.093	0.387
2587	2.271	1.899	1.715	0.788	2.503
3821	2.628	2.740	1.984	1.137	3.121
4362	0.338	0.313	0.255	0.130	0.385
4511	0.186	0.172	0.140	0.072	0.212
4512	0.055	0.063	0.042	0.026	0.068
5191	0.501	0.436	0.378	0.181	0.559
5192	1.759	1.647	1.328	0.683	2.012
8001	0.996	1.283	0.752	0.532	1.284
8002	0.789	1.039	0.596	0.431	1.027
8006	0.697	0.883	0.526	0.366	0.893
8008	0.451	0.480	0.341	0.199	0.540
8010	0.900	1.102	0.679	0.457	1.136
8013	0.206	0.207	0.155	0.086	0.241
8017	0.548	0.625	0.414	0.259	0.673
8018	2.010	1.797	1.518	0.746	2.263
8021	2.028	1.707	1.531	0.708	2.239
8031	1.158	1.042	0.874	0.432	1.307
8032	0.852	0.757	0.643	0.314	0.957
8033	0.984	1.128	0.743	0.468	1.211
8034	2.215	1.846	1.672	0.766	2.439
8039	0.639	0.863	0.482	0.358	0.840
8044	1.800	1.802	1.359	0.748	2.107
8046	1.061	1.176	0.801	0.488	1.289
8048	1.769	1.436	1.336	0.596	1.932
8058	1.299	1.641	0.981	0.681	1.662
8103	1.755	1.678	1.325	0.697	2.022
8105	7.909	5.961	5.972	2.474	8.445
8106	3.525	3.599	2.661	1.494	4.155

IX 000062

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2020

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	1.543	1.627	1.165	0.675	1.840
8111	1.578	1.712	1.191	0.710	1.902
8203	3.640	3.484	2.749	1.446	4.195
8204	2.398	3.928	1.810	1.630	3.441
8215	2.085	2.346	1.574	0.973	2.547
8232	3.818	3.736	2.882	1.551	4.433
8233	4.015	3.795	3.031	1.575	4.606
8235	2.598	2.344	1.961	0.973	2.934
8263	2.175	2.809	1.642	1.166	2.808
8264	2.976	3.055	2.247	1.268	3.514
8265	4.015	3.795	3.031	1.575	4.606
8279	2.640	2.905	1.993	1.206	3.199
8291	2.156	2.165	1.627	0.899	2.526
8292	2.012	1.953	1.519	0.811	2.330
8293	5.122	4.960	3.867	2.059	5.926
8350	3.663	3.366	2.766	1.397	4.162
8380	1.649	1.574	1.245	0.653	1.898
8381	0.982	1.278	0.742	0.531	1.272
8385	1.637	1.725	1.236	0.716	1.952
8392	0.810	0.991	0.612	0.411	1.023
8393	1.138	0.832	0.859	0.345	1.204
8500	4.015	3.795	3.031	1.575	4.606
8710	2.687	2.108	2.029	0.875	2.904
8719	2.687	2.108	2.029	0.875	2.904
8720	0.570	0.502	0.430	0.208	0.639
8745	3.554	5.275	2.683	2.189	4.872
8747	0.574	0.419	0.433	0.174	0.607
8824	1.003	0.907	0.758	0.376	1.134
8826	1.003	0.907	0.758	0.376	1.134
8829	1.331	1.173	1.005	0.487	1.492
8831	0.424	0.852	0.320	0.354	0.674
8835	1.337	1.034	1.009	0.429	1.439
9014	1.517	1.294	1.145	0.537	1.682
9015	1.909	1.844	1.441	0.765	2.206
9016	1.059	1.705	0.800	0.707	1.507
9033	1.893	1.667	1.429	0.692	2.121
9040	1.758	1.923	1.327	0.798	2.125
9052	1.003	0.907	0.758	0.376	1.134
9058	0.906	0.889	0.684	0.369	1.053
9060	0.536	0.714	0.405	0.296	0.701
9061	0.552	0.648	0.417	0.269	0.686
9063	0.357	0.491	0.270	0.204	0.474
9079	0.633	0.747	0.478	0.310	0.788
9089	0.496	0.646	0.374	0.268	0.642
9093	0.562	0.927	0.425	0.385	0.809
9101	1.648	2.225	1.245	0.923	2.168

IX 000063

Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2020

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)
9220	1.797	1.712	1.357	0.711	2.067
9410	1.596	1.886	1.205	0.783	1.987
9519	2.283	1.953	1.724	0.810	2.534
9586	0.209	0.160	0.158	0.066	0.224
9620	0.417	0.459	0.315	0.190	0.506

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2018 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 = 0.755, Medical = 0.415).

IX 000064

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2020

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	2.045	2.939	4.477	3.101	7.577
1624	0.805	0.906	1.761	0.955	2.717
1655	0.676	0.677	1.479	0.714	2.193
1710	0.805	0.906	1.761	0.955	2.717
2702	2.946	3.073	6.449	3.242	9.691
4000	1.083	0.969	2.370	1.022	3.393
6834	0.467	0.558	1.022	0.589	1.611
6836	0.789	1.089	1.728	1.149	2.877
7219	2.070	1.738	4.532	1.834	6.365
7230	2.162	2.134	4.732	2.252	6.983
7231	2.417	2.325	5.290	2.453	7.743
7360	0.988	1.070	2.163	1.129	3.292
7370	0.655	0.886	1.433	0.935	2.368
7380	1.405	1.358	3.076	1.432	4.508
7382	0.757	0.847	1.656	0.894	2.550
7403	1.017	1.188	2.227	1.253	3.480
7405	0.265	0.242	0.580	0.255	0.836
7420	1.801	0.842	3.942	0.889	4.831
7421	0.305	0.227	0.668	0.240	0.908
7422	0.305	0.227	0.668	0.240	0.908
7425	0.645	0.343	1.411	0.362	1.773
7431	0.305	0.227	0.668	0.240	0.908
7502	0.365	0.367	0.799	0.388	1.186
7515	0.457	1.128	1.000	1.190	2.190
7520	0.649	0.638	1.421	0.673	2.093
7539	0.266	0.259	0.581	0.274	0.855
7580	0.735	0.702	1.609	0.740	2.349
7590	0.825	0.792	1.806	0.835	2.642
7600	0.738	0.594	1.615	0.627	2.242
7704	0.868	1.104	1.900	1.165	3.065
7720	0.307	0.326	0.672	0.344	1.016
9019	0.644	0.508	1.410	0.536	1.946
9102	0.537	0.667	1.175	0.703	1.879
9154	0.342	0.474	0.748	0.500	1.249
9178	1.641	5.245	3.593	5.534	9.127
9179	7.471	11.228	16.354	11.846	28.199
9180	0.706	1.804	1.545	1.903	3.448
9182	0.569	0.846	1.245	0.892	2.138
9186	0.706	1.804	1.545	1.903	3.448
9402	0.952	0.839	2.083	0.885	2.968
9403	2.070	1.953	4.531	2.061	6.592

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2018 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 = 2.189, Medical = 1.055).

IX 000065

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G

A-Sheet Table of Contents

Class	To find the A-Sheet for: Description	Class	Look at the A-Sheet for: 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
2570	MATTRESS OR BOX SPRING MFG	2570	Section IX - G, Exhibit 30

IX 000066

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G

A-Sheet Table of Contents

Class	To find the A-Sheet for:	Class	Look at the A-Sheet for:
	Description		Exhibit
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	3082	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
3400	METAL GOODS MFG-NOC	3169	Section IX - G, Exhibit 53
3507	CONSTRUCTION OR AGRICULTURAL MACHINERY MFG	3507	Section IX - G, Exhibit 62

IX 000067

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G

A-Sheet Table of Contents

Class	To find the A-Sheet for:		Look at the A-Sheet for:	
		Description	Class	Exhibit
3515	TEXTILE MACHINERY MFG		3515	Section IX - G, Exhibit 63
3558	BOOT OR SHOE MACHINERY MFG		3558	Section IX - G, Exhibit 63
3571	STEAM OR AIR PRESSURE GAUGE MFG		3571	Section IX - G, Exhibit 64
3574	CASH REGISTER MFG		3574	Section IX - G, Exhibit 64
3612	PUMP MFG		3612	Section IX - G, Exhibit 65
3620	BOILERMAKING		3620	Section IX - G, Exhibit 65
3629	PRECISION MACHINED PARTS MFG-NOC		3574	Section IX - G, Exhibit 64
3632	MACHINE SHOP-NOC		3574	Section IX - G, Exhibit 64
3634	VALVE MFG		3634	Section IX - G, Exhibit 66
3635	GEAR MFG OR GRINDING		3635	Section IX - G, Exhibit 66
3638	BALL OR ROLLER BEARING MFG		3574	Section IX - G, Exhibit 64
3642	BATTERY MFG-DRY		3642	Section IX - G, Exhibit 67
3643	ELECTRIC POWER OR TRANSMISSION EQUIP MFG		3643	Section IX - G, Exhibit 67
3647	BATTERY MFG-STORAGE		3647	Section IX - G, Exhibit 68
3648	AUTOMOTIVE LIGHTING, IGNITION APPARATUS MFG NOC		3648	Section IX - G, Exhibit 68
3681	TELEVISION, RADIO, TELEPHONE OR TELECOMMUNCTN DEVICE MFG NOC		3681	Section IX - G, Exhibit 69
3685	INSTRUMENT MFG NOC		3685	Section IX - G, Exhibit 69
3724	MACHINERY OR EQUIPMENT ERECT OR REPAIR NOC &DR		3724	Section IX - G, Exhibit 70
3726	BOILER INSTALLATION OR REPAIR-STEAM		3726	Section IX - G, Exhibit 70
3807	AUTOMOBILE RADIATOR MFG		3169	Section IX - G, Exhibit 53
3808	AUTOMOBILE MFG OR ASSEMBLY		3808	Section IX - G, Exhibit 71
3821	AUTOMOBILE DISMANTLING & DRIVERS		3821	Section IX - G, Exhibit 71
3826	AIRCRAFT ENGINE MFG		3826	Section IX - G, Exhibit 72
3830	AIRPLANE MFG		3574	Section IX - G, Exhibit 64
3841	TUBULAR METAL PRODUCTS MFG OR ASSEMBLY		3841	Section IX - G, Exhibit 72
4000	SAND OR GRAVEL DIGGING & DRIVERS		4000	Section IX - G, Exhibit 73
4021	BRICK OR CLAY PRODUCTS MFG NOC & DRIVERS		4021	Section IX - G, Exhibit 73
4024	REFRACTORY PRODUCTS MFG & DRIVERS		4024	Section IX - G, Exhibit 74
4034	CONCRETE PRODUCTS MFG & DRIVERS		4034	Section IX - G, Exhibit 74
4036	PLASTERBOARD OR PLASTER BLOCK MFG & DRIVERS		4036	Section IX - G, Exhibit 75
4038	PLASTER STATUARY OR ORNAMENT MFG		4038	Section IX - G, Exhibit 75
4053	POTTERY MFG: CHINA OR TABLEWARE		4053	Section IX - G, Exhibit 76
4062	POTTERY MFG: PORCELAIN WARE-MECHANICAL PRESS FORMING		4062	Section IX - G, Exhibit 76
4112	INCANDESCENT LAMP MFG		4112	Section IX - G, Exhibit 77
4113	GLASS MFG-CUT		4053	Section IX - G, Exhibit 76
4114	GLASSWARE MFG-NOC		4114	Section IX - G, Exhibit 77
4130	GLASS MERCHANT		4130	Section IX - G, Exhibit 78
4133	CATHEDRAL OR ART GLASS WINDOW MFG		4133	Section IX - G, Exhibit 78
4150	OPTICAL GOODS MFG-NOC		4150	Section IX - G, Exhibit 79
4239	PAPER MFG		4239	Section IX - G, Exhibit 79
4243	BOX MFG-FOLDING PAPER-NOC		4243	Section IX - G, Exhibit 80
4244	CORRUGATED OR FIBERBOARD CONTAINER MFG		4244	Section IX - G, Exhibit 80
4250	PAPER COATING		4250	Section IX - G, Exhibit 81
4251	STATIONERY MFG		4251	Section IX - G, Exhibit 81
4273	BAG MFG-PAPER OR PLASTIC		4273	Section IX - G, Exhibit 82
4279	PAPER GOODS MFG NOC		4279	Section IX - G, Exhibit 82
4283	BUILDING OR ROOFING PAPER OR FELT PREPARATION-NO INSTALLATION		4283	Section IX - G, Exhibit 83
4299	PRINTING		4299	Section IX - G, Exhibit 83
4304	NEWSPAPER PUBLISHING		4304	Section IX - G, Exhibit 84
4307	BOOKBINDING		4307	Section IX - G, Exhibit 84
4308	LINOTYPE OR HAND COMPOSITION		4308	Section IX - G, Exhibit 85
4351	PHOTOENGRAVING		4351	Section IX - G, Exhibit 85
4352	ENGRAVING		4352	Section IX - G, Exhibit 86
4360	MOTION PICTURE: DEVLPMNT OF NEGATIVES, PRINTING & ALL SUB OP		4360	Section IX - G, Exhibit 86
4361	PHOTOGRAPHER - ALL EMP & CLERICAL, SALES, DRIVERS		4361	Section IX - G, Exhibit 87
4362	MOTION PICTURE: FILM EXCH & PROJECTION RMS, CL		4362	Section IX - G, Exhibit 87
4410	RUBBER GOODS MFG NOC		4410	Section IX - G, Exhibit 88
4432	FOUNTAIN PEN MFG		4432	Section IX - G, Exhibit 88
4439	LACQUER OR SPIRIT VARNISH MFG		4439	Section IX - G, Exhibit 89
4452	PLASTICS MFG: FABRICATED PRODUCTS NOC		4452	Section IX - G, Exhibit 89
4459	PLASTICS MFG: SHEETS, RODS OR TUBES		4459	Section IX - G, Exhibit 90
4470	CABLE MFG - INSULATED ELECTRICAL		4470	Section IX - G, Exhibit 90
4484	PLASTICS MFG: MOLDED PRODUCTS NOC		4484	Section IX - G, Exhibit 91
4493	FABRIC COATING OR IMPREGNATING NOC		4493	Section IX - G, Exhibit 91
4511	ANALYTICAL CHEMIST		4511	Section IX - G, Exhibit 92
4512	BIOMEDICAL RESEARCH LABS-INCL OUTSIDE OPERATNS		4512	Section IX - G, Exhibit 92
4557	INK MFG		4557	Section IX - G, Exhibit 93

IX 000068

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G

A-Sheet Table of Contents

Class	To find the A-Sheet for: Description	Class	Look at the A-Sheet for: Exhibit
4558	PAINT MFG	4558	Section IX - G, Exhibit 93
4583	FERTILIZER MFG & DRIVERS	4583	Section IX - G, Exhibit 94
4611	DRUG MEDICINE OR PHARMACEUTICAL PREP-NO MFG OF INGREDIENTS	4611	Section IX - G, Exhibit 94
4635	OXYGEN OR HYDROGEN MFG & DRIVERS	4635	Section IX - G, Exhibit 95
4653	GLUE MFG & DRIVERS	4653	Section IX - G, Exhibit 95
4665	RENDERING WORKS NOC & DR	4665	Section IX - G, Exhibit 96
4692	DENTAL LABORATORY	4692	Section IX - G, Exhibit 96
4693	PHARMACEUTICAL OR SURGICAL GOODS MFG NOC	4693	Section IX - G, Exhibit 97
4720	SOAP OR SYNTHETIC DETERGENT MFG	4720	Section IX - G, Exhibit 97
4740	OIL REFINING - PETROLEUM & DRIVERS	4740	Section IX - G, Exhibit 98
4741	ASPHALT OR TAR DISTILLING OR REFINING & DRIVERS	4741	Section IX - G, Exhibit 98
4771	EXPLOSIVES OR AMMUNITION MFG: NOC - & DRIVERS	4771	Section IX - G, Exhibit 99
4777	EXPLOSIVES DISTRIBUTORS & DRIVERS	4583	Section IX - G, Exhibit 94
4825	DRUG, MEDICINE OR PHARM PREP MFG & INCIDENTL MFG INGREDIENTS	4825	Section IX - G, Exhibit 99
4828	CHEMICAL BLENDING OR MIXING NOC- ALL OPERS & DR	4828	Section IX - G, Exhibit 100
4829	CHEMICAL MFG NOC-ALL OPERATIONS & DRIVERS	4828	Section IX - G, Exhibit 100
4902	SPORTING GOODS MFG NOC	2942	Section IX - G, Exhibit 40
4923	PHOTOGRAPHIC SUPPLIES MFG	4360	Section IX - G, Exhibit 86
5020	CEILING INSTALLATION-SUSPENDE ACOUSTICAL GRID	5020	Section IX - G, Exhibit 100
5022	MASONRY NOC	5022	Section IX - G, Exhibit 101
5037	PAINTING: METAL STRUCTURES-OVER 2 STORIES IN HEIGHT & DRIVERS	5037	Section IX - G, Exhibit 101
5040	IRON OR STEEL: ERECTION: ERECTION-FRAME STRUCTURES	5040	Section IX - G, Exhibit 102
5057	IRON OR STEEL: ERECTION-NOC	5057	Section IX - G, Exhibit 102
5059	IRON OR STEEL: ERECTION: FRAME STRUCT NOT OVER 2 STRS IN HGT	5059	Section IX - G, Exhibit 103
5102	DOOR, DOOR FRAME OR SASH ERECTION - METAL OR METAL COVERED	5102	Section IX - G, Exhibit 103
5146	FURNITURE OR FIXTURES INSTALLATION - PORTABLE - NOC	5146	Section IX - G, Exhibit 104
5160	ELEVATOR ERECTION OR REPAIR	5160	Section IX - G, Exhibit 104
5183	PLUMBING NOC & DRIVERS	5183	Section IX - G, Exhibit 105
5188	AUTOMATIC SPRINKLER INSTALLATION & DRIVERS	5188	Section IX - G, Exhibit 105
5190	ELECTRICAL WIRING - WITHIN BUILDINGS & DRIVERS	5190	Section IX - G, Exhibit 106
5191	OFFICE MACHICE OR APPLIANCE INSTALL, INSP, ADJSTMT OR REPAIR	5191	Section IX - G, Exhibit 106
5192	VENDING OR COIN OPERTD MACHINES-INSTALL, SRVC OR RPR & SALES, DR	5192	Section IX - G, Exhibit 107
5213	CONCRETE CONSTRUCTION-NOC	5213	Section IX - G, Exhibit 107
5215	CONCRETE WORK - INCIDENTAL TO CONSTRUCTION OF PRIVATE RES	5215	Section IX - G, Exhibit 108
5221	CONCRETE OR CEMENT WORK-FLOORS DRIVEWAYS YRDS OR SIDEWALKS & DR	5221	Section IX - G, Exhibit 108
5222	CONCRETE CONSTRUCTION IN CONNECTION WITH BRIDGES OR CULVERTS	5222	Section IX - G, Exhibit 109
5223	SWIMMING POOL CONSTRUCTN-NOT IRON OR STEEL & DR	5223	Section IX - G, Exhibit 109
5348	STONE, MOSAIC, TERRAZZO OR CERAMIC TILE WORK - INSIDE	5348	Section IX - G, Exhibit 110
5402	HOTHOUSE ERECTION - ALL OPERATIONS	5402	Section IX - G, Exhibit 110
5403	CARPENTRY NOC	5403	Section IX - G, Exhibit 111
5437	CARPENTRY-INSTALL OF CABINET WORK OR INT TRIM	5437	Section IX - G, Exhibit 111
5443	LATHING & DRIVERS	5443	Section IX - G, Exhibit 112
5445	WALLBOARD INSTALLATION WITHIN BUILDINGS & DR	5445	Section IX - G, Exhibit 112
5462	GLAZIER-AWAY FROM SHOP & DRIVERS	5462	Section IX - G, Exhibit 113
5472	ASBESTOS REMOVAL OP: ASBESTOS CONTR-PIPE&BOILR WORK EXCL & DR	5472	Section IX - G, Exhibit 113
5473	ASBESTOS REMOVAL OP: ASBESTOS CONTRCTR-NOC & DR	5473	Section IX - G, Exhibit 114
5474	PAINTING OR PAPERHANGING NOC & SHOP OPERS, DR	5474	Section IX - G, Exhibit 114
5478	CARPET, LINOLEUM, VINYL, ASPHALT OR RUBBER FLOOR TILE INSTAL	5478	Section IX - G, Exhibit 115
5479	INSULATION WORK NOC & DRIVERS	5479	Section IX - G, Exhibit 115
5480	PLASTERING NOC & DRIVERS	5480	Section IX - G, Exhibit 116
5506	STREET OR ROAD CONSTRUCTION: PAVING OR REPAVING & DRIVERS	5506	Section IX - G, Exhibit 116
5507	STREET OR ROAD CONSTRUCTION: SUB-SURFACE WORK & DRIVERS	5507	Section IX - G, Exhibit 117
5508	STREET OR ROAD CONSTRUCTION: ROCK EXCAVATION & DRIVERS	0050	Section IX - G, Exhibit 4
5509	STREET OR ROAD MAINTENANCE BY COUNTY OR MUNICIPAL EMP & DR	5509	Section IX - G, Exhibit 117
5538	SHEET METAL WORK-SHOP & OUTSIDE-NOC & DRIVERS	5538	Section IX - G, Exhibit 118
5545	ROOFING NOC & YARD EMP, DRIVERS	5545	Section IX - G, Exhibit 118
5547	ROOFING-BUILT UP - YARD EMP & DRIVERS	5547	Section IX - G, Exhibit 119
5606	CONTRACTOR-EXECUTIVE SUPERVISOR OR CONSTRUCT SUPERINTENDENT	5606	Section IX - G, Exhibit 119
5610	CLEANER - DEBRIS REMOVAL	5610	Section IX - G, Exhibit 120
5645	CARPENTRY-DETACHED ONE OR TWO FAMILY DWELLINGS	5645	Section IX - G, Exhibit 120
5701	WRECKING: BUILDING OR STRUCTURES-NOT MARINE- ALL OPERATIONS	5701	Section IX - G, Exhibit 121
5703	BUILDING RAISING OR MOVING & DRIVERS	5703	Section IX - G, Exhibit 121
5705	SALVAGE OPERATION - NO WRECKING OR ANY STRUCTURAL OPERATIONS	5705	Section IX - G, Exhibit 122
6003	PILE DRIVING & DRIVERS	6003	Section IX - G, Exhibit 122
6005	JETTY OR BREAKWATER CONSTRUCTION-ALL OPER TO COMPLETION & DR	0050	Section IX - G, Exhibit 4
6204	DRILLING NOC & DRIVERS	6204	Section IX - G, Exhibit 123
6217	EXCAVATION & DRIVERS	6217	Section IX - G, Exhibit 123

IX 000069

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G

A-Sheet Table of Contents

Class	To find the A-Sheet for:		Class	Look at the A-Sheet for:	
	Description			Exhibit	
6229	IRRIGATION OR DRAINAGE SYSTEM CONSTRUCTION &DR		6229	Section IX - G, Exhibit 124	
6233	OIL OR GAS PIPELINE CONSTRUCTION & DRIVERS		6233	Section IX - G, Exhibit 124	
6251	TUNNELING - NOT PNEUMATIC - ALL OPERATIONS		6251	Section IX - G, Exhibit 125	
6252	SHAFT SINKING - ALL OPERATIONS		6252	Section IX - G, Exhibit 125	
6306	SEWER CONSTRUCTION - ALL OPERATIONS & DRIVERS		6306	Section IX - G, Exhibit 126	
6319	GAS MAIN OR CONNECTION CONSTRUCTION & DRIVERS		6319	Section IX - G, Exhibit 126	
6325	CONDUIT CONSTRUCTION - FOR CABLES OR WIRES & DR		6325	Section IX - G, Exhibit 127	
6400	FENCE ERECTION - ALL TYPES		6400	Section IX - G, Exhibit 127	
6504	FOOD SUNDRIES MFG NOC - NO CEREAL MILLING		2089	Section IX - G, Exhibit 17	
6834	BOAT BUILDING OR REPAIRING & DRIVERS: MA ACT		6834	Section IX - G, Exhibit 128	
6836	MARINA & DRIVERS: MA ACT		6836	Section IX - G, Exhibit 128	
7219	TRUCKING: NOC - ALL EMP & DRIVERS		7219	Section IX - G, Exhibit 129	
7230	TRUCKING: PARCEL OR PACKAGE DELIVERY- ALL EMP & DRIVERS		7230	Section IX - G, Exhibit 129	
7231	TRUCKING: MAIL, PARCEL OR PACKAGE DELIVERY-ALL EMP & DRIVERS		7231	Section IX - G, Exhibit 130	
7360	FREIGHT HANDLING NOC: MA ACT		7360	Section IX - G, Exhibit 130	
7370	TAXICAB CO: ALL OTHER EMP & DRIVERS		7370	Section IX - G, Exhibit 131	
7380	DRIVERS, CHAUFFEURS AND HELPERS-NOC-COMMERCIAL		7380	Section IX - G, Exhibit 131	
7382	BUS CO: ALL OTHER EMPLOYEES & DRIVERS		7382	Section IX - G, Exhibit 132	
7403	AIRCRAFT OR HELICOP OP: AIR CARRIER-SCHD/ SUPPL: A/O EMP &DR		7403	Section IX - G, Exhibit 132	
7405	AIRCRAFT OR HELICOP OP: AIR CARRIER-SCHD/ SUPPL: FLYING CREW		7405	Section IX - G, Exhibit 133	
7420	AIRCRAFT OR HELICOP OP: PUBLIC EXHIB STUNT FLYING: FLY CREW		7420	Section IX - G, Exhibit 133	
7421	AIRCRAFT OR HELICOP OP: TRANSPORT PERS IN EMPLR BUS: FLY CRW		7421	Section IX - G, Exhibit 134	
7422	AIRCRAFT OR HELICOP OP: NOC-OTHR THAN HELICOP: FLYING CREW		7421	Section IX - G, Exhibit 134	
7425	AIRCRAFT OR HELICOP OP: NOC- HELICOPTERS: FLYING CREW		7425	Section IX - G, Exhibit 134	
7431	AIRCRAFT OR HELICOP OP: AIR CARRIER-COMMUTER: FLYING CREW		7421	Section IX - G, Exhibit 134	
7502	GAS COMPANY: GAS CO-NATURAL GAS-LOCAL DISTRIBUTION & DR		7502	Section IX - G, Exhibit 135	
7515	OIL OR GAS PIPELINE OPERATION & DRIVERS		7515	Section IX - G, Exhibit 135	
7520	WATERWORKS OPERATION & DRIVERS		7520	Section IX - G, Exhibit 136	
7538	ELECTRIC LIGHT OR POWER LINE CONSTRUCTION & DRIVERS		7538	Section IX - G, Exhibit 136	
7539	ELECTRIC LIGHT OR POWER CO NOC-ALL EMP & DRIVERS		7539	Section IX - G, Exhibit 137	
7580	SEWAGE DISPOSAL PLANT OPERATION & DRIVERS		7580	Section IX - G, Exhibit 137	
7590	GARBAGE WORKS		7590	Section IX - G, Exhibit 138	
7600	TELEPHONE OR TELEGRAPH CO: ALL OTHER EMP & DR		7600	Section IX - G, Exhibit 138	
7601	TELEPHONE, TELEGRAPH OR FIRE ALARM LINE CONSTRUCTION & DR		7601	Section IX - G, Exhibit 139	
7610	RADIO OR TV BROADCAST STATION-ALL EMP & CL, DR		7610	Section IX - G, Exhibit 139	
7704	FIREFIGHTERS & DRIVERS		7704	Section IX - G, Exhibit 140	
7720	POLICE OFFICERS & DRIVERS		7720	Section IX - G, Exhibit 140	
7855	RAILROAD CONSTR: LAYING/RELAYING TRACK OR MAINT BY CONTR &DR		7855	Section IX - G, Exhibit 141	
8001	STORE: FLORISTS & DRIVERS		8001	Section IX - G, Exhibit 141	
8002	AUTOMOBILE RENTAL CO: ALL OTHER EMP & COUNTER PERSONNEL, DR		8002	Section IX - G, Exhibit 142	
8006	STORE: GROCERY STORES-RETAIL-NO HANDLING OF FRESH MEATS		8006	Section IX - G, Exhibit 142	
8008	STORE: CLOTHING, WEARING APPAREL OR DRY GOODS - RETAIL		8008	Section IX - G, Exhibit 143	
8010	STORE: HARDWARE		8010	Section IX - G, Exhibit 143	
8013	STORE: JEWELRY STORES		8013	Section IX - G, Exhibit 144	
8017	STORE: RETAIL NOC		8017	Section IX - G, Exhibit 144	
8018	STORE: WHOLESALE NOC		8018	Section IX - G, Exhibit 145	
8021	STORE: MEAT, FISH OR POULTRY DEALER- WHOLESALE		8021	Section IX - G, Exhibit 145	
8031	STORE: MEAT, FISH OR POULTRY - RETAIL		8031	Section IX - G, Exhibit 146	
8032	STORE: CLOTHING, WEARING APPAREL OR DRY GOODS - WHOLESALE		8032	Section IX - G, Exhibit 146	
8033	STORE: MEAT, GROCERY & PROVISION COMBINED RETAIL-NOC		8033	Section IX - G, Exhibit 147	
8034	STORE: GROCERY STORES - WHOLESALE		8034	Section IX - G, Exhibit 147	
8039	STORE: DEPARTMENT - RETAIL		8039	Section IX - G, Exhibit 148	
8044	STORE: FURNITURE & DRIVERS		8044	Section IX - G, Exhibit 148	
8046	STORE: AUTOMOBILE ACCESSORIES-RETAIL-NOC & DR		8046	Section IX - G, Exhibit 149	
8048	STORE: FRUIT OR VEGETABLE -WHOLESALE		8048	Section IX - G, Exhibit 149	
8058	BUILDING MATERIAL DEALER-NEW MATERIALS ONLY-STORE EMP		8058	Section IX - G, Exhibit 150	
8103	WOOL MERCHANT		8103	Section IX - G, Exhibit 150	
8105	STORE: HIDE OR LEATHER DEALERS OR STORES		8105	Section IX - G, Exhibit 151	
8106	IRON OR STEEL MERCHANT & DRIVERS		8106	Section IX - G, Exhibit 151	
8107	MACHINERY DEALER- NOC- STORE OR YARD & DRIVERS		8107	Section IX - G, Exhibit 152	
8111	PLUMBERS SUPPLIES DEALERS & DRIVERS		8111	Section IX - G, Exhibit 152	
8203	ICE DEALER & DRIVERS		8203	Section IX - G, Exhibit 153	
8204	BUILDING MATERIAL YARD & LOCAL MANAGERS, DRIVERS		8204	Section IX - G, Exhibit 153	
8215	HAY, GRAIN OR FEED DEALER & LOCAL MANAGERS, DR		8215	Section IX - G, Exhibit 154	
8227	CONTRACTORS PERMANENT YARD		8227	Section IX - G, Exhibit 154	
8232	LUMBER YARD-NEW MATERIALS ONLY: A/O EMP INCL YRD & WHSE & DR		8232	Section IX - G, Exhibit 155	
8233	COAL MERCHANT & LOCAL MANAGERS & DRIVERS		8233	Section IX - G, Exhibit 155	

IX 000070

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G

A-Sheet Table of Contents

Class	To find the A-Sheet for:		Class	Look at the A-Sheet for:	
	Description			Exhibit	
8235	SASH, DOOR OR ASSEMBLED MILLWORK DEALER & DR		8235	Section IX - G, Exhibit 156	
8263	JUNK DEALERS & DRIVERS		8263	Section IX - G, Exhibit 156	
8264	BOTTLE DEALER-USED & DRIVERS		8264	Section IX - G, Exhibit 157	
8265	IRON OR STEEL SCRAP DEALERS & DRIVERS		8233	Section IX - G, Exhibit 155	
8279	STABLE OR BREEDING FARM & DRIVERS		8279	Section IX - G, Exhibit 157	
8291	STORAGE WAREHOUSE-COLD		8291	Section IX - G, Exhibit 158	
8292	STORAGE WAREHOUSE NOC		8292	Section IX - G, Exhibit 158	
8293	STORAGE WAREHOUSE-FURNITURE & DRIVERS		8293	Section IX - G, Exhibit 159	
8350	GASOLINE OR OIL DEALER & DRIVERS		8350	Section IX - G, Exhibit 159	
8380	AUTOMOBILE SERVICE OR REPAIR CENTER & DRIVERS		8380	Section IX - G, Exhibit 160	
8381	GASOLINE STATION-RETAIL-SELF SERVICE		8381	Section IX - G, Exhibit 160	
8385	BUS CO: GARAGE EMPLOYEES		8385	Section IX - G, Exhibit 161	
8392	AUTOMOBILE STORAGE GARAGE OR PARKING STATION & DRIVERS		8392	Section IX - G, Exhibit 161	
8393	AUTOMOBILE BODY REPAIR		8393	Section IX - G, Exhibit 162	
8500	METAL SCRAP DEALER & DRIVERS		8233	Section IX - G, Exhibit 155	
8601	ARCHITECT OR ENGINEER-CONSULTING		8601	Section IX - G, Exhibit 162	
8710	FIELD BONDED WAREHOUSING - ALL EMP & CLERICAL		8710	Section IX - G, Exhibit 163	
8719	STEVEDORING:TALLIERS & CHECKING CLERKS: MA ACT		8710	Section IX - G, Exhibit 163	
8720	INSPECTION OF RISKS FOR INSURANCE OR VALUATION PURPOSES NOC		8720	Section IX - G, Exhibit 163	
8721	REAL ESTATE APPRAISAL CO - OUTSIDE EMPLOYEES		8721	Section IX - G, Exhibit 164	
8742	SALESPERSONS, COLLECTORS OR MESSENGERS-OUTSIDE		8742	Section IX - G, Exhibit 164	
8745	NEWS AGENT OR DISTRIB OF MAGAZINE-NOT RETAIL & SALES,DR		8745	Section IX - G, Exhibit 165	
8747	DISPLAY SHOWROOMS - ALL TYPES		8747	Section IX - G, Exhibit 165	
8748	AUTOMOBILE SALESPERSONS		8748	Section IX - G, Exhibit 166	
8800	MAILING OR ADDRESSING CO & CLERICAL		8800	Section IX - G, Exhibit 166	
8803	AUDITORS, ACCOUNTANT OR FACTORY COST OR OFF SYSTEMZTR-TRAV		8803	Section IX - G, Exhibit 167	
8810	CLERICAL OFFICE EMPLOYEES NOC		8810	Section IX - G, Exhibit 167	
8820	ATTORNEY-ALL EMP & CLERICAL, MESSENGERS, DR		8820	Section IX - G, Exhibit 168	
8824	ASSISTED LIVING RESIDENCES: PERSONAL CARE EMPLOYEES		8824	Section IX - G, Exhibit 168	
8826	ASSISTED LIVING RESIDENCES: ALL OTHER EMPLOYEES, SALESPERSONS &		8826	Section IX - G, Exhibit 169	
8829	CONVALESCENT OR NURSING HOME-ALL EMPLOYEES		8829	Section IX - G, Exhibit 169	
8831	PET GROOMING & DRIVERS		8831	Section IX - G, Exhibit 170	
8832	PHYSICIAN & CLERICAL		8832	Section IX - G, Exhibit 170	
8833	HOSPITAL: PROFESSIONAL EMPLOYEES		8833	Section IX - G, Exhibit 171	
8835	NURSING-HOME HEALTH, PUBLIC & TRAVELING-ALL EMPLOYEES		8835	Section IX - G, Exhibit 171	
8868	COLLEGE: PROFESSIONAL EMPLOYEES & CLERICAL		8868	Section IX - G, Exhibit 172	
8901	TELEPHONE OR TELEGRAPH CO: OFF OR EXCH EMP & CL		8810	Section IX - G, Exhibit 167	
9014	BUILDINGS - OPERATION BY CONTRACTORS		9014	Section IX - G, Exhibit 172	
9015	BUILDINGS-OPERATION BY OWNER OR LESSEE		9015	Section IX - G, Exhibit 173	
9016	AMUSEMENT PARK OR EXHIBITION OPERATION & DR		9016	Section IX - G, Exhibit 173	
9019	BRIDGE OR VEHICULAR TUNNEL OPERATION & DRIVERS		9019	Section IX - G, Exhibit 174	
9033	HOUSING AUTHORITY & CLERICAL, SALES, DRIVERS		9033	Section IX - G, Exhibit 174	
9040	HOSPITAL: ALL OTHER EMPLOYEES		9040	Section IX - G, Exhibit 175	
9052	HOTEL: ALL OTHER EMPLOYEES & SALES, DRIVERS		9052	Section IX - G, Exhibit 175	
9058	HOTEL: RESTAURANT EMPLOYEES		9058	Section IX - G, Exhibit 176	
9060	CLUB-COUNTRY, GOLF, FISHING OR YACHT & CLERICAL		9060	Section IX - G, Exhibit 176	
9061	CLUB NOC & CLERICAL		9061	Section IX - G, Exhibit 177	
9063	YMCA, YWCA, YMHA OR YWHA, INSTITUTION-ALL EMPLOYEES & CLERICAL		9063	Section IX - G, Exhibit 177	
9079	RESTAURANT NOC		9079	Section IX - G, Exhibit 178	
9089	BILLIARD HALL		9089	Section IX - G, Exhibit 178	
9093	BOWLING LANE		9093	Section IX - G, Exhibit 179	
9101	COLLEGE: ALL OTHER EMPLOYEES		9101	Section IX - G, Exhibit 179	
9102	PARK NOC- ALL EMPLOYEES & DRIVERS		9102	Section IX - G, Exhibit 180	
9154	THEATER NOC: ALL OTHER EMPLOYEES		9154	Section IX - G, Exhibit 180	
9156	THEATER NOC: PLAYERS, ENTERTAINERS OR MUSICIANS		9156	Section IX - G, Exhibit 181	
9178	ATHLETIC TEAM OR PARK: NON-CONTACT SPORTS		9178	Section IX - G, Exhibit 181	
9179	ATHLETIC TEAM OR PARK: CONTACT SPORTS		9179	Section IX - G, Exhibit 182	
9180	AMUSEMENT DEVICE OPERATION NOC-NOT TRAV & DR		9180	Section IX - G, Exhibit 182	
9182	ATHLETIC TEAM OR PARK: OPERATIONS & DRIVERS		9182	Section IX - G, Exhibit 183	
9186	CARNIVAL, CIRCUS OR AMUSEMENT DEVICE OP-TRAV-ALL EMP & DR		9180	Section IX - G, Exhibit 182	
9220	CEMETERY OPERATION & DRIVERS		9220	Section IX - G, Exhibit 183	
9402	STREET CLEANING & DRIVERS		9402	Section IX - G, Exhibit 184	
9403	GARBAGE, ASHES OR REFUSE COLLECTION & DRIVERS		9403	Section IX - G, Exhibit 184	
9410	MUNICIPAL, TOWN, COUNTY OR STATE EMP NOC		9410	Section IX - G, Exhibit 185	
9501	SIGN PAINTING OR LETTERING-INSIDE & DRIVERS		9501	Section IX - G, Exhibit 185	
9505	PAINTING: AUTO OR CARRIAGE BODIES		9501	Section IX - G, Exhibit 185	
9519	HOUSEHOLD APPLIANCES-ELECTRICAL-INSTALL, SERV OR REPAIR & DR		9519	Section IX - G, Exhibit 186	

IX 000071

Section IX - Classification Pricing
Subsection G - Class Relativities
7/1/2020

Section IX - G

A-Sheet Table of Contents

To find the A-Sheet for:		Look at the A-Sheet for:	
Class	Description	Class	Exhibit
9521	HOUSE FURNISHINGS INSTALLATION-NOC	9521	Section IX - G, Exhibit 186
9522	UPHOLSTERING	9522	Section IX - G, Exhibit 187
9533	SCAFFOLDING: SCAFFOLD INST, RPR OR REMOVAL- BUILT UP FROM GROUN	9533	Section IX - G, Exhibit 187
9534	MOBILE CRANE & HOIST SERV CONTR-NOC-ALL OP -INCL YRD EMP &DR	9534	Section IX - G, Exhibit 188
9549	ADVERTISING CO & DRIVERS	9549	Section IX - G, Exhibit 188
9552	SIGN MFG-ERECTION, REPAIR OR MAINT & SHOP, DR	9552	Section IX - G, Exhibit 189
9586	BARBER SHOP, BEAUTY PARLOR, HAIR STYLING SALON	9586	Section IX - G, Exhibit 189
9620	FUNERAL DIRECTOR & DRIVERS	9620	Section IX - G, Exhibit 190

IX 000072

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 1

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	112,533	0	23	0	5,509	0	24,746	30,255	0.049	0.220	0.269
2014	111,959	1	18	13,664	7,802	4,529	16,922	42,916	0.192	0.192	0.383
2015	117,774	0	18	0	369,190	0	106,111	475,301	3.135	0.901	4.036
2016	119,731	2	28	87,838	6,251	71,933	39,544	205,567	0.786	0.931	1.717
2017	133,117	0	28	0	32,882	0	42,240	75,122	0.247	0.317	0.564
MA Total:	595,113	3	115	101,501	421,634	76,462	229,563	829,161	0.879	0.514	1.393

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.066	1.103	.
(14) Massachusetts Credibility:	0.220	0.310	.
(15) Countrywide Pure Premium:	1.482	0.825	2.307
(16) Countrywide Indicated Relativity:	1.851	1.790	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	1775.0	.	.
(19) Pure Premium Underlying Present Rate:	1.016	0.536	1.552
(20) Relativity to Underlying Present Rate:	1.354	1.300	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.484	1.410	.
(24) Balanced Formula Relativity:	1.474	1.411	1.451

Class(es):		Effective: 7/1/2020							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)
2013	295,175	0	38	0	68,901	0	313,664	382,565	0.233	1.063	1.296
2014	323,952	0	47	0	132,705	0	208,696	341,402	0.410	0.644	1.054
2015	355,510	1	48	37,353	429,612	2,839	175,786	645,590	1.314	0.502	1.816
2016	460,969	2	65	111,961	447,901	76,090	551,090	1,187,041	1.215	1.361	2.575
2017	539,462	1	58	44,953	595,872	58,034	350,904	1,049,763	1.188	0.758	1.946
MA Total:	1,975,069	4	256	194,266	1,674,992	136,963	1,600,140	3,606,361	0.946	0.880	1.826

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.147	1.886	.
(14) Massachusetts Credibility:	0.350	0.540	.
(15) Countrywide Pure Premium:	1.595	0.915	2.510
(16) Countrywide Indicated Relativity:	1.992	1.984	.
(17) Countrywide Credibility:	0.330	0.230	.
(18) Countrywide Lost-Time Claims:	4766.0	.	.
(19) Pure Premium Underlying Present Rate:	0.992	0.643	1.635
(20) Relativity to Underlying Present Rate:	1.322	1.559	.
(21) Credibility to Underlying Relativity:	0.320	0.230	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.482	1.833	.
(24) Balanced Formula Relativity:	1.471	1.835	1.602

IX 000073

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 2

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	78,206	0	11	0	182,483	0	68,920	251,404	2,333	0,881	3,215
2014	76,680	0	7	0	931	0	7,016	7,947	0,012	0,091	0,104
2015	77,633	0	12	0	4,420	0	24,609	29,029	0,057	0,317	0,374
2016	73,234	1	8	28,586	957	72,183	5,926	107,653	0,403	1,067	1,470
2017	76,508	1	4	12,805	52,704	8,145	74,369	148,022	0,856	1,078	1,935
MA Total:	382,260	2	42	41,390	241,496	80,328	180,841	544,055	0,740	0,683	1,423

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.897	1.465	.
(14) Massachusetts Credibility:	0.230	0.320	.
(15) Countrywide Pure Premium:	2.185	1.374	3.560
(16) Countrywide Indicated Relativity:	2.729	2.981	.
(17) Countrywide Credibility:	0.390	0.340	.
(18) Countrywide Lost-Time Claims:	1048.0	.	.
(19) Pure Premium Underlying Present Rate:	1.791	0.923	2.714
(20) Relativity to Underlying Present Rate:	2.387	2.239	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.178	2.244	.
(24) Balanced Formula Relativity:	2.162	2.245	2.192

Class(es):		Effective: 7/1/2020							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)
2013	91,677	0	23	0	48,495	0	92,721	141,216	0,529	1,011	1,540
2014	96,359	0	20	0	7,536	0	43,350	50,887	0,078	0,450	0,528
2015	104,310	1	24	32,467	68,095	42,463	126,351	269,376	0,964	1,618	2,582
2016	104,089	1	16	33,861	1,714	14,991	27,632	78,198	0,342	0,409	0,751
2017	102,228	0	19	0	78,294	0	81,675	159,969	0,766	0,799	1,565
MA Total:	498,664	2	102	66,328	204,135	57,454	371,729	699,646	0,542	0,861	1,403

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.657	1.846	.
(14) Massachusetts Credibility:	0.240	0.380	.
(15) Countrywide Pure Premium:	1.789	0.959	2.748
(16) Countrywide Indicated Relativity:	2.234	2.079	.
(17) Countrywide Credibility:	0.380	0.310	.
(18) Countrywide Lost-Time Claims:	3658.0	.	.
(19) Pure Premium Underlying Present Rate:	1.556	1.102	2.658
(20) Relativity to Underlying Present Rate:	2.074	2.674	.
(21) Credibility to Underlying Relativity:	0.380	0.310	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.795	2.175	.
(24) Balanced Formula Relativity:	1.782	2.176	1.924

IX 000074

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 3

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	344,086	3	71	123,077	512,955	86,651	265,781	988,464	1,848	1,024	2,873
2014	381,340	0	41	0	248,963	0	187,516	436,479	0,653	0,492	1,145
2015	381,802	1	61	5,348	281,723	6,921	156,084	450,075	0,752	0,427	1,179
2016	415,202	1	40	5,326	174,871	8,395	146,969	335,562	0,434	0,374	0,808
2017	481,314	0	42	0	127,426	0	108,041	235,467	0,265	0,224	0,489
MA Total:	2,003,743	5	255	133,751	1,345,939	101,967	864,390	2,446,047	0,738	0,482	1,221

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.895	1.034	.
(14) Massachusetts Credibility:	0.340	0.510	.
(15) Countrywide Pure Premium:	1.032	0.705	1.737
(16) Countrywide Indicated Relativity:	1.289	1.529	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	1421.0	.	.
(19) Pure Premium Underlying Present Rate:	0.891	0.568	1.459
(20) Relativity to Underlying Present Rate:	1.188	1.378	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.121	1.241	.
(24) Balanced Formula Relativity:	1.114	1.241	1.160

Class(es):		Effective: 7/1/2020							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)
2013	4,623,585	33	758	4,164,822	5,471,908	1,998,578	3,517,833	15,153,141	2,084	1,193	3,277
2014	5,040,205	31	758	3,716,706	5,727,470	1,493,961	3,840,037	14,778,175	1,874	1,058	2,932
2015	5,621,380	27	706	2,911,216	4,505,120	1,110,206	4,078,317	12,604,859	1,319	0,923	2,242
2016	5,994,798	26	712	3,729,467	6,098,843	1,644,522	5,924,065	17,396,896	1,639	1,263	2,902
2017	6,386,090	36	713	5,706,656	7,300,338	1,468,194	5,383,378	19,858,565	2,037	1,073	3,110
MA Total:	27,666,058	153	3,647	20,228,866	29,103,678	7,715,461	22,743,631	79,791,636	1,783	1,101	2,884

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.161	2.361	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.393	1.322	3.715
(16) Countrywide Indicated Relativity:	2.989	2.867	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7534.0	.	.
(19) Pure Premium Underlying Present Rate:	1.685	1.022	2.707
(20) Relativity to Underlying Present Rate:	2.246	2.479	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.161	2.361	.
(24) Balanced Formula Relativity:	2.146	2.362	2.224

IX 000075

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	115,931	1	15	175,191	62,714	17,501	53,542	308,948	2,052	0,613	2,665	
2014	133,322	0	21	0	21,993	0	26,466	48,459	0,165	0,199	0,363	
2015	128,180	0	15	0	221,848	0	114,698	336,546	1,731	0,895	2,626	
2016	142,333	2	17	526,502	86,171	305,660	104,622	1,022,955	4,305	2,883	7,187	
2017	166,427	2	23	501,473	290,883	293,481	407,016	1,492,854	4,761	4,209	8,970	
MA Total:	686,192	5	91	1,203,166	683,609	616,642	706,344	3,209,762	2,750	1,928	4,678	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.333	4.134	.
(14) Massachusetts Credibility:	0.210	0.320	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.069	1.177	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.808	0.489	1.297
(20) Relativity to Underlying Present Rate:	1.077	1.186	.
(21) Credibility to Underlying Relativity:	0.790	0.680	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.551	2.130	.
(24) Balanced Formula Relativity:	1.540	2.131	1.753

Class(es):		Effective: 7/1/2020							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)	
2013	15,705	0	1	0	0	0	143	143	0.000	0.009	0.009	
2014	22,996	0	1	0	0	0	1,544	1,544	0.000	0.067	0.067	
2015	19,519	0	0	0	0	0	0	0	0.000	0.000	0.000	
2016	17,940	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	16,971	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	93,131	0	2	0	0	0	1,687	1,687	0.000	0.018	0.018	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.015	.
(14) Massachusetts Credibility:	0.150	0.180	.
(15) Countrywide Pure Premium:	2.751	1.402	4.153
(16) Countrywide Indicated Relativity:	1.074	1.217	.
(17) Countrywide Credibility:	0.430	0.410	.
(18) Countrywide Lost-Time Claims:	854.00	.	.
(19) Pure Premium Underlying Present Rate:	2.401	0.935	3.336
(20) Relativity to Underlying Present Rate:	0.992	0.887	.
(21) Credibility to Underlying Relativity:	0.420	0.410	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.879	0.866	.
(24) Balanced Formula Relativity:	0.882	0.864	0.877

IX 000076

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	162,646	4	30	230,005	26,197	231,806	59,562	547,569	1,575	1,791	3,367
2014	151,607	0	18	0	47,538	0	74,743	122,280	0,314	0,493	0,807
2015	159,411	0	24	0	76,775	0	104,713	181,488	0,482	0,657	1,138
2016	162,612	0	17	0	133,326	0	75,858	209,183	0,820	0,466	1,286
2017	155,785	0	13	0	165,407	0	165,069	330,475	1,062	1,060	2,121
MA Total:	792,061	4	102	230,005	449,242	231,806	479,943	1,390,996	0,858	0,899	1,756

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.039	1.927	.
(14) Massachusetts Credibility:	0.270	0.460	.
(15) Countrywide Pure Premium:	0.980	0.663	1.642
(16) Countrywide Indicated Relativity:	1.224	1.437	.
(17) Countrywide Credibility:	0.370	0.270	.
(18) Countrywide Lost-Time Claims:	265.00	.	.
(19) Pure Premium Underlying Present Rate:	1.260	1.111	2,370
(20) Relativity to Underlying Present Rate:	1.679	2.694	.
(21) Credibility to Underlying Relativity:	0.360	0.270	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1,291
(23) Formula Relativity:	1.338	2.002	.
(24) Balanced Formula Relativity:	1.328	2.003	1,572

Class(es):		Effective: 7/1/2020							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)
2013	46,963	0	4	0	1,697	0	76,185	77,881	0,036	1,622	1,658
2014	55,904	0	8	0	0	0	6,424	6,424	0,000	0,115	0,115
2015	61,471	0	10	0	44,343	0	6,899	51,242	0,721	0,112	0,834
2016	55,705	0	10	0	655	0	32,495	33,150	0,012	0,583	0,595
2017	76,331	1	4	90,246	3,384	45,344	7,585	146,559	1,227	0,693	1,920
MA Total:	296,374	1	36	90,246	50,079	45,344	129,588	315,257	0,473	0,590	1,064

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.574	1.266	.
(14) Massachusetts Credibility:	0.190	0.290	.
(15) Countrywide Pure Premium:	2.432	1.387	3,819
(16) Countrywide Indicated Relativity:	3.037	3.008	.
(17) Countrywide Credibility:	0.410	0.360	.
(18) Countrywide Lost-Time Claims:	2997.0	.	.
(19) Pure Premium Underlying Present Rate:	1.528	0.884	2,412
(20) Relativity to Underlying Present Rate:	2.037	2.144	.
(21) Credibility to Underlying Relativity:	0.400	0.350	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1,291
(23) Formula Relativity:	2.169	2.200	.
(24) Balanced Formula Relativity:	2.153	2.202	2,171

IX 000077

Calculation of Class Relativities

Class(es):									Effective: 7/1/2020			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)			
2013	397,328	5	96	591,718	1,048,320	480,500	932,896	3,053,435	4,128	3,557	7,685			
2014	410,351	6	90	128,331	1,254,758	429,849	936,083	2,749,022	3,371	3,329	6,699			
2015	444,881	8	89	1,055,875	1,380,837	548,097	780,555	3,765,364	5,477	2,987	8,464			
2016	463,759	4	97	919,847	1,292,530	671,976	1,114,743	3,999,096	4,771	3,853	8,623			
2017	581,562	3	96	662,040	1,566,220	516,660	1,420,449	4,165,368	3,832	3,331	7,162			
MA Total:	2,297,881	26	468	3,357,810	6,542,665	2,647,083	5,184,727	17,732,284	4,309	3,408	7,717			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.789	2.746	.
(14) Massachusetts Credibility:	0.680	1.000	.
(15) Countrywide Pure Premium:	4.618	2.932	7.551
(16) Countrywide Indicated Relativity:	2.019	2.510	.
(17) Countrywide Credibility:	0.160	0.000	.
(18) Countrywide Lost-Time Claims:	3164.0	.	.
(19) Pure Premium Underlying Present Rate:	4.477	3.101	7.577
(20) Relativity to Underlying Present Rate:	2.055	2.948	.
(21) Credibility to Underlying Relativity:	0.160	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	1.868	2.746	.
(24) Balanced Formula Relativity:	1.863	2.763	2.169

Class(es):									Effective: 7/1/2020			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)			
2013	2,990	0	15	0	83,329	0	95,850	179,179	27,866	32,054	59,920			
2014	3,339	1	21	91,023	580,621	4,016	199,429	875,089	201.15	60,930	262.08			
2015	3,429	0	21	0	80,936	0	129,076	210,012	23,604	37,644	61,248			
2016	3,529	2	14	97,689	180,810	32,602	134,753	445,853	78,908	47,417	126.33			
2017	3,515	1	16	1,101	22,528	8,237	27,675	59,541	6,723	10,218	16,941			
MA Total:	16,802	4	87	189,813	948,224	44,854	586,783	1,769,674	67,731	37,592	105.32			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	82.097	80.611	.
(14) Massachusetts Credibility:	0.320	0.410	.
(15) Countrywide Pure Premium:	153.21	71.820	225.03
(16) Countrywide Indicated Relativity:	119.28	91.755	.
(17) Countrywide Credibility:	0.340	0.300	.
(18) Countrywide Lost-Time Claims:	480.00	.	.
(19) Pure Premium Underlying Present Rate:	90.198	38.126	128.32
(20) Relativity to Underlying Present Rate:	120.21	92.477	.
(21) Credibility to Underlying Relativity:	0.340	0.290	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	107.70	87.395	.
(24) Balanced Formula Relativity:	106.93	87.456	99.899

IX 000078

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 7

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	337	0	6	0	95,152	0	48,300	143,452	282.60	143.45	426.05	
2014	338	0	5	0	53,093	0	100,233	153,327	157.15	296.68	453.83	
2015	336	0	4	0	0	0	3,152	3,152	0.000	9.371	9.371	
2016	342	1	3	2,658	2,210	19,574	3,764	28,205	14,232	68,240	82,472	
2017	299	0	2	0	0	0	32,535	32,535	0.000	108.87	108.87	
MA Total:	1,652	1	20	2,658	150,455	19,574	187,985	360,671	92,694	125.66	218.35	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	112.35	269.45	.
(14) Massachusetts Credibility:	0.150	0.270	.
(15) Countrywide Pure Premium:	84.644	73.266	157.91
(16) Countrywide Indicated Relativity:	189.53	334.07	.
(17) Countrywide Credibility:	0.100	0.110	.
(18) Countrywide Lost-Time Claims:	4.000	.	.
(19) Pure Premium Underlying Present Rate:	143.31	138.81	282.12
(20) Relativity to Underlying Present Rate:	191.00	336.70	.
(21) Credibility to Underlying Relativity:	0.750	0.620	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	179.05	318.25	.
(24) Balanced Formula Relativity:	177.78	318.47	228.59

Class(es):		Effective: 7/1/2020							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)	
2013	302,403	4	37	71,079	150,145	5,980	98,687	325,891	0.732	0.346	1.078	
2014	372,616	2	47	902	178,423	1,857	79,337	260,518	0.481	0.218	0.699	
2015	414,975	2	51	178,778	89,292	10,415	174,953	453,438	0.646	0.447	1.093	
2016	446,604	2	59	118,381	546,208	27,185	195,613	887,388	1.488	0.499	1.987	
2017	492,458	3	37	391,369	292,439	89,901	95,199	868,908	1.389	0.376	1.764	
MA Total:	2,029,055	13	231	760,509	1,256,507	135,338	643,789	2,796,144	0.994	0.384	1.378	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.205	0.823	.
(14) Massachusetts Credibility:	0.400	0.580	.
(15) Countrywide Pure Premium:	1.941	0.994	2.935
(16) Countrywide Indicated Relativity:	2.424	2.156	.
(17) Countrywide Credibility:	0.300	0.210	.
(18) Countrywide Lost-Time Claims:	916.00	.	.
(19) Pure Premium Underlying Present Rate:	1.330	0.765	2.095
(20) Relativity to Underlying Present Rate:	1.773	1.856	.
(21) Credibility to Underlying Relativity:	0.300	0.210	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.741	1.320	.
(24) Balanced Formula Relativity:	1.729	1.321	1.581

IX 000079

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	5,801,546	7	70	580,835	900,756	288,554	318,105	2,088,249	0.255	0.105	0.360
2014	6,713,372	10	62	465,412	454,216	167,795	162,104	1,249,527	0.137	0.049	0.186
2015	7,313,039	8	80	539,657	923,891	88,395	461,840	2,013,783	0.200	0.075	0.275
2016	6,494,666	6	78	574,161	804,527	125,572	249,096	1,753,355	0.212	0.058	0.270
2017	8,654,614	15	81	1,183,377	2,224,413	291,879	865,423	4,565,092	0.394	0.134	0.527
MA Total:	34,977,237	46	371	3,343,440	5,307,803	962,194	2,056,567	11,670,005	0.247	0.086	0.334

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.300	0.185	.
(14) Massachusetts Credibility:	0.680	0.780	.
(15) Countrywide Pure Premium:	0.407	0.178	0.585
(16) Countrywide Indicated Relativity:	0.508	0.387	.
(17) Countrywide Credibility:	0.160	0.110	.
(18) Countrywide Lost-Time Claims:	62,000	.	.
(19) Pure Premium Underlying Present Rate:	0.294	0.093	0.387
(20) Relativity to Underlying Present Rate:	0.391	0.226	.
(21) Credibility to Underlying Relativity:	0.160	0.110	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.348	0.212	.
(24) Balanced Formula Relativity:	0.345	0.212	0.297

Class(es):		Effective: 7/1/2020							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)
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
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	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:	1.308	0.876	2.185
(16) Countrywide Indicated Relativity:	1.465	1.872	.
(17) Countrywide Credibility:	0.330	0.350	.
(18) Countrywide Lost-Time Claims:	72,000	.	.
(19) Pure Premium Underlying Present Rate:	2.420	0.967	3.386
(20) Relativity to Underlying Present Rate:	2.748	2.158	.
(21) Credibility to Underlying Relativity:	0.660	0.640	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.297	2.036	.
(24) Balanced Formula Relativity:	2.267	2.009	2.178

IX 000080

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 9

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
1438 SMELTING, SINTERING OR REFINING-METALS-NOT IRON OR LEAD-NOC & D											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	141.367	0	17	0	82.951	0	72.791	155.742	0.587	0.515	1.102
2014	141.023	1	19	92.495	60.641	7.123	115.070	275.329	1.086	0.866	1.952
2015	135.407	0	18	0	35.268	0	39.103	74.371	0.260	0.289	0.549
2016	128.957	0	13	0	7.244	0	33.200	40.444	0.056	0.257	0.314
2017	144.211	0	16	0	142.027	0	96.426	238.453	0.985	0.669	1.653
MA Total:	690.966	1	83	92,495	328,131	7,123	356,591	784,339	0.609	0.526	1.135

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.627	1.029	.
(14) Massachusetts Credibility:	0.270	0.370	.
(15) Countrywide Pure Premium:	2.635	1.168	3.804
(16) Countrywide Indicated Relativity:	2.951	2.495	.
(17) Countrywide Credibility:	0.370	0.320	.
(18) Countrywide Lost-Time Claims:	812.00	.	.
(19) Pure Premium Underlying Present Rate:	1.470	0.715	2.185
(20) Relativity to Underlying Present Rate:	1.669	1.595	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.862	1.674	.
(24) Balanced Formula Relativity:	1.838	1.652	1.774

Class(es):		Effective: 7/1/2020							Manufacturing		
1463 ASPHALT WORKS & 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)
2013	131.628	1	17	42.666	189.852	5.295	268.883	506.696	1.766	2.083	3.849
2014	137.912	4	25	961.909	217.105	518.341	163.279	1,860.634	8.549	4.942	13.491
2015	81.397	1	12	295.113	107.217	61.657	245.049	709.036	4.943	3.768	8.711
2016	89.008	2	24	520.473	636.269	996.953	460.133	2,613.828	12.996	16.370	29.366
2017	103.477	1	20	133.631	195.193	51.696	134.469	514.990	3.178	1.799	4.977
MA Total:	543.422	9	98	1,953.792	1,345.636	1,633.943	1,271.813	6,205.184	6.072	5.347	11.419

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.255	10.451	.
(14) Massachusetts Credibility:	0.370	0.540	.
(15) Countrywide Pure Premium:	4.045	2.104	6.149
(16) Countrywide Indicated Relativity:	4.530	4.493	.
(17) Countrywide Credibility:	0.320	0.230	.
(18) Countrywide Lost-Time Claims:	624.00	.	.
(19) Pure Premium Underlying Present Rate:	4.075	2.400	6.475
(20) Relativity to Underlying Present Rate:	4.628	5.358	.
(21) Credibility to Underlying Relativity:	0.310	0.230	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	5.199	7.909	.
(24) Balanced Formula Relativity:	5.131	7.806	6.054

IX 000081

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 10

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
1624 QUARRY 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)
2013	460,264	5	49	1,230,960	326,453	361,447	413,316	2,332,177	3,384	1,683	5,067
2014	492,709	3	62	392,578	470,659	204,957	443,816	1,512,010	1,752	1,317	3,069
2015	499,924	1	75	19,839	275,785	4,487	407,716	707,827	0,591	0,825	1,416
2016	496,311	2	63	480,919	940,357	121,692	490,350	2,033,318	2,864	1,233	4,097
2017	518,144	2	66	120,862	503,199	37,895	301,196	963,152	1,204	0,654	1,859
MA Total:	2,467,353	13	315	2,245,157	2,516,453	730,479	2,056,394	7,548,483	1,930	1,129	3,059

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.801	0.910	.
(14) Massachusetts Credibility:	0.480	0.690	.
(15) Countrywide Pure Premium:	1.712	0.831	2,544
(16) Countrywide Indicated Relativity:	0.749	0.712	.
(17) Countrywide Credibility:	0.260	0.160	.
(18) Countrywide Lost-Time Claims:	1229.0	.	.
(19) Pure Premium Underlying Present Rate:	1.761	0.955	2,717
(20) Relativity to Underlying Present Rate:	0.808	0.908	.
(21) Credibility to Underlying Relativity:	0.260	0.150	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3,650
(23) Formula Relativity:	0.789	0.878	.
(24) Balanced Formula Relativity:	0.787	0.883	0.820

Class(es):		Effective: 7/1/2020							Miscellaneous		
1655 LIME MFG-QUARRY-SURFACE & 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)
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
2016	3,319	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,018	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	18,647	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:	0.060	0.090	.
(15) Countrywide Pure Premium:	0.414	0.188	0.602
(16) Countrywide Indicated Relativity:	0.181	0.161	.
(17) Countrywide Credibility:	0.140	0.150	.
(18) Countrywide Lost-Time Claims:	9.000	.	.
(19) Pure Premium Underlying Present Rate:	1.479	0.714	2,193
(20) Relativity to Underlying Present Rate:	0.679	0.679	.
(21) Credibility to Underlying Relativity:	0.800	0.760	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3,650
(23) Formula Relativity:	0.569	0.540	.
(24) Balanced Formula Relativity:	0.567	0.543	0.559

IX 000082

Calculation of Class Relativities

Class(es): 1701 CEMENT MFG		Effective: 7/1/2020							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)
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
2016	1,876	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	422	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	27,419	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:	1.096	0.618	1.714
(16) Countrywide Indicated Relativity:	1.228	1.319	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	442.00	.	.
(19) Pure Premium Underlying Present Rate:	1.289	0.538	1.827
(20) Relativity to Underlying Present Rate:	1.465	1.201	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.251	1.147	.
(24) Balanced Formula Relativity:	1.234	1.132	1.199

Class(es): 1747 EMERY WORKS & DRIVERS		Effective: 7/1/2020							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)
2013	18,821	0	4	0	13,654	0	12,931	26,586	0.725	0.687	1.413
2014	46,843	2	6	130,224	26,994	198,430	20,010	375,658	3.356	4.663	8.020
2015	47,083	0	9	0	17,595	0	18,069	35,664	0.374	0.384	0.757
2016	46,528	0	9	0	15,886	0	15,958	31,843	0.341	0.343	0.684
2017	52,458	0	3	0	877	0	1,061	1,938	0.017	0.020	0.037
MA Total:	211,733	2	31	130,224	75,006	198,430	68,030	471,689	0.969	1.258	2.228

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.999	2.460	.
(14) Massachusetts Credibility:	0.170	0.220	.
(15) Countrywide Pure Premium:	1.386	0.627	2.012
(16) Countrywide Indicated Relativity:	1.552	1.339	.
(17) Countrywide Credibility:	0.340	0.360	.
(18) Countrywide Lost-Time Claims:	76.000	.	.
(19) Pure Premium Underlying Present Rate:	1.493	0.665	2.159
(20) Relativity to Underlying Present Rate:	1.696	1.486	.
(21) Credibility to Underlying Relativity:	0.490	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.528	1.647	.
(24) Balanced Formula Relativity:	1.508	1.625	1.549

IX 000083

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
1748 ABRASIVE WHEEL 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)
2013	39,087	0	14	0	49,393	0	76,948	126,341	1,264	1,969	3,232
2014	40,371	0	14	0	4,315	0	19,768	24,083	0,107	0,490	0,597
2015	38,198	0	9	0	29,156	0	53,848	83,005	0,763	1,410	2,173
2016	43,459	1	8	187,034	5,794	61,542	19,847	274,218	4,437	1,873	6,310
2017	50,469	0	11	0	50,621	0	43,400	94,021	1,003	0,860	1,863
MA Total:	211,584	1	56	187,034	139,279	61,542	213,812	601,667	1,542	1,301	2,844

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.589	2.544	.
(14) Massachusetts Credibility:	0.150	0.240	.
(15) Countrywide Pure Premium:	1.258	1.039	2.298
(16) Countrywide Indicated Relativity:	1.409	2.220	.
(17) Countrywide Credibility:	0.300	0.310	.
(18) Countrywide Lost-Time Claims:	55.000	.	.
(19) Pure Premium Underlying Present Rate:	1.193	0.817	2.010
(20) Relativity to Underlying Present Rate:	1.355	1.824	.
(21) Credibility to Underlying Relativity:	0.550	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.406	2.119	.
(24) Balanced Formula Relativity:	1.388	2.092	1.631

Class(es):		Effective: 7/1/2020							Manufacturing		
1853 MICA GOODS MFG & MICA PREPARING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
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
2016	840	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	957	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	6,093	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:	0.030	0.040	.
(15) Countrywide Pure Premium:	0.754	0.095	0.848
(16) Countrywide Indicated Relativity:	0.844	0.203	.
(17) Countrywide Credibility:	0.060	0.060	.
(18) Countrywide Lost-Time Claims:	1.000	.	.
(19) Pure Premium Underlying Present Rate:	0.766	0.231	0.997
(20) Relativity to Underlying Present Rate:	0.870	0.516	.
(21) Credibility to Underlying Relativity:	0.910	0.900	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.843	0.476	.
(24) Balanced Formula Relativity:	0.832	0.470	0.707

IX 000084

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 13

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	164,303	1	16	102,244	240,413	11,857	65,977	420,491	2,086	0,474	2,559	
2014	142,738	0	20	0	133,152	0	50,294	183,447	0,933	0,352	1,285	
2015	152,446	0	23	0	30,462	0	42,596	73,058	0,200	0,279	0,479	
2016	149,172	1	19	106,032	308,707	10,123	172,617	597,479	2,780	1,225	4,005	
2017	126,667	0	22	0	95,150	0	62,178	157,327	0,751	0,491	1,242	
MA Total:	735,326	2	100	208,276	807,883	21,980	393,661	1,431,801	1,382	0,565	1,947	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.424	1.105	.
(14) Massachusetts Credibility:	0.240	0.320	.
(15) Countrywide Pure Premium:	1.146	0.559	1.705
(16) Countrywide Indicated Relativity:	1.284	1.193	.
(17) Countrywide Credibility:	0.380	0.340	.
(18) Countrywide Lost-Time Claims:	510.00	.	.
(19) Pure Premium Underlying Present Rate:	0.994	0.481	1.475
(20) Relativity to Underlying Present Rate:	1.129	1.073	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.259	1.124	.
(24) Balanced Formula Relativity:	1.242	1.110	1.196

Class(es):		Effective: 7/1/2020							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)	
2013	5,017	0	2	0	66,991	0	580,952	647,943	13,353	115.80	129.15	
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	
2016	185	0	1	0	310	0	675	986	1,675	3,646	5,321	
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	8,532	0	3	0	67,302	0	581,627	648,929	7,888	68,169	76,057	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	8.126	133.23	.
(14) Massachusetts Credibility:	0.050	0.150	.
(15) Countrywide Pure Premium:	1.735	1.072	2.807
(16) Countrywide Indicated Relativity:	1.943	2.289	.
(17) Countrywide Credibility:	0.480	0.430	.
(18) Countrywide Lost-Time Claims:	751.00	.	.
(19) Pure Premium Underlying Present Rate:	1.630	6.630	8.260
(20) Relativity to Underlying Present Rate:	1.851	14.801	.
(21) Credibility to Underlying Relativity:	0.470	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.209	27.186	.
(24) Balanced Formula Relativity:	2.180	26.831	10.688

IX 000085

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 14

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2003 BAKERY & DRIVERS, ROUTE SUPERVISORS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	1,918,912	19	310	1,233,829	1,672,005	760,116	918,049	4,583,998	1,514	0,875	2,389
2014	2,017,733	16	298	1,807,285	3,692,671	633,589	1,814,472	7,948,017	2,726	1,213	3,939
2015	2,132,914	8	326	876,695	2,809,296	199,510	1,721,175	5,606,676	1,728	0,900	2,629
2016	2,248,618	8	288	587,425	3,593,840	203,544	1,625,464	6,010,273	1,859	0,813	2,673
2017	2,511,401	9	329	1,164,170	4,257,513	274,876	1,849,912	7,546,472	2,159	0,846	3,005
MA Total:	10,829,578	60	1,551	5,669,403	16,025,325	2,071,635	7,929,072	31,695,435	2,003	0,923	2,927

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.064	1.805	.
(14) Massachusetts Credibility:	0.860	1.000	.
(15) Countrywide Pure Premium:	1.704	0.778	2.481
(16) Countrywide Indicated Relativity:	1.908	1.661	.
(17) Countrywide Credibility:	0.070	0.000	.
(18) Countrywide Lost-Time Claims:	6693.0	.	.
(19) Pure Premium Underlying Present Rate:	1.708	0.826	2.534
(20) Relativity to Underlying Present Rate:	1.940	1.844	.
(21) Credibility to Underlying Relativity:	0.070	0.000	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.044	1.805	.
(24) Balanced Formula Relativity:	2.017	1.781	1.936

Class(es):		Effective: 7/1/2020							Manufacturing		
2014 GRAIN MILLING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
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
2016	2,168	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,339	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	29,773	0	1	0	0	0	113	113	0.000	0.004	0.004

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.007	.
(14) Massachusetts Credibility:	0.080	0.100	.
(15) Countrywide Pure Premium:	2.533	1.192	3.726
(16) Countrywide Indicated Relativity:	2.837	2.546	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	1218.0	.	.
(19) Pure Premium Underlying Present Rate:	1.584	0.708	2.293
(20) Relativity to Underlying Present Rate:	1.800	1.582	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.133	1.858	.
(24) Balanced Formula Relativity:	2.105	1.834	2.011

IX 000086

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 15

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2021 SUGAR REFINING-ALL 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)
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	4,600	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	4,223	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,135	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	14,235	0	1	0	0	0	508	508	0.000	0.036	0.036

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.070	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	1.322	0.688	2.010
(16) Countrywide Indicated Relativity:	1.481	1.469	.
(17) Countrywide Credibility:	0.480	0.470	.
(18) Countrywide Lost-Time Claims:	242.00	.	.
(19) Pure Premium Underlying Present Rate:	1.074	0.544	1.617
(20) Relativity to Underlying Present Rate:	1.219	1.214	.
(21) Credibility to Underlying Relativity:	0.470	0.460	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.284	1.253	.
(24) Balanced Formula Relativity:	1.267	1.237	1.257

Class(es):		Effective: 7/1/2020							Manufacturing		
2039 ICE CREAM 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)
2013	144,801	1	18	431,969	23,740	198,275	29,641	683,626	3,147	1,574	4,721
2014	160,530	3	35	349,154	105,957	126,247	155,024	736,382	2,835	1,752	4,587
2015	173,109	3	33	143,421	146,046	64,987	121,694	476,148	1,672	1,078	2,751
2016	132,001	2	22	271,656	356,062	27,605	89,589	744,911	4,755	0,888	5,643
2017	59,707	0	6	0	4,204	0	5,033	9,237	0,070	0,084	0,155
MA Total:	670,147	9	114	1,196,199	636,010	417,115	400,980	2,650,304	2,734	1,221	3,955

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.817	2.386	.
(14) Massachusetts Credibility:	0.270	0.400	.
(15) Countrywide Pure Premium:	1.268	0.585	1.853
(16) Countrywide Indicated Relativity:	1.420	1.250	.
(17) Countrywide Credibility:	0.370	0.300	.
(18) Countrywide Lost-Time Claims:	411.00	.	.
(19) Pure Premium Underlying Present Rate:	1.583	0.922	2.505
(20) Relativity to Underlying Present Rate:	1.798	2.058	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.933	1.947	.
(24) Balanced Formula Relativity:	1.908	1.922	1.913

IX 000087

Calculation of Class Relativities

Class(es): 2041 CONFECTION MFG		Effective: 7/1/2020							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)
2013	225,929	1	16	22,493	259,705	3,112	93,514	378,825	1,249	0,428	1,677
2014	216,574	4	16	241,990	364,659	18,624	185,568	810,842	2,801	0,943	3,744
2015	235,757	0	16	0	35,290	0	48,720	84,010	0,150	0,207	0,356
2016	217,288	0	17	0	318,989	0	169,051	488,040	1,468	0,778	2,246
2017	175,099	0	21	0	79,516	0	49,240	128,756	0,454	0,281	0,735
MA Total:	1,070,646	5	86	264,484	1,058,159	21,736	546,094	1,890,472	1,235	0,530	1,766

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.273	1.037	.
(14) Massachusetts Credibility:	0.310	0.410	.
(15) Countrywide Pure Premium:	1.210	0.572	1.782
(16) Countrywide Indicated Relativity:	1.356	1.221	.
(17) Countrywide Credibility:	0.350	0.300	.
(18) Countrywide Lost-Time Claims:	1018.0	.	.
(19) Pure Premium Underlying Present Rate:	1.307	0.591	1.898
(20) Relativity to Underlying Present Rate:	1.484	1.320	.
(21) Credibility to Underlying Relativity:	0.340	0.290	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.374	1.174	.
(24) Balanced Formula Relativity:	1.356	1.159	1.288

Class(es): 2070 CREAMERY OR DAIRY & ROUTE SUPERVISORS, DRIVERS		Effective: 7/1/2020							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)
2013	293,456	3	36	486,882	456,755	190,738	178,341	1,312,716	3,216	1,258	4,473
2014	298,686	3	30	223,718	227,039	104,724	124,321	679,802	1,509	0,767	2,276
2015	297,353	1	21	238,045	33,778	53,860	103,478	429,161	0,914	0,529	1,443
2016	151,921	0	13	0	276,893	0	77,406	354,299	1,823	0,510	2,332
2017	149,992	1	14	1,526	94,009	750	65,237	161,521	0,637	0,440	1,077
MA Total:	1,191,409	8	114	950,170	1,088,474	350,072	548,783	2,937,500	1,711	0,754	2,466

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.763	1.475	.
(14) Massachusetts Credibility:	0.370	0.500	.
(15) Countrywide Pure Premium:	2.059	0.879	2.938
(16) Countrywide Indicated Relativity:	2.306	1.877	.
(17) Countrywide Credibility:	0.320	0.250	.
(18) Countrywide Lost-Time Claims:	3481.0	.	.
(19) Pure Premium Underlying Present Rate:	1.849	0.872	2.722
(20) Relativity to Underlying Present Rate:	2.101	1.947	.
(21) Credibility to Underlying Relativity:	0.310	0.250	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.041	1.693	.
(24) Balanced Formula Relativity:	2.015	1.671	1.896

IX 000088

Calculation of Class Relativities

Class(es): 2081 BUTCHERING		Effective: 7/1/2020							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)
2013	16.802	0	20	0	1,501	0	10,939	12,439	0.089	0.651	0.740
2014	18.882	0	10	0	42	0	5,977	6,020	0.002	0.317	0.319
2015	21.751	0	7	0	3,782	0	6,208	9,990	0.174	0.285	0.459
2016	25.569	0	5	0	7,324	0	10,139	17,464	0.286	0.397	0.683
2017	27.808	0	16	0	34,564	0	34,544	69,108	1.243	1.242	2.485
MA Total:	110,811	0	58	0	47,214	0	67,807	115,021	0.426	0.612	1.038

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.439	1.196	.
(14) Massachusetts Credibility:	0.120	0.200	.
(15) Countrywide Pure Premium:	1.286	0.767	2.053
(16) Countrywide Indicated Relativity:	1.441	1.637	.
(17) Countrywide Credibility:	0.440	0.400	.
(18) Countrywide Lost-Time Claims:	833.00	.	.
(19) Pure Premium Underlying Present Rate:	1.266	0.943	2.209
(20) Relativity to Underlying Present Rate:	1.438	2.105	.
(21) Credibility to Underlying Relativity:	0.440	0.400	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.319	1.736	.
(24) Balanced Formula Relativity:	1.302	1.713	1.444

Class(es): 2089 PACKING HOUSE- ALL OPERATIONS		Effective: 7/1/2020							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)
2013	1,286,083	10	203	752,153	1,558,979	295,368	547,225	3,153,725	1,797	0.655	2,452
2014	1,419,367	7	214	581,678	701,296	185,387	528,734	1,997,095	0.904	0.503	1,407
2015	1,658,444	14	221	1,737,785	1,614,610	405,827	908,012	4,666,234	2.021	0.792	2,814
2016	1,732,123	4	245	280,002	1,351,412	71,297	647,870	2,350,580	0.942	0.415	1,357
2017	1,973,731	9	267	869,233	2,701,672	160,433	1,303,865	5,035,204	1.809	0.742	2,551
MA Total:	8,069,749	44	1,150	4,220,851	7,927,969	1,118,312	3,935,706	17,202,839	1.505	0.626	2.132

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.551	1.224	.
(14) Massachusetts Credibility:	0.720	0.920	.
(15) Countrywide Pure Premium:	1.246	0.654	1.899
(16) Countrywide Indicated Relativity:	1.395	1.396	.
(17) Countrywide Credibility:	0.140	0.040	.
(18) Countrywide Lost-Time Claims:	10734	.	.
(19) Pure Premium Underlying Present Rate:	1.487	0.612	2.099
(20) Relativity to Underlying Present Rate:	1.689	1.365	.
(21) Credibility to Underlying Relativity:	0.140	0.040	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.548	1.237	.
(24) Balanced Formula Relativity:	1.528	1.220	1.422

IX 000089

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 18

Calculation of Class Relativities

Class(es): 2095 MEAT PRODUCTS MFG-NOC		Effective: 7/1/2020							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)
2013	401,525	1	67	243,199	734,612	27,303	274,720	1,279,834	2,435	0,752	3,187
2014	398,697	1	59	18,030	252,088	1,145	141,920	413,182	0,678	0,359	1,036
2015	406,845	4	60	650,355	475,699	118,762	173,498	1,418,314	2,768	0,718	3,486
2016	473,075	1	72	2,726	346,859	6,253	148,859	504,696	0,739	0,328	1,067
2017	493,605	2	78	145,099	626,312	68,353	261,006	1,100,770	1,563	0,667	2,230
MA Total:	2,173,746	9	336	1,059,408	2,435,570	221,815	1,000,002	4,716,796	1,608	0,562	2,170

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.656	1.099	.
(14) Massachusetts Credibility:	0.450	0.580	.
(15) Countrywide Pure Premium:	1.527	0.850	2.377
(16) Countrywide Indicated Relativity:	1.710	1.816	.
(17) Countrywide Credibility:	0.280	0.210	.
(18) Countrywide Lost-Time Claims:	3668.0	.	.
(19) Pure Premium Underlying Present Rate:	1.662	0.693	2.356
(20) Relativity to Underlying Present Rate:	1.888	1.547	.
(21) Credibility to Underlying Relativity:	0.270	0.210	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.734	1.343	.
(24) Balanced Formula Relativity:	1.711	1.326	1.578

Class(es): 2111 CANNERY NOC		Effective: 7/1/2020							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)
2013	6,454	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	7,438	0	1	0	1,728	0	1,630	3,358	0.232	0.219	0.452
2015	9,343	0	1	0	0	0	305	305	0.000	0.033	0.033
2016	10,683	0	2	0	53,980	0	24,284	78,264	5.053	2.273	7.326
2017	4,054	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	37,971	0	4	0	55,708	0	26,219	81,927	1,467	0,690	2,158

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.511	1.350	.
(14) Massachusetts Credibility:	0.070	0.100	.
(15) Countrywide Pure Premium:	1.061	0.589	1.649
(16) Countrywide Indicated Relativity:	1.188	1.257	.
(17) Countrywide Credibility:	0.470	0.450	.
(18) Countrywide Lost-Time Claims:	1085.0	.	.
(19) Pure Premium Underlying Present Rate:	0.953	0.467	1.420
(20) Relativity to Underlying Present Rate:	1.083	1.042	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.162	1.170	.
(24) Balanced Formula Relativity:	1.147	1.154	1.150

IX 000090

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 19

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2115 SEAFOOD PRODUCTS MFG-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)
2013	128,207	1	24	6,653	329,786	425	121,144	458,008	2,624	0,948	3,572
2014	178,880	2	28	740,062	365,260	67,936	147,630	1,320,888	6,179	1,205	7,384
2015	173,410	2	47	587,751	591,779	85,561	323,732	1,588,822	6,802	2,360	9,162
2016	69,585	0	21	0	76,629	0	105,780	182,410	1,101	1,520	2,621
2017	70,831	0	18	0	40,888	0	39,271	80,159	0,577	0,554	1,132
MA Total:	620,913	5	138	1,334,466	1,404,342	153,921	737,557	3,630,286	4,411	1,436	5,847

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.544	2.806	.
(14) Massachusetts Credibility:	0.310	0.410	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.604	2.294	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.320	1.039	3.359
(20) Relativity to Underlying Present Rate:	2.634	2.320	.
(21) Credibility to Underlying Relativity:	0.690	0.590	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	3.226	2.519	.
(24) Balanced Formula Relativity:	3.184	2.486	2.943

Class(es):		Effective: 7/1/2020							Manufacturing		
2121 BREWERY & 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)
2013	93,124	0	16	0	5,331	0	25,598	30,929	0,057	0,275	0,332
2014	114,534	0	15	0	3,251	0	10,584	13,834	0,028	0,092	0,121
2015	159,803	0	22	0	170,494	0	59,248	229,742	1,067	0,371	1,438
2016	211,012	0	45	0	451,475	0	202,093	653,568	2,140	0,958	3,097
2017	307,327	1	38	69,441	99,536	19,291	56,933	245,201	0,550	0,248	0,798
MA Total:	885,800	1	136	69,441	730,086	19,291	354,456	1,173,274	0,903	0,422	1,325

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.930	0.825	.
(14) Massachusetts Credibility:	0.200	0.290	.
(15) Countrywide Pure Premium:	0.752	0.353	1.105
(16) Countrywide Indicated Relativity:	0.842	0.754	.
(17) Countrywide Credibility:	0.400	0.360	.
(18) Countrywide Lost-Time Claims:	610.00	.	.
(19) Pure Premium Underlying Present Rate:	0.540	0.298	0.838
(20) Relativity to Underlying Present Rate:	0.613	0.665	.
(21) Credibility to Underlying Relativity:	0.400	0.350	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.768	0.743	.
(24) Balanced Formula Relativity:	0.758	0.734	0.750

IX 000091

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2130 SPIRITUOUS LIQUOR DISTILLERY											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	1,148	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	4,230	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	13,861	0	1	0	0	0	1,296	1,296	0.000	0.093	0.093
2016	9,836	0	1	0	0	0	940	940	0.000	0.096	0.096
2017	9,137	0	1	0	0	0	1,058	1,058	0.000	0.116	0.116
MA Total:	38,213	0	3	0	0	0	3,294	3,294	0.000	0.086	0.086

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.168	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	0.670	0.396	1.066
(16) Countrywide Indicated Relativity:	0.751	0.846	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	249.00	.	.
(19) Pure Premium Underlying Present Rate:	0.835	0.361	1.197
(20) Relativity to Underlying Present Rate:	0.949	0.806	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.789	0.767	.
(24) Balanced Formula Relativity:	0.779	0.757	0.771

Class(es):		Effective: 7/1/2020							Manufacturing		
2131 SPIRITUOUS LIQUOR BOTTLING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	51,848	0	14	0	168,243	0	118,242	286,485	3,245	2,281	5,525
2014	64,419	0	18	0	338,271	0	146,751	485,023	5,251	2,278	7,529
2015	56,368	0	18	0	21,087	0	22,953	44,040	0.374	0.407	0.781
2016	58,005	0	26	0	697,183	0	121,926	819,109	12,019	2,102	14,121
2017	64,821	0	19	0	19,590	0	43,819	63,409	0.302	0.676	0.978
MA Total:	295,462	0	95	0	1,244,375	0	453,691	1,698,065	4,212	1,536	5,747

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.339	3.001	.
(14) Massachusetts Credibility:	0.170	0.250	.
(15) Countrywide Pure Premium:	0.617	0.339	0.956
(16) Countrywide Indicated Relativity:	0.691	0.724	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	150.00	.	.
(19) Pure Premium Underlying Present Rate:	1.146	0.620	1.766
(20) Relativity to Underlying Present Rate:	1.301	1.384	.
(21) Credibility to Underlying Relativity:	0.410	0.370	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.561	1.537	.
(24) Balanced Formula Relativity:	1.541	1.517	1.533

IX 000092

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 21

Calculation of Class Relativities

Class(es): 2143 FRUIT JUICE MFG		Effective: 7/1/2020							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)
2013	43,418	0	15	0	12,155	0	16,496	28,651	0.280	0.380	0.660
2014	46,627	0	8	0	190	0	7,842	8,032	0.004	0.168	0.172
2015	57,914	1	18	201,858	75,015	37,742	68,181	382,796	4.781	1.829	6.610
2016	62,149	0	11	0	10,002	0	7,799	17,801	0.161	0.125	0.286
2017	71,778	1	8	333,848	11,706	23,962	3,102	372,619	4.814	0.377	5.191
MA Total:	281,886	2	60	535,706	109,069	61,704	103,420	809,899	2.287	0.586	2.873

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.356	1.145	.
(14) Massachusetts Credibility:	0.150	0.210	.
(15) Countrywide Pure Premium:	1.158	0.525	1.683
(16) Countrywide Indicated Relativity:	1.297	1.121	.
(17) Countrywide Credibility:	0.430	0.400	.
(18) Countrywide Lost-Time Claims:	277.00	.	.
(19) Pure Premium Underlying Present Rate:	0.845	0.450	1.295
(20) Relativity to Underlying Present Rate:	0.960	1.005	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.314	1.081	.
(24) Balanced Formula Relativity:	1.297	1.067	1.218

Class(es): 2150 ICE MFG		Effective: 7/1/2020							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)
2013	7,624	0	2	0	3,214	0	11,664	14,878	0.422	1.530	1.952
2014	6,795	0	2	0	2,556	0	2,385	4,941	0.376	0.351	0.727
2015	7,338	0	1	0	3,572	0	1,587	5,159	0.487	0.216	0.703
2016	11,932	0	2	0	0	0	1,647	1,647	0.000	0.138	0.138
2017	11,783	0	1	0	0	0	1,227	1,227	0.000	0.104	0.104
MA Total:	45,472	0	8	0	9,342	0	18,510	27,852	0.205	0.407	0.613

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.212	0.796	.
(14) Massachusetts Credibility:	0.100	0.140	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.253	2.270	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.007	1.029	3.036
(20) Relativity to Underlying Present Rate:	2.280	2.297	.
(21) Credibility to Underlying Relativity:	0.900	0.860	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.073	2.086	.
(24) Balanced Formula Relativity:	2.046	2.059	2.050

IX 000093

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 22

Calculation of Class Relativities

Class(es): 2156 BOTTLING-NOT CARBONATED LIQUIDS OR SPIRIT LIQRS & RTE SUP,DR									Effective: 7/1/2020 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)
2013	64,810	1	13	30,502	177,936	3,613	164,067	376,118	3,216	2,587	5,803
2014	77,369	0	14	0	27,715	0	59,674	87,389	0,358	0,771	1,130
2015	89,808	1	11	33,411	126,870	76,241	36,928	273,450	1,785	1,260	3,045
2016	92,127	1	10	108,971	52,619	29,929	53,795	245,314	1,754	0,909	2,663
2017	113,880	0	10	0	183,328	0	152,754	336,082	1,610	1,341	2,951
MA Total:	437,993	3	58	172,884	568,469	109,783	467,218	1,318,353	1,693	1,317	3,010

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.744	2.575	.
(14) Massachusetts Credibility:	0.260	0.360	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.425	2.274	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.160	1.030	3.191
(20) Relativity to Underlying Present Rate:	2.454	2.300	.
(21) Credibility to Underlying Relativity:	0.740	0.640	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.269	2.399	.
(24) Balanced Formula Relativity:	2.240	2.368	2.284

Class(es): 2157 BOTTLING NOC & ROUTE SUPERVISORS, DRIVERS									Effective: 7/1/2020 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)
2013	294,943	3	102	515,166	179,119	81,990	140,031	916,306	2,354	0,753	3,107
2014	322,436	1	83	83,527	298,343	13,498	272,061	667,429	1,184	0,886	2,070
2015	344,869	1	89	269,625	619,314	33,175	338,688	1,260,802	2,578	1,078	3,656
2016	362,709	1	95	160,409	886,313	28,180	270,314	1,345,216	2,886	0,823	3,709
2017	404,000	2	119	220,038	750,263	84,112	338,573	1,392,985	2,402	1,046	3,448
MA Total:	1,728,956	8	488	1,248,765	2,733,351	240,955	1,359,667	5,582,739	2,303	0,926	3,229

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.373	1.809	.
(14) Massachusetts Credibility:	0.420	0.550	.
(15) Countrywide Pure Premium:	2.209	0.835	3.045
(16) Countrywide Indicated Relativity:	2.474	1.784	.
(17) Countrywide Credibility:	0.290	0.230	.
(18) Countrywide Lost-Time Claims:	6008.0	.	.
(19) Pure Premium Underlying Present Rate:	1.802	0.773	2.575
(20) Relativity to Underlying Present Rate:	2.047	1.726	.
(21) Credibility to Underlying Relativity:	0.290	0.220	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.308	1.785	.
(24) Balanced Formula Relativity:	2.277	1.762	2.099

IX 000094

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 23

Calculation of Class Relativities

Class(es): 2172 CIGARETTE MFG		Effective: 7/1/2020							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)
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
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	1,669	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	0.020	.
(15) Countrywide Pure Premium:	0.922	0.349	1.271
(16) Countrywide Indicated Relativity:	1.032	0.745	.
(17) Countrywide Credibility:	0.490	0.490	.
(18) Countrywide Lost-Time Claims:	285.00	.	.
(19) Pure Premium Underlying Present Rate:	0.990	0.323	1.312
(20) Relativity to Underlying Present Rate:	1.124	0.720	.
(21) Credibility to Underlying Relativity:	0.490	0.490	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.057	0.718	.
(24) Balanced Formula Relativity:	1.043	0.709	0.928

Class(es): 2211 COTTON BATTING, WADDING OR WASTE MFG		Effective: 7/1/2020							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)
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
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	858	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	2,140	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:	0.030	0.050	.
(15) Countrywide Pure Premium:	2.910	1.615	4.525
(16) Countrywide Indicated Relativity:	3.259	3.448	.
(17) Countrywide Credibility:	0.310	0.330	.
(18) Countrywide Lost-Time Claims:	63.000	.	.
(19) Pure Premium Underlying Present Rate:	2.858	1.530	4.387
(20) Relativity to Underlying Present Rate:	3.246	3.414	.
(21) Credibility to Underlying Relativity:	0.660	0.620	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	3.153	3.255	.
(24) Balanced Formula Relativity:	3.112	3.212	3.146

IX 000095

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 24

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2220 YARN OR THREAD MFG-COTTON											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	85,462	1	29	124,936	146,132	12,740	58,109	341,917	3,172	0,829	4,001
2014	94,001	0	25	0	60,911	0	56,382	117,293	0,648	0,600	1,248
2015	96,917	1	17	6,900	588	714	14,588	22,790	0,077	0,158	0,235
2016	105,665	1	25	201,488	160,264	45,470	89,699	496,921	3,424	1,279	4,703
2017	106,061	0	20	0	130,229	0	62,692	192,920	1,228	0,591	1,819
MA Total:	488,107	3	116	333,324	498,124	58,925	281,469	1,171,842	1,703	0,697	2,401

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.755	1.363	.
(14) Massachusetts Credibility:	0.210	0.300	.
(15) Countrywide Pure Premium:	0.800	0.442	1.242
(16) Countrywide Indicated Relativity:	0.896	0.945	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	818.00	.	.
(19) Pure Premium Underlying Present Rate:	1.070	0.603	1.674
(20) Relativity to Underlying Present Rate:	1.216	1.347	.
(21) Credibility to Underlying Relativity:	0.390	0.350	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.201	1.211	.
(24) Balanced Formula Relativity:	1.185	1.195	1.189

Class(es):		Effective: 7/1/2020							Manufacturing		
2260 WOOL COMBING OR SCOURING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
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
2016	522	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	534	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	2,470	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:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	3.177	2.616	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.830	1.186	4.016
(20) Relativity to Underlying Present Rate:	3.214	2.646	.
(21) Credibility to Underlying Relativity:	0.960	0.950	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	3.086	2.514	.
(24) Balanced Formula Relativity:	3.045	2.481	2.851

IX 000096

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 25

Calculation of Class Relativities

Class(es): 2288 FELTING MFG		Effective: 7/1/2020							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)
2013	128,095	0	26	0	115,777	0	53,650	169,427	0.904	0.419	1,323
2014	110,090	1	17	62,756	212,619	5,184	37,317	317,876	2,501	0,386	2,887
2015	117,630	0	26	0	384,223	0	77,130	461,353	3,266	0,656	3,922
2016	68,868	0	8	0	441,721	0	231,169	672,890	6,414	3,357	9,771
2017	31,564	0	7	0	131,982	0	55,033	187,015	4,181	1,744	5,925
MA Total:	456,247	1	84	62,756	1,286,322	5,184	454,300	1,808,562	2,957	1,007	3,964

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.046	1.968	.
(14) Massachusetts Credibility:	0.220	0.300	.
(15) Countrywide Pure Premium:	1.295	0.980	2,275
(16) Countrywide Indicated Relativity:	1.451	2.092	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	213.00	.	.
(19) Pure Premium Underlying Present Rate:	1.416	0.652	2,068
(20) Relativity to Underlying Present Rate:	1.608	1.456	.
(21) Credibility to Underlying Relativity:	0.390	0.350	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1,482
(23) Formula Relativity:	1.863	1.832	.
(24) Balanced Formula Relativity:	1.839	1.808	1,828

Class(es): 2305 TEXTILE FIBER MFG-SYNTHETIC		Effective: 7/1/2020							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)
2013	13,319	3	2	132,609	26,603	29,370	2,664	191,246	11,954	2,405	14,359
2014	2,148	0	2	0	0	0	1,785	1,785	0,000	0,831	0,831
2015	3,525	0	2	0	2,230	0	2,073	4,302	0,633	0,588	1,221
2016	5,945	0	1	0	0	0	82	82	0,000	0,014	0,014
2017	4,509	0	3	0	8,829	0	6,169	14,998	1,958	1,368	3,326
MA Total:	29,446	3	10	132,609	37,662	29,370	12,773	212,413	5,783	1,431	7,214

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.957	2.797	.
(14) Massachusetts Credibility:	0.090	0.110	.
(15) Countrywide Pure Premium:	1.021	0.583	1,604
(16) Countrywide Indicated Relativity:	1.144	1.245	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	735.00	.	.
(19) Pure Premium Underlying Present Rate:	1.983	0.914	2,896
(20) Relativity to Underlying Present Rate:	2.252	2.039	.
(21) Credibility to Underlying Relativity:	0.450	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1,482
(23) Formula Relativity:	2.076	1.765	.
(24) Balanced Formula Relativity:	2.049	1.742	1,943

IX 000097

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 26

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2362 KNIT GOODS MFG 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)
2013	14,472	0	1	0	0	0	307	307	0.000	0.021	0.021
2014	13,641	0	1	0	0	0	3,043	3,043	0.000	0.223	0.223
2015	9,754	0	3	0	5,771	0	25,115	30,886	0.592	2.575	3.167
2016	10,080	0	6	0	8,674	0	13,917	22,591	0.861	1.381	2.241
2017	21,300	0	1	0	0	0	684	684	0.000	0.032	0.032
MA Total:	69,247	0	12	0	14,445	0	43,066	57,511	0.209	0.622	0.831

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.215	1.216	.
(14) Massachusetts Credibility:	0.080	0.120	.
(15) Countrywide Pure Premium:	0.754	0.561	1.315
(16) Countrywide Indicated Relativity:	0.845	1.199	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	163.00	.	.
(19) Pure Premium Underlying Present Rate:	0.659	0.433	1.091
(20) Relativity to Underlying Present Rate:	0.748	0.966	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.750	1.098	.
(24) Balanced Formula Relativity:	0.740	1.084	0.859

Class(es):		Effective: 7/1/2020							Manufacturing		
2380 WEBBING 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)
2013	67,407	1	10	169,345	145,950	70,702	56,623	442,619	4.678	1.889	6.566
2014	70,637	0	5	0	6,220	0	9,635	15,855	0.088	0.136	0.224
2015	63,280	0	15	0	15,446	0	30,250	45,696	0.244	0.478	0.722
2016	62,937	0	6	0	5,482	0	7,424	12,906	0.087	0.118	0.205
2017	56,467	0	5	0	5,263	0	5,005	10,267	0.093	0.089	0.182
MA Total:	320,728	1	41	169,345	178,360	70,702	108,936	527,343	1.084	0.560	1.644

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.117	1.095	.
(14) Massachusetts Credibility:	0.170	0.250	.
(15) Countrywide Pure Premium:	0.913	0.509	1.422
(16) Countrywide Indicated Relativity:	1.022	1.087	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	218.00	.	.
(19) Pure Premium Underlying Present Rate:	1.082	0.567	1.649
(20) Relativity to Underlying Present Rate:	1.229	1.266	.
(21) Credibility to Underlying Relativity:	0.410	0.370	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.123	1.155	.
(24) Balanced Formula Relativity:	1.109	1.140	1.119

IX 000098

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 27

Calculation of Class Relativities

Class(es): 2402 CARPET OR RUG MFG NOC		Effective: 7/1/2020							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)
2013	9,491	0	2	0	0	0	263	263	0.000	0.028	0.028
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
2016	10,548	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	9,820	0	1	0	0	0	643	643	0.000	0.065	0.065
MA Total:	44,966	0	3	0	0	0	906	906	0.000	0.020	0.020

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.039	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	1.241	0.737	1.977
(16) Countrywide Indicated Relativity:	1.389	1.573	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	463.00	.	.
(19) Pure Premium Underlying Present Rate:	1.018	0.542	1.560
(20) Relativity to Underlying Present Rate:	1.156	1.210	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.171	1.244	.
(24) Balanced Formula Relativity:	1.155	1.228	1.181

Class(es): 2413 TEXTILE - BLEACHING, DYEING, MERCERZNG, FINISH		Effective: 7/1/2020							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)
2013	278,287	0	39	0	427,625	0	135,923	563,548	1.537	0.488	2.025
2014	328,027	2	42	198,627	349,718	40,550	237,204	826,099	1.672	0.847	2.518
2015	297,053	3	49	659,687	421,809	329,437	187,756	1,598,687	3.641	1.741	5.382
2016	248,924	1	26	151,273	576,137	16,377	199,147	942,935	2.922	0.866	3.788
2017	113,159	0	16	0	241,735	0	73,951	315,686	2.136	0.654	2.790
MA Total:	1,265,450	6	172	1,009,586	2,017,023	386,364	833,981	4,246,955	2.392	0.964	3.356

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.464	1.885	.
(14) Massachusetts Credibility:	0.340	0.500	.
(15) Countrywide Pure Premium:	1.041	0.687	1.727
(16) Countrywide Indicated Relativity:	1.166	1.466	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	230.00	.	.
(19) Pure Premium Underlying Present Rate:	1.463	0.845	2.308
(20) Relativity to Underlying Present Rate:	1.662	1.886	.
(21) Credibility to Underlying Relativity:	0.330	0.250	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.771	1.781	.
(24) Balanced Formula Relativity:	1.748	1.757	1.751

IX 000099

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2416 YARN OR THREAD DYEING OR FINISHING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	16.577	1	4	90.854	101.747	24.676	32.904	250.181	11.619	3.474	15.092
2014	16.410	0	2	0	0	0	2.653	2.653	0.000	0.162	0.162
2015	14.775	1	3	778	476	8.164	16.888	26.307	0.085	1.696	1.780
2016	16.949	0	3	0	20.079	0	6.438	26.517	1.185	0.380	1.565
2017	20.981	0	7	0	4.346	0	10.823	15.169	0.207	0.516	0.723
MA Total:	85.692	2	19	91,632	126,648	32,841	69,707	320,828	2.547	1.197	3.744

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.624	2.339	.
(14) Massachusetts Credibility:	0.110	0.140	.
(15) Countrywide Pure Premium:	0.559	0.422	0.981
(16) Countrywide Indicated Relativity:	0.626	0.902	.
(17) Countrywide Credibility:	0.260	0.270	.
(18) Countrywide Lost-Time Claims:	38.000	.	.
(19) Pure Premium Underlying Present Rate:	1.259	0.547	1.806
(20) Relativity to Underlying Present Rate:	1.430	1.222	.
(21) Credibility to Underlying Relativity:	0.630	0.590	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.352	1.292	.
(24) Balanced Formula Relativity:	1.335	1.275	1.314

Class(es):		Effective: 7/1/2020							Manufacturing		
2417 CLOTH 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)
2013	54.585	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	54.295	0	2	0	80.366	0	16.139	96.505	1.480	0.297	1.777
2015	59.268	0	1	0	327	0	940	1.266	0.006	0.016	0.021
2016	18.910	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2.061	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	189.120	0	3	0	80,693	0	17,078	97,771	0.427	0.090	0.517

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.440	0.176	.
(14) Massachusetts Credibility:	0.160	0.190	.
(15) Countrywide Pure Premium:	0.479	0.278	0.756
(16) Countrywide Indicated Relativity:	0.536	0.593	.
(17) Countrywide Credibility:	0.260	0.270	.
(18) Countrywide Lost-Time Claims:	38.000	.	.
(19) Pure Premium Underlying Present Rate:	1.374	0.527	1.902
(20) Relativity to Underlying Present Rate:	1.561	1.177	.
(21) Credibility to Underlying Relativity:	0.580	0.540	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.115	0.829	.
(24) Balanced Formula Relativity:	1.101	0.818	1.003

IX 000100

Calculation of Class Relativities

Class(es): 2501 CLOTHING MFG		Effective: 7/1/2020							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)
2013	887.702	5	106	360.404	320.586	95.130	257.119	1,033.239	0.767	0.397	1.164
2014	861.903	3	81	440.427	803.176	130.213	476.359	1,850.176	1.443	0.704	2.147
2015	913.151	2	109	281.156	698.421	41.640	336.699	1,357.915	1.073	0.414	1.487
2016	951.077	5	101	386.089	845.926	147.156	525.388	1,904.559	1.295	0.707	2.003
2017	969.531	2	99	70.219	592.567	33.589	307.413	1,003.788	0.684	0.352	1.035
MA Total:	4,583,364	17	496	1,538,295	3,260,676	447,728	1,902,977	7,149,676	1.047	0.513	1.560

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.079	1.002	.
(14) Massachusetts Credibility:	0.470	0.630	.
(15) Countrywide Pure Premium:	0.974	0.591	1.565
(16) Countrywide Indicated Relativity:	1.091	1.263	.
(17) Countrywide Credibility:	0.270	0.190	.
(18) Countrywide Lost-Time Claims:	2642.0	.	.
(19) Pure Premium Underlying Present Rate:	0.893	0.418	1.311
(20) Relativity to Underlying Present Rate:	1.014	0.934	.
(21) Credibility to Underlying Relativity:	0.260	0.180	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.065	1.039	.
(24) Balanced Formula Relativity:	1.051	1.026	1.042

Class(es): 2503 DRESSMAKING OR TAILORING-CUSTOM EXCLUSIVELY		Effective: 7/1/2020							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)
2013	51.737	1	3	136.849	12.167	14.299	3.077	166.392	2.880	0.336	3.216
2014	62.087	0	2	0	4.149	0	1.620	5.769	0.067	0.026	0.093
2015	54.241	0	2	0	97.042	0	44.859	141.900	1.789	0.827	2.616
2016	49.561	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	42.449	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	260,075	1	7	136,849	113,358	14,299	49,555	314,062	0.962	0.246	1.208

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.991	0.480	.
(14) Massachusetts Credibility:	0.130	0.170	.
(15) Countrywide Pure Premium:	0.360	0.160	0.520
(16) Countrywide Indicated Relativity:	0.403	0.341	.
(17) Countrywide Credibility:	0.240	0.250	.
(18) Countrywide Lost-Time Claims:	32.000	.	.
(19) Pure Premium Underlying Present Rate:	0.661	0.272	0.932
(20) Relativity to Underlying Present Rate:	0.750	0.607	.
(21) Credibility to Underlying Relativity:	0.630	0.580	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.698	0.519	.
(24) Balanced Formula Relativity:	0.689	0.512	0.628

IX 000101

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 30

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2570 MATTRESS OR BOX SPRING 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)
2013	29,228	0	8	0	52,163	0	10,510	62,673	1,785	0,360	2,144
2014	33,050	0	4	0	0	0	3,396	3,396	0,000	0,103	0,103
2015	38,338	0	6	0	855	0	2,511	3,366	0,022	0,066	0,088
2016	40,003	0	1	0	0	0	150	150	0,000	0,004	0,004
2017	44,344	0	8	0	11,063	0	14,076	25,140	0,249	0,317	0,567
MA Total:	184,963	0	27	0	64,082	0	30,642	94,724	0,346	0,166	0,512

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.357	0.324	.
(14) Massachusetts Credibility:	0.210	0.270	.
(15) Countrywide Pure Premium:	1.937	0.879	2.816
(16) Countrywide Indicated Relativity:	2.169	1.877	.
(17) Countrywide Credibility:	0.400	0.370	.
(18) Countrywide Lost-Time Claims:	564.00	.	.
(19) Pure Premium Underlying Present Rate:	2.902	1.196	4.098
(20) Relativity to Underlying Present Rate:	3.296	2.669	.
(21) Credibility to Underlying Relativity:	0.390	0.360	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.228	1.743	.
(24) Balanced Formula Relativity:	2.199	1.720	2,034

Class(es):		Effective: 7/1/2020							Manufacturing		
2576 CANVAS GOODS MFG NOC-SHOP											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	101,331	0	11	0	82,015	0	53,952	135,967	0,809	0,532	1,342
2014	111,278	1	11	2,350	43,469	3,224	60,684	109,727	0,412	0,574	0,986
2015	117,479	0	11	0	405,501	0	109,885	515,386	3,452	0,935	4,387
2016	131,538	0	14	0	27,920	0	24,220	52,140	0,212	0,184	0,396
2017	129,309	2	13	76,659	124,653	62,980	73,451	337,743	1,557	1,055	2,612
MA Total:	590,935	3	60	79,009	683,558	66,204	322,191	1,150,962	1,290	0,657	1,948

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.329	1.285	.
(14) Massachusetts Credibility:	0.190	0.280	.
(15) Countrywide Pure Premium:	1.373	0.805	2,178
(16) Countrywide Indicated Relativity:	1.538	1.720	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	17,000	.	.
(19) Pure Premium Underlying Present Rate:	0.754	0.425	1,179
(20) Relativity to Underlying Present Rate:	0.856	0.948	.
(21) Credibility to Underlying Relativity:	0.620	0.520	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1,482
(23) Formula Relativity:	1.076	1.197	.
(24) Balanced Formula Relativity:	1.062	1.181	1,103

IX 000102

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2585 LAUNDRY NOC & ROUTE SUPERVISORS, 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)
2013	672.991	6	76	311.786	280.162	191.494	210.549	993.991	0.880	0.597	1.477
2014	743.525	4	111	407.454	740.998	57.837	383.446	1,589.734	1.545	0.594	2.138
2015	782.288	6	115	769.754	334.041	583.706	285.122	1,972.623	1.411	1.111	2.522
2016	884.918	2	120	113.620	813.007	42.120	480.759	1,449.505	1.047	0.591	1.638
2017	828.115	4	120	364.965	597.790	309.625	586.914	1,859.295	1.163	1.083	2.245
MA Total:	3,911.836	22	542	1,967,578	2,765,998	1,184,782	1,946,790	7,865,149	1.210	0.801	2.011

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.247	1.565	.
(14) Massachusetts Credibility:	0.520	0.730	.
(15) Countrywide Pure Premium:	1.585	0.782	2.367
(16) Countrywide Indicated Relativity:	1.775	1.671	.
(17) Countrywide Credibility:	0.240	0.140	.
(18) Countrywide Lost-Time Claims:	3491.0	.	.
(19) Pure Premium Underlying Present Rate:	1.333	0.694	2.026
(20) Relativity to Underlying Present Rate:	1.514	1.549	.
(21) Credibility to Underlying Relativity:	0.240	0.130	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.437	1.577	.
(24) Balanced Formula Relativity:	1.419	1.557	1.466

Class(es):		Effective: 7/1/2020							Manufacturing		
2586 CLEANING OR DYEING & ROUTE SUPERVISORS, 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)
2013	510.922	1	41	44.195	82.749	4.286	83.334	214.564	0.248	0.171	0.420
2014	492.235	0	55	0	375.176	0	179.895	555.071	0.762	0.365	1.128
2015	532.960	2	49	108.747	161.048	58.000	72.868	400.663	0.506	0.246	0.752
2016	538.249	3	41	310.365	867.293	73.913	880.610	2,132.181	2.188	1.773	3.961
2017	520.036	0	22	0	216.242	0	74.860	291.102	0.416	0.144	0.560
MA Total:	2,594.402	6	208	463.307	1,702,507	136,199	1,291,568	3,593,581	0.835	0.550	1.385

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.860	1.076	.
(14) Massachusetts Credibility:	0.350	0.490	.
(15) Countrywide Pure Premium:	1.095	0.649	1.744
(16) Countrywide Indicated Relativity:	1.226	1.385	.
(17) Countrywide Credibility:	0.330	0.260	.
(18) Countrywide Lost-Time Claims:	263.00	.	.
(19) Pure Premium Underlying Present Rate:	0.785	0.397	1.183
(20) Relativity to Underlying Present Rate:	0.892	0.886	.
(21) Credibility to Underlying Relativity:	0.320	0.250	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.991	1.109	.
(24) Balanced Formula Relativity:	0.978	1.094	1.018

IX 000103

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 32

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	23,502	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	28,700	1	2	62,514	1,029	31,617	1,175	96,335	2,214	1,143	3,357
2015	27,234	0	1	0	0	0	276	276	0.000	0.010	0.010
2016	50,527	0	5	0	3,175	0	5,164	8,339	0.063	0.102	0.165
2017	37,788	0	1	0	0	0	1,325	1,325	0.000	0.035	0.035
MA Total:	167,752	1	9	62,514	4,204	31,617	7,940	106,275	0.398	0.236	0.634

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.482	0.506	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	0.962	0.397	1,359
(16) Countrywide Indicated Relativity:	1.201	0.861	.
(17) Countrywide Credibility:	0.370	0.390	.
(18) Countrywide Lost-Time Claims:	93,000	.	.
(19) Pure Premium Underlying Present Rate:	1.715	0.788	2,503
(20) Relativity to Underlying Present Rate:	2.285	1.911	.
(21) Credibility to Underlying Relativity:	0.470	0.390	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1,291
(23) Formula Relativity:	1.595	1.192	.
(24) Balanced Formula Relativity:	1.584	1.193	1,443

Class(es):		Effective: 7/1/2020							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)
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
2016	168	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	205	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	7,424	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:	2.664	1.551	4,215
(16) Countrywide Indicated Relativity:	2.983	3.313	.
(17) Countrywide Credibility:	0.390	0.410	.
(18) Countrywide Lost-Time Claims:	108,00	.	.
(19) Pure Premium Underlying Present Rate:	2.295	1.082	3,377
(20) Relativity to Underlying Present Rate:	2.606	2.416	.
(21) Credibility to Underlying Relativity:	0.560	0.520	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1,482
(23) Formula Relativity:	2.623	2.615	.
(24) Balanced Formula Relativity:	2.589	2.580	2,586

IX 000104

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 33

Calculation of Class Relativities

Class(es): 2651 SHOE STOCK MFG		Effective: 7/1/2020							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)
2013	61.831	0	7	0	0	0	2.612	2.612	0.000	0.042	0.042
2014	61.617	0	4	0	1.546	0	6.445	7.991	0.025	0.105	0.130
2015	58.024	1	4	14.843	27.061	23.424	48.883	114.211	0.722	1.246	1.968
2016	55.673	0	2	0	7.068	0	15.099	22.166	0.127	0.271	0.398
2017	47.248	0	5	0	17.683	0	5.582	23.265	0.374	0.118	0.492
MA Total:	284.392	1	22	14.843	53.358	23.424	78.620	170.244	0.240	0.359	0.599

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.247	0.701	.
(14) Massachusetts Credibility:	0.140	0.190	.
(15) Countrywide Pure Premium:	0.932	0.526	1.458
(16) Countrywide Indicated Relativity:	1.043	1.123	.
(17) Countrywide Credibility:	0.360	0.380	.
(18) Countrywide Lost-Time Claims:	90.000	.	.
(19) Pure Premium Underlying Present Rate:	0.691	0.318	1.008
(20) Relativity to Underlying Present Rate:	0.785	0.709	.
(21) Credibility to Underlying Relativity:	0.500	0.430	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.803	0.865	.
(24) Balanced Formula Relativity:	0.792	0.854	0.813

Class(es): 2660 BOOT OR SHOE MFG NOC		Effective: 7/1/2020							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)
2013	44.048	0	1	0	1.867	0	8.601	10.468	0.042	0.195	0.238
2014	46.156	1	2	4.187	0	2.023	333	6.543	0.091	0.051	0.142
2015	44.779	0	4	0	110.566	0	33.295	143.861	2.469	0.744	3.213
2016	37.929	0	7	0	661	0	3.533	4.193	0.017	0.093	0.111
2017	52.045	0	3	0	2.209	0	3.551	5.759	0.042	0.068	0.111
MA Total:	224.958	1	17	4.187	115.302	2.023	49.313	170.825	0.531	0.228	0.759

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.547	0.446	.
(14) Massachusetts Credibility:	0.130	0.200	.
(15) Countrywide Pure Premium:	1.294	0.787	2.082
(16) Countrywide Indicated Relativity:	1.449	1.681	.
(17) Countrywide Credibility:	0.440	0.400	.
(18) Countrywide Lost-Time Claims:	300.00	.	.
(19) Pure Premium Underlying Present Rate:	0.808	0.480	1.288
(20) Relativity to Underlying Present Rate:	0.917	1.072	.
(21) Credibility to Underlying Relativity:	0.430	0.400	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.103	1.190	.
(24) Balanced Formula Relativity:	1.089	1.175	1.119

IX 000105

Section IX - Classification Pricing
Subsection G - Class Relativities
7/1/2020

Section IX - G
Exhibit 34

Calculation of Class Relativities

Class(es): 2683 LUGGAGE MFG		Effective: 7/1/2020							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)
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
2016	2,320	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,131	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	11,235	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:	1.600	0.929	2.529
(16) Countrywide Indicated Relativity:	1.792	1.984	.
(17) Countrywide Credibility:	0.280	0.290	.
(18) Countrywide Lost-Time Claims:	46.000	.	.
(19) Pure Premium Underlying Present Rate:	0.745	0.483	1.228
(20) Relativity to Underlying Present Rate:	0.847	1.078	.
(21) Credibility to Underlying Relativity:	0.680	0.650	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.077	1.276	.
(24) Balanced Formula Relativity:	1.063	1.260	1.131

Class(es): 2688 LEATHER GOODS MFG NOC		Effective: 7/1/2020							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)
2013	70,432	0	8	0	222	0	20,176	20,398	0.003	0.286	0.290
2014	81,800	1	7	58,850	89,135	2,421	166,697	317,103	1.809	2.067	3.877
2015	81,706	0	8	0	3,786	0	11,819	15,604	0.046	0.145	0.191
2016	78,560	1	2	103,522	3,537	37,197	1,177	145,433	1.363	0.488	1.851
2017	82,441	0	11	0	4,342	0	12,661	17,003	0.053	0.154	0.206
MA Total:	394,938	2	36	162,371	101,023	39,619	212,529	515,542	0.667	0.638	1.305

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.687	1.248	.
(14) Massachusetts Credibility:	0.190	0.260	.
(15) Countrywide Pure Premium:	0.713	0.470	1.183
(16) Countrywide Indicated Relativity:	0.798	1.003	.
(17) Countrywide Credibility:	0.370	0.370	.
(18) Countrywide Lost-Time Claims:	96.000	.	.
(19) Pure Premium Underlying Present Rate:	1.039	0.500	1.539
(20) Relativity to Underlying Present Rate:	1.180	1.116	.
(21) Credibility to Underlying Relativity:	0.440	0.370	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.945	1.108	.
(24) Balanced Formula Relativity:	0.933	1.094	0.988

IX 000106

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 35

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	30.199	0	8	0	278.894	0	197.731	476.625	9.235	6.548	15.783
2014	33.107	0	6	0	44.870	0	68.081	112.951	1.355	2.056	3.412
2015	42.026	0	8	0	79.490	0	41.131	120.621	1.891	0.979	2.870
2016	48.866	0	3	0	7.586	0	3.566	11.152	0.155	0.073	0.228
2017	44.984	0	3	0	31.188	0	35.928	67.116	0.693	0.799	1.492
MA Total:	199,183	0	28	0	442,028	0	346,437	788,465	2.219	1.739	3.959

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.921	1.401	.
(14) Massachusetts Credibility:	0.290	0.410	.
(15) Countrywide Pure Premium:	9.263	4.688	13.951
(16) Countrywide Indicated Relativity:	4.049	4.013	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	1644.0	.	.
(19) Pure Premium Underlying Present Rate:	6.449	3.242	9.691
(20) Relativity to Underlying Present Rate:	2.960	3.083	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	2.761	2.673	.
(24) Balanced Formula Relativity:	2.753	2.689	2.731

Class(es):		Effective: 7/1/2020							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)
2013	32.059	0	10	0	7.695	0	17.243	24.938	0.240	0.538	0.778
2014	30.445	1	8	2.333	16.642	3.288	18.513	40.776	0.623	0.716	1.339
2015	36.050	1	6	12.194	46.148	16.865	20.463	95.671	1.618	1.035	2.654
2016	32.162	0	9	0	141.321	0	75.597	216.918	4.394	2.350	6.744
2017	33.841	0	5	0	2.667	0	7.203	9.870	0.079	0.213	0.292
MA Total:	164,556	2	38	14,527	214,474	20,153	139,019	388,172	1.392	0.967	2.359

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.434	1.891	.
(14) Massachusetts Credibility:	0.200	0.300	.
(15) Countrywide Pure Premium:	3.447	2.013	5.460
(16) Countrywide Indicated Relativity:	3.860	4.298	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	2258.0	.	.
(19) Pure Premium Underlying Present Rate:	2.899	1.798	4.697
(20) Relativity to Underlying Present Rate:	3.293	4.014	.
(21) Credibility to Underlying Relativity:	0.400	0.350	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	3.148	3.477	.
(24) Balanced Formula Relativity:	3.107	3.431	3.219

IX 000107

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 36

Calculation of Class Relativities

Class(es): 2731 PLANING OR MOLDING MILL		Effective: 7/1/2020							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)
2013	35,328	0	8	0	0	0	4,298	4,298	0.000	0.122	0.122
2014	37,484	0	7	0	18,741	0	31,795	50,536	0.500	0.848	1.348
2015	39,539	0	7	0	29,380	0	23,273	52,652	0.743	0.589	1.332
2016	41,077	0	6	0	957	0	5,855	6,813	0.023	0.143	0.166
2017	41,093	0	8	0	24,955	0	19,478	44,433	0.607	0.474	1.081
MA Total:	194,520	0	36	0	74,033	0	84,699	158,732	0.381	0.435	0.816

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.392	0.851	.
(14) Massachusetts Credibility:	0.160	0.230	.
(15) Countrywide Pure Premium:	1.734	1.096	2.829
(16) Countrywide Indicated Relativity:	1.941	2.340	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	1410.0	.	.
(19) Pure Premium Underlying Present Rate:	1.356	0.802	2.158
(20) Relativity to Underlying Present Rate:	1.541	1.790	.
(21) Credibility to Underlying Relativity:	0.420	0.380	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.525	1.788	.
(24) Balanced Formula Relativity:	1.505	1.765	1.595

Class(es): 2747 COOPERAGE ASSEMBLY		Effective: 7/1/2020							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)
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
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	1	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	1	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:	0.000	0.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	3.009	2.765	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.680	1.253	3.934
(20) Relativity to Underlying Present Rate:	3.044	2.797	.
(21) Credibility to Underlying Relativity:	1.000	1.000	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	3.044	2.797	.
(24) Balanced Formula Relativity:	3.005	2.761	2.920

IX 000108

Calculation of Class Relativities

Class(es): 2790 PATTERN MAKING NOC		Effective: 7/1/2020							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)
2013	35,372	0	4	0	201,549	0	35,539	237,088	5,698	1,005	6,703
2014	35,435	0	8	0	22,544	0	25,084	47,629	0,636	0,708	1,344
2015	39,867	0	3	0	1,249	0	4,666	5,915	0,031	0,117	0,148
2016	34,859	0	5	0	1,984	0	3,811	5,795	0,057	0,109	0,166
2017	49,425	0	11	0	31,740	0	23,562	55,302	0,642	0,477	1,119
MA Total:	194,957	0	31	0	259,067	0	92,663	351,730	1,329	0,475	1,804

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.369	0.929	.
(14) Massachusetts Credibility:	0.120	0.170	.
(15) Countrywide Pure Premium:	0.737	0.403	1.141
(16) Countrywide Indicated Relativity:	0.826	0.861	.
(17) Countrywide Credibility:	0.440	0.420	.
(18) Countrywide Lost-Time Claims:	212.00	.	.
(19) Pure Premium Underlying Present Rate:	0.763	0.366	1.128
(20) Relativity to Underlying Present Rate:	0.866	0.816	.
(21) Credibility to Underlying Relativity:	0.440	0.410	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.909	0.854	.
(24) Balanced Formula Relativity:	0.897	0.843	0.878

Class(es): 2802 CARPENTRY-SHOP ONLY & DRIVERS		Effective: 7/1/2020							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)
2013	1,073,949	3	209	77,086	1,375,903	45,169	813,102	2,311,259	1,353	0,799	2,152
2014	1,078,139	1	169	15,341	699,229	8,139	642,128	1,364,837	0,663	0,603	1,266
2015	1,138,051	7	168	666,776	2,032,663	302,848	944,265	3,946,552	2,372	1,096	3,468
2016	1,197,062	6	173	346,058	1,415,719	259,181	891,991	2,912,949	1,472	0,962	2,433
2017	1,222,115	5	162	595,023	2,833,367	731,632	1,151,842	5,311,864	2,805	1,541	4,346
MA Total:	5,709,316	22	881	1,700,284	8,356,881	1,346,968	4,443,327	15,847,461	1,762	1,014	2,776

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.815	1.982	.
(14) Massachusetts Credibility:	0.680	0.940	.
(15) Countrywide Pure Premium:	2.131	1.196	3.327
(16) Countrywide Indicated Relativity:	2.386	2.554	.
(17) Countrywide Credibility:	0.160	0.030	.
(18) Countrywide Lost-Time Claims:	5886.0	.	.
(19) Pure Premium Underlying Present Rate:	1.806	0.900	2.706
(20) Relativity to Underlying Present Rate:	2.051	2.009	.
(21) Credibility to Underlying Relativity:	0.160	0.030	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.944	2.000	.
(24) Balanced Formula Relativity:	1.919	1.974	1.938

IX 000109

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 38

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
2835 BRUSH OR BROOM ASSEMBLY											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	51.653	0	4	0	7.771	0	13.239	21.010	0.150	0.256	0.407
2014	46.309	0	5	0	209	0	5.738	5.947	0.005	0.124	0.128
2015	50.627	0	3	0	138	0	2.223	2.361	0.003	0.044	0.047
2016	49.397	1	4	4.048	0	25.618	2.534	32.200	0.082	0.570	0.652
2017	53.322	0	6	0	0	0	4.767	4.767	0.000	0.089	0.089
MA Total:	251.309	1	22	4.048	8.118	25.618	28.501	66.285	0.048	0.215	0.264

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.050	0.421	.
(14) Massachusetts Credibility:	0.140	0.200	.
(15) Countrywide Pure Premium:	0.669	0.388	1.056
(16) Countrywide Indicated Relativity:	0.749	0.828	.
(17) Countrywide Credibility:	0.310	0.330	.
(18) Countrywide Lost-Time Claims:	63.000	.	.
(19) Pure Premium Underlying Present Rate:	0.805	0.439	1.244
(20) Relativity to Underlying Present Rate:	0.914	0.981	.
(21) Credibility to Underlying Relativity:	0.550	0.470	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.742	0.818	.
(24) Balanced Formula Relativity:	0.732	0.808	0.758

Class(es):		Effective: 7/1/2020							Manufacturing		
2836 BRUSH OR BROOM MFG 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)
2013	5.613	0	3	0	41	0	1.061	1.102	0.007	0.189	0.196
2014	5.804	0	1	0	230	0	632	862	0.040	0.109	0.149
2015	6.979	0	1	0	0	0	90	90	0.000	0.013	0.013
2016	5.718	0	1	0	10.692	0	954	11.646	1.870	0.167	2.037
2017	7.209	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	31.323	0	6	0	10.963	0	2.737	13.700	0.350	0.087	0.437

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.361	0.171	.
(14) Massachusetts Credibility:	0.060	0.090	.
(15) Countrywide Pure Premium:	1.410	0.697	2.108
(16) Countrywide Indicated Relativity:	1.579	1.489	.
(17) Countrywide Credibility:	0.290	0.310	.
(18) Countrywide Lost-Time Claims:	53.000	.	.
(19) Pure Premium Underlying Present Rate:	0.880	0.429	1.309
(20) Relativity to Underlying Present Rate:	0.999	0.957	.
(21) Credibility to Underlying Relativity:	0.650	0.600	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.129	1.051	.
(24) Balanced Formula Relativity:	1.114	1.038	1.088

IX 000110

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 39

Calculation of Class Relativities

Class(es): 2841 WOODENWARE MFG NOC		Effective: 7/1/2020							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)
2013	44,738	0	13	0	135,753	0	56,396	192,149	3,034	1,261	4,295
2014	49,723	0	11	0	64,850	0	18,123	82,972	1,304	0,364	1,669
2015	42,775	0	6	0	25,891	0	27,200	53,091	0,605	0,636	1,241
2016	34,041	0	1	0	0	0	160	160	0,000	0,005	0,005
2017	32,136	1	0	177,089	0	219,065	0	396,155	5,511	6,817	12,327
MA Total:	203,413	1	31	177,089	226,494	219,065	101,878	724,526	1,984	1,578	3,562

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.044	3.084	.
(14) Massachusetts Credibility:	0.170	0.230	.
(15) Countrywide Pure Premium:	1.636	1.196	2.831
(16) Countrywide Indicated Relativity:	1.832	2.553	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	178.00	.	.
(19) Pure Premium Underlying Present Rate:	1.634	0.715	2,349
(20) Relativity to Underlying Present Rate:	1.856	1.596	.
(21) Credibility to Underlying Relativity:	0.410	0.380	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1,482
(23) Formula Relativity:	1.878	2.311	.
(24) Balanced Formula Relativity:	1.853	2.281	2,001

Class(es): 2883 FURNITURE MFG-WOOD-NOC		Effective: 7/1/2020							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)
2013	450,967	1	77	28,752	863,394	3,407	424,125	1,319,679	1,978	0,948	2,926
2014	509,563	5	68	833,643	597,897	73,869	288,211	1,793,620	2,809	0,711	3,520
2015	546,445	3	67	390,447	241,023	76,108	330,037	1,037,615	1,156	0,743	1,899
2016	555,315	2	103	585,969	454,109	124,857	253,488	1,418,423	1,873	0,681	2,554
2017	537,493	3	80	571,548	463,894	396,199	309,589	1,741,230	1,926	1,313	3,240
MA Total:	2,599,783	14	395	2,410,359	2,620,316	674,442	1,605,450	7,310,567	1,935	0,877	2,812

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.993	1.714	.
(14) Massachusetts Credibility:	0.460	0.610	.
(15) Countrywide Pure Premium:	1.468	0.806	2,274
(16) Countrywide Indicated Relativity:	1.644	1.722	.
(17) Countrywide Credibility:	0.270	0.200	.
(18) Countrywide Lost-Time Claims:	5235.0	.	.
(19) Pure Premium Underlying Present Rate:	1.468	0.668	2,136
(20) Relativity to Underlying Present Rate:	1.667	1.491	.
(21) Credibility to Underlying Relativity:	0.270	0.190	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1,482
(23) Formula Relativity:	1.811	1.673	.
(24) Balanced Formula Relativity:	1.787	1.651	1,740

IX 000111

Calculation of Class Relativities

Class(es): 2923 PIANO MFG		Effective: 7/1/2020							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)
2013	52,244	0	7	0	62,779	0	5,981	68,761	1,202	0.114	1.316
2014	52,592	0	2	0	0	0	2,110	2,110	0.000	0.040	0.040
2015	51,404	1	2	182,462	0	77,990	649	261,101	3,550	1,530	5,079
2016	58,472	0	1	0	0	0	431	431	0.000	0.007	0.007
2017	58,733	0	4	0	0	0	1,406	1,406	0.000	0.024	0.024
MA Total:	273,446	1	16	182,462	62,779	77,990	10,577	333,809	0.897	0.324	1.221

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.924	0.633	.
(14) Massachusetts Credibility:	0.140	0.200	.
(15) Countrywide Pure Premium:	0.776	0.439	1.215
(16) Countrywide Indicated Relativity:	0.869	0.937	.
(17) Countrywide Credibility:	0.360	0.380	.
(18) Countrywide Lost-Time Claims:	89,000	.	.
(19) Pure Premium Underlying Present Rate:	0.764	0.386	1.150
(20) Relativity to Underlying Present Rate:	0.868	0.862	.
(21) Credibility to Underlying Relativity:	0.500	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.876	0.845	.
(24) Balanced Formula Relativity:	0.865	0.834	0.854

Class(es): 2942 PENCIL, PENHOLDER OR CRAYON MFG		Effective: 7/1/2020							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)
2013	953,373	1	54	9,618	525,267	340	514,808	1,050,032	0.561	0.540	1.101
2014	145,227	0	8	0	17,477	0	17,465	34,942	0.120	0.120	0.241
2015	140,412	0	9	0	0	0	7,089	7,089	0.000	0.050	0.050
2016	134,148	0	12	0	220,020	0	65,763	285,783	1.640	0.490	2.130
2017	160,530	0	18	0	314,165	0	121,705	435,870	1.957	0.758	2.715
MA Total:	1,533,690	1	101	9,618	1,076,929	340	726,830	1,813,717	0.708	0.474	1.183

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.730	0.927	.
(14) Massachusetts Credibility:	0.300	0.420	.
(15) Countrywide Pure Premium:	0.815	0.496	1.312
(16) Countrywide Indicated Relativity:	0.913	1.060	.
(17) Countrywide Credibility:	0.350	0.290	.
(18) Countrywide Lost-Time Claims:	458,000	.	.
(19) Pure Premium Underlying Present Rate:	0.846	0.450	1.296
(20) Relativity to Underlying Present Rate:	0.961	1.004	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.875	0.988	.
(24) Balanced Formula Relativity:	0.863	0.975	0.902

IX 000112

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 41

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3018 IRON OR STEEL: MFG: ROLLING MILL & 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)
2013	206,122	0	19	0	100,283	0	71,393	171,676	0.487	0.346	0.833
2014	185,303	1	17	1,828	123,348	11,327	57,028	193,530	0.676	0.369	1.044
2015	171,105	0	6	0	192,979	0	53,770	246,749	1.128	0.314	1.442
2016	209,784	1	31	159,405	373,214	51,384	191,789	775,791	2.539	1.159	3.698
2017	218,380	1	18	169,961	117,081	78,262	96,220	461,524	1.314	0.799	2.113
MA Total:	990,694	3	91	331,193	906,905	140,972	470,200	1,849,271	1.250	0.617	1.867

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.287	1.206	.
(14) Massachusetts Credibility:	0.290	0.380	.
(15) Countrywide Pure Premium:	1.280	0.654	1.935
(16) Countrywide Indicated Relativity:	1.434	1.398	.
(17) Countrywide Credibility:	0.360	0.310	.
(18) Countrywide Lost-Time Claims:	481.00	.	.
(19) Pure Premium Underlying Present Rate:	1.283	0.544	1.828
(20) Relativity to Underlying Present Rate:	1.458	1.215	.
(21) Credibility to Underlying Relativity:	0.350	0.310	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.400	1.268	.
(24) Balanced Formula Relativity:	1.381	1.251	1.337

Class(es):		Effective: 7/1/2020							Manufacturing		
3022 PIPE OR TUBE MFG 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)
2013	10,326	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	17,051	1	4	16,638	16,953	33,969	27,776	95,336	1.970	3.621	5.591
2015	18,656	0	6	0	21,688	0	14,779	36,468	1.163	0.792	1.955
2016	8,139	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	5,211	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	59,384	1	10	16,638	38,642	33,969	42,555	131,804	0.931	1.289	2.220

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.959	2.519	.
(14) Massachusetts Credibility:	0.100	0.150	.
(15) Countrywide Pure Premium:	1.774	0.863	2.636
(16) Countrywide Indicated Relativity:	1.986	1.842	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	493.00	.	.
(19) Pure Premium Underlying Present Rate:	1.598	0.861	2.459
(20) Relativity to Underlying Present Rate:	1.815	1.922	.
(21) Credibility to Underlying Relativity:	0.450	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.806	1.977	.
(24) Balanced Formula Relativity:	1.783	1.951	1.841

IX 000113

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 42

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3027 ROLLING MILL 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)
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	1	3	30,138	5,060	4,975	10,650	50,823	3.302	1.466	4.768
2016	9,601	0	1	0	0	0	660	660	0.000	0.069	0.069
2017	7,162	0	1	0	0	0	450	450	0.000	0.063	0.063
MA Total:	31,281	1	5	30,138	5,060	4,975	11,760	51,933	1.125	0.535	1.660

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.159	1.046	.
(14) Massachusetts Credibility:	0.090	0.150	.
(15) Countrywide Pure Premium:	1.016	0.567	1.584
(16) Countrywide Indicated Relativity:	1.138	1.211	.
(17) Countrywide Credibility:	0.460	0.430	.
(18) Countrywide Lost-Time Claims:	417.00	.	.
(19) Pure Premium Underlying Present Rate:	1.976	1.574	3.550
(20) Relativity to Underlying Present Rate:	2.244	3.514	.
(21) Credibility to Underlying Relativity:	0.450	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.638	2.153	.
(24) Balanced Formula Relativity:	1.616	2.125	1.792

Class(es):		Effective: 7/1/2020							Manufacturing		
3028 PIPE OR TUBE MFG - IRON OR STEEL & 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)
2013	4,653	0	9	0	21,851	0	23,004	44,855	4.696	4.944	9.639
2014	5,315	0	1	0	8,045	0	8,634	16,679	1.514	1.624	3.138
2015	24,770	0	9	0	8,226	0	15,341	23,567	0.332	0.619	0.951
2016	6,253	0	5	0	9,343	0	5,601	14,944	1.494	0.896	2.390
2017	5,763	0	3	0	13,922	0	5,406	19,328	2.416	0.938	3.354
MA Total:	46,754	0	27	0	61,386	0	57,986	119,372	1.313	1.240	2.553

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.353	2.424	.
(14) Massachusetts Credibility:	0.090	0.120	.
(15) Countrywide Pure Premium:	1.410	0.699	2.109
(16) Countrywide Indicated Relativity:	1.579	1.492	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	1105.0	.	.
(19) Pure Premium Underlying Present Rate:	1.233	0.687	1.919
(20) Relativity to Underlying Present Rate:	1.400	1.533	.
(21) Credibility to Underlying Relativity:	0.450	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.478	1.622	.
(24) Balanced Formula Relativity:	1.459	1.601	1.508

IX 000114

Calculation of Class Relativities

Class(es): 3030 IRON OR STEEL: FABRICATION: IRON/STEEL WORK-SHOP-STRUCT & DR									Effective: 7/1/2020 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)
2013	115.752	0	33	0	1,058,520	0	243,535	1,302,055	9,145	2,104	11,249
2014	117.891	0	11	0	13,699	0	18,222	31,921	0,116	0,155	0,271
2015	124.152	0	25	0	249,130	0	176,604	425,733	2,007	1,422	3,429
2016	125.621	1	21	166,251	42,937	258,243	115,673	583,104	1,665	2,977	4,642
2017	120.391	1	19	64,023	558,076	35,864	223,626	881,588	5,167	2,155	7,323
MA Total:	603,807	2	109	230,274	1,922,361	294,107	777,659	3,224,401	3,565	1,775	5,340

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.673	3.469	.
(14) Massachusetts Credibility:	0.330	0.440	.
(15) Countrywide Pure Premium:	2.604	1.300	3.903
(16) Countrywide Indicated Relativity:	2.916	2.775	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	2665.0	.	.
(19) Pure Premium Underlying Present Rate:	2.774	1.264	4.038
(20) Relativity to Underlying Present Rate:	3.151	2.821	.
(21) Credibility to Underlying Relativity:	0.330	0.280	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	3.243	3.093	.
(24) Balanced Formula Relativity:	3.201	3.053	3.150

Class(es): 3040 IRON OR STEEL: FABRICATION: IRON WORKS-SHOP-ORNAMENTAL & DR									Effective: 7/1/2020 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)
2013	168.205	1	27	13,307	24,777	850	29,521	68,455	0,226	0,181	0,407
2014	184.645	1	31	188,415	101,880	20,077	52,071	362,443	1,572	0,391	1,963
2015	196.068	2	21	568,969	694,896	89,417	168,989	1,522,271	6,446	1,318	7,764
2016	217.526	2	40	843,777	147,096	101,485	199,560	1,291,917	4,555	1,384	5,939
2017	239.531	0	38	0	333,461	0	163,847	497,309	1,392	0,684	2,076
MA Total:	1,005,975	6	157	1,614,469	1,302,109	211,829	613,988	3,742,394	2,899	0,821	3,720

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.987	1.604	.
(14) Massachusetts Credibility:	0.380	0.480	.
(15) Countrywide Pure Premium:	2.303	1.203	3.507
(16) Countrywide Indicated Relativity:	2.580	2.570	.
(17) Countrywide Credibility:	0.310	0.260	.
(18) Countrywide Lost-Time Claims:	1564.0	.	.
(19) Pure Premium Underlying Present Rate:	2.411	0.928	3.339
(20) Relativity to Underlying Present Rate:	2.738	2.072	.
(21) Credibility to Underlying Relativity:	0.310	0.260	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.784	1.977	.
(24) Balanced Formula Relativity:	2.747	1.951	2.472

IX 000115

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 44

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	38.530	0	1	0	0	0	1.925	1.925	0.000	0.050	0.050
2014	50.510	0	4	0	0	0	2.533	2.533	0.000	0.050	0.050
2015	40.557	0	3	0	0	0	1.370	1.370	0.000	0.034	0.034
2016	43.286	0	2	0	5.287	0	2.715	8.002	0.122	0.063	0.185
2017	50.813	0	6	0	1.373	0	6.296	7.669	0.027	0.124	0.151
MA Total:	223.697	0	16	0	6.660	0	14.840	21.500	0.030	0.066	0.096

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.031	0.130	.
(14) Massachusetts Credibility:	0.170	0.270	.
(15) Countrywide Pure Premium:	1.582	0.824	2.406
(16) Countrywide Indicated Relativity:	1.771	1.760	.
(17) Countrywide Credibility:	0.420	0.370	.
(18) Countrywide Lost-Time Claims:	204.00	.	.
(19) Pure Premium Underlying Present Rate:	1.481	0.977	2.457
(20) Relativity to Underlying Present Rate:	1.682	2.180	.
(21) Credibility to Underlying Relativity:	0.410	0.360	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.439	1.471	.
(24) Balanced Formula Relativity:	1.420	1.452	1.431

Class(es):		Effective: 7/1/2020							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)
2013	7.294	0	2	0	1.981	0	40.012	41.993	0.272	5.486	5.757
2014	6.749	0	2	0	0	0	761	761	0.000	0.113	0.113
2015	7.198	0	2	0	0	0	1.924	1.924	0.000	0.267	0.267
2016	7.941	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	8.752	0	2	0	0	0	3.075	3.075	0.000	0.351	0.351
MA Total:	37.934	0	8	0	1.981	0	45.772	47.753	0.052	1.207	1.259

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.054	2.358	.
(14) Massachusetts Credibility:	0.110	0.140	.
(15) Countrywide Pure Premium:	1.885	1.041	2.926
(16) Countrywide Indicated Relativity:	2.111	2.223	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	195.00	.	.
(19) Pure Premium Underlying Present Rate:	2.851	1.110	3.962
(20) Relativity to Underlying Present Rate:	3.239	2.478	.
(21) Credibility to Underlying Relativity:	0.440	0.430	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.381	2.352	.
(24) Balanced Formula Relativity:	2.350	2.321	2.340

IX 000116

Calculation of Class Relativities

Class(es): 3066 SHEET METAL WORK - SHOP		Effective: 7/1/2020							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)
2013	932.349	3	143	159.112	601.352	52.977	722.506	1,535.947	0.816	0.832	1.647
2014	920.719	4	139	173.974	578.648	43.337	449.271	1,245.229	0.817	0.535	1.352
2015	950.801	3	151	207.241	560.883	56.035	383.951	1,208.110	0.808	0.463	1.271
2016	943.850	2	134	109.065	778.092	74.900	475.091	1,437.148	0.940	0.583	1.523
2017	987.743	4	129	406.459	769.650	142.124	480.871	1,799.105	1.191	0.631	1.821
MA Total:	4,735.462	16	696	1,055.851	3,288.626	369.372	2,511.689	7,225.539	0.917	0.608	1.526

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.945	1.189	.
(14) Massachusetts Credibility:	0.500	0.730	.
(15) Countrywide Pure Premium:	1.548	0.811	2.359
(16) Countrywide Indicated Relativity:	1.734	1.732	.
(17) Countrywide Credibility:	0.250	0.140	.
(18) Countrywide Lost-Time Claims:	981.00	.	.
(19) Pure Premium Underlying Present Rate:	1.023	0.573	1.595
(20) Relativity to Underlying Present Rate:	1.162	1.278	.
(21) Credibility to Underlying Relativity:	0.250	0.130	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.196	1.277	.
(24) Balanced Formula Relativity:	1.181	1.260	1.208

Class(es): 3076 FIREPROOF EQUIPMENT MFG		Effective: 7/1/2020							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)
2013	303.824	0	33	0	249.450	0	112.243	361.692	0.821	0.369	1.190
2014	364.179	0	34	0	21.950	0	55.278	77.228	0.060	0.152	0.212
2015	281.707	3	27	215.388	489.595	93.516	143.627	942.126	2.503	0.842	3.344
2016	270.095	0	47	0	171.372	0	94.616	265.988	0.634	0.350	0.985
2017	293.702	2	31	52.701	26.270	18.864	39.706	137.542	0.269	0.199	0.468
MA Total:	1,513.507	5	172	268.089	958.636	112.380	445.470	1,784.575	0.811	0.369	1.179

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.835	0.720	.
(14) Massachusetts Credibility:	0.320	0.440	.
(15) Countrywide Pure Premium:	1.247	0.709	1.956
(16) Countrywide Indicated Relativity:	1.396	1.514	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	8773.0	.	.
(19) Pure Premium Underlying Present Rate:	1.010	0.516	1.525
(20) Relativity to Underlying Present Rate:	1.147	1.151	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.132	1.063	.
(24) Balanced Formula Relativity:	1.117	1.049	1.094

IX 000117

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 46

Calculation of Class Relativities

Class(es): 3081 FOUNDRY-FERROUS-NOC		Effective: 7/1/2020							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)
2013	16,664	0	4	0	11,192	0	146,234	157,425	0.672	8,775	9,447
2014	18,779	2	4	150,601	55	50,737	3,360	204,754	8,023	2,881	10,903
2015	15,003	0	4	0	7,541	0	36,929	44,470	0.503	2,461	2,964
2016	16,294	0	2	0	0	0	428	428	0.000	0.026	0.026
2017	19,902	0	5	0	1,948	0	9,975	11,924	0.098	0.501	0.599
MA Total:	86,642	2	19	150,601	20,736	50,737	196,927	419,001	1.978	2.858	4.836

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.037	5.587	.
(14) Massachusetts Credibility:	0.140	0.200	.
(15) Countrywide Pure Premium:	2.200	1.098	3.298
(16) Countrywide Indicated Relativity:	2.463	2.345	.
(17) Countrywide Credibility:	0.430	0.400	.
(18) Countrywide Lost-Time Claims:	2042.0	.	.
(19) Pure Premium Underlying Present Rate:	2.120	1.256	3.377
(20) Relativity to Underlying Present Rate:	2.408	2.804	.
(21) Credibility to Underlying Relativity:	0.430	0.400	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.380	3.177	.
(24) Balanced Formula Relativity:	2.349	3.135	2.620

Class(es): 3085 FOUNDRY-NON FERROUS		Effective: 7/1/2020							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)
2013	114,230	4	24	603,028	44,661	130,069	44,926	822,685	5,670	1,532	7,202
2014	116,847	0	23	0	146,480	0	62,688	209,168	1,254	0,536	1,790
2015	112,511	2	10	447,427	208,227	213,075	57,094	925,822	5,827	2,401	8,229
2016	109,493	0	18	0	17,944	0	41,805	59,749	0.164	0.382	0.546
2017	114,568	0	31	0	261,042	0	129,435	390,478	2,278	1,130	3,408
MA Total:	567,650	6	106	1,050,455	678,353	343,144	335,949	2,407,902	3.046	1.196	4.242

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.137	2.338	.
(14) Massachusetts Credibility:	0.290	0.410	.
(15) Countrywide Pure Premium:	1.656	0.988	2.644
(16) Countrywide Indicated Relativity:	1.855	2.110	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	852.00	.	.
(19) Pure Premium Underlying Present Rate:	2.189	1.107	3.296
(20) Relativity to Underlying Present Rate:	2.486	2.470	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.448	2.308	.
(24) Balanced Formula Relativity:	2.416	2.278	2.368

IX 000118

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 47

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3110 FORGING WORK - DROP OR MACHINE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	14,727	0	11	0	48,352	0	38,899	87,251	3,283	2,641	5,925
2014	14,155	0	5	0	29,166	0	11,264	40,431	2,061	0,796	2,856
2015	11,186	0	6	0	134,508	0	87,390	221,897	12,025	7,813	19,838
2016	20,193	1	12	80,469	147,947	35,893	69,706	334,014	11,312	5,230	16,541
2017	17,397	0	9	0	128,050	0	47,580	175,631	7,361	2,735	10,096
MA Total:	77,657	1	43	80,469	488,023	35,893	254,840	859,224	7,321	3,744	11,064

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	7.541	7.317	.
(14) Massachusetts Credibility:	0.170	0.240	.
(15) Countrywide Pure Premium:	2.324	1.061	3.385
(16) Countrywide Indicated Relativity:	2.602	2.266	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	442.00	.	.
(19) Pure Premium Underlying Present Rate:	3.995	2.155	6.149
(20) Relativity to Underlying Present Rate:	4.537	4.810	.
(21) Credibility to Underlying Relativity:	0.410	0.380	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	4.235	4.445	.
(24) Balanced Formula Relativity:	4.180	4.387	4.251

Class(es):		Effective: 7/1/2020							Manufacturing		
3111 BLACKSMITH											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	60,460	0	10	0	659	0	5,040	5,698	0.011	0.083	0.094
2014	66,537	2	12	160,279	15,419	31,472	19,790	226,960	2,641	0,770	3,411
2015	71,625	0	9	0	7,773	0	34,089	41,862	0.109	0,476	0,584
2016	79,120	0	7	0	7,978	0	26,715	34,693	0.101	0,338	0,438
2017	81,346	0	7	0	59,712	0	22,294	82,006	0.734	0,274	1,008
MA Total:	359,089	2	45	160,279	91,540	31,472	107,928	391,219	0.701	0.388	1.089

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.722	0.759	.
(14) Massachusetts Credibility:	0.170	0.240	.
(15) Countrywide Pure Premium:	1.051	0.462	1.513
(16) Countrywide Indicated Relativity:	1.177	0.986	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	240.00	.	.
(19) Pure Premium Underlying Present Rate:	0.863	0.470	1.333
(20) Relativity to Underlying Present Rate:	0.980	1.050	.
(21) Credibility to Underlying Relativity:	0.410	0.380	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.019	0.955	.
(24) Balanced Formula Relativity:	1.006	0.943	0.984

IX 000119

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 48

Calculation of Class Relativities

Class(es): 3113 TOOL MFG-NOT DROP OR MACHINE FORGED-NOC									Effective: 7/1/2020			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)			
2013	794,761	0	81	0	344,194	0	244,717	588,911	0.433	0.308	0.741			
2014	848,311	5	65	499,328	147,658	127,807	172,899	947,692	0.763	0.354	1.117			
2015	882,763	5	69	756,303	664,676	282,949	390,771	2,094,700	1.610	0.763	2.373			
2016	805,945	1	87	95,903	445,434	22,477	276,063	839,877	0.672	0.370	1.042			
2017	749,898	2	64	80,119	450,943	91,814	279,284	902,160	0.708	0.495	1.203			
MA Total:	4,081,679	13	366	1,431,653	2,052,905	525,047	1,363,735	5,373,340	0.854	0.463	1.316			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.879	0.904	.
(14) Massachusetts Credibility:	0.400	0.560	.
(15) Countrywide Pure Premium:	0.767	0.399	1.166
(16) Countrywide Indicated Relativity:	0.859	0.851	.
(17) Countrywide Credibility:	0.300	0.220	.
(18) Countrywide Lost-Time Claims:	1631.0	.	.
(19) Pure Premium Underlying Present Rate:	0.669	0.346	1.015
(20) Relativity to Underlying Present Rate:	0.760	0.773	.
(21) Credibility to Underlying Relativity:	0.300	0.220	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.838	0.864	.
(24) Balanced Formula Relativity:	0.827	0.852	0.836

Class(es): 3114 TOOL MFG-DROP OR MACHINE FORGED-NOC: MACHINING OR FINISHING									Effective: 7/1/2020			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)			
2013	34,544	1	9	2,855	341,785	2,645	87,960	435,245	9.977	2.623	12.600			
2014	34,349	1	7	16,622	139,601	19,807	50,305	226,335	4.548	2.041	6.589			
2015	38,343	0	13	0	3,723	0	12,569	16,292	0.097	0.328	0.425			
2016	41,619	1	9	96,540	385	11,157	6,563	114,645	2.329	0.426	2.755			
2017	30,261	0	9	0	1,548	0	6,541	8,089	0.051	0.216	0.267			
MA Total:	179,116	3	47	116,017	487,042	33,609	163,938	800,606	3.367	1.103	4.470			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.468	2.156	.
(14) Massachusetts Credibility:	0.140	0.210	.
(15) Countrywide Pure Premium:	1.351	0.721	2.072
(16) Countrywide Indicated Relativity:	1.513	1.540	.
(17) Countrywide Credibility:	0.430	0.400	.
(18) Countrywide Lost-Time Claims:	258.00	.	.
(19) Pure Premium Underlying Present Rate:	1.131	0.668	1.799
(20) Relativity to Underlying Present Rate:	1.284	1.491	.
(21) Credibility to Underlying Relativity:	0.430	0.390	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.688	1.650	.
(24) Balanced Formula Relativity:	1.666	1.629	1.653

IX 000120

Calculation of Class Relativities

Class(es): 3118 SAW MFG		Effective: 7/1/2020							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)
2013	326.043	0	22	0	255.260	0	51.584	306.844	0.783	0.158	0.941
2014	329.012	1	20	311.663	312.202	32.499	72.654	729.019	1.896	0.320	2.216
2015	332.270	0	15	0	281.151	0	116.124	397.275	0.846	0.349	1.196
2016	262.897	0	17	0	73.166	0	60.767	133.933	0.278	0.231	0.509
2017	90.032	0	9	0	119.875	0	139.311	259.186	1.331	1.547	2.879
MA Total:	1,340,254	1	83	311,663	1,041,654	32,499	440,440	1,826,257	1.010	0.353	1.363

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.040	0.690	.
(14) Massachusetts Credibility:	0.300	0.330	.
(15) Countrywide Pure Premium:	0.636	0.449	1.085
(16) Countrywide Indicated Relativity:	0.712	0.958	.
(17) Countrywide Credibility:	0.350	0.340	.
(18) Countrywide Lost-Time Claims:	125.00	.	.
(19) Pure Premium Underlying Present Rate:	0.970	0.284	1.255
(20) Relativity to Underlying Present Rate:	1.102	0.635	.
(21) Credibility to Underlying Relativity:	0.350	0.330	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.947	0.763	.
(24) Balanced Formula Relativity:	0.935	0.753	0.872

Class(es): 3119 NEEDLE MFG		Effective: 7/1/2020							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)
2013	77.087	0	3	0	0	0	3.307	3.307	0.000	0.043	0.043
2014	57.363	1	7	49.117	3.809	18.921	13.279	85.125	0.923	0.561	1.484
2015	65.239	1	6	73.619	0	12.171	3.367	89.157	1.128	0.238	1.367
2016	57.898	0	6	0	64.365	0	48.090	112.454	1.112	0.831	1.942
2017	58.683	0	2	0	0	0	7.748	7.748	0.000	0.132	0.132
MA Total:	316,270	2	24	122,736	68,173	31,092	75,790	297,792	0.604	0.338	0.942

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.622	0.661	.
(14) Massachusetts Credibility:	0.100	0.170	.
(15) Countrywide Pure Premium:	0.328	0.096	0.424
(16) Countrywide Indicated Relativity:	0.367	0.205	.
(17) Countrywide Credibility:	0.160	0.170	.
(18) Countrywide Lost-Time Claims:	12.000	.	.
(19) Pure Premium Underlying Present Rate:	0.302	0.216	0.518
(20) Relativity to Underlying Present Rate:	0.343	0.482	.
(21) Credibility to Underlying Relativity:	0.740	0.660	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.375	0.466	.
(24) Balanced Formula Relativity:	0.370	0.459	0.401

IX 000121

Calculation of Class Relativities

Class(es): 3120 RAZOR MFG-SAFETY		Effective: 7/1/2020							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)
2013	7.300	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	6.869	1	0	8.385	0	6.265	0	14.650	1.221	0.912	2.133
2015	34.123	1	1	13.492	0	420	2.325	16.237	0.395	0.080	0.476
2016	53.954	1	1	37.672	3.055	3.903	643	45.273	0.755	0.084	0.839
2017	60.462	1	4	17.239	54.956	12.087	11.026	95.308	1.194	0.382	1.576
MA Total:	162,708	4	6	76,789	58,011	22,674	13,994	171,468	0.828	0.225	1.054

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.853	0.440	.
(14) Massachusetts Credibility:	0.110	0.140	.
(15) Countrywide Pure Premium:	0.118	0.321	0.439
(16) Countrywide Indicated Relativity:	0.132	0.685	.
(17) Countrywide Credibility:	0.130	0.140	.
(18) Countrywide Lost-Time Claims:	7.000	.	.
(19) Pure Premium Underlying Present Rate:	0.715	0.275	0.990
(20) Relativity to Underlying Present Rate:	0.812	0.615	.
(21) Credibility to Underlying Relativity:	0.760	0.720	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.728	0.600	.
(24) Balanced Formula Relativity:	0.719	0.592	0.675

Class(es): 3122 CUTLERY MFG-NOC		Effective: 7/1/2020							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)
2013	108.468	3	41	179.363	28.041	30.124	89.822	327.350	1.912	1.106	3.018
2014	111.219	1	24	116.576	98.739	16.570	60.475	292.360	1.936	0.693	2.629
2015	122.922	1	39	115.995	61.635	4.096	53.276	235.002	1.445	0.467	1.912
2016	126.037	0	46	0	191.828	0	130.202	322.030	1.522	1.033	2.555
2017	127.683	0	39	0	20.419	0	46.190	66.610	0.160	0.362	0.522
MA Total:	596,328	5	189	411,934	400,662	50,790	379,965	1,243,352	1.363	0.722	2.085

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.404	1.412	.
(14) Massachusetts Credibility:	0.210	0.310	.
(15) Countrywide Pure Premium:	1.108	0.668	1.776
(16) Countrywide Indicated Relativity:	1.241	1.427	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	107.00	.	.
(19) Pure Premium Underlying Present Rate:	0.880	0.536	1.416
(20) Relativity to Underlying Present Rate:	0.999	1.197	.
(21) Credibility to Underlying Relativity:	0.400	0.340	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.178	1.344	.
(24) Balanced Formula Relativity:	1.163	1.326	1.219

IX 000122

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3127 PRECISION MEASURING TOOL MFG-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)
2013	2,144	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	1,665	0	1	0	104,938	0	24,264	129,202	63,043	14,577	77,619
2015	2,614	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	1,749	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	1,642	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	9,814	0	1	0	104,938	0	24,264	129,202	10,693	2,472	13,166

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	11.016	4.832	.
(14) Massachusetts Credibility:	0.030	0.050	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.645	0.789	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.575	0.358	0.933
(20) Relativity to Underlying Present Rate:	0.653	0.798	.
(21) Credibility to Underlying Relativity:	0.970	0.950	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.964	1.000	.
(24) Balanced Formula Relativity:	0.951	0.987	0.964

Class(es):		Effective: 7/1/2020							Manufacturing		
3131 BUTTON OR FASTENER MFG-METAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
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	1,947	1,947	0.000	0.244	0.244
2016	8,520	0	1	0	0	0	236	236	0.000	0.028	0.028
2017	9,894	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	40,304	0	2	0	0	0	2,183	2,183	0.000	0.054	0.054

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.106	.
(14) Massachusetts Credibility:	0.060	0.090	.
(15) Countrywide Pure Premium:	0.708	0.446	1.154
(16) Countrywide Indicated Relativity:	0.793	0.952	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	281.00	.	.
(19) Pure Premium Underlying Present Rate:	0.658	0.362	1.020
(20) Relativity to Underlying Present Rate:	0.747	0.808	.
(21) Credibility to Underlying Relativity:	0.470	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.724	0.811	.
(24) Balanced Formula Relativity:	0.715	0.800	0.744

IX 000123

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 52

Calculation of Class Relativities

Class(es): 3132 NUT OR BOLT MFG		Effective: 7/1/2020							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)
2013	10.119	0	1	0	8.721	0	5.490	14.211	0.862	0.543	1.404
2014	10.358	0	4	0	85.856	0	30.007	115.863	8.289	2.897	11.186
2015	13.189	0	2	0	1.514	0	9.647	11.161	0.115	0.731	0.846
2016	15.158	0	2	0	0	0	2.643	2.643	0.000	0.174	0.174
2017	15.421	0	1	0	0	0	1.039	1.039	0.000	0.067	0.067
MA Total:	64,245	0	10	0	96,091	0	48,825	144,916	1.496	0.760	2.256

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.541	1.485	.
(14) Massachusetts Credibility:	0.100	0.150	.
(15) Countrywide Pure Premium:	0.936	0.600	1.536
(16) Countrywide Indicated Relativity:	1.048	1.282	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	328.00	.	.
(19) Pure Premium Underlying Present Rate:	1.324	0.769	2.093
(20) Relativity to Underlying Present Rate:	1.503	1.716	.
(21) Credibility to Underlying Relativity:	0.450	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.302	1.495	.
(24) Balanced Formula Relativity:	1.285	1.475	1.351

Class(es): 3145 SCREW MFG		Effective: 7/1/2020							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)
2013	190.150	0	34	0	213.462	0	91.497	304.959	1.123	0.481	1.604
2014	199.751	0	15	0	129.848	0	28.421	158.269	0.650	0.142	0.792
2015	205.780	1	25	237.348	40.327	15.584	60.382	353.641	1.349	0.369	1.719
2016	205.318	1	18	212.537	48.776	30.459	56.778	348.550	1.273	0.425	1.698
2017	368.567	0	18	0	134.223	0	113.293	247.515	0.364	0.307	0.672
MA Total:	1,169,566	2	110	449,885	566,636	46,043	350,370	1,412,934	0.869	0.339	1.208

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.895	0.662	.
(14) Massachusetts Credibility:	0.250	0.350	.
(15) Countrywide Pure Premium:	0.857	0.494	1.351
(16) Countrywide Indicated Relativity:	0.960	1.055	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	574.00	.	.
(19) Pure Premium Underlying Present Rate:	0.712	0.361	1.073
(20) Relativity to Underlying Present Rate:	0.808	0.807	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.888	0.838	.
(24) Balanced Formula Relativity:	0.876	0.827	0.859

IX 000124

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 53

Calculation of Class Relativities

Class(es): 3146 HARDWARE MFG-NOC		Effective: 7/1/2020							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)
2013	79,044	1	7	48,770	5,797	15,400	10,550	80,517	0.690	0.328	1.019
2014	105,273	0	11	0	235,830	0	27,953	263,783	2.240	0.266	2.506
2015	86,768	1	12	8,600	41,092	18,100	115,883	183,675	0.573	1.544	2.117
2016	89,198	1	11	65,105	847	54,566	10,558	131,076	0.739	0.730	1.469
2017	91,029	0	17	0	31,844	0	38,477	70,322	0.350	0.423	0.773
MA Total:	451,312	3	58	122,475	315,410	88,066	203,421	729,373	0.970	0.646	1.616

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.000	1.262	.
(14) Massachusetts Credibility:	0.190	0.280	.
(15) Countrywide Pure Premium:	1.155	0.619	1.774
(16) Countrywide Indicated Relativity:	1.293	1.323	.
(17) Countrywide Credibility:	0.410	0.360	.
(18) Countrywide Lost-Time Claims:	1814.0	.	.
(19) Pure Premium Underlying Present Rate:	0.945	0.551	1.495
(20) Relativity to Underlying Present Rate:	1.073	1.229	.
(21) Credibility to Underlying Relativity:	0.400	0.360	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.149	1.272	.
(24) Balanced Formula Relativity:	1.134	1.256	1.176

Class(es): 3169 STOVE MFG		Effective: 7/1/2020							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)
2013	376,468	2	62	127,954	320,424	20,226	440,382	908,986	1.191	1.223	2.415
2014	437,178	1	51	38,433	365,380	16,708	462,109	882,631	0.924	1.095	2.019
2015	415,233	3	50	336,218	512,031	335,730	192,203	1,376,182	2.043	1.271	3.314
2016	420,303	0	52	0	565,420	0	497,316	1,062,737	1.345	1.183	2.528
2017	474,449	1	55	16,517	136,750	10,732	164,905	328,904	0.323	0.370	0.693
MA Total:	2,123,632	7	270	519,122	1,900,006	383,396	1,756,916	4,559,440	1.139	1.008	2.147

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.174	1.970	.
(14) Massachusetts Credibility:	0.370	0.580	.
(15) Countrywide Pure Premium:	1.276	0.714	1.990
(16) Countrywide Indicated Relativity:	1.429	1.524	.
(17) Countrywide Credibility:	0.320	0.210	.
(18) Countrywide Lost-Time Claims:	6792.0	.	.
(19) Pure Premium Underlying Present Rate:	1.070	0.718	1.788
(20) Relativity to Underlying Present Rate:	1.215	1.602	.
(21) Credibility to Underlying Relativity:	0.310	0.210	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.268	1.799	.
(24) Balanced Formula Relativity:	1.252	1.776	1.432

IX 000125

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3179 ELECTRICAL APPARATUS MFG-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)
2013	1,507,501	5	112	415,794	410,663	84,951	269,166	1,180,574	0.548	0.235	0.783
2014	1,236,577	2	85	86,337	288,050	20,318	121,811	516,516	0.303	0.115	0.418
2015	1,369,620	0	75	0	588,193	0	324,618	912,811	0.429	0.237	0.666
2016	1,330,715	1	82	39,298	723,526	49,175	358,251	1,170,249	0.573	0.306	0.879
2017	1,545,662	1	91	14,054	957,795	17,391	329,061	1,318,301	0.629	0.224	0.853
MA Total:	6,990,075	9	445	555,484	2,968,227	171,835	1,402,906	5,098,451	0.504	0.225	0.729

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.519	0.440	.
(14) Massachusetts Credibility:	0.460	0.590	.
(15) Countrywide Pure Premium:	0.782	0.416	1.197
(16) Countrywide Indicated Relativity:	0.875	0.887	.
(17) Countrywide Credibility:	0.270	0.210	.
(18) Countrywide Lost-Time Claims:	4155.0	.	.
(19) Pure Premium Underlying Present Rate:	0.571	0.227	0.798
(20) Relativity to Underlying Present Rate:	0.648	0.506	.
(21) Credibility to Underlying Relativity:	0.270	0.200	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.650	0.547	.
(24) Balanced Formula Relativity:	0.642	0.540	0.607

Class(es):		Effective: 7/1/2020							Manufacturing		
3180 ELECTRIC OR GAS LIGHTING FIXTURES 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)
2013	152,488	0	33	0	21,431	0	48,362	69,793	0.141	0.317	0.458
2014	120,495	0	30	0	126,509	0	62,349	188,858	1.050	0.517	1.567
2015	118,871	2	23	473,401	96,628	95,790	47,253	713,073	4.795	1.203	5.999
2016	124,574	1	19	37,020	5,391	8,388	15,226	66,025	0.340	0.190	0.530
2017	130,353	0	25	0	144,918	0	63,449	208,367	1.112	0.487	1.598
MA Total:	646,781	3	130	510,420	394,877	104,178	236,640	1,246,116	1.400	0.527	1.927

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.442	1.030	.
(14) Massachusetts Credibility:	0.250	0.340	.
(15) Countrywide Pure Premium:	0.800	0.476	1.276
(16) Countrywide Indicated Relativity:	0.896	1.017	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	342.00	.	.
(19) Pure Premium Underlying Present Rate:	1.274	0.603	1.877
(20) Relativity to Underlying Present Rate:	1.447	1.347	.
(21) Credibility to Underlying Relativity:	0.370	0.330	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.236	1.130	.
(24) Balanced Formula Relativity:	1.220	1.115	1.184

IX 000126

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 55

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3188 PLUMBERS SUPPLIES MFG-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)
2013	18,059	0	4	0	20,611	0	26,297	46,908	1,141	1,456	2,597
2014	22,598	0	7	0	19,451	0	9,758	29,209	0,861	0,432	1,293
2015	21,597	0	5	0	295,319	0	63,242	358,561	13,674	2,928	16,602
2016	22,318	0	5	0	0	0	4,102	4,102	0,000	0,184	0,184
2017	21,811	0	4	0	11,852	0	14,064	25,916	0,543	0,645	1,188
MA Total:	106,382	0	25	0	347,233	0	117,463	464,696	3,264	1,104	4,368

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.362	2.158	.
(14) Massachusetts Credibility:	0.100	0.150	.
(15) Countrywide Pure Premium:	0.963	0.525	1.488
(16) Countrywide Indicated Relativity:	1.079	1.120	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	427.00	.	.
(19) Pure Premium Underlying Present Rate:	0.911	0.454	1.366
(20) Relativity to Underlying Present Rate:	1.035	1.014	.
(21) Credibility to Underlying Relativity:	0.450	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.287	1.231	.
(24) Balanced Formula Relativity:	1.271	1.215	1.252

Class(es):		Effective: 7/1/2020							Manufacturing		
3200 ARMS MFG-SMALL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	78,866	0	14	0	4,577	0	16,767	21,343	0,058	0,213	0,271
2014	69,092	1	13	51,951	50,359	8,152	30,893	141,354	1,481	0,565	2,046
2015	69,171	0	7	0	95,432	0	22,276	117,708	1,380	0,322	1,702
2016	106,226	0	9	0	126,018	0	116,839	242,857	1,186	1,100	2,286
2017	58,551	0	7	0	181,316	0	51,085	232,402	3,097	0,872	3,969
MA Total:	381,906	1	50	51,951	457,702	8,152	237,860	755,665	1,334	0,644	1,979

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.375	1.259	.
(14) Massachusetts Credibility:	0.170	0.250	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.010	1.038	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.900	0.470	1.370
(20) Relativity to Underlying Present Rate:	1.022	1.050	.
(21) Credibility to Underlying Relativity:	0.830	0.750	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.082	1.102	.
(24) Balanced Formula Relativity:	1.068	1.088	1.075

IX 000127

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 56

Calculation of Class Relativities

Class(es): 3220 CAN MFG		Effective: 7/1/2020							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)
2013	97,625	1	10	185,223	21,633	8,396	16,601	231,852	2,119	0,256	2,375
2014	100,269	2	12	264,798	8,538	399,175	11,099	683,609	2,726	4,092	6,818
2015	98,802	1	10	114,730	0	10,244	16,280	141,253	1,161	0,268	1,430
2016	66,719	0	8	0	14,606	0	22,687	37,293	0,219	0,340	0,559
2017	101,274	0	5	0	214,393	0	60,115	274,507	2,117	0,594	2,711
MA Total:	464,690	4	45	564,750	259,169	417,814	126,782	1,368,514	1,773	1,172	2,945

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.827	2.291	.
(14) Massachusetts Credibility:	0.260	0.320	.
(15) Countrywide Pure Premium:	0.763	0.341	1.104
(16) Countrywide Indicated Relativity:	0.854	0.728	.
(17) Countrywide Credibility:	0.370	0.340	.
(18) Countrywide Lost-Time Claims:	303.00	.	.
(19) Pure Premium Underlying Present Rate:	1.958	0.753	2.711
(20) Relativity to Underlying Present Rate:	2.224	1.681	.
(21) Credibility to Underlying Relativity:	0.370	0.340	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.614	1.552	.
(24) Balanced Formula Relativity:	1.593	1.532	1.572

Class(es): 3255 WIRE CLOTH MFG		Effective: 7/1/2020							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)
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
2016	968	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	1,331	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	7,803	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:	0.849	0.515	1.363
(16) Countrywide Indicated Relativity:	0.950	1.099	.
(17) Countrywide Credibility:	0.240	0.260	.
(18) Countrywide Lost-Time Claims:	33.000	.	.
(19) Pure Premium Underlying Present Rate:	1.005	0.490	1.495
(20) Relativity to Underlying Present Rate:	1.141	1.095	.
(21) Credibility to Underlying Relativity:	0.720	0.690	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.050	1.041	.
(24) Balanced Formula Relativity:	1.036	1.028	1.033

IX 000128

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 57

Calculation of Class Relativities

Class(es): 3257 WIRE GOODS MFG - NOC		Effective: 7/1/2020							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)
2013	205.502	0	29	0	22.170	0	35.340	57.510	0.108	0.172	0.280
2014	210.922	1	44	32.715	160.504	5.538	95.740	294.497	0.916	0.480	1.396
2015	217.374	0	61	0	266.145	0	160.776	426.922	1.224	0.740	1.964
2016	239.664	1	49	405.272	170.167	156.518	102.991	834.948	2.401	1.083	3.484
2017	251.839	0	60	0	56.430	0	77.117	133.547	0.224	0.306	0.530
MA Total:	1,125.301	2	243	437.987	675.417	162.056	471.963	1,747.423	0.989	0.563	1.553

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.019	1.101	.
(14) Massachusetts Credibility:	0.300	0.420	.
(15) Countrywide Pure Premium:	1.025	0.617	1.642
(16) Countrywide Indicated Relativity:	1.148	1.318	.
(17) Countrywide Credibility:	0.350	0.290	.
(18) Countrywide Lost-Time Claims:	1033.0	.	.
(19) Pure Premium Underlying Present Rate:	1.156	0.613	1.769
(20) Relativity to Underlying Present Rate:	1.313	1.368	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.167	1.241	.
(24) Balanced Formula Relativity:	1.152	1.225	1.177

Class(es): 3270 EYELET MFG		Effective: 7/1/2020							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)
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	58	58	0.000	0.009	0.009
2016	6.087	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	5.750	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	29.519	0	2	0	0	0	643	643	0.000	0.022	0.022

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.043	.
(14) Massachusetts Credibility:	0.060	0.090	.
(15) Countrywide Pure Premium:	1.517	0.749	2.267
(16) Countrywide Indicated Relativity:	1.699	1.601	.
(17) Countrywide Credibility:	0.450	0.460	.
(18) Countrywide Lost-Time Claims:	155.00	.	.
(19) Pure Premium Underlying Present Rate:	0.911	0.458	1.369
(20) Relativity to Underlying Present Rate:	1.035	1.022	.
(21) Credibility to Underlying Relativity:	0.490	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.272	1.200	.
(24) Balanced Formula Relativity:	1.255	1.184	1.231

IX 000129

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3300 BED SPRING OR WIRE MATTRESS 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)
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
2016	4,863	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	286	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	5,262	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:	1.255	1.043	2.298
(16) Countrywide Indicated Relativity:	1.405	2.228	.
(17) Countrywide Credibility:	0.480	0.470	.
(18) Countrywide Lost-Time Claims:	321.00	.	.
(19) Pure Premium Underlying Present Rate:	1.509	0.945	2.454
(20) Relativity to Underlying Present Rate:	1.714	2.110	.
(21) Credibility to Underlying Relativity:	0.480	0.470	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.497	2.039	.
(24) Balanced Formula Relativity:	1.478	2.012	1.662

Class(es):		Effective: 7/1/2020							Manufacturing		
3315 BRASS OR COPPER GOODS 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)
2013	196,174	1	32	86,401	43,830	11,136	89,280	230,646	0.664	0.512	1.176
2014	199,184	0	36	0	51,394	0	46,003	97,397	0.258	0.231	0.489
2015	212,728	0	47	0	174,533	0	201,197	375,731	0.820	0.946	1.766
2016	197,543	0	38	0	290,443	0	269,466	559,909	1.470	1.364	2.834
2017	217,137	0	34	0	815,449	0	243,721	1,059,170	3.755	1.122	4.878
MA Total:	1,022,767	1	187	86,401	1,375,649	11,136	849,667	2,322,852	1.430	0.842	2.271

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.473	1.645	.
(14) Massachusetts Credibility:	0.310	0.420	.
(15) Countrywide Pure Premium:	1.346	0.622	1.967
(16) Countrywide Indicated Relativity:	1.507	1.327	.
(17) Countrywide Credibility:	0.350	0.290	.
(18) Countrywide Lost-Time Claims:	155.00	.	.
(19) Pure Premium Underlying Present Rate:	1.450	0.652	2.102
(20) Relativity to Underlying Present Rate:	1.646	1.456	.
(21) Credibility to Underlying Relativity:	0.340	0.290	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.544	1.498	.
(24) Balanced Formula Relativity:	1.524	1.478	1.508

IX 000130

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 59

Calculation of Class Relativities

Class(es): 3336 TYPE FOUNDRY		Effective: 7/1/2020							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)
2013	7,023	0	2	0	3,158	0	1,937	5,095	0.450	0.276	0.725
2014	9,353	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	5,644	0	2	0	1,931	0	1,144	3,075	0.342	0.203	0.545
2016	4,317	0	4	0	851	0	2,270	3,121	0.197	0.526	0.723
2017	4,022	0	1	0	0	0	242	242	0.000	0.060	0.060
MA Total:	30,358	0	9	0	5,939	0	5,593	11,532	0.196	0.184	0.380

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.202	0.360	.
(14) Massachusetts Credibility:	0.080	0.100	.
(15) Countrywide Pure Premium:	1.600	0.717	2.317
(16) Countrywide Indicated Relativity:	1.792	1.530	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	308.00	.	.
(19) Pure Premium Underlying Present Rate:	1.754	0.643	2.397
(20) Relativity to Underlying Present Rate:	1.992	1.434	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.757	1.370	.
(24) Balanced Formula Relativity:	1.734	1.352	1.602

Class(es): 3365 WELDING OR CUTTING - NOC & DRIVERS		Effective: 7/1/2020							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)
2013	122,325	1	31	64,272	654,438	20,098	246,567	985,375	5.875	2.180	8.055
2014	139,860	2	31	14,338	45,519	9,826	90,757	160,442	0.428	0.719	1.147
2015	152,386	1	23	51,435	426,020	3,654	283,964	765,073	3.133	1.887	5.021
2016	157,538	0	28	0	172,824	0	179,578	352,402	1.097	1.140	2.237
2017	168,010	0	19	0	318,037	0	225,357	543,394	1.893	1.341	3.234
MA Total:	740,118	4	132	130,046	1,616,838	33,579	1,026,223	2,806,685	2.360	1.432	3.792

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.907	1.206	.
(14) Massachusetts Credibility:	0.370	0.480	.
(15) Countrywide Pure Premium:	2.227	1.009	3.236
(16) Countrywide Indicated Relativity:	0.870	0.876	.
(17) Countrywide Credibility:	0.320	0.260	.
(18) Countrywide Lost-Time Claims:	1028.0	.	.
(19) Pure Premium Underlying Present Rate:	2.961	1.274	4.235
(20) Relativity to Underlying Present Rate:	1.224	1.209	.
(21) Credibility to Underlying Relativity:	0.310	0.260	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.993	1.121	.
(24) Balanced Formula Relativity:	0.997	1.119	1.035

IX 000131

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 60

Calculation of Class Relativities

Class(es): 3372 ELECTROPLATING		Effective: 7/1/2020							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)
2013	541.986	0	82	0	346.901	0	374.943	721.844	0.640	0.692	1.332
2014	542.333	0	76	0	465.134	0	204.894	670.028	0.858	0.378	1.235
2015	562.107	2	46	100.099	193.623	32.468	113.068	439.258	0.523	0.259	0.781
2016	570.001	1	49	39.228	499.310	2.645	288.609	829.792	0.945	0.511	1.456
2017	586.830	2	54	56.610	271.180	102.875	165.643	596.307	0.559	0.458	1.016
MA Total:	2,803,258	5	307	195,936	1,776,148	137,988	1,147,156	3,257,228	0.703	0.458	1.162

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.725	0.896	.
(14) Massachusetts Credibility:	0.390	0.590	.
(15) Countrywide Pure Premium:	1.330	0.753	2.082
(16) Countrywide Indicated Relativity:	1.489	1.607	.
(17) Countrywide Credibility:	0.310	0.210	.
(18) Countrywide Lost-Time Claims:	1028.0	.	.
(19) Pure Premium Underlying Present Rate:	0.939	0.583	1.522
(20) Relativity to Underlying Present Rate:	1.066	1.302	.
(21) Credibility to Underlying Relativity:	0.300	0.200	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.064	1.127	.
(24) Balanced Formula Relativity:	1.050	1.112	1.072

Class(es): 3373 GALVANIZING OR TINNING - NOT ELECTROLYTIC		Effective: 7/1/2020							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)
2013	9.776	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	9.304	1	0	171.614	0	19.498	0	191.112	18.445	2.096	20.541
2015	7.823	0	2	0	0	0	799	799	0.000	0.102	0.102
2016	8.421	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	7.270	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	42,594	1	2	171,614	0	19,498	799	191,911	4.029	0.477	4.506

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.151	0.931	.
(14) Massachusetts Credibility:	0.100	0.120	.
(15) Countrywide Pure Premium:	1.499	0.832	2.331
(16) Countrywide Indicated Relativity:	1.678	1.777	.
(17) Countrywide Credibility:	0.440	0.440	.
(18) Countrywide Lost-Time Claims:	146.00	.	.
(19) Pure Premium Underlying Present Rate:	1.871	0.719	2.590
(20) Relativity to Underlying Present Rate:	2.125	1.606	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.131	1.600	.
(24) Balanced Formula Relativity:	2.103	1.579	1.922

IX 000132

Calculation of Class Relativities

Class(es): 3381 SILVERWARE MFG		Effective: 7/1/2020							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)
2013	5,499	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	8,487	0	2	0	0	0	1,290	1,290	0.000	0.152	0.152
2015	8,683	0	2	0	0	0	1,649	1,649	0.000	0.190	0.190
2016	7,946	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	7,161	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	37,777	0	4	0	0	0	2,939	2,939	0.000	0.078	0.078

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.152	.
(14) Massachusetts Credibility:	0.070	0.100	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.180	1.118	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.052	0.506	1.558
(20) Relativity to Underlying Present Rate:	1.194	1.131	.
(21) Credibility to Underlying Relativity:	0.930	0.900	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.111	1.033	.
(24) Balanced Formula Relativity:	1.096	1.019	1.070

Class(es): 3383 JEWELRY MFG		Effective: 7/1/2020							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)
2013	650,118	1	74	146,529	431,415	437,877	208,556	1,224,377	0.889	0.994	1.883
2014	601,130	4	64	450,185	335,573	147,321	216,536	1,149,615	1.307	0.605	1.912
2015	630,897	2	50	53,953	473,858	27,627	253,065	808,504	0.837	0.445	1.282
2016	572,785	0	53	0	506,440	0	285,433	791,873	0.884	0.498	1.382
2017	521,522	0	40	0	83,305	0	90,987	174,292	0.160	0.174	0.334
MA Total:	2,976,452	7	281	650,668	1,830,591	612,826	1,054,577	4,148,662	0.834	0.560	1.394

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.859	1.095	.
(14) Massachusetts Credibility:	0.370	0.550	.
(15) Countrywide Pure Premium:	0.647	0.327	0.974
(16) Countrywide Indicated Relativity:	0.725	0.697	.
(17) Countrywide Credibility:	0.320	0.230	.
(18) Countrywide Lost-Time Claims:	269.00	.	.
(19) Pure Premium Underlying Present Rate:	0.769	0.458	1.227
(20) Relativity to Underlying Present Rate:	0.873	1.023	.
(21) Credibility to Underlying Relativity:	0.310	0.220	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.820	0.988	.
(24) Balanced Formula Relativity:	0.810	0.975	0.867

IX 000133

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 62

Calculation of Class Relativities

Class(es): 3385 WATCH MFG		Effective: 7/1/2020							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)
2013	27.418	0	2	0	0	0	798	798	0.000	0.029	0.029
2014	27.218	0	2	0	0	0	531	531	0.000	0.020	0.020
2015	27.842	0	3	0	7,139	0	11,642	18,781	0.256	0.418	0.675
2016	24.624	0	2	0	0	0	2,201	2,201	0.000	0.089	0.089
2017	24.734	0	2	0	0	0	1,901	1,901	0.000	0.077	0.077
MA Total:	131.837	0	11	0	7,139	0	17,072	24,211	0.054	0.129	0.184

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.056	0.253	.
(14) Massachusetts Credibility:	0.070	0.100	.
(15) Countrywide Pure Premium:	0.422	0.258	0.679
(16) Countrywide Indicated Relativity:	0.472	0.550	.
(17) Countrywide Credibility:	0.180	0.190	.
(18) Countrywide Lost-Time Claims:	15.000	.	.
(19) Pure Premium Underlying Present Rate:	0.311	0.161	0.472
(20) Relativity to Underlying Present Rate:	0.353	0.359	.
(21) Credibility to Underlying Relativity:	0.750	0.710	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.354	0.385	.
(24) Balanced Formula Relativity:	0.349	0.380	0.360

Class(es): 3507 CONSTRUCTION OR AGRICULTURAL MACHINERY MFG		Effective: 7/1/2020							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)
2013	52.458	0	16	0	87,940	0	48,715	136,655	1.676	0.929	2.605
2014	55.651	0	12	0	13,722	0	7,597	21,319	0.247	0.137	0.383
2015	35.050	0	7	0	6,216	0	24,278	30,494	0.177	0.693	0.870
2016	34.192	0	4	0	7,484	0	11,380	18,864	0.219	0.333	0.552
2017	26.518	0	5	0	339,986	0	48,149	388,134	12.821	1.816	14.636
MA Total:	203.870	0	44	0	455,348	0	140,117	595,465	2.234	0.687	2.921

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.301	1.343	.
(14) Massachusetts Credibility:	0.150	0.200	.
(15) Countrywide Pure Premium:	1.196	0.617	1.814
(16) Countrywide Indicated Relativity:	1.340	1.318	.
(17) Countrywide Credibility:	0.430	0.400	.
(18) Countrywide Lost-Time Claims:	4937.0	.	.
(19) Pure Premium Underlying Present Rate:	1.234	0.556	1.790
(20) Relativity to Underlying Present Rate:	1.401	1.241	.
(21) Credibility to Underlying Relativity:	0.420	0.400	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.510	1.292	.
(24) Balanced Formula Relativity:	1.490	1.275	1.416

IX 000134

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3515 TEXTILE MACHINERY 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)
2013	33.505	0	19	0	12.220	0	22.570	34.790	0.365	0.674	1.038
2014	35.015	0	24	0	38.046	0	31.197	69.243	1.087	0.891	1.977
2015	43.110	1	18	86.225	30.332	11.275	24.314	152.146	2.704	0.826	3.529
2016	46.748	1	18	168.500	78.342	7.590	54.243	308.675	5.280	1.323	6.603
2017	53.464	0	12	0	38.892	0	21.963	60.855	0.727	0.411	1.138
MA Total:	211.842	2	91	254.725	197.833	18.865	154.285	625.708	2.136	0.817	2.954

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.201	1.597	.
(14) Massachusetts Credibility:	0.160	0.230	.
(15) Countrywide Pure Premium:	1.088	0.635	1.723
(16) Countrywide Indicated Relativity:	1.219	1.355	.
(17) Countrywide Credibility:	0.290	0.310	.
(18) Countrywide Lost-Time Claims:	53.000	.	.
(19) Pure Premium Underlying Present Rate:	1.252	0.725	1.976
(20) Relativity to Underlying Present Rate:	1.421	1.618	.
(21) Credibility to Underlying Relativity:	0.550	0.460	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.487	1.532	.
(24) Balanced Formula Relativity:	1.468	1.512	1.483

Class(es):		Effective: 7/1/2020							Manufacturing		
3558 BOOT OR SHOE MACHINERY 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)
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
2016	2.390	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2.374	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	11.547	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:	0.030	0.050	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.355	0.594	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.316	0.269	0.586
(20) Relativity to Underlying Present Rate:	0.359	0.601	.
(21) Credibility to Underlying Relativity:	0.970	0.950	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.349	0.571	.
(24) Balanced Formula Relativity:	0.344	0.563	0.420

IX 000135

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 64

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3571 STEAM OR AIR PRESSURE GAUGE 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)
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
2016	8,666	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	9,343	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	38,299	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:	0.235	0.142	0.377
(16) Countrywide Indicated Relativity:	0.263	0.304	.
(17) Countrywide Credibility:	0.080	0.080	.
(18) Countrywide Lost-Time Claims:	2.000	.	.
(19) Pure Premium Underlying Present Rate:	0.382	0.178	0.560
(20) Relativity to Underlying Present Rate:	0.433	0.397	.
(21) Credibility to Underlying Relativity:	0.870	0.850	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.398	0.362	.
(24) Balanced Formula Relativity:	0.393	0.357	0.381

Class(es):		Effective: 7/1/2020							Manufacturing		
3574 CASH REGISTER 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)
2013	5,988,144	8	543	1,073,935	4,546,517	301,425	2,111,520	8,033,398	0.939	0.403	1,342
2014	6,011,026	14	522	1,768,983	3,088,964	1,099,425	2,005,600	7,962,971	0.808	0.517	1,325
2015	6,277,891	9	474	1,548,982	3,110,095	518,974	1,895,058	7,073,109	0.742	0.385	1,127
2016	6,117,980	12	462	2,190,067	4,568,174	811,143	2,223,413	9,792,797	1.105	0.496	1,601
2017	5,841,276	7	411	1,111,533	2,614,969	424,150	2,230,607	6,381,259	0.638	0.454	1,092
MA Total:	30,236,317	50	2,412	7,693,499	17,928,720	3,155,116	10,466,199	39,243,533	0.847	0.450	1,298

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.873	0.880	.
(14) Massachusetts Credibility:	0.930	1.000	.
(15) Countrywide Pure Premium:	0.844	0.442	1.285
(16) Countrywide Indicated Relativity:	0.945	0.943	.
(17) Countrywide Credibility:	0.040	0.000	.
(18) Countrywide Lost-Time Claims:	18932	.	.
(19) Pure Premium Underlying Present Rate:	0.755	0.365	1.120
(20) Relativity to Underlying Present Rate:	0.858	0.814	.
(21) Credibility to Underlying Relativity:	0.030	0.000	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.875	0.880	.
(24) Balanced Formula Relativity:	0.864	0.869	0.866

IX 000136

Calculation of Class Relativities

Class(es): 3612 PUMP MFG		Effective: 7/1/2020							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)
2013	294,411	0	25	0	187,126	0	203,665	390,792	0.636	0.692	1.327
2014	293,375	0	22	0	14,968	0	24,713	39,681	0.051	0.084	0.135
2015	278,611	0	20	0	3,459	0	32,470	35,929	0.012	0.117	0.129
2016	284,610	0	21	0	57,496	0	167,293	224,789	0.202	0.588	0.790
2017	274,512	0	14	0	42,550	0	24,303	66,853	0.155	0.089	0.244
MA Total:	1,425,519	0	102	0	305,599	0	452,445	758,043	0.214	0.317	0.532

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.221	0.620	.
(14) Massachusetts Credibility:	0.270	0.400	.
(15) Countrywide Pure Premium:	0.835	0.409	1.243
(16) Countrywide Indicated Relativity:	0.935	0.873	.
(17) Countrywide Credibility:	0.370	0.300	.
(18) Countrywide Lost-Time Claims:	1781.0	.	.
(19) Pure Premium Underlying Present Rate:	0.739	0.432	1.171
(20) Relativity to Underlying Present Rate:	0.839	0.963	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.708	0.799	.
(24) Balanced Formula Relativity:	0.698	0.788	0.730

Class(es): 3620 BOILERMAKING		Effective: 7/1/2020							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)
2013	179,144	1	18	6,653	41,303	425	113,828	162,210	0.268	0.638	0.905
2014	161,029	0	24	0	43,229	0	68,178	111,406	0.268	0.423	0.692
2015	157,183	1	20	298,513	30,670	34,061	38,572	401,816	2.094	0.462	2.556
2016	139,554	0	15	0	210,567	0	81,473	292,039	1.509	0.584	2.093
2017	129,551	0	18	0	464,192	0	343,605	807,798	3.583	2.652	6.235
MA Total:	766,462	2	95	305,166	789,961	34,486	645,656	1,775,269	1.429	0.887	2.316

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.472	1.734	.
(14) Massachusetts Credibility:	0.300	0.500	.
(15) Countrywide Pure Premium:	1.468	0.786	2.255
(16) Countrywide Indicated Relativity:	1.644	1.680	.
(17) Countrywide Credibility:	0.350	0.250	.
(18) Countrywide Lost-Time Claims:	1291.0	.	.
(19) Pure Premium Underlying Present Rate:	1.785	1.402	3.187
(20) Relativity to Underlying Present Rate:	2.028	3.129	.
(21) Credibility to Underlying Relativity:	0.350	0.250	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.727	2.069	.
(24) Balanced Formula Relativity:	1.704	2.042	1.821

IX 000137

Calculation of Class Relativities

Class(es): 3634 VALVE MFG		Effective: 7/1/2020							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)
2013	441.895	0	33	0	258.949	0	119.611	378.559	0.586	0.271	0.857
2014	322.852	2	35	160.402	198.766	24.038	146.646	529.852	1.112	0.529	1.641
2015	460.279	0	23	0	145.370	0	31.838	177.208	0.316	0.069	0.385
2016	295.587	0	19	0	493.308	0	67.868	561.176	1.669	0.230	1.899
2017	260.803	0	20	0	70.926	0	74.152	145.078	0.272	0.284	0.556
MA Total:	1,781.417	2	130	160,402	1,167,319	24,038	440,115	1,791,875	0.745	0.261	1.006

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.768	0.509	.
(14) Massachusetts Credibility:	0.290	0.390	.
(15) Countrywide Pure Premium:	0.738	0.387	1.124
(16) Countrywide Indicated Relativity:	0.826	0.826	.
(17) Countrywide Credibility:	0.360	0.310	.
(18) Countrywide Lost-Time Claims:	950.00	.	.
(19) Pure Premium Underlying Present Rate:	0.673	0.315	0.988
(20) Relativity to Underlying Present Rate:	0.764	0.703	.
(21) Credibility to Underlying Relativity:	0.350	0.300	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.788	0.665	.
(24) Balanced Formula Relativity:	0.777	0.657	0.736

Class(es): 3635 GEAR MFG OR GRINDING		Effective: 7/1/2020							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)
2013	257.744	1	48	89.652	775.400	29.681	310.356	1,205.090	3.356	1.319	4.676
2014	273.066	2	33	118.363	462.248	16.986	241.969	839.566	2.126	0.948	3.075
2015	302.157	0	40	0	106.137	0	94.405	200.542	0.351	0.312	0.664
2016	339.117	4	38	197.076	344.999	136.130	730.999	1,409.204	1.598	2.557	4.156
2017	52.775	0	5	0	13.836	0	3.565	17.402	0.262	0.068	0.330
MA Total:	1,224.858	7	164	405,091	1,702,621	182,797	1,381,295	3,671,804	1.721	1.277	2.998

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.773	2.496	.
(14) Massachusetts Credibility:	0.310	0.440	.
(15) Countrywide Pure Premium:	1.047	0.523	1.570
(16) Countrywide Indicated Relativity:	1.172	1.117	.
(17) Countrywide Credibility:	0.350	0.280	.
(18) Countrywide Lost-Time Claims:	564.00	.	.
(19) Pure Premium Underlying Present Rate:	1.225	0.640	1.865
(20) Relativity to Underlying Present Rate:	1.391	1.429	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.433	1.811	.
(24) Balanced Formula Relativity:	1.414	1.787	1.543

IX 000138

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 67

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3642 BATTERY MFG-DRY											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	157,524	0	5	0	28,815	0	17,170	45,984	0.183	0.109	0.292
2014	196,131	0	14	0	188,576	0	66,951	255,527	0.961	0.341	1.303
2015	167,546	0	10	0	9,150	0	24,574	33,724	0.055	0.147	0.201
2016	41,867	0	2	0	0	0	3,274	3,274	0.000	0.078	0.078
2017	68,163	0	1	0	0	0	1,572	1,572	0.000	0.023	0.023
MA Total:	631,231	0	32	0	226,541	0	113,541	340,081	0.359	0.180	0.539

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.370	0.352	.
(14) Massachusetts Credibility:	0.170	0.230	.
(15) Countrywide Pure Premium:	0.601	0.354	0.955
(16) Countrywide Indicated Relativity:	0.673	0.756	.
(17) Countrywide Credibility:	0.370	0.390	.
(18) Countrywide Lost-Time Claims:	94.000	.	.
(19) Pure Premium Underlying Present Rate:	0.539	0.236	0.774
(20) Relativity to Underlying Present Rate:	0.612	0.526	.
(21) Credibility to Underlying Relativity:	0.460	0.380	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.593	0.575	.
(24) Balanced Formula Relativity:	0.586	0.568	0.579

Class(es):		Effective: 7/1/2020							Manufacturing		
3643 ELECTRIC POWER OR TRANSMISSION EQUIP 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)
2013	881,007	0	97	0	381,751	0	271,068	652,819	0.433	0.308	0.741
2014	917,874	2	65	14,750	163,882	5,461	158,185	342,279	0.195	0.178	0.373
2015	892,848	3	61	174,979	632,945	37,245	253,222	1,098,390	0.905	0.325	1.230
2016	1,013,186	4	34	494,078	681,868	323,795	211,726	1,711,468	1.161	0.529	1.689
2017	1,059,733	2	64	146,909	487,605	58,975	460,186	1,153,675	0.599	0.490	1.089
MA Total:	4,764,648	11	321	830,717	2,348,051	425,476	1,354,387	4,958,631	0.667	0.374	1.041

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.687	0.730	.
(14) Massachusetts Credibility:	0.430	0.590	.
(15) Countrywide Pure Premium:	0.912	0.458	1.370
(16) Countrywide Indicated Relativity:	1.022	0.978	.
(17) Countrywide Credibility:	0.290	0.210	.
(18) Countrywide Lost-Time Claims:	2059.0	.	.
(19) Pure Premium Underlying Present Rate:	0.706	0.334	1.040
(20) Relativity to Underlying Present Rate:	0.802	0.745	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.816	0.785	.
(24) Balanced Formula Relativity:	0.806	0.775	0.795

IX 000139

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 68

Calculation of Class Relativities

Class(es): 3647 BATTERY MFG-STORAGE		Effective: 7/1/2020							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)
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
2016	2,400	0	1	0	0	0	1,711	1,711	0.000	0.713	0.713
2017	3,828	0	1	0	0	0	204	204	0.000	0.053	0.053
MA Total:	11,158	0	2	0	0	0	1,916	1,916	0.000	0.172	0.172

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.336	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	1.222	0.628	1.850
(16) Countrywide Indicated Relativity:	1.369	1.341	.
(17) Countrywide Credibility:	0.480	0.470	.
(18) Countrywide Lost-Time Claims:	368.00	.	.
(19) Pure Premium Underlying Present Rate:	0.914	0.415	1.329
(20) Relativity to Underlying Present Rate:	1.038	0.926	.
(21) Credibility to Underlying Relativity:	0.480	0.470	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.155	1.086	.
(24) Balanced Formula Relativity:	1.140	1.072	1.117

Class(es): 3648 AUTOMOTIVE LIGHTING, IGNITION APPARATUS MFG NOC		Effective: 7/1/2020							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)
2013	417	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	933	0	1	0	0	0	304	304	0.000	0.326	0.326
2015	1,248	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	40,505	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	31,529	0	1	0	0	0	69	69	0.000	0.002	0.002
MA Total:	74,632	0	2	0	0	0	373	373	0.000	0.005	0.005

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.010	.
(14) Massachusetts Credibility:	0.070	0.110	.
(15) Countrywide Pure Premium:	0.596	0.400	0.995
(16) Countrywide Indicated Relativity:	0.667	0.854	.
(17) Countrywide Credibility:	0.470	0.450	.
(18) Countrywide Lost-Time Claims:	532.00	.	.
(19) Pure Premium Underlying Present Rate:	0.559	0.321	0.879
(20) Relativity to Underlying Present Rate:	0.634	0.716	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.605	0.700	.
(24) Balanced Formula Relativity:	0.597	0.691	0.630

IX 000140

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
3681 TELEVISION, RADIO, TELEPHONE OR TELECOMMUNCTN DEVICE MFG 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)
2013	5,232,680	12	200	1,374,050	1,542,202	341,149	639,027	3,896,427	0.557	0.187	0.745
2014	5,584,890	7	199	888,774	557,217	276,798	535,445	2,258,234	0.259	0.145	0.404
2015	5,277,890	2	190	76,348	1,307,379	5,940	834,626	2,224,293	0.262	0.159	0.421
2016	5,298,944	7	154	950,213	1,207,317	327,540	439,005	2,924,075	0.407	0.145	0.552
2017	5,587,483	6	182	524,149	1,762,448	183,077	776,114	3,245,787	0.409	0.172	0.581
MA Total:	26,981,888	34	925	3,813,533	6,376,563	1,134,504	3,224,216	14,548,816	0.378	0.162	0.539

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.389	0.316	.
(14) Massachusetts Credibility:	0.640	0.840	.
(15) Countrywide Pure Premium:	0.322	0.175	0.497
(16) Countrywide Indicated Relativity:	0.361	0.373	.
(17) Countrywide Credibility:	0.180	0.080	.
(18) Countrywide Lost-Time Claims:	2845.0	.	.
(19) Pure Premium Underlying Present Rate:	0.329	0.146	0.474
(20) Relativity to Underlying Present Rate:	0.373	0.325	.
(21) Credibility to Underlying Relativity:	0.180	0.080	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.381	0.321	.
(24) Balanced Formula Relativity:	0.376	0.317	0.356

Class(es):		Effective: 7/1/2020							Manufacturing		
3685 INSTRUMENT MFG 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)
2013	5,690,345	11	205	1,318,111	1,436,394	414,079	631,630	3,800,213	0.484	0.184	0.668
2014	6,760,840	5	253	492,211	1,724,218	91,511	946,459	3,254,399	0.328	0.154	0.481
2015	7,268,401	7	250	1,012,227	2,503,567	102,997	1,009,909	4,628,699	0.484	0.153	0.637
2016	6,636,729	9	204	541,463	1,021,551	155,487	744,004	2,462,505	0.236	0.136	0.371
2017	6,345,984	4	223	622,723	435,601	125,719	576,961	1,761,003	0.167	0.111	0.277
MA Total:	32,702,298	36	1,135	3,986,734	7,121,331	889,793	3,908,962	15,906,819	0.340	0.147	0.486

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.350	0.287	.
(14) Massachusetts Credibility:	0.660	0.870	.
(15) Countrywide Pure Premium:	0.397	0.219	0.616
(16) Countrywide Indicated Relativity:	0.445	0.468	.
(17) Countrywide Credibility:	0.170	0.070	.
(18) Countrywide Lost-Time Claims:	2130.0	.	.
(19) Pure Premium Underlying Present Rate:	0.298	0.131	0.429
(20) Relativity to Underlying Present Rate:	0.339	0.293	.
(21) Credibility to Underlying Relativity:	0.170	0.060	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.364	0.300	.
(24) Balanced Formula Relativity:	0.359	0.296	0.337

IX 000141

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	2,545,889	13	323	2,336,477	5,954,831	663,726	2,538,355	11,493,390	3,257	1,258	4,514	
2014	2,740,333	22	314	3,078,159	6,262,810	1,269,650	3,208,356	13,818,974	3,409	1,634	5,043	
2015	3,249,861	17	403	4,550,054	5,080,738	1,030,848	3,479,607	14,141,247	2,963	1,388	4,351	
2016	3,529,122	13	371	2,696,101	4,991,399	710,460	3,049,690	11,447,651	2,178	1,065	3,244	
2017	3,522,482	13	364	2,229,456	6,306,848	514,264	3,416,949	12,467,517	2,423	1,116	3,539	
MA Total:	15,587,688	78	1,775	14,890,247	28,596,626	4,188,948	15,692,958	63,368,778	2,790	1,275	4,065	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.071	1.074	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.783	0.756	2.539
(16) Countrywide Indicated Relativity:	0.696	0.656	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7910.0	.	.
(19) Pure Premium Underlying Present Rate:	2.632	1.127	3.759
(20) Relativity to Underlying Present Rate:	1.087	1.069	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.071	1.074	.
(24) Balanced Formula Relativity:	1.076	1.072	1.075

Class(es):		Effective: 7/1/2020							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)	
2013	67,705	1	7	62,102	68,166	16,884	37,814	184,966	1,924	0,808	2,732	
2014	90,952	1	4	92,045	5,577	14,942	33,943	146,507	1,073	0,537	1,611	
2015	113,846	0	6	0	6,882	0	24,287	31,169	0,060	0,213	0,274	
2016	181,597	1	6	248,225	811,497	46,482	247,938	1,354,142	5,836	1,621	7,457	
2017	153,302	0	4	0	145,550	0	42,435	187,985	0,949	0,277	1,226	
MA Total:	607,403	3	27	402,372	1,037,673	78,308	386,416	1,904,769	2,371	0,765	3,136	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.911	0.644	.
(14) Massachusetts Credibility:	0.320	0.360	.
(15) Countrywide Pure Premium:	1.821	0.711	2.532
(16) Countrywide Indicated Relativity:	0.711	0.617	.
(17) Countrywide Credibility:	0.340	0.320	.
(18) Countrywide Lost-Time Claims:	553.00	.	.
(19) Pure Premium Underlying Present Rate:	2.690	0.791	3.481
(20) Relativity to Underlying Present Rate:	1.112	0.751	.
(21) Credibility to Underlying Relativity:	0.340	0.320	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.911	0.670	.
(24) Balanced Formula Relativity:	0.915	0.669	0.838

IX 000142

Calculation of Class Relativities

Class(es): 3808 AUTOMOBILE MFG OR ASSEMBLY		Effective: 7/1/2020							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)
2013	115.967	0	27	0	46.849	0	147.539	194.388	0.404	1.272	1.676
2014	130.689	2	35	237.652	7.715	79.064	35.938	360.369	1.877	0.880	2.757
2015	155.929	0	49	0	125.366	0	143.392	268.758	0.804	0.920	1.724
2016	123.879	2	37	248.913	31.562	49.471	36.107	366.052	2.264	0.691	2.955
2017	280.125	0	59	0	952.529	0	463.697	1,416.226	3.400	1.655	5.056
MA Total:	806.588	4	207	486.565	1,164.021	128.535	826.673	2,605.794	2.046	1.184	3.231

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.108	2.315	.
(14) Massachusetts Credibility:	0.260	0.380	.
(15) Countrywide Pure Premium:	1.610	0.713	2.323
(16) Countrywide Indicated Relativity:	1.803	1.522	.
(17) Countrywide Credibility:	0.370	0.310	.
(18) Countrywide Lost-Time Claims:	6233.0	.	.
(19) Pure Premium Underlying Present Rate:	1.216	0.672	1.888
(20) Relativity to Underlying Present Rate:	1.381	1.500	.
(21) Credibility to Underlying Relativity:	0.370	0.310	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.726	1.816	.
(24) Balanced Formula Relativity:	1.704	1.793	1.734

Class(es): 3821 AUTOMOBILE DISMANTLING & DRIVERS		Effective: 7/1/2020							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)
2013	174.556	1	28	104.839	36.416	96.454	133.192	370.901	0.809	1.316	2.125
2014	160.662	3	27	259.912	24.946	249.314	90.973	625.146	1.773	2.118	3.891
2015	156.663	0	19	0	170.361	0	79.064	249.425	1.087	0.505	1.592
2016	156.778	1	27	109.726	666.973	72.511	297.761	1,146.971	4.954	2.362	7.316
2017	184.461	1	21	281.291	283.801	357.392	124.724	1,047.208	3.063	2.614	5.677
MA Total:	833.121	6	122	755.769	1,182.497	775.671	725.713	3,439.650	2.327	1.802	4.129

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.820	3.864	.
(14) Massachusetts Credibility:	0.330	0.480	.
(15) Countrywide Pure Premium:	2.777	1.528	4.305
(16) Countrywide Indicated Relativity:	3.468	3.314	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	920.00	.	.
(19) Pure Premium Underlying Present Rate:	1.984	1.137	3.121
(20) Relativity to Underlying Present Rate:	2.644	2.758	.
(21) Credibility to Underlying Relativity:	0.330	0.260	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.982	3.434	.
(24) Balanced Formula Relativity:	2.961	3.436	3.133

IX 000143

Calculation of Class Relativities

Class(es): 3826 AIRCRAFT ENGINE MFG		Effective: 7/1/2020							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)
2013	1,849,772	15	291	1,082,546	3,160,383	812,366	2,774,801	7,830,096	2,294	1,939	4,233
2014	1,729,388	16	250	1,467,216	2,296,482	620,841	2,602,995	6,987,534	2,176	1,864	4,040
2015	1,607,228	9	261	2,195,559	5,376,300	389,033	3,921,173	11,882,065	4,711	2,682	7,393
2016	2,272,901	13	187	2,340,008	2,418,259	964,987	2,001,943	7,725,197	2,093	1,305	3,399
2017	2,282,308	9	151	1,049,142	3,674,670	346,589	2,672,652	7,743,052	2,070	1,323	3,393
MA Total:	9,741,597	62	1,140	8,134,471	16,926,093	3,133,815	13,973,563	42,167,942	2,573	1,756	4,329

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.650	3.432	.
(14) Massachusetts Credibility:	0.920	1.000	.
(15) Countrywide Pure Premium:	0.466	0.194	0.660
(16) Countrywide Indicated Relativity:	0.522	0.415	.
(17) Countrywide Credibility:	0.040	0.000	.
(18) Countrywide Lost-Time Claims:	411.00	.	.
(19) Pure Premium Underlying Present Rate:	2.278	1.532	3.809
(20) Relativity to Underlying Present Rate:	2.587	3.419	.
(21) Credibility to Underlying Relativity:	0.040	0.000	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.562	3.432	.
(24) Balanced Formula Relativity:	2.529	3.387	2.825

Class(es): 3841 TUBULAR METAL PRODUCTS MFG OR ASSEMBLY		Effective: 7/1/2020							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)
2013	46,193	0	2	0	0	0	978	978	0.000	0.021	0.021
2014	57,808	1	4	196,224	0	39,642	3,177	239,043	3,394	0.741	4,135
2015	58,501	0	2	0	200,569	0	35,643	236,212	3,428	0.609	4,038
2016	64,013	0	3	0	0	0	1,617	1,617	0.000	0.025	0.025
2017	61,442	0	4	0	5,794	0	7,036	12,830	0.094	0.115	0.209
MA Total:	287,958	1	15	196,224	206,363	39,642	48,451	490,681	1,398	0.306	1,704

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.440	0.598	.
(14) Massachusetts Credibility:	0.130	0.190	.
(15) Countrywide Pure Premium:	0.519	0.410	0.929
(16) Countrywide Indicated Relativity:	0.581	0.875	.
(17) Countrywide Credibility:	0.310	0.330	.
(18) Countrywide Lost-Time Claims:	62.000	.	.
(19) Pure Premium Underlying Present Rate:	0.577	0.323	0.901
(20) Relativity to Underlying Present Rate:	0.656	0.722	.
(21) Credibility to Underlying Relativity:	0.560	0.480	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.735	0.749	.
(24) Balanced Formula Relativity:	0.725	0.739	0.730

IX 000144

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous			
4000 SAND OR GRAVEL DIGGING & 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)	
2013	392.176	1	38	282.706	499.715	115.189	289.002	1,186.612	1.995	1.031	3.026	
2014	397.186	3	33	450.306	743.949	164.890	304.226	1,663.372	3.007	1.181	4.188	
2015	445.165	3	52	727.353	906.668	236.760	295.230	2,166.011	3.671	1.195	4.866	
2016	475.676	4	41	935.303	681.551	673.586	491.546	2,781.986	3.399	2.449	5.848	
2017	491.949	0	40	0	761.180	0	662.318	1,423.499	1.547	1.346	2.894	
MA Total:	2,202,151	11	204	2,395,668	3,593,063	1,190,425	2,042,323	9,221,479	2.719	1.468	4.187	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.129	1.183	.
(14) Massachusetts Credibility:	0.520	0.680	.
(15) Countrywide Pure Premium:	2.720	1.259	3.979
(16) Countrywide Indicated Relativity:	1.189	1.078	.
(17) Countrywide Credibility:	0.240	0.160	.
(18) Countrywide Lost-Time Claims:	1013.0	.	.
(19) Pure Premium Underlying Present Rate:	2.370	1.022	3.393
(20) Relativity to Underlying Present Rate:	1.088	0.972	.
(21) Credibility to Underlying Relativity:	0.240	0.160	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	1.134	1.132	.
(24) Balanced Formula Relativity:	1.130	1.139	1.133

Class(es):		Effective: 7/1/2020							Manufacturing			
4021 BRICK OR CLAY PRODUCTS MFG 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)	
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	
2016	10.263	0	2	0	13.712	0	13.830	27.543	1.336	1.348	2.684	
2017	7.427	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	58,539	0	2	0	13,712	0	13,830	27,543	0.234	0.236	0.471	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.241	0.462	.
(14) Massachusetts Credibility:	0.110	0.150	.
(15) Countrywide Pure Premium:	2.035	1.128	3.163
(16) Countrywide Indicated Relativity:	2.279	2.409	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	278.00	.	.
(19) Pure Premium Underlying Present Rate:	1.662	0.893	2.555
(20) Relativity to Underlying Present Rate:	1.888	1.993	.
(21) Credibility to Underlying Relativity:	0.440	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.883	1.942	.
(24) Balanced Formula Relativity:	1.858	1.917	1.878

IX 000145

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4024 REFRACTORY PRODUCTS 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)
2013	4,733	0	1	0	0	0	258	258	0.000	0.054	0.054
2014	5,869	0	1	0	6,421	0	5,962	12,383	1.094	1.016	2.110
2015	42	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	49	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	10,695	0	2	0	6,421	0	6,220	12,640	0.600	0.582	1.182

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.618	1.137	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	2.015	0.914	2.928
(16) Countrywide Indicated Relativity:	2.256	1.952	.
(17) Countrywide Credibility:	0.410	0.440	.
(18) Countrywide Lost-Time Claims:	127.00	.	.
(19) Pure Premium Underlying Present Rate:	1.376	0.651	2.027
(20) Relativity to Underlying Present Rate:	1.562	1.453	.
(21) Credibility to Underlying Relativity:	0.540	0.490	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.800	1.650	.
(24) Balanced Formula Relativity:	1.776	1.629	1.725

Class(es):		Effective: 7/1/2020							Manufacturing		
4034 CONCRETE PRODUCTS 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)
2013	155,112	3	39	94,486	306,381	67,710	226,773	695,351	2,584	1,899	4,483
2014	175,307	2	48	217,965	511,158	147,277	284,089	1,160,490	4,159	2,461	6,620
2015	198,757	0	38	0	489,865	0	228,427	718,292	2,465	1,149	3,614
2016	213,542	0	28	0	156,544	0	132,080	288,624	0,733	0,619	1,352
2017	204,441	0	35	0	504,236	0	332,553	836,789	2,466	1,627	4,093
MA Total:	947,159	5	188	312,451	1,968,185	214,987	1,203,922	3,699,546	2,408	1,498	3,906

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.481	2.928	.
(14) Massachusetts Credibility:	0.390	0.580	.
(15) Countrywide Pure Premium:	2.804	1.451	4.255
(16) Countrywide Indicated Relativity:	3.141	3.098	.
(17) Countrywide Credibility:	0.310	0.210	.
(18) Countrywide Lost-Time Claims:	2711.0	.	.
(19) Pure Premium Underlying Present Rate:	2.645	1.648	4.293
(20) Relativity to Underlying Present Rate:	3.005	3.678	.
(21) Credibility to Underlying Relativity:	0.300	0.210	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.842	3.121	.
(24) Balanced Formula Relativity:	2.805	3.080	2.900

IX 000146

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 75

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	11,496	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	10,463	0	2	0	12,956	0	18,039	30,994	1,238	1,724	2,962
2015	10,394	0	1	0	709	0	4,853	5,561	0,068	0,467	0,535
2016	12,550	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	11,931	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	56,834	0	3	0	13,664	0	22,891	36,556	0.240	0.403	0.643

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.248	0.787	.
(14) Massachusetts Credibility:	0.090	0.120	.
(15) Countrywide Pure Premium:	0.904	0.571	1.475
(16) Countrywide Indicated Relativity:	1.012	1.219	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	268.00	.	.
(19) Pure Premium Underlying Present Rate:	1.124	0.491	1.615
(20) Relativity to Underlying Present Rate:	1.277	1.096	.
(21) Credibility to Underlying Relativity:	0.450	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.063	1.113	.
(24) Balanced Formula Relativity:	1.049	1.099	1.066

Class(es):		Effective: 7/1/2020							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)
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
2016	13,856	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	14,182	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	74,710	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:	0.110	0.140	.
(15) Countrywide Pure Premium:	2.953	0.550	3.503
(16) Countrywide Indicated Relativity:	3.307	1.175	.
(17) Countrywide Credibility:	0.290	0.310	.
(18) Countrywide Lost-Time Claims:	53.000	.	.
(19) Pure Premium Underlying Present Rate:	1.365	0.583	1.948
(20) Relativity to Underlying Present Rate:	1.550	1.302	.
(21) Credibility to Underlying Relativity:	0.600	0.550	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.889	1.081	.
(24) Balanced Formula Relativity:	1.864	1.066	1.589

IX 000147

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4053 POTTERY MFG: CHINA OR TABLEWARE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	59,220	0	10	0	10,788	0	54,335	65,122	0.182	0.918	1.100
2014	71,577	2	7	280,099	328,287	124,028	21,740	754,155	8.500	2.037	10.536
2015	78,068	0	11	0	72,207	0	34,810	107,017	0.925	0.446	1.371
2016	81,111	0	5	0	7,012	0	12,555	19,567	0.086	0.155	0.241
2017	83,652	0	12	0	39,545	0	18,660	58,206	0.473	0.223	0.696
MA Total:	373,627	2	45	280,099	457,841	124,028	142,100	1,004,067	1.975	0.712	2.687

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.035	1.392	.
(14) Massachusetts Credibility:	0.180	0.260	.
(15) Countrywide Pure Premium:	0.436	0.391	0.827
(16) Countrywide Indicated Relativity:	0.488	0.835	.
(17) Countrywide Credibility:	0.160	0.160	.
(18) Countrywide Lost-Time Claims:	11.000	.	.
(19) Pure Premium Underlying Present Rate:	0.961	0.575	1.536
(20) Relativity to Underlying Present Rate:	1.092	1.284	.
(21) Credibility to Underlying Relativity:	0.660	0.580	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.165	1.240	.
(24) Balanced Formula Relativity:	1.150	1.224	1.175

Class(es):		Effective: 7/1/2020							Manufacturing		
4062 POTTERY MFG: PORCELAIN WARE-MECHANICAL PRESS FORMING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	43,212	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	58,612	0	2	0	845	0	5,772	6,618	0.014	0.098	0.113
2015	69,316	0	1	0	0	0	232	232	0.000	0.003	0.003
2016	73,394	0	1	0	0	0	182	182	0.000	0.002	0.002
2017	84,799	0	3	0	46,223	0	26,412	72,635	0.545	0.311	0.857
MA Total:	329,333	0	7	0	47,068	0	32,599	79,667	0.143	0.099	0.242

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.147	0.193	.
(14) Massachusetts Credibility:	0.150	0.220	.
(15) Countrywide Pure Premium:	1.228	0.680	1.908
(16) Countrywide Indicated Relativity:	1.375	1.452	.
(17) Countrywide Credibility:	0.430	0.390	.
(18) Countrywide Lost-Time Claims:	315.00	.	.
(19) Pure Premium Underlying Present Rate:	0.751	0.404	1.155
(20) Relativity to Underlying Present Rate:	0.853	0.902	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.972	0.960	.
(24) Balanced Formula Relativity:	0.959	0.948	0.955

IX 000148

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 77

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4112 INCANDESCENT LAMP 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)
2013	72.342	0	3	0	0	0	1.203	1.203	0.000	0.017	0.017
2014	55.027	0	5	0	3,953	0	12.518	16.471	0.072	0.227	0.299
2015	54.906	0	8	0	2,878	0	6.330	9.209	0.052	0.115	0.168
2016	44.168	0	2	0	1,668	0	6.854	8.522	0.038	0.155	0.193
2017	64.542	0	2	0	523	0	2,719	3.242	0.008	0.042	0.050
MA Total:	290.984	0	20	0	9,022	0	29,625	38,647	0.031	0.102	0.133

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.032	0.199	.
(14) Massachusetts Credibility:	0.090	0.120	.
(15) Countrywide Pure Premium:	0.102	0.094	0.196
(16) Countrywide Indicated Relativity:	0.114	0.201	.
(17) Countrywide Credibility:	0.140	0.140	.
(18) Countrywide Lost-Time Claims:	8.000	.	.
(19) Pure Premium Underlying Present Rate:	0.220	0.104	0.324
(20) Relativity to Underlying Present Rate:	0.250	0.231	.
(21) Credibility to Underlying Relativity:	0.770	0.740	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.211	0.223	.
(24) Balanced Formula Relativity:	0.209	0.220	0.213

Class(es):		Effective: 7/1/2020							Manufacturing		
4114 GLASSWARE MFG-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)
2013	136.672	1	13	86.781	5,224	15.846	7.556	115.407	0.673	0.171	0.844
2014	157.682	0	17	0	225,305	0	102,790	328,095	1.429	0.652	2.081
2015	188.417	0	22	0	67,532	0	45,426	112,958	0.358	0.241	0.600
2016	145.591	0	20	0	435,939	0	108,665	544,603	2.994	0.746	3.741
2017	39.083	1	10	78,889	142,865	59,777	18,244	299,775	5.674	1.996	7.670
MA Total:	667.446	2	82	165,670	876,865	75,623	282,681	1,400,838	1.562	0.537	2.099

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.609	1.049	.
(14) Massachusetts Credibility:	0.240	0.290	.
(15) Countrywide Pure Premium:	1.453	0.553	2.006
(16) Countrywide Indicated Relativity:	1.627	1.180	.
(17) Countrywide Credibility:	0.380	0.360	.
(18) Countrywide Lost-Time Claims:	325.00	.	.
(19) Pure Premium Underlying Present Rate:	1.102	0.423	1.525
(20) Relativity to Underlying Present Rate:	1.252	0.943	.
(21) Credibility to Underlying Relativity:	0.380	0.350	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.480	1.059	.
(24) Balanced Formula Relativity:	1.461	1.046	1.318

IX 000149

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 78

Calculation of Class Relativities

Class(es): 4130 GLASS MERCHANT		Effective: 7/1/2020							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)
2013	193,870	0	25	0	352,322	0	125,417	477,739	1,817	0,647	2,464
2014	217,699	1	30	240,106	21,198	108,521	45,646	415,471	1,200	0,708	1,908
2015	211,918	1	19	214,917	81,069	33,768	98,666	428,420	1,397	0,625	2,022
2016	256,142	1	42	447,526	363,059	102,643	119,450	1,032,677	3,165	0,867	4,032
2017	287,993	0	45	0	285,965	0	152,026	437,991	0,993	0,528	1,521
MA Total:	1,167,622	3	161	902,549	1,103,612	244,932	541,205	2,792,298	1,718	0,673	2,391

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.770	1.316	.
(14) Massachusetts Credibility:	0.320	0.450	.
(15) Countrywide Pure Premium:	1.399	0.765	2.164
(16) Countrywide Indicated Relativity:	1.567	1.635	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	935.00	.	.
(19) Pure Premium Underlying Present Rate:	1.371	0.685	2.055
(20) Relativity to Underlying Present Rate:	1.557	1.528	.
(21) Credibility to Underlying Relativity:	0.340	0.270	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.628	1.462	.
(24) Balanced Formula Relativity:	1.607	1.443	1.551

Class(es): 4133 CATHEDRAL OR ART GLASS WINDOW MFG		Effective: 7/1/2020							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)
2013	10,431	0	1	0	74	0	624	698	0.007	0.060	0.067
2014	14,947	0	1	0	0	0	1,222	1,222	0.000	0.082	0.082
2015	11,759	0	2	0	0	0	1,451	1,451	0.000	0.123	0.123
2016	11,922	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	11,462	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	60,521	0	4	0	74	0	3,297	3,371	0.001	0.054	0.056

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.001	0.106	.
(14) Massachusetts Credibility:	0.080	0.100	.
(15) Countrywide Pure Premium:	0.783	0.376	1.160
(16) Countrywide Indicated Relativity:	0.877	0.804	.
(17) Countrywide Credibility:	0.230	0.240	.
(18) Countrywide Lost-Time Claims:	28.000	.	.
(19) Pure Premium Underlying Present Rate:	0.762	0.336	1.098
(20) Relativity to Underlying Present Rate:	0.866	0.750	.
(21) Credibility to Underlying Relativity:	0.690	0.660	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.799	0.699	.
(24) Balanced Formula Relativity:	0.789	0.690	0.755

IX 000150

Calculation of Class Relativities

Class(es): 4150 OPTICAL GOODS MFG-NOC		Effective: 7/1/2020							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)
2013	1,758,297	0	108	0	280,139	0	288,482	568,621	0.159	0.164	0.323
2014	1,889,441	1	102	122,200	352,805	28,249	185,031	688,284	0.251	0.113	0.364
2015	2,135,133	2	102	248,977	351,310	40,134	208,258	848,680	0.281	0.116	0.397
2016	2,271,241	2	83	384,982	282,742	41,206	181,902	890,832	0.294	0.098	0.392
2017	1,725,575	3	70	340,428	588,208	92,832	138,077	1,159,545	0.538	0.134	0.672
MA Total:	9,779,686	8	465	1,096,587	1,855,204	202,421	1,001,751	4,155,963	0.302	0.123	0.425

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.311	0.241	.
(14) Massachusetts Credibility:	0.410	0.540	.
(15) Countrywide Pure Premium:	0.672	0.285	0.957
(16) Countrywide Indicated Relativity:	0.753	0.608	.
(17) Countrywide Credibility:	0.300	0.230	.
(18) Countrywide Lost-Time Claims:	88,000	.	.
(19) Pure Premium Underlying Present Rate:	0.298	0.134	0.431
(20) Relativity to Underlying Present Rate:	0.338	0.298	.
(21) Credibility to Underlying Relativity:	0.290	0.230	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.451	0.338	.
(24) Balanced Formula Relativity:	0.446	0.334	0.407

Class(es): 4239 PAPER MFG		Effective: 7/1/2020							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)
2013	163,576	0	27	0	56,527	0	38,944	95,471	0.346	0.238	0.584
2014	171,243	1	43	54,278	72,257	5,719	91,424	223,679	0.739	0.567	1.306
2015	192,752	0	34	0	92,697	0	91,126	183,824	0.481	0.473	0.954
2016	163,690	0	26	0	151,829	0	80,256	232,085	0.928	0.490	1.418
2017	155,440	1	17	46,097	118,386	43,503	103,910	311,895	1.058	0.948	2.007
MA Total:	846,702	2	147	100,375	491,696	49,221	405,660	1,046,952	0.699	0.537	1.237

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.720	1.050	.
(14) Massachusetts Credibility:	0.250	0.350	.
(15) Countrywide Pure Premium:	1.175	0.497	1.673
(16) Countrywide Indicated Relativity:	1.316	1.062	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	1819.0	.	.
(19) Pure Premium Underlying Present Rate:	1.047	0.528	1.575
(20) Relativity to Underlying Present Rate:	1.189	1.180	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.120	1.096	.
(24) Balanced Formula Relativity:	1.105	1.081	1.097

IX 000151

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4243 BOX MFG-FOLDING PAPER-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)
2013	225,510	1	30	13,948	286,952	6,580	100,016	407,497	1,334	0,473	1,807
2014	243,323	1	27	152,926	308,353	17,640	139,673	618,592	1,896	0,647	2,542
2015	213,373	1	36	38,349	563,463	1,692	176,812	780,316	2,820	0,837	3,657
2016	254,426	0	40	0	613,386	0	305,221	918,607	2,411	1,200	3,611
2017	257,211	2	27	121,446	264,668	48,211	84,470	518,795	1,501	0,516	2,017
MA Total:	1,193,844	5	160	326,668	2,036,823	74,124	806,192	3,243,807	1,980	0,737	2,717

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.039	1.441	.
(14) Massachusetts Credibility:	0.340	0.450	.
(15) Countrywide Pure Premium:	1.044	0.493	1.537
(16) Countrywide Indicated Relativity:	1.169	1.052	.
(17) Countrywide Credibility:	0.330	0.280	.
(18) Countrywide Lost-Time Claims:	1003.0	.	.
(19) Pure Premium Underlying Present Rate:	1.489	0.684	2.173
(20) Relativity to Underlying Present Rate:	1.691	1.526	.
(21) Credibility to Underlying Relativity:	0.330	0.270	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.637	1.355	.
(24) Balanced Formula Relativity:	1.616	1.337	1.520

Class(es):		Effective: 7/1/2020							Manufacturing		
4244 CORRUGATED OR FIBERBOARD CONTAINER 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)
2013	310,612	2	34	478,480	95,655	60,661	123,165	757,961	1,848	0,592	2,440
2014	325,214	5	37	237,568	347,705	71,856	160,989	818,117	1,800	0,716	2,516
2015	205,715	0	29	0	216,065	0	54,662	270,727	1,050	0,266	1,316
2016	211,914	2	27	142,494	638,892	69,941	158,465	1,009,792	3,687	1,078	4,765
2017	247,774	0	34	0	213,505	0	114,145	327,650	0,862	0,461	1,322
MA Total:	1,301,229	9	161	858,542	1,511,822	202,457	611,426	3,184,247	1,822	0,625	2,447

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.877	1.222	.
(14) Massachusetts Credibility:	0.310	0.410	.
(15) Countrywide Pure Premium:	1.106	0.553	1.659
(16) Countrywide Indicated Relativity:	1.238	1.181	.
(17) Countrywide Credibility:	0.350	0.300	.
(18) Countrywide Lost-Time Claims:	1191.0	.	.
(19) Pure Premium Underlying Present Rate:	1.116	0.483	1.599
(20) Relativity to Underlying Present Rate:	1.267	1.079	.
(21) Credibility to Underlying Relativity:	0.340	0.290	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.446	1.168	.
(24) Balanced Formula Relativity:	1.427	1.153	1.332

IX 000152

Calculation of Class Relativities

Class(es): 4250 PAPER COATING		Effective: 7/1/2020							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)
2013	926,296	2	84	261,755	498,465	46,634	278,228	1,085,082	0.821	0.351	1.171
2014	923,429	1	93	69,866	831,941	4,093	432,961	1,338,862	0.977	0.473	1.450
2015	945,444	0	78	0	488,316	0	299,006	787,322	0.516	0.316	0.833
2016	848,955	5	61	891,388	384,680	349,230	221,235	1,846,532	1.503	0.672	2.175
2017	677,713	2	54	77,674	514,265	51,149	256,830	899,918	0.873	0.454	1.328
MA Total:	4,321,837	10	370	1,300,683	2,717,668	451,106	1,488,259	5,957,716	0.930	0.449	1.379

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.958	0.877	.
(14) Massachusetts Credibility:	0.440	0.640	.
(15) Countrywide Pure Premium:	0.795	0.461	1.257
(16) Countrywide Indicated Relativity:	0.891	0.985	.
(17) Countrywide Credibility:	0.280	0.180	.
(18) Countrywide Lost-Time Claims:	739.00	.	.
(19) Pure Premium Underlying Present Rate:	0.809	0.453	1.262
(20) Relativity to Underlying Present Rate:	0.919	1.011	.
(21) Credibility to Underlying Relativity:	0.280	0.180	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.928	0.921	.
(24) Balanced Formula Relativity:	0.916	0.909	0.914

Class(es): 4251 STATIONERY MFG		Effective: 7/1/2020							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)
2013	138,853	0	8	0	9,131	0	10,173	19,304	0.066	0.073	0.139
2014	109,254	0	3	0	547,093	0	60,334	607,427	5.008	0.552	5.560
2015	113,382	0	7	0	17,797	0	12,324	30,120	0.157	0.109	0.266
2016	108,686	0	10	0	30,429	0	34,008	64,437	0.280	0.313	0.593
2017	103,404	0	6	0	1,678	0	6,556	8,234	0.016	0.063	0.080
MA Total:	573,579	0	34	0	606,127	0	123,396	729,523	1.057	0.215	1.272

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.089	0.420	.
(14) Massachusetts Credibility:	0.220	0.270	.
(15) Countrywide Pure Premium:	1.097	0.520	1.617
(16) Countrywide Indicated Relativity:	1.229	1.111	.
(17) Countrywide Credibility:	0.390	0.370	.
(18) Countrywide Lost-Time Claims:	327.00	.	.
(19) Pure Premium Underlying Present Rate:	1.122	0.411	1.533
(20) Relativity to Underlying Present Rate:	1.274	0.917	.
(21) Credibility to Underlying Relativity:	0.390	0.360	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.216	0.855	.
(24) Balanced Formula Relativity:	1.200	0.843	1.077

IX 000153

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4273 BAG MFG-PAPER OR PLASTIC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	46,643	1	15	70,424	73,727	24,578	36,521	205,251	3,091	1,310	4,401
2014	48,334	0	12	0	189,976	0	91,184	281,160	3,930	1,887	5,817
2015	46,720	2	15	269,217	28,873	25,978	30,261	354,329	6,380	1,204	7,584
2016	50,284	1	22	66,155	84,608	12,122	63,757	226,642	2,998	1,509	4,507
2017	52,552	0	8	0	117,873	0	38,078	155,951	2,243	0,725	2,968
MA Total:	244,533	4	72	405,797	495,057	62,678	259,802	1,223,333	3,684	1,319	5,003

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.795	2.577	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	0.998	0.536	1.534
(16) Countrywide Indicated Relativity:	1.117	1.145	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	722.00	.	.
(19) Pure Premium Underlying Present Rate:	1.189	0.581	1.770
(20) Relativity to Underlying Present Rate:	1.350	1.297	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.644	1.519	.
(24) Balanced Formula Relativity:	1.622	1.499	1.580

Class(es):		Effective: 7/1/2020							Manufacturing		
4279 PAPER GOODS MFG 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)
2013	349,087	1	40	125,028	177,210	17,908	116,226	436,372	0,866	0,384	1,250
2014	407,010	3	74	71,429	195,010	51,497	165,390	483,326	0,655	0,533	1,188
2015	478,342	2	57	363,998	101,664	51,690	167,233	684,583	0,973	0,458	1,431
2016	423,740	1	44	102,648	632,483	41,045	275,446	1,051,622	1,735	0,747	2,482
2017	511,106	2	66	407,124	458,681	52,276	240,561	1,158,642	1,694	0,573	2,267
MA Total:	2,169,286	9	281	1,070,227	1,565,047	214,416	964,855	3,814,546	1,215	0,544	1,758

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.251	1.062	.
(14) Massachusetts Credibility:	0.340	0.480	.
(15) Countrywide Pure Premium:	1.127	0.534	1.661
(16) Countrywide Indicated Relativity:	1.262	1.141	.
(17) Countrywide Credibility:	0.330	0.260	.
(18) Countrywide Lost-Time Claims:	1505.0	.	.
(19) Pure Premium Underlying Present Rate:	0.876	0.445	1.321
(20) Relativity to Underlying Present Rate:	0.995	0.994	.
(21) Credibility to Underlying Relativity:	0.330	0.260	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.170	1.065	.
(24) Balanced Formula Relativity:	1.155	1.051	1.119

IX 000154

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	15,366	0	3	0	5,155	0	3,510	8,665	0.335	0.228	0.564
2014	6,683	0	1	0	12,735	0	682	13,417	1.906	0.102	2.008
2015	10,701	0	2	0	51,418	0	11,678	63,097	4.805	1.091	5.896
2016	6,369	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	15,363	0	2	0	682	0	2,810	3,492	0.044	0.183	0.227
MA Total:	54,482	0	8	0	69,991	0	18,680	88,672	1.285	0.343	1.628

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.323	0.670	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	0.709	0.318	1.027
(16) Countrywide Indicated Relativity:	0.794	0.679	.
(17) Countrywide Credibility:	0.420	0.440	.
(18) Countrywide Lost-Time Claims:	128.00	.	.
(19) Pure Premium Underlying Present Rate:	0.928	0.458	1.386
(20) Relativity to Underlying Present Rate:	1.054	1.022	.
(21) Credibility to Underlying Relativity:	0.500	0.450	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.967	0.832	.
(24) Balanced Formula Relativity:	0.954	0.821	0.908

Class(es):		Effective: 7/1/2020							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)
2013	2,271,014	8	302	716,064	1,469,445	222,499	1,073,273	3,481,281	0.962	0.571	1.533
2014	2,209,793	13	191	1,284,060	841,262	199,624	585,805	2,910,750	0.962	0.355	1.317
2015	2,441,677	14	238	1,306,342	804,185	897,828	756,024	3,764,379	0.864	0.677	1.542
2016	2,216,506	5	179	579,591	2,190,453	65,352	864,495	3,699,891	1.250	0.420	1.669
2017	2,403,226	5	180	472,563	911,252	98,831	899,404	2,382,049	0.576	0.415	0.991
MA Total:	11,542,217	45	1,090	4,358,619	6,216,596	1,484,134	4,179,001	16,238,350	0.916	0.491	1.407

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.944	0.959	.
(14) Massachusetts Credibility:	0.660	0.930	.
(15) Countrywide Pure Premium:	0.831	0.463	1.294
(16) Countrywide Indicated Relativity:	0.930	0.989	.
(17) Countrywide Credibility:	0.170	0.040	.
(18) Countrywide Lost-Time Claims:	5246.0	.	.
(19) Pure Premium Underlying Present Rate:	0.821	0.436	1.257
(20) Relativity to Underlying Present Rate:	0.932	0.973	.
(21) Credibility to Underlying Relativity:	0.170	0.030	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.940	0.961	.
(24) Balanced Formula Relativity:	0.927	0.948	0.934

IX 000155

Calculation of Class Relativities

Class(es): 4304 NEWSPAPER PUBLISHING		Effective: 7/1/2020							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)
2013	594,154	4	72	522,453	947,760	416,639	539,820	2,426,672	2,474	1,610	4,084
2014	598,084	2	75	178,670	570,536	147,398	269,767	1,166,370	1,253	0,698	1,950
2015	694,569	5	68	553,285	1,016,798	154,099	519,336	2,243,519	2,261	0,970	3,230
2016	484,125	0	83	0	938,855	0	598,932	1,537,787	1,939	1,237	3,176
2017	333,639	4	48	492,826	1,066,788	164,199	479,301	2,203,114	4,675	1,929	6,603
MA Total:	2,704,571	15	346	1,747,233	4,540,737	882,335	2,407,155	9,577,461	2,325	1,216	3,541

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.395	2.377	.
(14) Massachusetts Credibility:	0.540	0.810	.
(15) Countrywide Pure Premium:	1.968	1.104	3.072
(16) Countrywide Indicated Relativity:	2.204	2.358	.
(17) Countrywide Credibility:	0.230	0.100	.
(18) Countrywide Lost-Time Claims:	1216.0	.	.
(19) Pure Premium Underlying Present Rate:	2.120	1.296	3.416
(20) Relativity to Underlying Present Rate:	2.408	2.892	.
(21) Credibility to Underlying Relativity:	0.230	0.090	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.354	2.422	.
(24) Balanced Formula Relativity:	2.323	2.390	2.346

Class(es): 4307 BOOKBINDING		Effective: 7/1/2020							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)
2013	149,037	0	10	0	270,301	0	70,184	340,485	1,814	0,471	2,285
2014	159,570	0	12	0	12,179	0	34,489	46,668	0,076	0,216	0,292
2015	156,716	1	13	95,622	2,666	20,367	18,773	137,427	0,627	0,250	0,877
2016	173,267	0	14	0	89,037	0	160,442	249,478	0,514	0,926	1,440
2017	156,568	0	10	0	45,107	0	50,032	95,139	0,288	0,320	0,608
MA Total:	795,157	1	59	95,622	419,289	20,367	333,919	869,198	0,648	0,446	1,093

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.667	0.871	.
(14) Massachusetts Credibility:	0.210	0.310	.
(15) Countrywide Pure Premium:	0.761	0.421	1.181
(16) Countrywide Indicated Relativity:	0.852	0.899	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	202.00	.	.
(19) Pure Premium Underlying Present Rate:	0.692	0.391	1.083
(20) Relativity to Underlying Present Rate:	0.786	0.873	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.787	0.881	.
(24) Balanced Formula Relativity:	0.777	0.870	0.809

IX 000156

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 85

Calculation of Class Relativities

Class(es): 4308 LINOTYPE OR HAND COMPOSITION		Effective: 7/1/2020							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)
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
2016	104	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	323	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	756	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:	1.578	0.388	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.406	0.176	1.582
(20) Relativity to Underlying Present Rate:	1.597	0.393	.
(21) Credibility to Underlying Relativity:	0.980	0.990	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.565	0.389	.
(24) Balanced Formula Relativity:	1.544	0.384	1.144

Class(es): 4351 PHOTOENGRAVING		Effective: 7/1/2020							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)
2013	264.619	1	25	299.593	70.449	154.785	29.576	554.403	1.398	0.697	2.095
2014	270.241	1	29	139.031	38.769	6.134	50.397	234.331	0.658	0.209	0.867
2015	285.673	1	25	37.783	24.638	1.667	51.739	115.826	0.219	0.187	0.405
2016	305.322	0	38	0	98.453	0	85.567	184.020	0.322	0.280	0.603
2017	328.065	0	36	0	39.084	0	26.802	65.886	0.119	0.082	0.201
MA Total:	1,453.919	3	153	476.407	271.393	162.585	244.081	1,154.467	0.514	0.280	0.794

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.530	0.547	.
(14) Massachusetts Credibility:	0.220	0.300	.
(15) Countrywide Pure Premium:	0.382	0.212	0.594
(16) Countrywide Indicated Relativity:	0.428	0.454	.
(17) Countrywide Credibility:	0.240	0.260	.
(18) Countrywide Lost-Time Claims:	33.000	.	.
(19) Pure Premium Underlying Present Rate:	0.421	0.196	0.617
(20) Relativity to Underlying Present Rate:	0.478	0.438	.
(21) Credibility to Underlying Relativity:	0.540	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.477	0.475	.
(24) Balanced Formula Relativity:	0.471	0.469	0.470

IX 000157

Calculation of Class Relativities

Class(es): 4352 ENGRAVING		Effective: 7/1/2020							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)
2013	46.244	0	1	0	0	0	171	171	0.000	0.004	0.004
2014	50.295	0	2	0	0	0	570	570	0.000	0.011	0.011
2015	64.195	0	2	0	0	0	753	753	0.000	0.012	0.012
2016	63.939	0	3	0	1,284	0	950	2,234	0.020	0.015	0.035
2017	71.041	0	4	0	0	0	3,775	3,775	0.000	0.053	0.053
MA Total:	295.715	0	12	0	1,284	0	6,219	7,503	0.004	0.021	0.025

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.004	0.041	.
(14) Massachusetts Credibility:	0.140	0.180	.
(15) Countrywide Pure Premium:	0.849	0.375	1.225
(16) Countrywide Indicated Relativity:	0.951	0.802	.
(17) Countrywide Credibility:	0.380	0.400	.
(18) Countrywide Lost-Time Claims:	100.00	.	.
(19) Pure Premium Underlying Present Rate:	0.704	0.261	0.966
(20) Relativity to Underlying Present Rate:	0.800	0.583	.
(21) Credibility to Underlying Relativity:	0.480	0.420	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.746	0.573	.
(24) Balanced Formula Relativity:	0.736	0.565	0.677

Class(es): 4360 MOTION PICTURE: DEVLPMNT OF NEGATIVES, PRINTING & ALL SUB OP		Effective: 7/1/2020							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)
2013	576.029	0	5	0	0	0	22,914	22,914	0.000	0.040	0.040
2014	574.511	0	6	0	1,719	0	6,091	7,810	0.003	0.011	0.014
2015	573.042	0	1	0	0	0	283	283	0.000	0.000	0.000
2016	541.230	0	3	0	380	0	5,071	5,451	0.001	0.009	0.010
2017	573.538	0	1	0	0	0	220	220	0.000	0.000	0.000
MA Total:	2,838.350	0	16	0	2,099	0	34,579	36,678	0.001	0.012	0.013

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.001	0.024	.
(14) Massachusetts Credibility:	0.250	0.330	.
(15) Countrywide Pure Premium:	0.490	0.277	0.768
(16) Countrywide Indicated Relativity:	0.549	0.592	.
(17) Countrywide Credibility:	0.380	0.340	.
(18) Countrywide Lost-Time Claims:	174.00	.	.
(19) Pure Premium Underlying Present Rate:	0.285	0.129	0.414
(20) Relativity to Underlying Present Rate:	0.324	0.288	.
(21) Credibility to Underlying Relativity:	0.370	0.330	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.329	0.304	.
(24) Balanced Formula Relativity:	0.324	0.300	0.316

IX 000158

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	610,285	1	24	209,374	23,503	381,643	39,040	653,560	0.382	0.689	1.071	
2014	610,340	0	24	0	48,180	0	95,466	143,646	0.079	0.156	0.235	
2015	611,325	1	13	122,873	8,278	70,046	12,103	213,300	0.215	0.134	0.349	
2016	635,480	3	21	294,743	9,921	107,185	35,128	446,977	0.479	0.224	0.703	
2017	590,338	1	19	154,435	3,720	88,050	23,446	269,651	0.268	0.189	0.457	
MA Total:	3,057,768	6	101	781,426	93,602	646,924	205,183	1,727,135	0.286	0.279	0.565	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.127	6.545	.
(14) Massachusetts Credibility:	0.260	0.400	.
(15) Countrywide Pure Premium:	0.274	0.191	0.465
(16) Countrywide Indicated Relativity:	4.591	4.946	.
(17) Countrywide Credibility:	0.370	0.300	.
(18) Countrywide Lost-Time Claims:	497.00	.	.
(19) Pure Premium Underlying Present Rate:	0.305	0.200	0.505
(20) Relativity to Underlying Present Rate:	4.724	5.150	.
(21) Credibility to Underlying Relativity:	0.370	0.300	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	4.519	5.647	.
(24) Balanced Formula Relativity:	4.539	5.657	4.964

Class(es):		Effective: 7/1/2020							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)	
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	
2016	1,769	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	2,697	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	23,297	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:	0.030	0.050	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.337	0.313	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.255	0.130	0.385
(20) Relativity to Underlying Present Rate:	0.340	0.315	.
(21) Credibility to Underlying Relativity:	0.970	0.950	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.330	0.300	.
(24) Balanced Formula Relativity:	0.327	0.300	0.317

IX 000159

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 88

Calculation of Class Relativities

Class(es): 4410 RUBBER GOODS MFG NOC		Effective: 7/1/2020							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)
2013	575.846	3	94	55.336	195.500	23.778	202.020	476.634	0.436	0.392	0.828
2014	482.606	5	68	511.975	830.963	277.082	425.027	2,045.047	2.783	1.455	4.238
2015	457.932	1	77	4.002	445.994	15.075	306.091	771.162	0.983	0.701	1.684
2016	387.605	0	48	0	914.842	0	1,139.618	2,054.459	2.360	2.940	5.300
2017	427.338	1	41	213.722	211.996	34.235	257.024	716.977	0.996	0.682	1.678
MA Total:	2,331,328	10	328	785,036	2,599,294	350,170	2,329,779	6,064,280	1.452	1.150	2.601

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.495	2.247	.
(14) Massachusetts Credibility:	0.400	0.570	.
(15) Countrywide Pure Premium:	1.240	0.691	1.930
(16) Countrywide Indicated Relativity:	1.388	1.475	.
(17) Countrywide Credibility:	0.300	0.220	.
(18) Countrywide Lost-Time Claims:	2743.0	.	.
(19) Pure Premium Underlying Present Rate:	1.159	0.623	1.782
(20) Relativity to Underlying Present Rate:	1.316	1.390	.
(21) Credibility to Underlying Relativity:	0.300	0.210	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.410	1.897	.
(24) Balanced Formula Relativity:	1.391	1.872	1.557

Class(es): 4432 FOUNTAIN PEN MFG		Effective: 7/1/2020							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)
2013	57.316	0	5	0	5.237	0	18.663	23.899	0.091	0.326	0.417
2014	60.186	0	3	0	5.171	0	12.156	17.327	0.086	0.202	0.288
2015	73.496	0	4	0	9.899	0	1.654	11.553	0.135	0.023	0.157
2016	63.230	0	5	0	8.544	0	1.546	10.090	0.135	0.024	0.160
2017	63.484	0	10	0	3.856	0	5.566	9.422	0.061	0.088	0.148
MA Total:	317,713	0	27	0	32,707	0	39,584	72,291	0.103	0.125	0.228

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.106	0.244	.
(14) Massachusetts Credibility:	0.110	0.170	.
(15) Countrywide Pure Premium:	0.251	0.218	0.469
(16) Countrywide Indicated Relativity:	0.281	0.466	.
(17) Countrywide Credibility:	0.270	0.290	.
(18) Countrywide Lost-Time Claims:	44.000	.	.
(19) Pure Premium Underlying Present Rate:	0.374	0.228	0.601
(20) Relativity to Underlying Present Rate:	0.425	0.508	.
(21) Credibility to Underlying Relativity:	0.620	0.540	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.351	0.451	.
(24) Balanced Formula Relativity:	0.346	0.445	0.380

IX 000160

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 89

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4439 LACQUER OR SPIRIT VARNISH 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)
2013	41,149	0	4	0	0	0	1,800	1,800	0.000	0.044	0.044
2014	38,754	1	4	283,133	0	177,195	5,051	465,380	7.306	4.703	12,009
2015	41,771	0	10	0	510,062	0	252,553	762,615	12.211	6.046	18,257
2016	42,107	0	10	0	53,432	0	70,005	123,437	1.269	1.663	2,931
2017	43,570	0	6	0	53,013	0	14,830	67,842	1.217	0.340	1,557
MA Total:	207,351	1	34	283,133	616,507	177,195	344,239	1,421,074	4.339	2.515	6.853

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.470	4.915	.
(14) Massachusetts Credibility:	0.180	0.290	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.163	2.790	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.927	1.264	3.191
(20) Relativity to Underlying Present Rate:	2.188	2.822	.
(21) Credibility to Underlying Relativity:	0.820	0.710	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.599	3.429	.
(24) Balanced Formula Relativity:	2.565	3.384	2.848

Class(es):		Effective: 7/1/2020							Manufacturing		
4452 PLASTICS MFG: FABRICATED PRODUCTS 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)
2013	560,272	3	88	377,347	295,197	177,381	254,213	1,104,138	1.200	0.770	1.971
2014	697,898	4	87	273,681	553,995	192,139	237,829	1,257,644	1.186	0.616	1.802
2015	694,402	5	107	390,729	927,991	96,453	410,392	1,825,566	1.899	0.730	2,629
2016	777,658	2	91	233,270	1,027,729	188,647	409,244	1,858,890	1.622	0.769	2,390
2017	772,863	2	105	230,262	924,636	58,053	337,081	1,550,033	1.494	0.511	2,006
MA Total:	3,503,093	16	478	1,505,290	3,729,547	712,674	1,648,759	7,596,270	1.494	0.674	2.168

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.539	1.318	.
(14) Massachusetts Credibility:	0.500	0.680	.
(15) Countrywide Pure Premium:	1.074	0.622	1.696
(16) Countrywide Indicated Relativity:	1.203	1.328	.
(17) Countrywide Credibility:	0.250	0.160	.
(18) Countrywide Lost-Time Claims:	2075.0	.	.
(19) Pure Premium Underlying Present Rate:	1.385	0.642	2.028
(20) Relativity to Underlying Present Rate:	1.573	1.434	.
(21) Credibility to Underlying Relativity:	0.250	0.160	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.464	1.338	.
(24) Balanced Formula Relativity:	1.445	1.320	1.402

IX 000161

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 90

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4459 PLASTICS MFG: SHEETS, RODS OR TUBES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	628.364	1	109	66.980	1,241.473	6.715	405.748	1,720.916	2.082	0.656	2.739
2014	658.725	2	118	195.836	641.480	49.323	362.756	1,249.394	1.271	0.626	1.897
2015	499.031	2	68	133.283	729.845	40.713	462.698	1,366.538	1.730	1.009	2.738
2016	553.511	0	82	0	912.362	0	386.067	1,298.428	1.648	0.697	2.346
2017	533.736	2	80	355.997	666.804	121.716	383.280	1,527.797	1.916	0.946	2.862
MA Total:	2,873.367	7	457	752.095	4,191.963	218.466	2,000.549	7,163.074	1.721	0.772	2.493

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.773	1.509	.
(14) Massachusetts Credibility:	0.430	0.610	.
(15) Countrywide Pure Premium:	1.039	0.546	1.584
(16) Countrywide Indicated Relativity:	1.164	1.165	.
(17) Countrywide Credibility:	0.290	0.200	.
(18) Countrywide Lost-Time Claims:	2595.0	.	.
(19) Pure Premium Underlying Present Rate:	1.169	0.599	1.768
(20) Relativity to Underlying Present Rate:	1.328	1.336	.
(21) Credibility to Underlying Relativity:	0.280	0.190	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.472	1.408	.
(24) Balanced Formula Relativity:	1.452	1.389	1.431

Class(es):		Effective: 7/1/2020							Manufacturing		
4470 CABLE MFG - INSULATED ELECTRICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	503.684	1	57	199.686	306.233	52.278	310.295	868.492	1.004	0.720	1.724
2014	423.595	4	51	737.015	345.948	455.458	164.608	1,703.029	2.557	1.464	4.020
2015	475.096	1	39	34.192	127.157	6.949	88.529	256.827	0.340	0.201	0.541
2016	480.077	0	44	0	175.847	0	94.595	270.442	0.366	0.197	0.563
2017	577.543	1	59	315.559	365.669	68.234	315.227	1,064.689	1.180	0.664	1.843
MA Total:	2,459.994	7	250	1,286.452	1,320.854	582.919	973.254	4,163.479	1.060	0.633	1.692

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.092	1.236	.
(14) Massachusetts Credibility:	0.380	0.490	.
(15) Countrywide Pure Premium:	0.960	0.431	1.391
(16) Countrywide Indicated Relativity:	1.075	0.921	.
(17) Countrywide Credibility:	0.310	0.260	.
(18) Countrywide Lost-Time Claims:	410.00	.	.
(19) Pure Premium Underlying Present Rate:	0.989	0.401	1.390
(20) Relativity to Underlying Present Rate:	1.123	0.896	.
(21) Credibility to Underlying Relativity:	0.310	0.250	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.097	1.069	.
(24) Balanced Formula Relativity:	1.082	1.055	1.073

IX 000162

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 91

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4484 PLASTICS MFG: MOLDED PRODUCTS 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)
2013	1,737,189	7	213	335,384	511,346	73,124	527,395	1,447,249	0.487	0.346	0.833
2014	2,005,823	11	221	1,085,014	725,218	757,713	611,445	3,179,390	0.902	0.683	1.585
2015	2,374,062	4	333	163,498	2,078,829	258,798	1,335,156	3,836,281	0.945	0.671	1.616
2016	2,207,444	10	274	824,355	2,087,958	579,854	1,109,054	4,601,221	1.319	0.765	2.084
2017	1,817,078	5	234	630,068	1,165,812	139,340	726,576	2,661,796	0.988	0.477	1.465
MA Total:	10,141,596	37	1,275	3,038,319	6,569,162	1,808,830	4,309,626	15,725,937	0.947	0.603	1.551

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.976	1.179	.
(14) Massachusetts Credibility:	0.630	0.930	.
(15) Countrywide Pure Premium:	1.030	0.595	1.625
(16) Countrywide Indicated Relativity:	1.154	1.271	.
(17) Countrywide Credibility:	0.190	0.040	.
(18) Countrywide Lost-Time Claims:	9877.0	.	.
(19) Pure Premium Underlying Present Rate:	0.857	0.487	1.344
(20) Relativity to Underlying Present Rate:	0.973	1.088	.
(21) Credibility to Underlying Relativity:	0.180	0.030	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.009	1.180	.
(24) Balanced Formula Relativity:	0.996	1.165	1.054

Class(es):		Effective: 7/1/2020							Manufacturing		
4493 FABRIC COATING OR IMPREGNATING 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)
2013	408,814	0	58	0	144,616	0	101,514	246,130	0.354	0.248	0.602
2014	402,658	1	61	239,034	474,263	20,163	267,607	1,001,067	1.771	0.715	2.486
2015	336,120	0	43	0	47,399	0	68,950	116,349	0.141	0.205	0.346
2016	294,171	0	36	0	151,495	0	76,721	228,215	0.515	0.261	0.776
2017	330,057	1	37	66,501	177,111	44,351	125,338	413,301	0.738	0.514	1.252
MA Total:	1,771,819	2	235	305,535	994,884	64,514	640,130	2,005,063	0.734	0.398	1.132

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.756	0.777	.
(14) Massachusetts Credibility:	0.330	0.450	.
(15) Countrywide Pure Premium:	1.074	0.603	1.677
(16) Countrywide Indicated Relativity:	1.203	1.287	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	187.00	.	.
(19) Pure Premium Underlying Present Rate:	0.962	0.471	1.433
(20) Relativity to Underlying Present Rate:	1.093	1.052	.
(21) Credibility to Underlying Relativity:	0.330	0.270	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.019	0.994	.
(24) Balanced Formula Relativity:	1.006	0.981	0.997

IX 000163

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 92

Calculation of Class Relativities

Class(es): 4511 ANALYTICAL CHEMIST		Effective: 7/1/2020							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)
2013	5,650,654	4	106	175,376	147,725	173,650	164,058	660,808	0.057	0.060	0.117
2014	6,578,399	4	100	555,906	164,820	91,319	283,890	1,095,935	0.110	0.057	0.167
2015	5,356,765	1	74	16,145	513,220	31,704	244,405	805,475	0.099	0.052	0.150
2016	5,606,370	2	93	214,783	72,542	82,086	264,326	633,737	0.051	0.062	0.113
2017	5,777,786	1	86	90,197	551,209	27,899	316,058	985,363	0.111	0.060	0.171
MA Total:	28,969,974	12	459	1,052,407	1,449,516	406,658	1,272,737	4,181,318	0.086	0.058	0.144

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.105	0.124	.
(14) Massachusetts Credibility:	0.470	0.650	.
(15) Countrywide Pure Premium:	0.238	0.133	0.371
(16) Countrywide Indicated Relativity:	0.297	0.288	.
(17) Countrywide Credibility:	0.270	0.180	.
(18) Countrywide Lost-Time Claims:	1815.0	.	.
(19) Pure Premium Underlying Present Rate:	0.140	0.072	0.212
(20) Relativity to Underlying Present Rate:	0.187	0.173	.
(21) Credibility to Underlying Relativity:	0.260	0.170	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.178	0.162	.
(24) Balanced Formula Relativity:	0.177	0.162	0.172

Class(es): 4512 BIOMEDICAL RESEARCH LABS-INCL OUTSIDE OPERATNS		Effective: 7/1/2020							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)
2013	9,156,498	0	84	0	173,706	0	106,517	280,222	0.019	0.012	0.031
2014	10,031,372	0	90	0	314,125	0	222,116	536,242	0.031	0.022	0.053
2015	12,206,041	2	121	262,945	300,274	29,993	336,454	929,665	0.046	0.030	0.076
2016	14,024,024	2	97	175,549	532,447	88,998	222,226	1,019,220	0.050	0.022	0.073
2017	15,380,739	1	113	172,538	1,409,505	53,837	329,164	1,965,045	0.103	0.025	0.128
MA Total:	60,798,673	5	505	611,033	2,730,057	172,828	1,216,477	4,730,394	0.055	0.023	0.078

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.067	0.049	.
(14) Massachusetts Credibility:	0.390	0.590	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.055	0.063	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.042	0.026	0.068
(20) Relativity to Underlying Present Rate:	0.056	0.063	.
(21) Credibility to Underlying Relativity:	0.610	0.410	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.060	0.055	.
(24) Balanced Formula Relativity:	0.059	0.055	0.058

IX 000164

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 93

Calculation of Class Relativities

Class(es): 4557 INK MFG		Effective: 7/1/2020							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)
2013	380.076	2	53	181.308	393.735	183.190	109.443	867.676	1.513	0.770	2.283
2014	412.269	0	33	0	330.913	0	92.175	423.088	0.803	0.224	1.026
2015	832.698	1	52	240.835	306.852	46.779	150.757	745.224	0.658	0.237	0.895
2016	397.721	1	30	11.171	198.778	4.121	70.645	284.715	0.528	0.188	0.716
2017	459.827	3	22	536.089	258.628	145.852	90.183	1,030.752	1.728	0.513	2.242
MA Total:	2,482,591	7	190	969,404	1,488,906	379,942	513,203	3,351,454	0.990	0.360	1.350

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.020	0.703	.
(14) Massachusetts Credibility:	0.340	0.500	.
(15) Countrywide Pure Premium:	0.836	0.447	1.284
(16) Countrywide Indicated Relativity:	0.937	0.955	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	557.00	.	.
(19) Pure Premium Underlying Present Rate:	0.753	0.421	1.174
(20) Relativity to Underlying Present Rate:	0.856	0.939	.
(21) Credibility to Underlying Relativity:	0.330	0.250	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.938	0.825	.
(24) Balanced Formula Relativity:	0.926	0.814	0.888

Class(es): 4558 PAINT MFG		Effective: 7/1/2020							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)
2013	85.298	0	8	0	10.721	0	22.415	33.136	0.126	0.263	0.388
2014	90.338	0	5	0	48.526	0	75.918	124.445	0.537	0.840	1.378
2015	79.244	1	7	154.595	154	97.636	4.081	256.466	1.953	1.284	3.236
2016	129.470	0	9	0	3.195	0	9.931	13.126	0.025	0.077	0.101
2017	150.758	1	12	40.547	21.418	45.400	29.644	137.008	0.411	0.498	0.909
MA Total:	535,109	2	41	195,142	84,013	143,035	141,989	564,179	0.522	0.533	1.054

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.537	1.041	.
(14) Massachusetts Credibility:	0.170	0.250	.
(15) Countrywide Pure Premium:	0.842	0.414	1.256
(16) Countrywide Indicated Relativity:	0.942	0.884	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	536.00	.	.
(19) Pure Premium Underlying Present Rate:	0.578	0.337	0.916
(20) Relativity to Underlying Present Rate:	0.657	0.753	.
(21) Credibility to Underlying Relativity:	0.410	0.370	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.757	0.875	.
(24) Balanced Formula Relativity:	0.747	0.863	0.787

IX 000165

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 94

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4583 FERTILIZER 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)
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	4.164	0	10.526	14.690	0.077	0.195	0.272
2016	55.189	0	2	0	2.926	0	1.760	4.686	0.053	0.032	0.085
2017	55.074	0	7	0	0	0	17.656	17.656	0.000	0.321	0.321
MA Total:	251.652	0	11	0	7.090	0	29.942	37.032	0.028	0.119	0.147

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.029	0.233	.
(14) Massachusetts Credibility:	0.180	0.230	.
(15) Countrywide Pure Premium:	1.571	0.851	2.422
(16) Countrywide Indicated Relativity:	1.759	1.817	.
(17) Countrywide Credibility:	0.410	0.390	.
(18) Countrywide Lost-Time Claims:	538.00	.	.
(19) Pure Premium Underlying Present Rate:	1.557	0.621	2.178
(20) Relativity to Underlying Present Rate:	1.769	1.386	.
(21) Credibility to Underlying Relativity:	0.410	0.380	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.452	1.289	.
(24) Balanced Formula Relativity:	1.433	1.272	1.377

Class(es):		Effective: 7/1/2020							Manufacturing		
4611 DRUG MEDICINE OR PHARMACEUTICAL PREP-NO MFG OF INGREDIENTS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	1,011.513	1	42	9.260	190.025	327	148.384	347.995	0.197	0.147	0.344
2014	906.497	0	28	0	192.231	0	94.998	287.229	0.212	0.105	0.317
2015	1,129.420	3	43	305.216	188.755	126.482	89.702	710.156	0.437	0.191	0.629
2016	703.787	1	57	269.354	271.474	63.596	97.925	702.348	0.768	0.230	0.998
2017	581.578	1	32	98.011	537.034	24.409	293.817	953.270	1.092	0.547	1.639
MA Total:	4,332.794	6	202	681.840	1,379.519	214.814	724.826	3,000.998	0.476	0.217	0.693

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.490	0.424	.
(14) Massachusetts Credibility:	0.280	0.370	.
(15) Countrywide Pure Premium:	0.363	0.220	0.583
(16) Countrywide Indicated Relativity:	0.407	0.470	.
(17) Countrywide Credibility:	0.360	0.320	.
(18) Countrywide Lost-Time Claims:	2097.0	.	.
(19) Pure Premium Underlying Present Rate:	0.268	0.118	0.386
(20) Relativity to Underlying Present Rate:	0.305	0.264	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.393	0.389	.
(24) Balanced Formula Relativity:	0.388	0.384	0.387

IX 000166

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 95

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4635 OXYGEN OR HYDROGEN 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)
2013	145,252	3	28	339,397	186,585	124,163	216,699	866,843	3,621	2,347	5,968
2014	159,756	0	25	0	170,633	0	186,914	357,547	1,068	1,170	2,238
2015	112,404	1	18	130,962	561,915	46,056	366,008	1,104,942	6,164	3,666	9,830
2016	163,269	2	23	313,588	153,340	158,014	192,369	817,311	2,860	2,146	5,006
2017	167,372	0	11	0	326,678	0	289,813	616,491	1,952	1,732	3,683
MA Total:	748,053	6	105	783,948	1,399,151	328,233	1,251,803	3,763,135	2,918	2,112	5,031

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.006	4.128	.
(14) Massachusetts Credibility:	0.320	0.480	.
(15) Countrywide Pure Premium:	1.507	0.651	2.158
(16) Countrywide Indicated Relativity:	1.688	1.390	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	665.00	.	.
(19) Pure Premium Underlying Present Rate:	2.126	1.250	3.375
(20) Relativity to Underlying Present Rate:	2.414	2.789	.
(21) Credibility to Underlying Relativity:	0.340	0.260	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	2.357	3.068	.
(24) Balanced Formula Relativity:	2.326	3.028	2.568

Class(es):		Effective: 7/1/2020							Manufacturing		
4653 GLUE 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)
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	0.000	0.000	0.000
2015	43,331	0	8	0	311,926	0	88,310	400,235	7,199	2,038	9,237
2016	46,606	0	7	0	10,689	0	25,390	36,080	0,229	0,545	0,774
2017	46,048	0	5	0	79,483	0	51,417	130,900	1,726	1,117	2,843
MA Total:	219,129	0	22	0	402,098	0	165,667	567,765	1,835	0,756	2,591

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.890	1.478	.
(14) Massachusetts Credibility:	0.130	0.170	.
(15) Countrywide Pure Premium:	0.641	0.291	0.933
(16) Countrywide Indicated Relativity:	0.718	0.623	.
(17) Countrywide Credibility:	0.330	0.350	.
(18) Countrywide Lost-Time Claims:	74.000	.	.
(19) Pure Premium Underlying Present Rate:	0.783	0.336	1.119
(20) Relativity to Underlying Present Rate:	0.889	0.751	.
(21) Credibility to Underlying Relativity:	0.540	0.480	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.963	0.829	.
(24) Balanced Formula Relativity:	0.950	0.819	0.905

IX 000167

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 96

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	53,599	0	10	0	118,392	0	56,445	174,837	2,209	1,053	3,262
2014	51,440	2	17	343,023	493,306	100,086	185,276	1,121,690	16,258	5,547	21,806
2015	53,466	2	10	290,755	180,044	94,511	37,010	602,320	8,806	2,460	11,266
2016	55,468	1	11	309,967	54,747	153,908	70,838	589,461	6,575	4,052	10,627
2017	57,365	0	9	0	110,347	0	56,553	166,900	1,924	0,986	2,909
MA Total:	271,337	5	57	943,745	956,836	348,505	406,122	2,655,208	7,004	2,781	9,786

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	7.216	5.436	.
(14) Massachusetts Credibility:	0.270	0.370	.
(15) Countrywide Pure Premium:	3.162	1.718	4.880
(16) Countrywide Indicated Relativity:	3.541	3.669	.
(17) Countrywide Credibility:	0.370	0.320	.
(18) Countrywide Lost-Time Claims:	405.00	.	.
(19) Pure Premium Underlying Present Rate:	3.670	1.861	5.531
(20) Relativity to Underlying Present Rate:	4.168	4.154	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	4.759	4.473	.
(24) Balanced Formula Relativity:	4.697	4.414	4.599

Class(es):		Effective: 7/1/2020							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)
2013	314,608	0	6	0	0	0	6,755	6,755	0.000	0.021	0.021
2014	274,992	0	4	0	12,153	0	17,042	29,196	0.044	0.062	0.106
2015	320,551	0	3	0	3,839	0	6,614	10,453	0.012	0.021	0.033
2016	414,821	0	7	0	57,063	0	20,927	77,990	0.138	0.050	0.188
2017	411,534	0	6	0	470	0	7,143	7,613	0.001	0.017	0.018
MA Total:	1,736,506	0	26	0	73,525	0	58,481	132,006	0.042	0.034	0.076

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.044	0.066	.
(14) Massachusetts Credibility:	0.200	0.270	.
(15) Countrywide Pure Premium:	0.325	0.151	0.477
(16) Countrywide Indicated Relativity:	0.364	0.323	.
(17) Countrywide Credibility:	0.400	0.370	.
(18) Countrywide Lost-Time Claims:	213.00	.	.
(19) Pure Premium Underlying Present Rate:	0.278	0.131	0.408
(20) Relativity to Underlying Present Rate:	0.315	0.291	.
(21) Credibility to Underlying Relativity:	0.400	0.360	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.281	0.242	.
(24) Balanced Formula Relativity:	0.277	0.239	0.264

IX 000168

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 97

Calculation of Class Relativities

Class(es): 4693 PHARMACEUTICAL OR SURGICAL GOODS MFG NOC									Effective: 7/1/2020			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)			
2013	695.851	1	36	69.575	236.730	6.782	225.982	539.070	0.440	0.335	0.775			
2014	835.735	2	26	81.771	31.076	14.235	50.796	177.878	0.135	0.078	0.213			
2015	491.780	1	44	11.516	145.877	11.310	152.336	321.039	0.320	0.333	0.653			
2016	492.297	1	41	98.643	186.412	51.684	102.923	439.663	0.579	0.314	0.893			
2017	620.568	2	29	127.821	232.152	50.918	100.755	511.646	0.580	0.244	0.824			
MA Total:	3,136.231	7	176	389.326	832.248	134.930	632.792	1,989.296	0.390	0.245	0.634			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.401	0.478	.
(14) Massachusetts Credibility:	0.290	0.410	.
(15) Countrywide Pure Premium:	0.376	0.236	0.612
(16) Countrywide Indicated Relativity:	0.421	0.505	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	768.00	.	.
(19) Pure Premium Underlying Present Rate:	0.409	0.204	0.612
(20) Relativity to Underlying Present Rate:	0.464	0.455	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.430	0.479	.
(24) Balanced Formula Relativity:	0.425	0.473	0.441

Class(es): 4720 SOAP OR SYNTHETIC DETERGENT MFG									Effective: 7/1/2020			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)			
2013	187.957	1	26	144.526	93.340	47.220	80.176	365.263	1.266	0.678	1.943			
2014	214.134	0	24	0	83.326	0	45.032	128.357	0.389	0.210	0.599			
2015	224.363	0	13	0	243.935	0	97.869	341.805	1.087	0.436	1.523			
2016	219.466	0	20	0	143.248	0	69.331	212.579	0.653	0.316	0.969			
2017	250.194	1	14	73.485	31.257	23.013	41.856	169.611	0.419	0.259	0.678			
MA Total:	1,096.114	2	97	218.010	595.106	70.234	334.264	1,217.614	0.742	0.369	1.111			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.764	0.721	.
(14) Massachusetts Credibility:	0.260	0.370	.
(15) Countrywide Pure Premium:	0.912	0.485	1.397
(16) Countrywide Indicated Relativity:	1.021	1.036	.
(17) Countrywide Credibility:	0.370	0.320	.
(18) Countrywide Lost-Time Claims:	426.00	.	.
(19) Pure Premium Underlying Present Rate:	0.839	0.451	1.290
(20) Relativity to Underlying Present Rate:	0.953	1.006	.
(21) Credibility to Underlying Relativity:	0.370	0.310	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.929	0.910	.
(24) Balanced Formula Relativity:	0.917	0.898	0.910

IX 000169

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 98

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4740 OIL REFINING - PETROLEUM & 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)
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
2016	16.503	0	2	0	248	0	1.942	2.191	0.015	0.118	0.133
2017	14.478	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	90.527	0	2	0	248	0	1.942	2.191	0.003	0.021	0.024

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.003	0.042	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	0.417	0.205	0.622
(16) Countrywide Indicated Relativity:	0.467	0.437	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	483.00	.	.
(19) Pure Premium Underlying Present Rate:	0.530	0.264	0.794
(20) Relativity to Underlying Present Rate:	0.602	0.589	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.492	0.461	.
(24) Balanced Formula Relativity:	0.486	0.455	0.475

Class(es):		Effective: 7/1/2020							Manufacturing		
4741 ASPHALT OR TAR DISTILLING OR REFINING & 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)
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
2016	3.033	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	3.531	0	1	0	7.419	0	3.958	11.377	2.101	1.121	3.222
MA Total:	19.466	0	1	0	7.419	0	3.958	11.377	0.381	0.203	0.584

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.393	0.397	.
(14) Massachusetts Credibility:	0.060	0.070	.
(15) Countrywide Pure Premium:	1.096	0.514	1.610
(16) Countrywide Indicated Relativity:	1.228	1.097	.
(17) Countrywide Credibility:	0.370	0.400	.
(18) Countrywide Lost-Time Claims:	99.000	.	.
(19) Pure Premium Underlying Present Rate:	1.141	0.416	1.557
(20) Relativity to Underlying Present Rate:	1.296	0.929	.
(21) Credibility to Underlying Relativity:	0.570	0.530	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.217	0.959	.
(24) Balanced Formula Relativity:	1.201	0.946	1.113

IX 000170

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 99

Calculation of Class Relativities

Class(es): 4771 EXPLOSIVES OR AMMUNITION MFG: NOC - & DRIVERS									Effective: 7/1/2020			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)			
2013	1,024	0	0	0	0	0	0	0	0.000	0.000	0.000			
2014	3,997	0	1	0	0	0	1,980	1,980	0.000	0.495	0.495			
2015	5,140	0	0	0	0	0	0	0	0.000	0.000	0.000			
2016	11,970	0	1	0	0	0	101	101	0.000	0.008	0.008			
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000			
MA Total:	22,130	0	2	0	0	0	2,081	2,081	0.000	0.094	0.094			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.184	.
(14) Massachusetts Credibility:	0.080	0.080	.
(15) Countrywide Pure Premium:	1.084	0.565	1.649
(16) Countrywide Indicated Relativity:	1.214	1.207	.
(17) Countrywide Credibility:	0.460	0.460	.
(18) Countrywide Lost-Time Claims:	335.00	.	.
(19) Pure Premium Underlying Present Rate:	2.396	0.494	2.891
(20) Relativity to Underlying Present Rate:	2.722	1.103	.
(21) Credibility to Underlying Relativity:	0.460	0.460	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.811	1.077	.
(24) Balanced Formula Relativity:	1.787	1.063	1.537

Class(es): 4825 DRUG, MEDICINE OR PHARM PREP MFG & INCIDENTAL MFG INGREDIENTS									Effective: 7/1/2020			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)			
2013	2,572,314	0	38	0	296,087	0	438,718	734,805	0.115	0.171	0.286			
2014	2,606,420	2	33	14,134	598,279	30,692	161,193	804,300	0.235	0.074	0.309			
2015	2,587,699	0	34	0	21,074	0	38,087	59,160	0.008	0.015	0.023			
2016	3,803,048	3	52	542,167	288,225	141,505	198,916	1,170,813	0.218	0.090	0.308			
2017	3,322,304	0	50	0	263,173	0	136,319	399,492	0.079	0.041	0.120			
MA Total:	14,891,784	5	207	556,301	1,466,839	172,197	973,233	3,168,570	0.136	0.077	0.213			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.140	0.150	.
(14) Massachusetts Credibility:	0.460	0.590	.
(15) Countrywide Pure Premium:	0.392	0.191	0.583
(16) Countrywide Indicated Relativity:	0.439	0.408	.
(17) Countrywide Credibility:	0.270	0.210	.
(18) Countrywide Lost-Time Claims:	766.00	.	.
(19) Pure Premium Underlying Present Rate:	0.260	0.106	0.366
(20) Relativity to Underlying Present Rate:	0.295	0.236	.
(21) Credibility to Underlying Relativity:	0.270	0.200	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.263	0.222	.
(24) Balanced Formula Relativity:	0.259	0.219	0.245

IX 000171

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Manufacturing		
4828 CHEMICAL BLENDING OR MIXING NOC- ALL OPERS & 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)
2013	863.221	0	22	0	333.222	0	146.631	479.854	0.386	0.170	0.556
2014	935.225	1	21	374.222	203.054	37.435	114.838	729.549	0.617	0.163	0.780
2015	1,034.967	2	29	285.090	469.459	27.116	447.890	1,229.556	0.729	0.459	1.188
2016	1,083.705	1	31	12.229	251.090	7.424	189.163	459.906	0.243	0.181	0.424
2017	1,071.309	0	23	0	136.354	0	117.340	253.694	0.127	0.110	0.237
MA Total:	4,988.428	4	126	671.541	1,393.180	71.975	1,015.862	3,152.559	0.414	0.218	0.632

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.426	0.426	.
(14) Massachusetts Credibility:	0.380	0.520	.
(15) Countrywide Pure Premium:	0.514	0.258	0.772
(16) Countrywide Indicated Relativity:	0.576	0.552	.
(17) Countrywide Credibility:	0.310	0.240	.
(18) Countrywide Lost-Time Claims:	2233.0	.	.
(19) Pure Premium Underlying Present Rate:	0.495	0.236	0.731
(20) Relativity to Underlying Present Rate:	0.562	0.527	.
(21) Credibility to Underlying Relativity:	0.310	0.240	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.515	0.481	.
(24) Balanced Formula Relativity:	0.508	0.474	0.496

Class(es):		Effective: 7/1/2020							Construction		
5020 CEILING INSTALLATION-SUSPENDED ACOUSTICAL GRID											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	242.440	0	17	0	342.704	0	84.184	426.888	1.414	0.347	1.761
2014	218.297	1	17	17.550	630.352	2.750	193.159	843.811	2.968	0.897	3.865
2015	210.962	2	16	578.284	497.794	194.973	123.317	1,394.369	5.101	1.509	6.610
2016	224.390	0	14	0	827.894	0	205.143	1,033.037	3.690	0.914	4.604
2017	242.158	0	14	0	49.641	0	34.777	84.417	0.205	0.144	0.349
MA Total:	1,138.248	3	78	595.834	2,348.385	197.723	640.581	3,782.522	2.587	0.736	3.323

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.993	0.620	.
(14) Massachusetts Credibility:	0.390	0.470	.
(15) Countrywide Pure Premium:	2.816	1.281	4.097
(16) Countrywide Indicated Relativity:	1.100	1.112	.
(17) Countrywide Credibility:	0.310	0.270	.
(18) Countrywide Lost-Time Claims:	285.00	.	.
(19) Pure Premium Underlying Present Rate:	2.324	0.798	3.122
(20) Relativity to Underlying Present Rate:	0.960	0.758	.
(21) Credibility to Underlying Relativity:	0.300	0.260	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.016	0.789	.
(24) Balanced Formula Relativity:	1.021	0.787	0.948

IX 000172

Calculation of Class Relativities

Class(es): 5022 MASONRY NOC		Effective: 7/1/2020							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)
2013	1,102,711	13	127	3,799,013	3,453,797	1,064,587	1,393,061	9,710,458	6,577	2,229	8,806
2014	1,163,367	13	112	3,261,709	3,275,565	1,048,479	1,561,901	9,147,654	5,619	2,244	7,863
2015	1,279,113	15	110	3,297,804	3,769,330	1,104,397	2,175,463	10,346,994	5,525	2,564	8,089
2016	1,374,802	12	120	1,636,311	5,064,670	1,200,940	1,942,151	9,844,072	4,874	2,286	7,160
2017	1,501,148	12	117	3,051,515	4,812,184	1,858,346	1,887,657	11,609,701	5,238	2,495	7,734
MA Total:	6,421,142	65	586	15,046,351	20,375,546	6,276,749	8,960,234	50,658,880	5,516	2,373	7,889

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.119	1.999	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.847	1.637	5.484
(16) Countrywide Indicated Relativity:	1.502	1.422	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	5155.0	.	.
(19) Pure Premium Underlying Present Rate:	5.064	2.040	7.104
(20) Relativity to Underlying Present Rate:	2.093	1.936	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	2.119	1.999	.
(24) Balanced Formula Relativity:	2.128	1.995	2.086

Class(es): 5037 PAINTING: METAL STRUCTURES-OVER 2 STORIES IN HEIGHT & DRIVERS		Effective: 7/1/2020							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)
2013	95,019	2	11	479,721	767,965	107,062	199,838	1,554,587	13,131	3,230	16,361
2014	105,650	2	11	137,057	1,036,820	29,203	354,414	1,557,494	11,111	3,631	14,742
2015	80,013	3	7	451,478	745,530	90,830	351,369	1,639,207	14,960	5,527	20,487
2016	61,101	0	5	0	0	0	5,386	0,000	0,000	0,088	0,088
2017	89,725	0	7	0	1,155,367	0	588,240	1,743,607	12,877	6,556	19,433
MA Total:	431,508	7	41	1,068,256	3,705,683	227,095	1,499,247	6,500,281	11,063	4,001	15,064

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.249	3.370	.
(14) Massachusetts Credibility:	0.460	0.560	.
(15) Countrywide Pure Premium:	7.270	3.200	10.470
(16) Countrywide Indicated Relativity:	2.839	2.779	.
(17) Countrywide Credibility:	0.270	0.220	.
(18) Countrywide Lost-Time Claims:	93,000	.	.
(19) Pure Premium Underlying Present Rate:	9.279	3.213	12.492
(20) Relativity to Underlying Present Rate:	3.834	3.049	.
(21) Credibility to Underlying Relativity:	0.270	0.220	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	3.756	3.169	.
(24) Balanced Formula Relativity:	3.772	3.163	3.582

IX 000173

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	220,834	5	43	1,390,990	1,905,897	310,355	696,619	4,303,861	14,929	4,560	19,489	
2014	282,222	7	63	1,948,570	1,572,708	803,539	778,978	5,103,794	12,477	5,607	18,084	
2015	255,712	4	59	1,946,638	2,288,870	632,736	856,685	5,724,929	16,564	5,825	22,388	
2016	243,004	1	44	609,630	3,123,547	94,586	1,063,308	4,891,071	15,363	4,765	20,128	
2017	304,055	6	60	1,306,716	1,494,426	351,435	715,378	3,867,956	9,213	3,509	12,721	
MA Total:	1,305,826	23	269	7,202,544	10,385,448	2,192,650	4,110,968	23,891,611	13,469	4,827	18,296	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.173	4.066	.
(14) Massachusetts Credibility:	0.840	0.990	.
(15) Countrywide Pure Premium:	3.452	1.417	4.869
(16) Countrywide Indicated Relativity:	1.348	1.230	.
(17) Countrywide Credibility:	0.080	0.010	.
(18) Countrywide Lost-Time Claims:	889.00	.	.
(19) Pure Premium Underlying Present Rate:	13.349	4.425	17.774
(20) Relativity to Underlying Present Rate:	5.516	4.199	.
(21) Credibility to Underlying Relativity:	0.080	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	4.894	4.037	.
(24) Balanced Formula Relativity:	4.915	4.030	4.638

Class(es):		Effective: 7/1/2020							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)	
2013	7,100	0	4	0	25,840	0	10,884	36,723	3,640	1,533	5,173	
2014	11,700	0	8	0	513,412	0	206,982	720,394	43,881	17,691	61,572	
2015	20,181	0	2	0	692,745	0	246,712	939,458	34,327	12,225	46,552	
2016	21,372	1	7	194,060	495,945	699,322	97,604	1,486,931	32,286	37,289	69,574	
2017	32,070	0	6	0	146,916	0	64,618	211,535	4,581	2,015	6,596	
MA Total:	92,422	1	27	194,060	1,874,858	699,322	626,801	3,395,040	22,386	14,349	36,734	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	8.598	12.085	.
(14) Massachusetts Credibility:	0.260	0.380	.
(15) Countrywide Pure Premium:	2.395	0.917	3.312
(16) Countrywide Indicated Relativity:	0.935	0.796	.
(17) Countrywide Credibility:	0.370	0.310	.
(18) Countrywide Lost-Time Claims:	945.00	.	.
(19) Pure Premium Underlying Present Rate:	10.264	5.687	15.951
(20) Relativity to Underlying Present Rate:	4.241	5.397	.
(21) Credibility to Underlying Relativity:	0.370	0.310	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	4.151	6.512	.
(24) Balanced Formula Relativity:	4.168	6.500	4.899

IX 000174

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction			
5059 IRON OR STEEL: ERECTION: FRAME STRUCT NOT OVER 2 STRS IN HGT												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2013	65,252	0	9	0	930,495	0	364,071	1,294,566	14,260	5,579	19,840	
2014	67,619	1	15	474,082	119,684	111,902	78,667	784,335	8,781	2,818	11,599	
2015	102,691	4	13	1,091,655	1,724,371	481,284	787,646	4,084,956	27,422	12,357	39,779	
2016	125,530	1	16	480,122	1,679,120	206,118	679,937	3,045,298	17,201	7,059	24,260	
2017	135,095	2	12	1,066,507	1,195,288	779,221	378,382	3,419,398	16,742	8,569	25,311	
MA Total:	496,187	8	65	3,112,365	5,648,959	1,578,525	2,288,704	12,628,552	17,657	7,794	25,451	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.782	6.564	.
(14) Massachusetts Credibility:	0.470	0.650	.
(15) Countrywide Pure Premium:	8.930	4.613	13.543
(16) Countrywide Indicated Relativity:	3.487	4.005	.
(17) Countrywide Credibility:	0.270	0.180	.
(18) Countrywide Lost-Time Claims:	397.00	.	.
(19) Pure Premium Underlying Present Rate:	8.251	4.080	12.331
(20) Relativity to Underlying Present Rate:	3.410	3.872	.
(21) Credibility to Underlying Relativity:	0.260	0.170	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	5.015	5.646	.
(24) Balanced Formula Relativity:	5.037	5.636	5.224

Class(es):		Effective: 7/1/2020							Construction			
5102 DOOR, DOOR FRAME OR SASH ERECTION - METAL OR METAL COVERED												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2013	529,302	6	60	781,805	1,526,057	179,365	502,803	2,990,029	4,360	1,289	5,649	
2014	688,510	8	68	1,543,545	1,761,761	335,292	738,277	4,378,875	4,801	1,559	6,360	
2015	767,734	7	94	1,011,185	2,485,447	191,381	682,750	4,370,763	4,554	1,139	5,693	
2016	787,041	6	62	1,196,813	1,566,671	295,991	653,076	3,712,551	3,511	1,206	4,717	
2017	820,898	4	77	546,399	2,822,207	267,450	1,105,283	4,741,339	4,104	1,672	5,776	
MA Total:	3,593,483	31	361	5,079,746	10,162,143	1,269,479	3,682,188	20,193,556	4,242	1,378	5,619	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.629	1.161	.
(14) Massachusetts Credibility:	0.730	0.850	.
(15) Countrywide Pure Premium:	3.206	1.376	4.582
(16) Countrywide Indicated Relativity:	1.252	1.195	.
(17) Countrywide Credibility:	0.140	0.080	.
(18) Countrywide Lost-Time Claims:	1982.0	.	.
(19) Pure Premium Underlying Present Rate:	3.420	1.114	4.534
(20) Relativity to Underlying Present Rate:	1.413	1.057	.
(21) Credibility to Underlying Relativity:	0.130	0.070	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.548	1.156	.
(24) Balanced Formula Relativity:	1.555	1.154	1.429

IX 000175

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 104

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	564,164	8	95	1,313,353	1,234,206	323,526	683,585	3,554,669	4,516	1,785	6,301
2014	611,666	6	110	1,392,516	1,472,694	248,761	624,524	3,738,495	4,684	1,428	6,112
2015	692,972	3	83	685,434	1,910,025	99,727	1,020,816	3,716,001	3,745	1,617	5,362
2016	681,527	4	102	421,016	1,966,328	74,503	818,940	3,280,786	3,503	1,311	4,814
2017	699,655	9	88	1,402,552	2,042,562	1,046,747	1,021,793	5,513,655	4,924	2,957	7,881
MA Total:	3,249,984	30	478	5,214,871	8,625,814	1,793,264	4,169,658	19,803,607	4,259	1,835	6,093

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.636	1.545	.
(14) Massachusetts Credibility:	0.710	0.910	.
(15) Countrywide Pure Premium:	2.521	1.035	3.557
(16) Countrywide Indicated Relativity:	0.985	0.899	.
(17) Countrywide Credibility:	0.150	0.050	.
(18) Countrywide Lost-Time Claims:	1735.0	.	.
(19) Pure Premium Underlying Present Rate:	3.612	1.472	5.084
(20) Relativity to Underlying Present Rate:	1.493	1.397	.
(21) Credibility to Underlying Relativity:	0.140	0.040	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.518	1.507	.
(24) Balanced Formula Relativity:	1.524	1.504	1.518

Class(es):		Effective: 7/1/2020							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)
2013	735,464	0	29	0	681,422	0	230,354	911,776	0.927	0.313	1,240
2014	859,239	4	34	978,269	693,109	479,585	309,863	2,460,827	1,945	0,919	2,864
2015	901,781	5	48	707,083	419,760	216,125	414,357	1,757,324	1,250	0,699	1,949
2016	991,153	2	49	78,031	357,641	80,855	354,084	870,611	0,440	0,439	0,878
2017	1,071,737	4	49	374,609	1,806,016	188,322	599,414	2,968,361	2,035	0,735	2,770
MA Total:	4,559,374	15	209	2,137,991	3,957,949	964,888	1,908,072	8,968,900	1,337	0,630	1,967

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.514	0.531	.
(14) Massachusetts Credibility:	0.570	0.720	.
(15) Countrywide Pure Premium:	1.359	0.477	1.836
(16) Countrywide Indicated Relativity:	0.531	0.414	.
(17) Countrywide Credibility:	0.220	0.140	.
(18) Countrywide Lost-Time Claims:	483.00	.	.
(19) Pure Premium Underlying Present Rate:	1.456	0.578	2.035
(20) Relativity to Underlying Present Rate:	0.602	0.549	.
(21) Credibility to Underlying Relativity:	0.210	0.140	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.536	0.517	.
(24) Balanced Formula Relativity:	0.538	0.516	0.531

IX 000176

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction			
5183 PLUMBING 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)	
2013	6,200.395	31	633	5,249.148	5,021.410	1,614.430	3,008.390	14,893.378	1.656	0.746	2.402	
2014	6,795.089	26	609	4,946.093	6,515.131	1,227.357	2,889.708	15,578.289	1.687	0.606	2.293	
2015	7,440.616	30	627	4,822.734	8,713.593	2,050.926	3,606.163	19,193.416	1.819	0.760	2.580	
2016	8,047.647	35	633	6,379.093	10,067.695	2,294.019	4,704.036	23,444.843	2.044	0.870	2.913	
2017	8,722.163	23	689	2,187.357	10,409.978	1,556.287	5,373.334	19,526.956	1.444	0.794	2.239	
MA Total:	37,205.911	145	3,191	23,584.424	40,727.807	8,743.020	19,581.632	92,636.883	1.729	0.761	2.490	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.664	0.641	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.674	0.664	2.338
(16) Countrywide Indicated Relativity:	0.654	0.577	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	11014	.	.
(19) Pure Premium Underlying Present Rate:	1.537	0.628	2.166
(20) Relativity to Underlying Present Rate:	0.635	0.596	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.664	0.641	.
(24) Balanced Formula Relativity:	0.667	0.640	0.658

Class(es):		Effective: 7/1/2020							Construction			
5188 AUTOMATIC SPRINKLER INSTALLATION & 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)	
2013	799.807	4	70	784.487	1,314.033	147.166	414.346	2,660.031	2.624	0.702	3.326	
2014	877.910	8	66	2,198.491	1,201.549	662.601	414.771	4,477.413	3.873	1.227	5.100	
2015	932.903	6	70	1,149.996	2,039.808	312.520	471.092	3,973.415	3.419	0.840	4.259	
2016	959.104	2	83	541.226	1,029.795	381.474	404.386	2,356.881	1.638	0.819	2.457	
2017	986.940	2	65	165.105	1,328.558	91.251	365.372	1,950.285	1.513	0.463	1.976	
MA Total:	4,556.664	22	354	4,839.305	6,913.743	1,595.011	2,069.966	15,418.025	2.579	0.804	3.384	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.991	0.677	.
(14) Massachusetts Credibility:	0.690	0.850	.
(15) Countrywide Pure Premium:	1.623	0.652	2.274
(16) Countrywide Indicated Relativity:	0.634	0.566	.
(17) Countrywide Credibility:	0.160	0.080	.
(18) Countrywide Lost-Time Claims:	1073.0	.	.
(19) Pure Premium Underlying Present Rate:	2.334	0.866	3.200
(20) Relativity to Underlying Present Rate:	0.964	0.822	.
(21) Credibility to Underlying Relativity:	0.150	0.070	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.930	0.679	.
(24) Balanced Formula Relativity:	0.934	0.677	0.853

IX 000177

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	6,919,021	20	595	2,071,534	4,287,601	954,048	2,850,682	10,163,864	0.919	0.550	1.469
2014	8,116,621	22	638	3,690,378	6,471,837	1,832,672	3,478,623	15,473,510	1.252	0.654	1.906
2015	8,552,750	20	624	4,649,078	5,743,702	1,066,681	3,614,066	15,073,527	1.215	0.547	1.762
2016	9,203,470	29	595	5,099,345	6,337,159	1,812,178	4,000,622	17,249,304	1.243	0.632	1.874
2017	10,010,041	24	638	4,452,950	8,690,474	2,145,609	4,281,951	19,570,984	1.313	0.642	1.955
MA Total:	42,801,904	115	3,090	19,963,284	31,530,773	7,811,188	18,225,944	77,531,189	1.203	0.608	1.811

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.462	0.512	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.483	0.638	2.121
(16) Countrywide Indicated Relativity:	0.579	0.554	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	11149	.	.
(19) Pure Premium Underlying Present Rate:	1.067	0.534	1.601
(20) Relativity to Underlying Present Rate:	0.441	0.507	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.462	0.512	.
(24) Balanced Formula Relativity:	0.464	0.511	0.479

Class(es):		Effective: 7/1/2020							Goods and Services		
5191 OFFICE MACHICE OR APPLIANCE INSTALL, INSP, ADJSTMT 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)
2013	4,367,132	8	131	1,747,642	668,575	583,386	391,540	3,391,143	0.553	0.223	0.777
2014	4,630,329	7	157	1,032,276	947,196	296,976	559,851	2,836,299	0.428	0.185	0.613
2015	4,419,811	5	175	798,196	1,708,458	238,570	874,433	3,619,658	0.567	0.252	0.819
2016	4,414,778	4	119	421,601	1,184,859	126,404	1,108,263	2,841,127	0.364	0.280	0.644
2017	4,485,232	4	119	280,284	616,520	112,166	587,059	1,596,029	0.200	0.156	0.356
MA Total:	22,317,281	28	701	4,279,999	5,125,607	1,357,503	3,521,146	14,284,256	0.421	0.219	0.640

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.511	0.469	.
(14) Massachusetts Credibility:	0.630	0.850	.
(15) Countrywide Pure Premium:	0.439	0.196	0.635
(16) Countrywide Indicated Relativity:	0.548	0.424	.
(17) Countrywide Credibility:	0.190	0.080	.
(18) Countrywide Lost-Time Claims:	3429.0	.	.
(19) Pure Premium Underlying Present Rate:	0.378	0.181	0.559
(20) Relativity to Underlying Present Rate:	0.504	0.439	.
(21) Credibility to Underlying Relativity:	0.180	0.070	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.517	0.463	.
(24) Balanced Formula Relativity:	0.513	0.463	0.495

IX 000178

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 107

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Goods and Services		
5192 VENDING OR COIN OPERTD MACHINES-INSTALL, SRVC OR RPR &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)
2013	307,732	1	50	6,625	231,402	17,700	112,621	368,348	0.773	0.423	1.197
2014	376,378	4	50	461,015	763,239	335,765	276,518	1,836,537	3.253	1.627	4.880
2015	391,274	0	43	0	246,076	0	268,955	515,031	0.629	0.687	1.316
2016	383,815	2	33	40,760	96,157	64,249	52,385	253,551	0.357	0.304	0.661
2017	455,281	3	42	24,651	641,051	47,384	272,509	985,596	1.462	0.703	2.165
MA Total:	1,914,480	10	218	533,051	1,977,925	465,098	982,988	3,959,063	1.312	0.756	2.068

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.590	1.622	.
(14) Massachusetts Credibility:	0.390	0.540	.
(15) Countrywide Pure Premium:	1.398	0.678	2.076
(16) Countrywide Indicated Relativity:	1.746	1.470	.
(17) Countrywide Credibility:	0.310	0.230	.
(18) Countrywide Lost-Time Claims:	1702.0	.	.
(19) Pure Premium Underlying Present Rate:	1.328	0.683	2.012
(20) Relativity to Underlying Present Rate:	1.770	1.658	.
(21) Credibility to Underlying Relativity:	0.300	0.230	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.692	1.595	.
(24) Balanced Formula Relativity:	1.680	1.596	1.650

Class(es):		Effective: 7/1/2020							Construction		
5213 CONCRETE CONSTRUCTION-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)
2013	475,003	9	120	1,382,026	1,805,589	353,454	1,051,557	4,592,625	6.711	2.958	9.669
2014	543,405	8	136	3,174,075	3,679,405	1,211,873	1,127,433	9,192,786	12.612	4.305	16.917
2015	588,279	7	98	1,056,824	2,448,409	365,059	1,121,947	4,992,239	5.958	2.528	8.486
2016	726,450	6	100	502,122	3,007,352	319,806	1,250,979	5,080,259	4.831	2.162	6.993
2017	946,910	4	116	1,675,141	3,125,900	736,844	1,355,258	6,893,144	5.070	2.209	7.280
MA Total:	3,280,047	34	570	7,790,187	14,066,655	2,987,036	5,907,175	30,751,054	6.664	2.712	9.375

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.559	2.284	.
(14) Massachusetts Credibility:	0.910	1.000	.
(15) Countrywide Pure Premium:	2.973	1.300	4.273
(16) Countrywide Indicated Relativity:	1.161	1.129	.
(17) Countrywide Credibility:	0.050	0.000	.
(18) Countrywide Lost-Time Claims:	5015.0	.	.
(19) Pure Premium Underlying Present Rate:	6.502	2.357	8.859
(20) Relativity to Underlying Present Rate:	2.687	2.237	.
(21) Credibility to Underlying Relativity:	0.040	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	2.494	2.284	.
(24) Balanced Formula Relativity:	2.505	2.280	2.434

IX 000179

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction			
5215 CONCRETE WORK - INCIDENTAL TO CONSTRUCTION OF PRIVATE RES												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2013	281,377	1	28	127,639	442,897	12,393	245,687	828,615	2,028	0,917	2,945	
2014	265,067	1	26	104,050	205,550	13,933	113,073	436,606	1,168	0,479	1,647	
2015	315,915	0	21	0	258,884	0	68,255	327,140	0,819	0,216	1,036	
2016	339,164	1	21	304,897	652,961	179,370	296,194	1,433,421	2,824	1,402	4,226	
2017	368,463	3	22	315,731	228,508	72,633	179,210	796,083	1,477	0,683	2,161	
MA Total:	1,569,986	6	118	852,317	1,788,800	278,329	902,419	3,821,865	1,682	0,752	2,434	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.646	0.633	.
(14) Massachusetts Credibility:	0.450	0.540	.
(15) Countrywide Pure Premium:	3.236	1.394	4.630
(16) Countrywide Indicated Relativity:	1.264	1.210	.
(17) Countrywide Credibility:	0.280	0.230	.
(18) Countrywide Lost-Time Claims:	1642.0	.	.
(19) Pure Premium Underlying Present Rate:	2.377	0.828	3.204
(20) Relativity to Underlying Present Rate:	0.982	0.786	.
(21) Credibility to Underlying Relativity:	0.270	0.230	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.910	0.801	.
(24) Balanced Formula Relativity:	0.914	0.800	0.878

Class(es):		Effective: 7/1/2020							Construction			
5221 CONCRETE OR CEMENT WORK-FLOORS DRIVEWAYS YRDS OR SIDEWALKS & 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)	
2013	1,272,659	9	159	1,882,205	3,790,654	500,599	1,950,452	8,123,909	4,457	1,926	6,383	
2014	1,524,499	20	163	4,649,673	3,889,411	1,283,531	1,233,371	11,055,986	5,601	1,651	7,252	
2015	1,826,144	10	151	2,526,168	2,278,115	991,926	1,015,136	6,811,345	2,631	1,099	3,730	
2016	1,847,378	16	186	3,553,869	4,826,047	1,239,390	1,795,343	11,414,648	4,536	1,643	6,179	
2017	2,089,862	17	152	3,270,593	2,997,650	1,060,462	1,541,637	8,870,343	2,999	1,245	4,244	
MA Total:	8,560,543	72	811	15,882,508	17,781,877	5,075,907	7,535,938	46,276,230	3,933	1,473	5,406	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.510	1.241	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.567	1.055	3.621
(16) Countrywide Indicated Relativity:	1.002	0.916	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	8110.0	.	.
(19) Pure Premium Underlying Present Rate:	3.796	1.379	5.175
(20) Relativity to Underlying Present Rate:	1.569	1.309	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.510	1.241	.
(24) Balanced Formula Relativity:	1.517	1.239	1.430

IX 000180

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	241,376	2	31	606,654	1,099,581	216,636	427,051	2,349,922	7,069	2,667	9,736
2014	257,758	2	29	289,617	927,257	87,604	187,479	1,491,958	4,721	1,067	5,788
2015	325,326	3	52	1,129,708	687,242	232,360	234,125	2,283,435	5,585	1,434	7,019
2016	271,967	2	30	559,061	890,149	552,919	389,770	2,391,900	5,329	3,466	8,795
2017	260,958	0	23	0	3,196,150	0	695,694	3,891,844	12,248	2,666	14,914
MA Total:	1,357,385	9	165	2,585,040	6,800,379	1,089,520	1,934,119	12,409,058	6,914	2,228	9,142

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.656	1.876	.
(14) Massachusetts Credibility:	0.560	0.660	.
(15) Countrywide Pure Premium:	4.737	1.721	6.459
(16) Countrywide Indicated Relativity:	1.850	1.494	.
(17) Countrywide Credibility:	0.220	0.170	.
(18) Countrywide Lost-Time Claims:	1183.0	.	.
(19) Pure Premium Underlying Present Rate:	4.797	1.562	6.359
(20) Relativity to Underlying Present Rate:	1.982	1.482	.
(21) Credibility to Underlying Relativity:	0.220	0.170	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	2.330	1.744	.
(24) Balanced Formula Relativity:	2.340	1.741	2.152

Class(es):		Effective: 7/1/2020							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)
2013	183,083	0	27	0	135,863	0	237,681	373,544	0.742	1,298	2,040
2014	199,032	1	22	361,692	224,992	28,501	146,399	761,583	2,948	0,879	3,826
2015	218,059	1	41	297,127	147,177	28,832	205,270	678,406	2,038	1,074	3,111
2016	235,970	1	20	11,109	372,265	710	159,008	543,091	1,625	0,677	2,302
2017	238,937	1	21	82,505	67,450	47,584	52,592	250,131	0,628	0,419	1,047
MA Total:	1,075,081	4	131	752,433	947,746	105,627	800,949	2,606,755	1,581	0,843	2,425

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.607	0.710	.
(14) Massachusetts Credibility:	0.370	0.510	.
(15) Countrywide Pure Premium:	2.865	1.216	4.081
(16) Countrywide Indicated Relativity:	1.119	1.056	.
(17) Countrywide Credibility:	0.320	0.250	.
(18) Countrywide Lost-Time Claims:	727.00	.	.
(19) Pure Premium Underlying Present Rate:	2.081	1.012	3.093
(20) Relativity to Underlying Present Rate:	0.860	0.960	.
(21) Credibility to Underlying Relativity:	0.310	0.240	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.849	0.857	.
(24) Balanced Formula Relativity:	0.853	0.855	0.854

IX 000181

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction		
5348 STONE, MOSAIC, TERRAZZO OR CERAMIC TILE WORK - INSIDE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	577,412	4	49	834,678	334,236	436,512	206,998	1,812,424	2,024	1,114	3,139
2014	722,020	7	65	1,053,927	808,366	301,497	272,844	2,436,634	2,579	0,795	3,375
2015	746,146	7	66	915,162	1,017,093	108,543	379,029	2,419,827	2,590	0,653	3,243
2016	811,507	8	59	605,559	1,437,811	106,164	510,263	2,659,797	2,518	0,760	3,278
2017	941,147	6	48	889,643	1,849,601	165,016	911,855	3,816,114	2,911	1,144	4,055
MA Total:	3,798,232	32	287	4,298,969	5,447,107	1,117,731	2,280,990	13,144,797	2,566	0,895	3,461

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.986	0.754	.
(14) Massachusetts Credibility:	0.640	0.740	.
(15) Countrywide Pure Premium:	2.301	0.883	3.185
(16) Countrywide Indicated Relativity:	0.899	0.767	.
(17) Countrywide Credibility:	0.180	0.130	.
(18) Countrywide Lost-Time Claims:	1887.0	.	.
(19) Pure Premium Underlying Present Rate:	2.328	0.747	3.075
(20) Relativity to Underlying Present Rate:	0.962	0.708	.
(21) Credibility to Underlying Relativity:	0.180	0.130	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.966	0.750	.
(24) Balanced Formula Relativity:	0.970	0.748	0.900

Class(es):		Effective: 7/1/2020							Construction		
5402 HOTHOUSE ERECTION - 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)
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	3,835	3,835	0,000	0,955	0,955
2016	4,179	0	1	0	0	0	1,799	1,799	0,000	0,431	0,431
2017	6,876	0	1	0	13,393	0	9,130	22,523	1,948	1,328	3,276
MA Total:	23,126	0	5	0	13,393	0	17,567	30,960	0,579	0,760	1,339

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.222	0.640	.
(14) Massachusetts Credibility:	0.090	0.120	.
(15) Countrywide Pure Premium:	6.142	1.612	7.754
(16) Countrywide Indicated Relativity:	2.398	1.400	.
(17) Countrywide Credibility:	0.220	0.230	.
(18) Countrywide Lost-Time Claims:	25,000	.	.
(19) Pure Premium Underlying Present Rate:	2.569	1.415	3.984
(20) Relativity to Underlying Present Rate:	1.062	1.343	.
(21) Credibility to Underlying Relativity:	0.690	0.650	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.280	1.272	.
(24) Balanced Formula Relativity:	1.286	1.269	1.280

IX 000182

Calculation of Class Relativities

Class(es): 5403 CARPENTRY NOC		Effective: 7/1/2020							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)
2013	1,339,492	13	201	1,871,060	3,808,735	385,645	1,810,466	7,875,906	4,240	1,640	5,880
2014	1,563,822	21	221	2,040,224	4,217,155	641,608	1,873,645	8,772,632	4,001	1,608	5,610
2015	1,767,930	15	229	3,445,671	4,527,654	729,663	1,974,729	10,677,718	4,510	1,530	6,040
2016	2,025,746	24	254	5,567,220	8,096,333	2,934,497	3,150,047	19,748,097	6,745	3,004	9,749
2017	2,200,181	12	276	2,886,474	6,311,570	1,113,284	3,699,202	14,010,530	4,181	2,187	6,368
MA Total:	8,897,171	85	1,181	15,810,649	26,961,447	5,804,697	12,508,090	61,084,883	4,807	2,058	6,866

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.846	1.734	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.224	1.539	4.763
(16) Countrywide Indicated Relativity:	1.259	1.336	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7290.0	.	.
(19) Pure Premium Underlying Present Rate:	4.137	1.518	5.655
(20) Relativity to Underlying Present Rate:	1.710	1.440	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.846	1.734	.
(24) Balanced Formula Relativity:	1.854	1.730	1.815

Class(es): 5437 CARPENTRY-INSTALL OF CABINET WORK OR INT TRIM		Effective: 7/1/2020							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)
2013	2,415,108	19	247	1,951,241	4,675,128	906,139	2,044,302	9,576,810	2,744	1,222	3,965
2014	2,590,019	15	245	2,183,410	5,004,933	683,788	1,946,639	9,818,769	2,775	1,016	3,791
2015	2,829,086	10	233	1,563,970	4,775,134	464,043	2,292,590	9,095,736	2,241	0,974	3,215
2016	2,952,964	7	227	2,015,260	3,779,835	821,944	2,013,987	8,631,026	1,962	0,960	2,923
2017	3,169,263	14	277	2,512,131	4,609,363	820,255	2,332,636	10,274,386	2,247	0,995	3,242
MA Total:	13,956,440	65	1,229	10,226,011	22,844,393	3,696,169	10,630,154	47,396,727	2,370	1,027	3,396

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.910	0.865	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.154	1.379	4.534
(16) Countrywide Indicated Relativity:	1.232	1.198	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	4928.0	.	.
(19) Pure Premium Underlying Present Rate:	2.388	0.933	3.321
(20) Relativity to Underlying Present Rate:	0.987	0.886	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.910	0.865	.
(24) Balanced Formula Relativity:	0.914	0.863	0.898

IX 000183

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 112

Calculation of Class Relativities

Class(es): 5443 LATHING & DRIVERS		Effective: 7/1/2020							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)
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
2016	133	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	671	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	3,435	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:	0.030	0.040	.
(15) Countrywide Pure Premium:	2.432	1.005	3.437
(16) Countrywide Indicated Relativity:	0.950	0.872	.
(17) Countrywide Credibility:	0.420	0.440	.
(18) Countrywide Lost-Time Claims:	132.00	.	.
(19) Pure Premium Underlying Present Rate:	1.647	0.745	2.392
(20) Relativity to Underlying Present Rate:	0.681	0.707	.
(21) Credibility to Underlying Relativity:	0.550	0.520	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.773	0.752	.
(24) Balanced Formula Relativity:	0.777	0.750	0.768

Class(es): 5445 WALLBOARD INSTALLATION WITHIN BUILDINGS & DR		Effective: 7/1/2020							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)
2013	1,928,284	9	197	2,271,479	5,018,697	363,653	2,115,985	9,769,813	3,781	1,286	5,067
2014	2,481,343	15	230	3,264,791	6,037,242	843,085	2,325,738	12,470,856	3,749	1,277	5,026
2015	2,270,090	14	157	3,950,412	5,244,629	1,440,278	2,010,617	12,645,935	4,051	1,520	5,571
2016	2,105,067	11	158	3,292,717	4,208,456	1,002,528	1,621,271	10,124,972	3,563	1,246	4,810
2017	2,810,069	15	164	2,266,552	6,771,872	664,585	2,657,982	12,360,991	3,216	1,182	4,399
MA Total:	11,594,854	64	906	15,045,950	27,280,895	4,314,129	10,731,592	57,372,567	3,650	1,298	4,948

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.402	1.093	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.318	1.313	4.632
(16) Countrywide Indicated Relativity:	1.296	1.140	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	4622.0	.	.
(19) Pure Premium Underlying Present Rate:	3.354	1.150	4.505
(20) Relativity to Underlying Present Rate:	1.386	1.092	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.402	1.093	.
(24) Balanced Formula Relativity:	1.408	1.091	1.309

IX 000184

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	489,969	6	71	1,268,786	951,250	367,717	369,243	2,956,996	4,531	1,504	6,035
2014	625,998	2	79	710,097	782,033	187,549	344,430	2,024,108	2,384	0,850	3,233
2015	647,381	4	91	982,281	2,136,989	190,988	844,253	4,154,511	4,818	1,599	6,417
2016	666,300	2	77	318,412	950,036	73,025	457,515	1,798,988	1,904	0,796	2,700
2017	727,074	5	86	816,737	1,281,923	260,067	892,020	3,250,747	2,886	1,585	4,471
MA Total:	3,156,722	19	404	4,096,313	6,102,231	1,079,346	2,907,461	14,185,351	3,231	1,263	4,494

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.241	1.064	.
(14) Massachusetts Credibility:	0.690	0.830	.
(15) Countrywide Pure Premium:	3.182	1.435	4.618
(16) Countrywide Indicated Relativity:	1.243	1.246	.
(17) Countrywide Credibility:	0.160	0.090	.
(18) Countrywide Lost-Time Claims:	1519.0	.	.
(19) Pure Premium Underlying Present Rate:	3.387	1.187	4.574
(20) Relativity to Underlying Present Rate:	1.400	1.126	.
(21) Credibility to Underlying Relativity:	0.150	0.080	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.265	1.085	.
(24) Balanced Formula Relativity:	1.270	1.083	1.212

Class(es):		Effective: 7/1/2020							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)
2013	122,203	1	18	435,654	626,210	75,816	251,538	1,389,218	8,689	2,679	11,368
2014	144,765	2	10	154,721	130,689	71,071	49,463	405,943	1,972	0,833	2,804
2015	158,535	2	15	669,497	658,818	214,069	129,887	1,672,271	8,379	2,170	10,548
2016	130,859	4	5	380,059	742,210	306,278	115,899	1,544,445	8,576	3,226	11,802
2017	135,197	0	6	0	222,776	0	132,063	354,840	1,648	0,977	2,625
MA Total:	691,559	9	54	1,639,931	2,380,703	667,233	678,850	5,366,717	5,814	1,946	7,760

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.233	1.639	.
(14) Massachusetts Credibility:	0.430	0.520	.
(15) Countrywide Pure Premium:	3.027	1.311	4.338
(16) Countrywide Indicated Relativity:	1.182	1.138	.
(17) Countrywide Credibility:	0.290	0.240	.
(18) Countrywide Lost-Time Claims:	126.00	.	.
(19) Pure Premium Underlying Present Rate:	4.767	1.713	6.480
(20) Relativity to Underlying Present Rate:	1.970	1.625	.
(21) Credibility to Underlying Relativity:	0.280	0.240	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.855	1.516	.
(24) Balanced Formula Relativity:	1.862	1.513	1.753

IX 000185

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction			
5473 ASBESTOS REMOVAL OP: ASBESTOS CONTRCTR-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)	
2013	249,930	5	32	1,236,346	434,502	328,427	277,478	2,276,754	6,685	2,424	9,110	
2014	317,963	4	28	446,859	540,181	506,874	208,170	1,702,085	3,104	2,249	5,353	
2015	330,037	10	30	2,041,266	1,501,776	1,293,086	424,246	5,260,374	10,735	5,203	15,939	
2016	382,897	1	19	523,406	782,982	83,662	408,719	1,798,769	3,412	1,286	4,698	
2017	416,441	4	42	797,731	1,211,542	299,769	699,524	3,008,566	4,825	2,400	7,224	
MA Total:	1,697,269	24	151	5,045,610	4,470,983	2,511,817	2,018,137	14,046,547	5,607	2,669	8,276	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.153	2.248	.
(14) Massachusetts Credibility:	0.660	0.920	.
(15) Countrywide Pure Premium:	4.702	2.135	6.837
(16) Countrywide Indicated Relativity:	1.836	1.853	.
(17) Countrywide Credibility:	0.170	0.040	.
(18) Countrywide Lost-Time Claims:	491.00	.	.
(19) Pure Premium Underlying Present Rate:	5.675	2.873	8.547
(20) Relativity to Underlying Present Rate:	2.345	2.726	.
(21) Credibility to Underlying Relativity:	0.170	0.040	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	2.132	2.251	.
(24) Balanced Formula Relativity:	2.141	2.247	2.174

Class(es):		Effective: 7/1/2020							Construction			
5474 PAINTING OR PAPERHANGING NOC & SHOP OPERS, 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)	
2013	2,879,435	17	171	2,192,036	3,751,072	895,527	1,986,923	8,825,558	2,064	1,001	3,065	
2014	3,219,565	18	163	2,071,436	4,670,589	935,643	2,319,636	9,997,303	2,094	1,011	3,105	
2015	3,778,904	22	190	3,302,024	5,363,728	994,350	2,959,009	12,619,111	2,293	1,046	3,339	
2016	3,783,365	20	151	2,885,748	4,703,613	1,391,843	1,956,229	10,937,433	2,006	0,885	2,891	
2017	4,068,864	16	194	3,150,238	8,306,511	878,052	3,389,962	15,724,763	2,816	1,049	3,865	
MA Total:	17,730,133	93	869	13,601,482	26,795,513	5,095,415	12,611,758	58,104,169	2,278	0,999	3,277	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.875	0.841	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.956	1.347	4.303
(16) Countrywide Indicated Relativity:	1.154	1.169	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	5752.0	.	.
(19) Pure Premium Underlying Present Rate:	2.120	1.021	3.141
(20) Relativity to Underlying Present Rate:	0.876	0.969	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.875	0.841	.
(24) Balanced Formula Relativity:	0.879	0.840	0.867

IX 000186

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	674,847	3	53	213,916	674,643	143,672	269,215	1,301,446	1,317	0,612	1,929
2014	713,435	6	58	724,509	727,886	234,411	356,983	2,043,789	2,036	0,829	2,865
2015	816,411	3	54	417,053	1,434,420	98,144	360,641	2,310,258	2,268	0,562	2,830
2016	765,244	4	61	435,149	2,424,040	251,508	704,058	3,814,756	3,736	1,249	4,985
2017	843,181	0	48	0	1,931,612	0	573,016	2,504,628	2,291	0,680	2,970
MA Total:	3,813,117	16	274	1,790,627	7,192,602	727,735	2,263,913	11,974,877	2,356	0,785	3,140

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.905	0.661	.
(14) Massachusetts Credibility:	0.640	0.750	.
(15) Countrywide Pure Premium:	2.419	0.824	3.243
(16) Countrywide Indicated Relativity:	0.944	0.715	.
(17) Countrywide Credibility:	0.180	0.130	.
(18) Countrywide Lost-Time Claims:	1206.0	.	.
(19) Pure Premium Underlying Present Rate:	2.340	0.757	3.096
(20) Relativity to Underlying Present Rate:	0.967	0.718	.
(21) Credibility to Underlying Relativity:	0.180	0.120	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.923	0.675	.
(24) Balanced Formula Relativity:	0.927	0.674	0.848

Class(es):		Effective: 7/1/2020							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)
2013	393,554	2	84	85,682	1,712,988	39,218	534,323	2,372,211	4,570	1,457	6,028
2014	489,797	8	101	1,196,697	591,011	274,872	315,667	2,378,246	3,650	1,206	4,856
2015	552,591	1	89	130,837	893,783	41,173	455,305	1,521,098	1,854	0,898	2,753
2016	535,612	2	66	332,621	1,513,037	208,769	472,860	2,527,287	3,446	1,273	4,718
2017	586,405	0	84	0	1,228,170	0	587,583	1,815,753	2,094	1,002	3,096
MA Total:	2,557,959	13	424	1,745,837	5,938,990	564,031	2,365,737	10,614,596	3,004	1,145	4,150

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.154	0.965	.
(14) Massachusetts Credibility:	0.650	0.840	.
(15) Countrywide Pure Premium:	2.802	1.376	4.178
(16) Countrywide Indicated Relativity:	1.094	1.194	.
(17) Countrywide Credibility:	0.180	0.080	.
(18) Countrywide Lost-Time Claims:	1581.0	.	.
(19) Pure Premium Underlying Present Rate:	3.591	1.528	5.119
(20) Relativity to Underlying Present Rate:	1.484	1.450	.
(21) Credibility to Underlying Relativity:	0.170	0.080	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.199	1.022	.
(24) Balanced Formula Relativity:	1.204	1.020	1.147

IX 000187

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 116

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction		
5480 PLASTERING 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)
2013	390,786	2	23	523,518	445,127	268,972	280,272	1,517,890	2,479	1,405	3,884
2014	422,667	3	18	314,218	105,096	66,058	55,482	540,855	0,992	0,288	1,280
2015	475,707	0	28	0	2,748,432	0	744,707	3,493,139	5,778	1,565	7,343
2016	549,467	1	30	289,159	1,113,846	49,933	464,226	1,917,164	2,553	0,936	3,489
2017	558,154	2	34	179,277	1,049,910	300,896	499,018	2,029,101	2,202	1,433	3,635
MA Total:	2,396,780	8	133	1,306,172	5,462,411	685,859	2,043,706	9,498,148	2,824	1,139	3,963

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.085	0.959	.
(14) Massachusetts Credibility:	0.520	0.630	.
(15) Countrywide Pure Premium:	3.574	1.280	4.854
(16) Countrywide Indicated Relativity:	1.396	1.111	.
(17) Countrywide Credibility:	0.240	0.190	.
(18) Countrywide Lost-Time Claims:	146.00	.	.
(19) Pure Premium Underlying Present Rate:	2.192	0.796	2.988
(20) Relativity to Underlying Present Rate:	0.906	0.755	.
(21) Credibility to Underlying Relativity:	0.240	0.180	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.116	0.951	.
(24) Balanced Formula Relativity:	1.121	0.950	1.067

Class(es):		Effective: 7/1/2020							Construction		
5506 STREET OR ROAD CONSTRUCTION: PAVING OR REPAVING & 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)
2013	507,855	0	38	0	136,582	0	194,619	331,201	0,269	0,383	0,652
2014	604,604	5	47	1,045,245	511,492	219,628	525,009	2,301,375	2,575	1,232	3,806
2015	648,708	2	37	754,265	664,320	129,683	334,116	1,882,384	2,187	0,715	2,902
2016	668,156	3	32	599,686	1,262,191	155,206	563,790	2,580,872	2,787	1,076	3,863
2017	682,534	7	49	2,438,603	444,675	874,929	214,399	3,972,606	4,224	1,596	5,820
MA Total:	3,111,856	17	203	4,837,799	3,019,259	1,379,447	1,831,933	11,068,438	2,525	1,032	3,557

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.970	0.869	.
(14) Massachusetts Credibility:	0.630	0.810	.
(15) Countrywide Pure Premium:	3.137	1.478	4.615
(16) Countrywide Indicated Relativity:	1.225	1.283	.
(17) Countrywide Credibility:	0.190	0.100	.
(18) Countrywide Lost-Time Claims:	4464.0	.	.
(19) Pure Premium Underlying Present Rate:	2.719	1.125	3.844
(20) Relativity to Underlying Present Rate:	1.123	1.068	.
(21) Credibility to Underlying Relativity:	0.180	0.090	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.046	0.928	.
(24) Balanced Formula Relativity:	1.050	0.927	1.012

IX 000188

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	203,031	0	19	0	285,974	0	84,819	370,792	1,409	0,418	1,826
2014	238,372	0	19	0	650,475	0	104,786	755,260	2,729	0,440	3,168
2015	286,570	0	20	0	470,584	0	180,046	650,629	1,642	0,628	2,270
2016	185,186	0	14	0	2,106,284	0	464,725	2,571,008	11,374	2,509	13,883
2017	182,553	2	18	885,221	260,509	303,643	181,723	1,631,095	6,276	2,659	8,935
MA Total:	1,095,713	2	90	885,221	3,773,824	303,643	1,016,098	5,978,785	4,252	1,204	5,457

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.633	1.014	.
(14) Massachusetts Credibility:	0.420	0.560	.
(15) Countrywide Pure Premium:	2.393	0.968	3.361
(16) Countrywide Indicated Relativity:	0.934	0.840	.
(17) Countrywide Credibility:	0.290	0.220	.
(18) Countrywide Lost-Time Claims:	1439.0	.	.
(19) Pure Premium Underlying Present Rate:	2.850	1.288	4.138
(20) Relativity to Underlying Present Rate:	1.178	1.223	.
(21) Credibility to Underlying Relativity:	0.290	0.220	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.298	1.022	.
(24) Balanced Formula Relativity:	1.304	1.020	1.215

Class(es):		Effective: 7/1/2020							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)
2013	49,458	0	12	0	8,021	0	6,986	15,008	0,162	0,141	0,303
2014	62,924	0	8	0	10,479	0	17,524	28,003	0,167	0,278	0,445
2015	62,088	1	17	7,042	287,375	17,467	161,712	473,597	4,742	2,886	7,628
2016	69,565	0	17	0	511,718	0	107,035	618,753	7,356	1,539	8,895
2017	57,168	1	6	289,642	214,762	79,997	71,608	656,009	8,823	2,652	11,475
MA Total:	301,203	2	60	296,684	1,032,355	97,464	364,866	1,791,369	4,412	1,535	5,947

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.695	1.293	.
(14) Massachusetts Credibility:	0.210	0.320	.
(15) Countrywide Pure Premium:	2.154	1.284	3.438
(16) Countrywide Indicated Relativity:	0.841	1.115	.
(17) Countrywide Credibility:	0.400	0.340	.
(18) Countrywide Lost-Time Claims:	482.00	.	.
(19) Pure Premium Underlying Present Rate:	1.883	1.127	3.010
(20) Relativity to Underlying Present Rate:	0.778	1.070	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.996	1.156	.
(24) Balanced Formula Relativity:	1.000	1.154	1.048

IX 000189

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	1,963,092	16	250	2,011,060	1,809,810	629,838	1,015,448	5,466,157	1,946	0,838	2,784	
2014	2,228,677	17	284	3,041,313	2,829,598	1,066,747	1,881,643	8,819,302	2,634	1,323	3,957	
2015	2,515,073	7	282	1,746,051	2,951,692	325,594	1,614,446	6,637,783	1,868	0,771	2,639	
2016	2,631,060	9	253	2,106,278	4,253,451	612,720	2,058,119	9,030,568	2,417	1,015	3,432	
2017	2,803,209	12	310	2,636,028	4,898,583	1,379,382	2,567,814	11,481,807	2,688	1,408	4,096	
MA Total:	12,141,111	61	1,379	11,540,730	16,743,134	4,014,282	9,137,470	41,435,616	2,330	1,083	3,413	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.895	0.912	.
(14) Massachusetts Credibility:	0.950	1.000	.
(15) Countrywide Pure Premium:	3.354	1.320	4.674
(16) Countrywide Indicated Relativity:	1.310	1.146	.
(17) Countrywide Credibility:	0.030	0.000	.
(18) Countrywide Lost-Time Claims:	300.00	.	.
(19) Pure Premium Underlying Present Rate:	1.954	0.868	2.822
(20) Relativity to Underlying Present Rate:	0.808	0.823	.
(21) Credibility to Underlying Relativity:	0.020	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.905	0.912	.
(24) Balanced Formula Relativity:	0.909	0.911	0.910

Class(es):		Effective: 7/1/2020							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)	
2013	150,685	3	36	345,845	604,645	161,881	484,565	1,596,936	6,308	4,290	10,598	
2014	140,439	11	42	2,277,645	1,172,922	1,819,457	1,031,295	6,301,320	24,570	20,299	44,869	
2015	214,239	13	31	2,626,369	2,104,940	1,492,850	1,148,574	7,372,732	22,084	12,329	34,414	
2016	212,864	9	49	2,625,021	2,880,679	1,903,286	1,736,321	9,145,306	25,865	17,098	42,963	
2017	184,466	10	30	2,308,730	1,334,906	1,757,206	860,523	6,261,365	19,752	14,191	33,943	
MA Total:	902,693	46	188	10,183,610	8,098,092	7,134,680	5,261,278	30,677,660	20,252	13,732	33,985	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	7.778	11.566	.
(14) Massachusetts Credibility:	0.780	1.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	6.361	9.073	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	16.113	10.192	26.305
(20) Relativity to Underlying Present Rate:	6.658	9.672	.
(21) Credibility to Underlying Relativity:	0.220	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	7.532	11.566	.
(24) Balanced Formula Relativity:	7.564	11.544	8.811

IX 000190

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction		
5547 ROOFING-BUILT UP - 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)
2013	528,602	3	68	831,913	1,936,521	245,871	1,548,577	4,562,882	5,237	3,395	8,632
2014	613,150	13	63	2,870,347	581,671	1,538,864	468,878	5,459,759	5,630	3,274	8,904
2015	646,862	8	70	2,030,658	1,709,475	2,162,493	728,533	6,631,159	5,782	4,469	10,251
2016	662,932	8	65	1,344,927	4,090,114	1,009,759	2,071,275	8,516,076	8,198	4,648	12,846
2017	679,748	1	70	102,747	1,613,651	64,857	699,439	2,480,694	2,525	1,124	3,649
MA Total:	3,131,294	33	336	7,180,592	9,931,433	5,021,844	5,516,702	27,650,570	5,465	3,366	8,830

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.099	2.835	.
(14) Massachusetts Credibility:	0.810	1.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.031	2.931	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	5.144	3.293	8.437
(20) Relativity to Underlying Present Rate:	2.126	3.125	.
(21) Credibility to Underlying Relativity:	0.190	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	2.104	2.835	.
(24) Balanced Formula Relativity:	2.113	2.829	2.337

Class(es):		Effective: 7/1/2020							Construction		
5606 CONTRACTOR-EXECUTIVE SUPERVISOR OR CONSTRUCT SUPERINTENDENT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	5,908,614	10	163	1,242,000	2,364,402	1,004,590	1,308,584	5,919,576	0.610	0.391	1.002
2014	6,626,672	10	179	1,988,516	2,140,316	953,595	1,330,674	6,413,101	0.623	0.345	0.968
2015	7,542,864	14	178	3,201,278	1,652,474	1,222,565	1,520,035	7,596,351	0.643	0.364	1.007
2016	8,125,654	12	132	2,482,332	3,470,313	967,862	2,060,652	8,981,159	0.733	0.373	1.105
2017	8,734,250	15	150	3,062,946	3,795,908	1,319,820	2,808,222	10,986,896	0.785	0.473	1.258
MA Total:	36,938,054	61	802	11,977,071	13,423,413	5,468,433	9,028,168	39,897,084	0.688	0.392	1.080

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.264	0.331	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.530	0.241	0.771
(16) Countrywide Indicated Relativity:	0.207	0.209	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	3770.0	.	.
(19) Pure Premium Underlying Present Rate:	0.731	0.355	1.086
(20) Relativity to Underlying Present Rate:	0.302	0.337	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.264	0.331	.
(24) Balanced Formula Relativity:	0.265	0.330	0.285

IX 000191

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction		
5610 CLEANER - DEBRIS REMOVAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	365,358	2	30	312,020	747,479	34,014	309,466	1,402,979	2,900	0,940	3,840
2014	503,061	4	43	852,228	757,443	100,855	252,711	1,963,236	3,200	0,703	3,903
2015	584,074	2	47	179,000	1,645,967	9,804	452,471	2,287,241	3,125	0,791	3,916
2016	655,412	6	38	1,331,021	171,610	497,679	152,035	2,152,344	2,293	0,991	3,284
2017	655,469	0	38	0	764,144	0	278,038	1,042,182	1,166	0,424	1,590
MA Total:	2,763,374	14	196	2,674,268	4,086,643	642,352	1,444,719	8,847,982	2,447	0,755	3,202

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.940	0.636	.
(14) Massachusetts Credibility:	0.640	0.720	.
(15) Countrywide Pure Premium:	2.360	1.070	3.431
(16) Countrywide Indicated Relativity:	0.922	0.929	.
(17) Countrywide Credibility:	0.180	0.140	.
(18) Countrywide Lost-Time Claims:	522.00	.	.
(19) Pure Premium Underlying Present Rate:	3.254	0.944	4.198
(20) Relativity to Underlying Present Rate:	1.345	0.896	.
(21) Credibility to Underlying Relativity:	0.180	0.140	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.009	0.714	.
(24) Balanced Formula Relativity:	1.014	0.712	0.919

Class(es):		Effective: 7/1/2020							Construction		
5645 CARPENTRY-DETACHED ONE OR TWO FAMILY DWELLINGS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	4,950,258	52	659	8,658,274	12,588,711	4,427,138	7,728,506	33,402,629	4,292	2,456	6,748
2014	5,446,691	49	671	7,277,721	11,430,544	3,812,420	7,580,818	30,101,503	3,435	2,092	5,527
2015	6,226,683	64	710	9,692,843	13,052,655	4,821,042	7,891,420	35,457,960	3,653	2,042	5,695
2016	6,634,951	36	674	5,837,103	15,756,890	2,274,967	10,144,660	34,013,620	3,255	1,872	5,126
2017	7,028,832	50	681	7,935,414	15,632,029	4,791,985	8,769,648	37,129,075	3,353	1,929	5,282
MA Total:	30,287,414	251	3,395	39,401,356	68,460,829	20,127,551	42,115,052	170,104,788	3,561	2,055	5,616

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.368	1.731	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	5.441	2.741	8.183
(16) Countrywide Indicated Relativity:	2.125	2.380	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	13480	.	.
(19) Pure Premium Underlying Present Rate:	3.410	1.834	5.243
(20) Relativity to Underlying Present Rate:	1.409	1.740	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.368	1.731	.
(24) Balanced Formula Relativity:	1.374	1.728	1.484

IX 000192

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 121

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction		
5701 WRECKING: BUILDING OR STRUCTURES-NOT MARINE- 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)
2013	22,579	0	3	0	283,241	0	74,364	357,604	12,545	3,294	15,838
2014	52,257	0	10	0	169,890	0	99,034	268,924	3,251	1,895	5,146
2015	92,614	2	5	594,976	926,280	629,253	579,471	2,729,980	16,426	13,051	29,477
2016	77,673	0	13	0	117,761	0	50,528	168,289	1,516	0,651	2,167
2017	49,330	0	6	0	801,476	0	235,201	1,036,677	16,247	4,768	21,015
MA Total:	294,453	2	37	594,976	2,298,648	629,253	1,038,597	4,561,475	9,827	5,664	15,491

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.774	4.771	.
(14) Massachusetts Credibility:	0.410	0.630	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	3.830	5.795	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	9.702	6.510	16.212
(20) Relativity to Underlying Present Rate:	4.009	6.178	.
(21) Credibility to Underlying Relativity:	0.590	0.370	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	3.913	5.291	.
(24) Balanced Formula Relativity:	3.929	5.281	4.353

Class(es):		Effective: 7/1/2020							Construction		
5703 BUILDING RAISING OR MOVING & 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)
2013	8,169	0	1	0	74,501	0	34,988	109,489	9,120	4,283	13,404
2014	12,331	0	1	0	0	0	1,513	1,513	0,000	0,123	0,123
2015	11,512	0	0	0	0	0	0	0	0,000	0,000	0,000
2016	15,821	0	0	0	0	0	0	0	0,000	0,000	0,000
2017	14,884	0	1	0	14,174	0	7,206	21,380	0,952	0,484	1,436
MA Total:	62,717	0	3	0	88,675	0	43,706	132,381	1,414	0,697	2,111

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.543	0.587	.
(14) Massachusetts Credibility:	0.180	0.230	.
(15) Countrywide Pure Premium:	8.851	3.804	12.655
(16) Countrywide Indicated Relativity:	3.456	3.303	.
(17) Countrywide Credibility:	0.240	0.260	.
(18) Countrywide Lost-Time Claims:	33.000	.	.
(19) Pure Premium Underlying Present Rate:	5.955	2.326	8.281
(20) Relativity to Underlying Present Rate:	2.461	2.207	.
(21) Credibility to Underlying Relativity:	0.580	0.510	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	2.355	2.119	.
(24) Balanced Formula Relativity:	2.365	2.116	2.287

IX 000193

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
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
2016	1,952	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	247	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	4,615	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:	1.449	0.673	2.122
(16) Countrywide Indicated Relativity:	0.566	0.584	.
(17) Countrywide Credibility:	0.150	0.160	.
(18) Countrywide Lost-Time Claims:	10.000	.	.
(19) Pure Premium Underlying Present Rate:	6.624	2.931	9.555
(20) Relativity to Underlying Present Rate:	2.737	2.781	.
(21) Credibility to Underlying Relativity:	0.780	0.750	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	2.220	2.180	.
(24) Balanced Formula Relativity:	2.229	2.175	2.212

Class(es):		Effective: 7/1/2020							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)
2013	70,991	0	5	0	738,686	0	199,999	938,685	10,405	2,817	13,223
2014	67,323	1	9	248,892	46,268	205,702	14,176	515,037	4,384	3,266	7,650
2015	105,183	0	7	0	850,041	0	317,692	1,167,733	8,082	3,020	11,102
2016	89,447	1	11	25,155	287,294	2,953	187,927	503,330	3,493	2,134	5,627
2017	66,261	0	1	0	0	0	115	115	0.000	0.002	0.002
MA Total:	399,206	2	33	274,047	1,922,288	208,655	719,909	3,124,899	5,502	2,326	7,828

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.113	1.959	.
(14) Massachusetts Credibility:	0.350	0.430	.
(15) Countrywide Pure Premium:	3.944	1.265	5.209
(16) Countrywide Indicated Relativity:	1.540	1.098	.
(17) Countrywide Credibility:	0.330	0.290	.
(18) Countrywide Lost-Time Claims:	129.00	.	.
(19) Pure Premium Underlying Present Rate:	4.960	1.811	6.771
(20) Relativity to Underlying Present Rate:	2.050	1.719	.
(21) Credibility to Underlying Relativity:	0.320	0.280	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.904	1.642	.
(24) Balanced Formula Relativity:	1.912	1.639	1.826

IX 000194

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 123

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction		
6204 DRILLING 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)
2013	126,747	0	14	0	28,671	0	28,033	56,703	0.226	0.221	0.447
2014	139,839	2	16	9,425	86,226	11,458	68,873	175,982	0.684	0.574	1.258
2015	195,434	2	21	107,165	1,044,141	56,718	442,904	1,650,928	5.891	2.556	8.447
2016	170,168	1	10	21,113	416,812	7,265	118,066	563,256	2.573	0.737	3.310
2017	193,354	0	9	0	99,642	0	50,409	150,051	0.515	0.261	0.776
MA Total:	825,542	5	70	137,703	1,675,491	75,440	708,286	2,596,920	2.196	0.949	3.146

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.844	0.800	.
(14) Massachusetts Credibility:	0.390	0.480	.
(15) Countrywide Pure Premium:	3.627	1.542	5.169
(16) Countrywide Indicated Relativity:	1.416	1.339	.
(17) Countrywide Credibility:	0.310	0.260	.
(18) Countrywide Lost-Time Claims:	802.00	.	.
(19) Pure Premium Underlying Present Rate:	3.144	1.185	4.329
(20) Relativity to Underlying Present Rate:	1.299	1.124	.
(21) Credibility to Underlying Relativity:	0.300	0.260	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.158	1.024	.
(24) Balanced Formula Relativity:	1.163	1.022	1.119

Class(es):		Effective: 7/1/2020							Construction		
6217 EXCAVATION & 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)
2013	3,220,635	15	258	2,434,558	4,035,574	886,689	2,518,267	9,875,087	2,009	1,057	3,066
2014	3,613,044	25	258	3,974,028	4,114,912	1,517,708	2,064,096	11,670,744	2,239	0,991	3,230
2015	4,100,090	18	269	4,199,481	5,831,262	1,327,364	2,379,175	13,737,282	2,446	0,904	3,350
2016	4,210,413	24	223	4,596,568	6,564,642	1,604,560	3,397,464	16,163,234	2,651	1,188	3,839
2017	4,612,848	23	256	5,064,842	7,387,127	1,799,013	3,449,153	17,700,135	2,699	1,138	3,837
MA Total:	19,757,031	105	1,264	20,269,476	27,933,517	7,135,334	13,808,155	69,146,482	2,440	1,060	3,500

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.937	0.893	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.318	0.987	3.306
(16) Countrywide Indicated Relativity:	0.905	0.857	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	6275.0	.	.
(19) Pure Premium Underlying Present Rate:	2.069	0.912	2.980
(20) Relativity to Underlying Present Rate:	0.855	0.865	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.937	0.893	.
(24) Balanced Formula Relativity:	0.941	0.891	0.925

IX 000195

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	347,091	3	30	228,716	351,858	201,522	121,077	903,172	1,673	0,929	2,602
2014	338,517	4	22	650,614	336,899	164,268	257,295	1,409,076	2,917	1,245	4,162
2015	390,871	1	21	60,485	549,878	5,620	185,813	801,797	1,562	0,490	2,051
2016	415,725	2	15	313,903	259,453	240,693	134,166	948,216	1,379	0,902	2,281
2017	454,727	1	34	760,566	639,617	107,275	308,297	1,815,756	3,079	0,914	3,993
MA Total:	1,946,931	11	122	2,014,285	2,137,704	719,379	1,006,649	5,878,017	2,133	0,887	3,019

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.819	0.747	.
(14) Massachusetts Credibility:	0.460	0.580	.
(15) Countrywide Pure Premium:	2.287	1.176	3.462
(16) Countrywide Indicated Relativity:	0.893	1.021	.
(17) Countrywide Credibility:	0.270	0.210	.
(18) Countrywide Lost-Time Claims:	609.00	.	.
(19) Pure Premium Underlying Present Rate:	2.001	0.791	2.793
(20) Relativity to Underlying Present Rate:	0.827	0.751	.
(21) Credibility to Underlying Relativity:	0.270	0.210	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.841	0.805	.
(24) Balanced Formula Relativity:	0.845	0.804	0.832

Class(es):		Effective: 7/1/2020							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)
2013	11,870	0	1	0	0	0	908	908	0,000	0,076	0,076
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
2016	72,927	0	0	0	0	0	0	0	0,000	0,000	0,000
2017	21,267	0	0	0	0	0	0	0	0,000	0,000	0,000
MA Total:	164,834	0	1	0	0	0	908	908	0,000	0,006	0,006

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.005	.
(14) Massachusetts Credibility:	0.150	0.170	.
(15) Countrywide Pure Premium:	1.610	0.597	2.208
(16) Countrywide Indicated Relativity:	0.629	0.519	.
(17) Countrywide Credibility:	0.430	0.420	.
(18) Countrywide Lost-Time Claims:	541.00	.	.
(19) Pure Premium Underlying Present Rate:	1.425	0.462	1.887
(20) Relativity to Underlying Present Rate:	0.589	0.438	.
(21) Credibility to Underlying Relativity:	0.420	0.410	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.518	0.398	.
(24) Balanced Formula Relativity:	0.520	0.397	0.482

IX 000196

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 125

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
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
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	235	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	235	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	0.020	.
(15) Countrywide Pure Premium:	1.399	0.641	2.040
(16) Countrywide Indicated Relativity:	0.546	0.557	.
(17) Countrywide Credibility:	0.240	0.260	.
(18) Countrywide Lost-Time Claims:	34.000	.	.
(19) Pure Premium Underlying Present Rate:	3.111	0.763	3.875
(20) Relativity to Underlying Present Rate:	1.286	0.724	.
(21) Credibility to Underlying Relativity:	0.750	0.720	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.095	0.666	.
(24) Balanced Formula Relativity:	1.100	0.665	0.964

Class(es):		Effective: 7/1/2020							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)
2013	20.692	0	1	0	0	0	326	326	0.000	0.016	0.016
2014	34.212	0	2	0	0	0	3,509	3,509	0.000	0.103	0.103
2015	26.212	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	80.775	1	6	14.475	172.423	2.070	123.974	312.942	2.314	1.560	3.874
2017	50.464	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	212,355	1	9	14.475	172.423	2.070	127.809	316.777	0.880	0.612	1.492

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.338	0.515	.
(14) Massachusetts Credibility:	0.260	0.330	.
(15) Countrywide Pure Premium:	2.695	0.792	3.487
(16) Countrywide Indicated Relativity:	1.052	0.688	.
(17) Countrywide Credibility:	0.340	0.340	.
(18) Countrywide Lost-Time Claims:	75.000	.	.
(19) Pure Premium Underlying Present Rate:	4.406	1.722	6.128
(20) Relativity to Underlying Present Rate:	1.821	1.634	.
(21) Credibility to Underlying Relativity:	0.400	0.330	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.174	0.943	.
(24) Balanced Formula Relativity:	1.179	0.941	1.105

IX 000197

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 126

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Construction			
6306 SEWER CONSTRUCTION - ALL 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)	
2013	222,933	3	22	684,795	130,886	504,654	143,514	1,463,850	3,659	2,907	6,566	
2014	245,910	3	30	512,180	497,413	289,991	185,876	1,485,460	4,106	1,935	6,041	
2015	264,977	2	29	325,498	997,993	48,280	334,360	1,706,131	4,995	1,444	6,439	
2016	276,027	5	26	1,346,813	943,633	237,113	229,129	2,756,688	8,298	1,689	9,987	
2017	247,397	1	22	133,073	368,417	28,907	237,765	768,162	2,027	1,078	3,105	
MA Total:	1,257,245	14	129	3,002,359	2,938,343	1,108,945	1,130,644	8,180,291	4,725	1,781	6,507	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.815	1.500	.
(14) Massachusetts Credibility:	0.520	0.660	.
(15) Countrywide Pure Premium:	2.660	1.225	3.885
(16) Countrywide Indicated Relativity:	1.039	1.064	.
(17) Countrywide Credibility:	0.240	0.170	.
(18) Countrywide Lost-Time Claims:	1432.0	.	.
(19) Pure Premium Underlying Present Rate:	4.310	1.678	5.989
(20) Relativity to Underlying Present Rate:	1.781	1.593	.
(21) Credibility to Underlying Relativity:	0.240	0.170	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.620	1.442	.
(24) Balanced Formula Relativity:	1.627	1.439	1.568

Class(es):		Effective: 7/1/2020							Construction			
6319 GAS MAIN OR CONNECTION 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)	
2013	637,794	1	29	108,624	253,318	29,991	284,177	676,110	0,567	0,493	1,060	
2014	707,483	3	30	272,585	606,757	116,140	231,155	1,226,638	1,243	0,491	1,734	
2015	833,161	3	35	860,513	1,503,418	420,528	561,446	3,345,905	2,837	1,179	4,016	
2016	969,569	2	53	355,812	1,412,791	88,454	624,504	2,481,560	1,824	0,735	2,559	
2017	910,675	2	23	381,087	1,191,001	51,728	433,899	2,057,714	1,726	0,533	2,260	
MA Total:	4,058,682	11	170	1,978,620	4,967,285	706,841	2,135,181	9,787,928	1,711	0,700	2,412	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.657	0.590	.
(14) Massachusetts Credibility:	0.590	0.800	.
(15) Countrywide Pure Premium:	1.662	0.804	2.465
(16) Countrywide Indicated Relativity:	0.649	0.698	.
(17) Countrywide Credibility:	0.210	0.100	.
(18) Countrywide Lost-Time Claims:	1458.0	.	.
(19) Pure Premium Underlying Present Rate:	1.773	0.852	2.625
(20) Relativity to Underlying Present Rate:	0.733	0.808	.
(21) Credibility to Underlying Relativity:	0.200	0.100	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.671	0.622	.
(24) Balanced Formula Relativity:	0.673	0.621	0.657

IX 000198

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 127

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	224,228	1	7	202,224	2,658	98,414	11,267	314,564	0.914	0.489	1.403
2014	245,517	1	14	104,786	327,009	24,382	178,690	634,868	1.759	0.827	2.586
2015	263,217	0	10	0	238,141	0	192,831	430,971	0.905	0.733	1.637
2016	261,444	2	8	220,628	882	16,392	18,653	256,555	0.847	0.134	0.981
2017	281,605	0	12	0	53,763	0	96,297	150,060	0.191	0.342	0.533
MA Total:	1,276,011	4	51	527,638	622,453	139,188	497,738	1,787,017	0.901	0.499	1.400

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.346	0.420	.
(14) Massachusetts Credibility:	0.370	0.470	.
(15) Countrywide Pure Premium:	1.964	0.863	2.827
(16) Countrywide Indicated Relativity:	0.767	0.750	.
(17) Countrywide Credibility:	0.320	0.270	.
(18) Countrywide Lost-Time Claims:	1307.0	.	.
(19) Pure Premium Underlying Present Rate:	1.815	0.710	2.525
(20) Relativity to Underlying Present Rate:	0.750	0.673	.
(21) Credibility to Underlying Relativity:	0.310	0.260	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.606	0.575	.
(24) Balanced Formula Relativity:	0.609	0.574	0.598

Class(es):		Effective: 7/1/2020							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)
2013	318,243	3	36	119,571	272,065	81,457	114,330	587,423	1.231	0.615	1.846
2014	314,443	1	42	392,708	275,306	237,640	123,417	1,029,070	2.124	1.148	3.273
2015	356,043	3	40	693,867	335,302	223,242	290,669	1,543,080	2.891	1.443	4.334
2016	386,842	4	47	755,530	342,062	292,356	759,214	2,149,162	2.837	2.718	5.556
2017	430,648	1	61	79,212	726,854	62,714	324,086	1,192,866	1.872	0.898	2.770
MA Total:	1,806,220	12	226	2,040,887	1,951,590	897,409	1,611,716	6,501,601	2.210	1.389	3.600

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.849	1.170	.
(14) Massachusetts Credibility:	0.480	0.640	.
(15) Countrywide Pure Premium:	3.079	1.337	4.416
(16) Countrywide Indicated Relativity:	1.202	1.161	.
(17) Countrywide Credibility:	0.260	0.180	.
(18) Countrywide Lost-Time Claims:	1008.0	.	.
(19) Pure Premium Underlying Present Rate:	2.392	1.092	3.484
(20) Relativity to Underlying Present Rate:	0.988	1.036	.
(21) Credibility to Underlying Relativity:	0.260	0.180	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.977	1.144	.
(24) Balanced Formula Relativity:	0.981	1.142	1.032

IX 000199

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	196.116	0	22	0	61.069	0	85.979	147.048	0.311	0.438	0.750
2014	219.374	0	19	0	12.272	0	24.093	36.365	0.056	0.110	0.166
2015	245.659	0	28	0	44.050	0	121.590	165.640	0.179	0.495	0.674
2016	266.057	2	29	65.632	548.387	153.654	406.124	1,173.797	2.308	2.104	4.412
2017	279.743	1	25	69.556	117.666	38.147	106.811	332.179	0.669	0.518	1.187
MA Total:	1,206,949	3	123	135,187	783,444	191,801	744,598	1,855,029	0.761	0.776	1.537

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.316	0.625	.
(14) Massachusetts Credibility:	0.290	0.430	.
(15) Countrywide Pure Premium:	1.500	0.913	2.413
(16) Countrywide Indicated Relativity:	0.656	0.782	.
(17) Countrywide Credibility:	0.360	0.290	.
(18) Countrywide Lost-Time Claims:	1000.0	.	.
(19) Pure Premium Underlying Present Rate:	1.022	0.589	1.611
(20) Relativity to Underlying Present Rate:	0.469	0.560	.
(21) Credibility to Underlying Relativity:	0.350	0.280	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.492	0.652	.
(24) Balanced Formula Relativity:	0.490	0.656	0.547

Class(es):		Effective: 7/1/2020							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)
2013	441.967	2	71	294.400	1,157.139	140.243	969.377	2,561.158	3.284	2.511	5.795
2014	448.125	3	46	264.719	251.366	241.425	209.186	966.695	1.152	1.006	2.157
2015	480.536	0	57	0	222.367	0	247.667	470.033	0.463	0.515	0.978
2016	483.859	3	48	1,022.311	113.158	344.923	186.702	1,667.094	2.347	1.099	3.445
2017	543.485	1	88	216.144	314.151	149.863	412.394	1,092.551	0.976	1.035	2.010
MA Total:	2,397.973	9	310	1,797.573	2,058.180	876.453	2,025.325	6,757.532	1.608	1.210	2.818

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.668	0.975	.
(14) Massachusetts Credibility:	0.470	0.730	.
(15) Countrywide Pure Premium:	1.608	1.089	2.697
(16) Countrywide Indicated Relativity:	0.703	0.932	.
(17) Countrywide Credibility:	0.270	0.140	.
(18) Countrywide Lost-Time Claims:	616.00	.	.
(19) Pure Premium Underlying Present Rate:	1.728	1.149	2.877
(20) Relativity to Underlying Present Rate:	0.793	1.093	.
(21) Credibility to Underlying Relativity:	0.260	0.130	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.710	0.984	.
(24) Balanced Formula Relativity:	0.708	0.990	0.804

IX 000200

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 129

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	2,845,116	52	505	6,399,009	9,105,148	2,770,106	4,778,204	23,052,467	5,449	2,653	8,102
2014	2,841,923	33	463	4,538,305	8,548,438	1,285,611	3,994,784	18,367,139	4,605	1,858	6,463
2015	3,113,630	43	411	7,266,415	8,511,616	2,300,448	3,865,341	21,943,819	5,067	1,980	7,048
2016	3,127,636	31	370	4,566,414	8,335,785	3,340,338	3,935,263	20,177,800	4,125	2,326	6,451
2017	3,146,633	32	398	6,222,534	8,767,303	1,860,238	3,456,424	20,306,499	4,764	1,690	6,453
MA Total:	15,074,937	191	2,147	28,992,677	43,268,290	11,556,740	20,030,016	103,847,723	4,793	2,095	6,889

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.990	1.688	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	4.184	1.742	5.927
(16) Countrywide Indicated Relativity:	1.829	1.492	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	48975	.	.
(19) Pure Premium Underlying Present Rate:	4.532	1.834	6.365
(20) Relativity to Underlying Present Rate:	2.080	1.743	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	1.990	1.688	.
(24) Balanced Formula Relativity:	1.984	1.699	1.887

Class(es):		Effective: 7/1/2020							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)
2013	63,371	2	16	227,363	165,937	133,250	61,884	588,433	6,206	3,079	9,286
2014	53,922	1	11	71,082	723,929	24,627	73,082	892,719	14,744	1,812	16,556
2015	52,121	2	9	314,504	182,186	42,751	52,405	591,846	9,529	1,826	11,355
2016	73,897	2	11	73,670	183,385	13,461	131,775	402,292	3,479	1,965	5,444
2017	99,478	1	26	26,095	445,519	23,757	203,604	698,975	4,741	2,286	7,026
MA Total:	342,790	8	73	712,714	1,700,955	237,846	522,750	3,174,265	7,041	2,219	9,260

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.924	1.788	.
(14) Massachusetts Credibility:	0.320	0.440	.
(15) Countrywide Pure Premium:	3.891	1.843	5.734
(16) Countrywide Indicated Relativity:	1.701	1.578	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	507.00	.	.
(19) Pure Premium Underlying Present Rate:	4.732	2.252	6.983
(20) Relativity to Underlying Present Rate:	2.172	2.141	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	2.252	1.828	.
(24) Balanced Formula Relativity:	2.246	1.839	2.107

IX 000201

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
7231 TRUCKING: MAIL, 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)
2013	452,315	12	90	914,944	1,382,251	611,847	673,674	3,582,716	5,079	2,842	7,921
2014	484,082	18	95	1,339,626	982,230	417,636	584,090	3,323,582	4,796	2,069	6,866
2015	554,065	12	127	1,935,694	1,987,562	1,413,067	946,816	6,283,139	7,081	4,259	11,340
2016	668,100	26	124	3,520,671	1,452,627	1,932,283	1,107,965	8,013,547	7,444	4,551	11,995
2017	691,422	18	148	1,453,962	3,178,498	593,841	1,490,131	6,716,433	6,700	3,014	9,714
MA Total:	2,849,983	86	584	9,164,898	8,983,170	4,968,674	4,802,675	27,919,417	6,368	3,429	9,796

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.644	2.762	.
(14) Massachusetts Credibility:	0.790	1.000	.
(15) Countrywide Pure Premium:	4.590	1.999	6.590
(16) Countrywide Indicated Relativity:	2.007	1.711	.
(17) Countrywide Credibility:	0.110	0.000	.
(18) Countrywide Lost-Time Claims:	4812.0	.	.
(19) Pure Premium Underlying Present Rate:	5.290	2.453	7.743
(20) Relativity to Underlying Present Rate:	2.428	2.332	.
(21) Credibility to Underlying Relativity:	0.100	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	2.552	2.762	.
(24) Balanced Formula Relativity:	2.545	2.779	2.625

Class(es):		Effective: 7/1/2020							Miscellaneous		
7360 FREIGHT HANDLING NOC: 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)
2013	92,377	1	8	186,141	160,184	17,414	147,449	511,188	3,749	1,785	5,534
2014	103,693	0	20	0	30,372	0	42,752	73,124	0,293	0,412	0,705
2015	114,101	0	13	0	23,160	0	13,518	36,678	0,203	0,118	0,321
2016	103,752	0	14	0	188,469	0	72,557	261,026	1,817	0,699	2,516
2017	116,798	2	18	129,670	137,788	39,897	55,599	362,954	2,290	0,818	3,108
MA Total:	530,721	3	73	315,811	539,973	57,310	331,876	1,244,970	1,612	0,733	2,346

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.670	0.591	.
(14) Massachusetts Credibility:	0.280	0.400	.
(15) Countrywide Pure Premium:	2.095	1.170	3.265
(16) Countrywide Indicated Relativity:	0.916	1.001	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	1468.0	.	.
(19) Pure Premium Underlying Present Rate:	2.163	1.129	3.292
(20) Relativity to Underlying Present Rate:	0.993	1.073	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.875	0.859	.
(24) Balanced Formula Relativity:	0.872	0.864	0.869

IX 000202

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
7370 TAXICAB CO: ALL OTHER 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)
2013	1,210,842	13	317	891,598	913,189	502,934	820,189	3,127,910	1,491	1,093	2,583
2014	1,346,353	12	387	245,948	1,171,228	279,961	1,088,822	2,785,959	1,053	1,017	2,069
2015	1,397,906	12	299	477,698	1,465,762	238,716	1,137,860	3,320,037	1,390	0,985	2,375
2016	1,477,483	22	445	2,441,592	2,497,320	820,688	1,577,508	7,337,107	3,343	1,623	4,966
2017	1,708,385	16	529	1,974,619	2,486,882	482,374	1,786,022	6,729,897	2,612	1,328	3,939
MA Total:	7,140,970	75	1,977	6,031,455	8,534,381	2,324,673	6,410,401	23,300,910	2,040	1,223	3,263

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.847	0.986	.
(14) Massachusetts Credibility:	0.680	1.000	.
(15) Countrywide Pure Premium:	1.903	1.219	3.122
(16) Countrywide Indicated Relativity:	0.832	1.044	.
(17) Countrywide Credibility:	0.160	0.000	.
(18) Countrywide Lost-Time Claims:	2629.0	.	.
(19) Pure Premium Underlying Present Rate:	1.433	0.935	2.368
(20) Relativity to Underlying Present Rate:	0.658	0.889	.
(21) Credibility to Underlying Relativity:	0.160	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.814	0.986	.
(24) Balanced Formula Relativity:	0.812	0.992	0.873

Class(es):		Effective: 7/1/2020							Miscellaneous		
7380 DRIVERS, CHAUFFEURS AND HELPERS-NOC-COMMERCIAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	4,167,600	68	820	6,867,174	8,040,619	2,607,843	4,735,809	22,251,445	3,577	1,762	5,339
2014	3,945,342	53	815	6,595,490	6,390,476	2,025,285	3,783,599	18,794,850	3,291	1,472	4,764
2015	4,159,696	56	770	4,999,011	6,254,631	1,863,990	3,642,215	16,759,847	2,705	1,324	4,029
2016	4,101,623	56	745	5,428,053	8,104,762	2,349,184	5,206,149	21,088,149	3,299	1,842	5,141
2017	4,355,234	35	742	3,915,364	10,590,297	1,700,216	5,165,673	21,371,550	3,331	1,576	4,907
MA Total:	20,729,494	268	3,892	27,805,091	39,380,785	10,546,519	22,533,446	100,265,841	3,241	1,596	4,837

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.346	1.286	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.757	1.356	4.113
(16) Countrywide Indicated Relativity:	1.205	1.161	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	27579	.	.
(19) Pure Premium Underlying Present Rate:	3.076	1.432	4.508
(20) Relativity to Underlying Present Rate:	1.412	1.362	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	1.346	1.286	.
(24) Balanced Formula Relativity:	1.342	1.294	1.325

IX 000203

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 132

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
7382 BUS CO: ALL OTHER EMPLOYEES & 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)
2013	3,226,618	54	638	2,526,485	3,013,793	1,097,393	2,250,318	8,887,989	1,717	1,038	2,755
2014	3,263,260	45	655	2,641,791	2,754,462	1,497,426	2,054,614	8,948,293	1,654	1,088	2,742
2015	3,562,709	32	633	2,608,395	4,309,079	797,183	2,482,643	10,197,300	1,942	0,921	2,862
2016	3,839,864	41	710	3,602,405	3,955,969	1,375,455	2,840,164	11,773,992	1,968	1,098	3,066
2017	3,861,333	45	608	3,058,501	5,607,214	1,222,577	2,831,234	12,719,527	2,244	1,050	3,294
MA Total:	17,753,783	217	3,244	14,437,577	19,640,516	5,990,035	12,458,973	52,527,101	1,919	1,039	2,959

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.797	0.837	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.932	1.168	3.100
(16) Countrywide Indicated Relativity:	0.845	1.000	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7543.0	.	.
(19) Pure Premium Underlying Present Rate:	1.656	0.894	2.550
(20) Relativity to Underlying Present Rate:	0.760	0.850	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.797	0.837	.
(24) Balanced Formula Relativity:	0.795	0.842	0.811

Class(es):		Effective: 7/1/2020							Miscellaneous		
7403 AIRCRAFT OR HELICOP OP: AIR CARRIER-SCHD/ SUPPL: A/O 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)
2013	1,226,142	13	296	1,598,342	2,651,265	333,236	1,645,405	6,228,249	3,466	1,614	5,080
2014	1,314,032	11	247	1,375,726	1,807,979	918,100	1,329,866	5,431,671	2,423	1,711	4,134
2015	1,837,252	14	342	930,127	2,567,724	632,248	1,732,392	5,862,491	1,904	1,287	3,191
2016	1,793,979	5	254	497,155	1,473,521	140,242	1,423,766	3,534,684	1,098	0,872	1,970
2017	1,936,874	13	258	736,619	2,007,601	438,934	1,372,638	4,555,792	1,417	0,935	2,352
MA Total:	8,108,280	56	1,397	5,137,970	10,508,090	2,462,760	7,504,067	25,612,887	1,930	1,229	3,159

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.801	0.990	.
(14) Massachusetts Credibility:	0.850	1.000	.
(15) Countrywide Pure Premium:	2.229	1.162	3.391
(16) Countrywide Indicated Relativity:	0.975	0.995	.
(17) Countrywide Credibility:	0.080	0.000	.
(18) Countrywide Lost-Time Claims:	17198	.	.
(19) Pure Premium Underlying Present Rate:	2.227	1.253	3.480
(20) Relativity to Underlying Present Rate:	1.022	1.191	.
(21) Credibility to Underlying Relativity:	0.070	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.831	0.990	.
(24) Balanced Formula Relativity:	0.828	0.996	0.885

IX 000204

Calculation of Class Relativities

Class(es):									Effective: 7/1/2020			Miscellaneous	
7405 AIRCRAFT OR HELICOP OP: AIR CARRIER-SCHD/ SUPPL: FLYING CREW													
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2013	1,618,054	4	77	316,374	799,974	155,194	289,798	1,561,339	0.690	0.275	0.965		
2014	2,062,734	6	68	48,082	1,081,408	43,535	499,032	1,672,056	0.548	0.263	0.811		
2015	3,120,307	8	103	1,468,061	541,519	691,381	542,787	3,243,749	0.644	0.396	1.040		
2016	2,924,810	1	94	17,219	780,032	4,759	526,428	1,328,438	0.273	0.182	0.454		
2017	3,158,686	9	155	1,265,102	1,581,127	405,012	940,411	4,191,652	0.901	0.426	1.327		
MA Total:	12,884,591	28	497	3,114,837	4,784,059	1,299,881	2,798,456	11,997,233	0.613	0.318	0.931		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.255	0.256	.
(14) Massachusetts Credibility:	0.600	0.790	.
(15) Countrywide Pure Premium:	0.776	0.303	1.079
(16) Countrywide Indicated Relativity:	0.339	0.260	.
(17) Countrywide Credibility:	0.200	0.110	.
(18) Countrywide Lost-Time Claims:	5142.0	.	.
(19) Pure Premium Underlying Present Rate:	0.580	0.255	0.836
(20) Relativity to Underlying Present Rate:	0.266	0.243	.
(21) Credibility to Underlying Relativity:	0.200	0.100	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.274	0.255	.
(24) Balanced Formula Relativity:	0.273	0.257	0.268

Class(es):									Effective: 7/1/2020			Miscellaneous	
7420 AIRCRAFT OR HELICOP OP: PUBLIC EXHIB STUNT FLYING: FLY CREW													
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
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	2,958	0	7,470	10,428	0.667	1.683	2.350		
2016	3,623	1	0	337,673	0	597,195	0	934,868	93,209	164.85	258.05		
2017	3,061	0	1	0	284,722	0	40,721	325,442	93,010	13,302	106.31		
MA Total:	19,367	1	2	337,673	287,680	597,195	48,190	1,270,738	32,289	33,324	65,613		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	13.407	26.848	.
(14) Massachusetts Credibility:	0.100	0.100	.
(15) Countrywide Pure Premium:	6.066	1.109	7.175
(16) Countrywide Indicated Relativity:	2.652	0.949	.
(17) Countrywide Credibility:	0.230	0.250	.
(18) Countrywide Lost-Time Claims:	30,000	.	.
(19) Pure Premium Underlying Present Rate:	3.942	0.889	4.831
(20) Relativity to Underlying Present Rate:	1.810	0.845	.
(21) Credibility to Underlying Relativity:	0.670	0.650	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	3.163	3.471	.
(24) Balanced Formula Relativity:	3.154	3.493	3.269

IX 000205

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 134

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
7421 AIRCRAFT OR HELICOP OP: TRANSPORT PERS IN EMPLR BUS: FLY CRW											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	265.053	0	9	0	568.576	0	307.512	876.087	2.145	1.160	3.305
2014	271.060	0	3	0	0	0	4.375	4.375	0.000	0.016	0.016
2015	328.713	1	1	239.025	5.766	76.601	663	322.055	0.745	0.235	0.980
2016	380.964	0	3	0	276.993	0	39.669	316.661	0.727	0.104	0.831
2017	399.147	0	7	0	0	0	18.252	18.252	0.000	0.046	0.046
MA Total:	1,644.938	1	23	239.025	851.334	76.601	370.470	1,537.430	0.663	0.272	0.935

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.275	0.219	.
(14) Massachusetts Credibility:	0.280	0.340	.
(15) Countrywide Pure Premium:	0.647	0.310	0.957
(16) Countrywide Indicated Relativity:	0.283	0.266	.
(17) Countrywide Credibility:	0.360	0.330	.
(18) Countrywide Lost-Time Claims:	384.00	.	.
(19) Pure Premium Underlying Present Rate:	0.668	0.240	0.908
(20) Relativity to Underlying Present Rate:	0.307	0.228	.
(21) Credibility to Underlying Relativity:	0.360	0.330	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.289	0.237	.
(24) Balanced Formula Relativity:	0.288	0.239	0.272

Class(es):		Effective: 7/1/2020							Miscellaneous		
7425 AIRCRAFT OR HELICOP OP: NOC- HELICOPTERS: FLYING CREW											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	68.665	0	4	0	625	0	4.110	4.735	0.009	0.060	0.069
2014	70.934	0	2	0	2.201	0	3.012	5.213	0.031	0.042	0.073
2015	75.437	0	6	0	195.067	0	163.071	358.138	2.586	2.162	4.747
2016	83.601	0	3	0	0	0	3.528	3.528	0.000	0.042	0.042
2017	27.763	1	0	74.242	0	40.253	0	114.495	2.674	1.450	4.124
MA Total:	326.399	1	15	74.242	197.893	40.253	173.721	486.108	0.834	0.656	1.489

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.346	0.528	.
(14) Massachusetts Credibility:	0.200	0.210	.
(15) Countrywide Pure Premium:	1.696	0.404	2.100
(16) Countrywide Indicated Relativity:	0.741	0.346	.
(17) Countrywide Credibility:	0.400	0.400	.
(18) Countrywide Lost-Time Claims:	146.00	.	.
(19) Pure Premium Underlying Present Rate:	1.411	0.362	1.773
(20) Relativity to Underlying Present Rate:	0.648	0.344	.
(21) Credibility to Underlying Relativity:	0.400	0.390	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.625	0.383	.
(24) Balanced Formula Relativity:	0.623	0.386	0.542

IX 000206

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	129.354	0	13	0	14.849	0	20.536	35.385	0.115	0.159	0.274
2014	262.467	0	11	0	118.297	0	64.411	182.709	0.451	0.245	0.696
2015	219.283	2	12	376.620	77.276	96.031	93.397	643.324	2.070	0.864	2.934
2016	227.480	0	17	0	259.821	0	67.391	327.212	1.142	0.296	1.438
2017	267.378	1	22	194.809	177.477	16.074	122.666	511.026	1.392	0.519	1.911
MA Total:	1,105,962	3	75	571,429	647,720	112,105	368,401	1,699,654	1.102	0.434	1.537

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.458	0.350	.
(14) Massachusetts Credibility:	0.250	0.350	.
(15) Countrywide Pure Premium:	0.847	0.427	1.274
(16) Countrywide Indicated Relativity:	0.370	0.366	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	378.00	.	.
(19) Pure Premium Underlying Present Rate:	0.799	0.388	1.186
(20) Relativity to Underlying Present Rate:	0.367	0.368	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.391	0.361	.
(24) Balanced Formula Relativity:	0.390	0.363	0.381

Class(es):		Effective: 7/1/2020							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)
2013	12.168	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	7.723	2	11	187.909	26.564	265.382	49.509	529.364	27.771	40.773	68.544
2015	8.561	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	9.407	0	1	0	0	0	1.383	1.383	0.000	0.147	0.147
2017	4.220	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	42.079	2	12	187,909	26,564	265,382	50,892	530,747	5.097	7.516	12.613

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.116	6.056	.
(14) Massachusetts Credibility:	0.080	0.150	.
(15) Countrywide Pure Premium:	0.617	0.276	0.893
(16) Countrywide Indicated Relativity:	0.270	0.236	.
(17) Countrywide Credibility:	0.460	0.430	.
(18) Countrywide Lost-Time Claims:	377.00	.	.
(19) Pure Premium Underlying Present Rate:	1.000	1.190	2.190
(20) Relativity to Underlying Present Rate:	0.459	1.131	.
(21) Credibility to Underlying Relativity:	0.460	0.420	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.505	1.485	.
(24) Balanced Formula Relativity:	0.503	1.494	0.840

IX 000207

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
7520 WATERWORKS 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)
2013	260,963	1	49	992	88,084	5,886	140,825	235,787	0.341	0.562	0.904
2014	193,082	1	25	3,215	27,613	15,178	54,619	100,625	0.160	0.361	0.521
2015	241,367	0	34	0	113,127	0	181,690	294,817	0.469	0.753	1.221
2016	263,036	2	30	297,728	131,908	41,779	114,339	585,754	1.633	0.594	2.227
2017	167,155	2	21	1,139,443	21,853	232,201	18,681	1,412,178	6.947	1.501	8.448
MA Total:	1,125,602	6	159	1,441,377	382,585	295,045	510,154	2,629,161	1.620	0.715	2.336

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.673	0.576	.
(14) Massachusetts Credibility:	0.320	0.440	.
(15) Countrywide Pure Premium:	1.515	0.908	2.423
(16) Countrywide Indicated Relativity:	0.662	0.777	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	1895.0	.	.
(19) Pure Premium Underlying Present Rate:	1.421	0.673	2.093
(20) Relativity to Underlying Present Rate:	0.652	0.639	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.662	0.650	.
(24) Balanced Formula Relativity:	0.660	0.654	0.658

Class(es):		Effective: 7/1/2020							Construction		
7538 ELECTRIC LIGHT OR POWER LINE 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)
2013	184,275	1	21	418,859	743,108	182,743	428,057	1,772,767	6,306	3,315	9,620
2014	89,415	0	14	0	768,689	0	319,266	1,087,956	8,597	3,571	12,167
2015	123,894	1	13	197,167	711,289	52,698	292,582	1,253,737	7,333	2,787	10,119
2016	228,924	1	9	251,092	641,418	72,085	224,366	1,188,961	3,899	1,295	5,194
2017	216,147	0	9	0	44,016	0	19,561	63,578	0.204	0.091	0.294
MA Total:	842,655	3	66	867,118	2,908,521	307,526	1,283,834	5,366,998	4.481	1.889	6.369

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.721	1.591	.
(14) Massachusetts Credibility:	0.390	0.520	.
(15) Countrywide Pure Premium:	2.439	1.116	3.554
(16) Countrywide Indicated Relativity:	0.952	0.969	.
(17) Countrywide Credibility:	0.310	0.240	.
(18) Countrywide Lost-Time Claims:	1226.0	.	.
(19) Pure Premium Underlying Present Rate:	3.119	1.382	4.501
(20) Relativity to Underlying Present Rate:	1.289	1.311	.
(21) Credibility to Underlying Relativity:	0.300	0.240	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.353	1.374	.
(24) Balanced Formula Relativity:	1.359	1.372	1.363

IX 000208

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous			
7539 ELECTRIC LIGHT OR POWER CO 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)	
2013	1,012,938	1	20	280,886	102,034	20,850	52,518	456,289	0.378	0.072	0.450	
2014	1,003,814	0	29	0	117,759	0	155,326	273,086	0.117	0.155	0.272	
2015	1,128,567	2	40	206,223	608,613	221,387	235,579	1,271,802	0.722	0.405	1.127	
2016	1,274,073	2	58	543,257	483,039	413,043	594,530	2,033,869	0.806	0.791	1.596	
2017	1,128,701	1	39	65,878	239,322	35,336	233,916	574,452	0.270	0.239	0.509	
MA Total:	5,548,093	6	186	1,096,244	1,550,768	690,616	1,271,870	4,609,498	0.477	0.354	0.831	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.198	0.285	.
(14) Massachusetts Credibility:	0.430	0.580	.
(15) Countrywide Pure Premium:	0.802	0.427	1.229
(16) Countrywide Indicated Relativity:	0.351	0.365	.
(17) Countrywide Credibility:	0.290	0.210	.
(18) Countrywide Lost-Time Claims:	1278.0	.	.
(19) Pure Premium Underlying Present Rate:	0.581	0.274	0.855
(20) Relativity to Underlying Present Rate:	0.267	0.260	.
(21) Credibility to Underlying Relativity:	0.280	0.210	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.262	0.297	.
(24) Balanced Formula Relativity:	0.261	0.298	0.274

Class(es):		Effective: 7/1/2020							Miscellaneous			
7580 SEWAGE DISPOSAL PLANT 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)	
2013	341,832	1	24	271,882	254,364	33,179	207,604	767,029	1.539	0.704	2.244	
2014	296,448	4	23	274,096	83,279	69,873	48,121	475,369	1.206	0.398	1.604	
2015	276,182	1	30	237,216	912,933	40,834	237,707	1,428,690	4.164	1.009	5.173	
2016	221,081	2	25	734,965	97,798	90,979	88,694	1,012,436	3.767	0.813	4.579	
2017	209,949	0	21	0	402,145	0	202,209	604,354	1.915	0.963	2.879	
MA Total:	1,345,492	8	123	1,518,159	1,750,519	234,865	784,335	4,287,878	2.429	0.757	3.187	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.009	0.610	.
(14) Massachusetts Credibility:	0.360	0.490	.
(15) Countrywide Pure Premium:	1.127	0.751	1.878
(16) Countrywide Indicated Relativity:	0.493	0.643	.
(17) Countrywide Credibility:	0.320	0.260	.
(18) Countrywide Lost-Time Claims:	689.00	.	.
(19) Pure Premium Underlying Present Rate:	1.609	0.740	2.349
(20) Relativity to Underlying Present Rate:	0.739	0.704	.
(21) Credibility to Underlying Relativity:	0.320	0.250	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.757	0.642	.
(24) Balanced Formula Relativity:	0.755	0.646	0.718

IX 000209

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 138

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
7590 GARBAGE WORKS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2013	23,882	1	7	8,449	27,522	491	8,663	45,125	1,506	0,383	1,889
2014	29,485	1	8	26,639	25,678	8,390	18,323	79,030	1,774	0,906	2,680
2015	27,464	0	18	0	167,338	0	78,031	245,368	6,093	2,841	8,934
2016	26,800	4	21	163,433	419,796	181,401	288,139	1,052,769	21,763	17,520	39,283
2017	49,989	1	23	277,711	46,263	34,073	36,034	394,081	6,481	1,402	7,883
MA Total:	157,620	7	77	476,232	686,597	224,356	429,189	1,816,373	7,377	4,146	11,524

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.063	3.341	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	1.767	0.856	2.623
(16) Countrywide Indicated Relativity:	0.772	0.733	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	471.00	.	.
(19) Pure Premium Underlying Present Rate:	1.806	0.835	2.642
(20) Relativity to Underlying Present Rate:	0.829	0.794	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	1.163	1.330	.
(24) Balanced Formula Relativity:	1.159	1.339	1.220

Class(es):		Effective: 7/1/2020							Miscellaneous		
7600 TELEPHONE OR TELEGRAPH CO: ALL OTHER 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)
2013	3,694,151	34	286	5,163,510	4,825,397	1,594,022	1,845,034	13,427,963	2,704	0,931	3,635
2014	3,550,290	10	127	1,881,878	1,365,670	580,424	840,226	4,668,198	0,915	0,400	1,315
2015	3,070,547	14	167	1,464,436	4,684,567	549,797	1,800,667	8,499,467	2,003	0,765	2,768
2016	3,592,825	26	224	3,939,707	5,494,054	1,643,873	2,037,387	13,115,021	2,626	1,025	3,650
2017	3,729,715	18	264	2,132,524	5,832,412	680,944	2,684,221	11,330,100	2,136	0,902	3,038
MA Total:	17,637,528	102	1,068	14,582,055	22,202,101	5,049,059	9,207,534	51,040,749	2,086	0,808	2,894

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.866	0.651	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.466	1.101	3.567
(16) Countrywide Indicated Relativity:	1.078	0.943	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	12534	.	.
(19) Pure Premium Underlying Present Rate:	1.615	0.627	2.242
(20) Relativity to Underlying Present Rate:	0.741	0.596	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.866	0.651	.
(24) Balanced Formula Relativity:	0.863	0.655	0.793

IX 000210

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 139

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	259,744	1	29	67,861	391,387	101,739	162,191	723,177	1,768	1,016	2,784	
2014	271,376	0	22	0	326,424	0	127,347	453,772	1,203	0,469	1,672	
2015	237,038	5	27	807,475	53,244	953,150	87,120	1,900,989	3,631	4,389	8,020	
2016	272,846	0	13	0	23,966	0	130,165	154,131	0,088	0,477	0,565	
2017	268,280	1	9	46,257	31,119	22,462	19,260	119,098	0,288	0,156	0,444	
MA Total:	1,309,284	7	100	921,592	826,140	1,077,351	526,083	3,351,166	1,335	1,225	2,560	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.513	1.031	.
(14) Massachusetts Credibility:	0.470	0.680	.
(15) Countrywide Pure Premium:	6.042	3.047	9.090
(16) Countrywide Indicated Relativity:	2.359	2.646	.
(17) Countrywide Credibility:	0.200	0.160	.
(18) Countrywide Lost-Time Claims:	20.000	.	.
(19) Pure Premium Underlying Present Rate:	3.193	1.773	4.966
(20) Relativity to Underlying Present Rate:	1.319	1.683	.
(21) Credibility to Underlying Relativity:	0.330	0.160	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.148	1.394	.
(24) Balanced Formula Relativity:	1.153	1.391	1.228

Class(es):		Effective: 7/1/2020							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)	
2013	4,443,769	3	56	50,013	485,782	7,958	263,792	807,545	0.121	0.061	0.182	
2014	4,074,549	3	76	406,752	273,347	63,912	300,867	1,044,877	0.167	0.090	0.256	
2015	4,393,311	5	57	1,156,570	2,287,921	292,795	470,675	4,207,961	0.784	0.174	0.958	
2016	3,755,663	2	69	696,254	941,860	208,982	441,117	2,288,213	0.436	0.173	0.609	
2017	4,301,963	3	80	306,207	1,179,670	86,406	497,214	2,069,497	0.345	0.136	0.481	
MA Total:	20,969,254	16	338	2,615,796	5,168,581	660,053	1,973,664	10,418,093	0.371	0.126	0.497	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.354	2.950	.
(14) Massachusetts Credibility:	0.520	0.650	.
(15) Countrywide Pure Premium:	0.168	0.096	0.263
(16) Countrywide Indicated Relativity:	2.804	2.487	.
(17) Countrywide Credibility:	0.240	0.180	.
(18) Countrywide Lost-Time Claims:	1847.0	.	.
(19) Pure Premium Underlying Present Rate:	0.254	0.096	0.350
(20) Relativity to Underlying Present Rate:	3.936	2.464	.
(21) Credibility to Underlying Relativity:	0.240	0.170	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	4.401	2.784	.
(24) Balanced Formula Relativity:	4.420	2.789	3.800

IX 000211

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 140

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
7704 FIREFIGHTERS & 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)
2013	17,642	0	0	0	0	0	0	0	0.000	0.000	0.000
2014	15,028	0	4	0	3,111	0	7,480	10,591	0.207	0.498	0.705
2015	15,131	0	3	0	233,686	0	81,852	315,538	15,444	5,410	20,854
2016	15,648	0	2	0	342	0	2,678	3,019	0.022	0.171	0.193
2017	14,417	0	3	0	0	0	5,940	5,940	0.000	0.412	0.412
MA Total:	77,865	0	12	0	237,138	0	97,950	335,087	3.045	1.258	4.303

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.265	1.013	.
(14) Massachusetts Credibility:	0.120	0.190	.
(15) Countrywide Pure Premium:	1.739	1.440	3.180
(16) Countrywide Indicated Relativity:	0.760	1.233	.
(17) Countrywide Credibility:	0.440	0.410	.
(18) Countrywide Lost-Time Claims:	839.00	.	.
(19) Pure Premium Underlying Present Rate:	1.900	1.165	3.065
(20) Relativity to Underlying Present Rate:	0.872	1.107	.
(21) Credibility to Underlying Relativity:	0.440	0.400	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.870	1.141	.
(24) Balanced Formula Relativity:	0.868	1.148	0.963

Class(es):		Effective: 7/1/2020							Miscellaneous		
7720 POLICE OFFICERS & 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)
2013	1,678,734	4	105	408,251	884,431	150,509	502,667	1,945,858	0.770	0.389	1,159
2014	1,667,253	4	132	139,382	408,947	122,241	302,397	972,967	0.329	0.255	0.584
2015	1,822,447	7	107	463,626	265,283	542,471	245,830	1,517,210	0.400	0.433	0.833
2016	1,815,445	9	99	843,947	399,213	504,989	389,173	2,137,323	0.685	0.493	1,177
2017	2,085,850	5	115	173,827	517,000	90,816	388,927	1,170,570	0.331	0.230	0.561
MA Total:	9,069,729	29	558	2,029,033	2,474,874	1,411,026	1,828,994	7,743,927	0.497	0.357	0.854

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.206	0.288	.
(14) Massachusetts Credibility:	0.550	0.770	.
(15) Countrywide Pure Premium:	1.273	0.812	2.084
(16) Countrywide Indicated Relativity:	0.556	0.695	.
(17) Countrywide Credibility:	0.230	0.120	.
(18) Countrywide Lost-Time Claims:	11646	.	.
(19) Pure Premium Underlying Present Rate:	0.672	0.344	1.016
(20) Relativity to Underlying Present Rate:	0.308	0.327	.
(21) Credibility to Underlying Relativity:	0.220	0.110	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.309	0.341	.
(24) Balanced Formula Relativity:	0.308	0.343	0.320

IX 000212

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	13,133	0	1	0	5,701	0	5,015	10,716	0.434	0.382	0.816
2014	19,919	0	1	0	3,914	0	1,581	5,495	0.196	0.079	0.276
2015	60,790	0	6	0	107,465	0	24,717	132,181	1.768	0.407	2.174
2016	33,601	0	4	0	69,491	0	15,898	85,390	2.068	0.473	2.541
2017	55,224	0	1	0	0	0	14,442	14,442	0.000	0.262	0.262
MA Total:	182,668	0	13	0	186,571	0	61,653	248,224	1.021	0.338	1.359

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.392	0.284	.
(14) Massachusetts Credibility:	0.190	0.230	.
(15) Countrywide Pure Premium:	2.140	0.925	3.065
(16) Countrywide Indicated Relativity:	0.836	0.803	.
(17) Countrywide Credibility:	0.410	0.390	.
(18) Countrywide Lost-Time Claims:	292.00	.	.
(19) Pure Premium Underlying Present Rate:	2.270	0.868	3.138
(20) Relativity to Underlying Present Rate:	0.938	0.824	.
(21) Credibility to Underlying Relativity:	0.400	0.380	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.792	0.692	.
(24) Balanced Formula Relativity:	0.796	0.690	0.763

Class(es):		Effective: 7/1/2020							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)
2013	619,868	3	79	168,742	162,546	38,839	277,810	647,936	0.534	0.511	1.045
2014	624,081	5	52	500,257	238,231	432,973	111,461	1,282,923	1.183	0.872	2.056
2015	628,959	5	53	178,919	100,156	150,443	77,975	507,493	0.444	0.363	0.807
2016	654,670	6	83	178,180	291,249	115,842	307,652	892,923	0.717	0.647	1.364
2017	645,262	1	62	35,641	175,969	13,432	178,107	403,149	0.328	0.297	0.625
MA Total:	3,172,838	20	329	1,061,739	968,150	751,528	953,005	3,734,423	0.640	0.537	1.177

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.775	1.152	.
(14) Massachusetts Credibility:	0.380	0.600	.
(15) Countrywide Pure Premium:	0.888	0.611	1.499
(16) Countrywide Indicated Relativity:	1.109	1.325	.
(17) Countrywide Credibility:	0.310	0.200	.
(18) Countrywide Lost-Time Claims:	1267.0	.	.
(19) Pure Premium Underlying Present Rate:	0.752	0.532	1.284
(20) Relativity to Underlying Present Rate:	1.002	1.291	.
(21) Credibility to Underlying Relativity:	0.310	0.200	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.949	1.214	.
(24) Balanced Formula Relativity:	0.942	1.215	1.041

IX 000213

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 142

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	81,323	0	5	0	8,936	0	10,474	19,410	0.110	0.129	0.239
2014	98,640	1	26	3,034	39,398	134	135,993	178,559	0.430	1.380	1.810
2015	81,010	1	17	132,652	5,715	170,044	13,514	321,924	1.708	2.266	3.974
2016	73,750	0	15	0	23,399	0	69,968	93,366	0.317	0.949	1.266
2017	86,443	0	12	0	231,156	0	143,585	374,741	2.674	1.661	4.335
MA Total:	421,166	2	75	135,686	308,603	170,178	373,533	988,000	1.055	1.291	2.346

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.279	2.768	.
(14) Massachusetts Credibility:	0.150	0.250	.
(15) Countrywide Pure Premium:	0.848	0.598	1.446
(16) Countrywide Indicated Relativity:	1.059	1.298	.
(17) Countrywide Credibility:	0.430	0.380	.
(18) Countrywide Lost-Time Claims:	1824.0	.	.
(19) Pure Premium Underlying Present Rate:	0.596	0.431	1.027
(20) Relativity to Underlying Present Rate:	0.794	1.046	.
(21) Credibility to Underlying Relativity:	0.420	0.370	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.981	1.572	.
(24) Balanced Formula Relativity:	0.974	1.573	1.190

Class(es):		Effective: 7/1/2020							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)
2013	2,639,417	10	316	834,389	603,713	489,000	699,778	2,626,880	0.545	0.450	0.995
2014	2,788,551	4	301	444,218	1,047,060	505,381	1,135,368	3,132,027	0.535	0.588	1.123
2015	3,016,394	9	268	487,907	1,137,945	481,342	968,356	3,075,549	0.539	0.481	1.020
2016	3,164,128	6	236	317,887	454,568	96,840	498,331	1,367,625	0.244	0.188	0.432
2017	3,377,585	9	268	886,932	1,058,613	296,472	954,194	3,196,210	0.576	0.370	0.946
MA Total:	14,986,074	38	1,389	2,971,333	4,301,898	1,869,034	4,256,027	13,398,292	0.485	0.409	0.894

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.588	0.876	.
(14) Massachusetts Credibility:	0.610	0.970	.
(15) Countrywide Pure Premium:	0.855	0.515	1.370
(16) Countrywide Indicated Relativity:	1.068	1.116	.
(17) Countrywide Credibility:	0.200	0.020	.
(18) Countrywide Lost-Time Claims:	11464	.	.
(19) Pure Premium Underlying Present Rate:	0.526	0.366	0.893
(20) Relativity to Underlying Present Rate:	0.702	0.889	.
(21) Credibility to Underlying Relativity:	0.190	0.010	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.706	0.881	.
(24) Balanced Formula Relativity:	0.701	0.882	0.766

IX 000214

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 143

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	3,481,033	4	247	152,168	669,699	52,844	359,496	1,234,207	0.236	0.118	0.355
2014	3,472,316	13	226	585,055	870,591	412,126	526,016	2,393,788	0.419	0.270	0.689
2015	3,408,450	5	210	144,895	728,391	182,300	473,426	1,529,011	0.256	0.192	0.449
2016	3,322,267	5	178	381,298	1,042,000	187,018	658,958	2,269,274	0.428	0.255	0.683
2017	3,325,999	7	170	461,502	636,239	269,567	389,232	1,756,539	0.330	0.198	0.528
MA Total:	17,010,065	34	1,031	1,724,917	3,946,919	1,103,856	2,407,128	9,182,820	0.333	0.206	0.540

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.404	0.443	.
(14) Massachusetts Credibility:	0.540	0.800	.
(15) Countrywide Pure Premium:	0.459	0.303	0.762
(16) Countrywide Indicated Relativity:	0.573	0.657	.
(17) Countrywide Credibility:	0.230	0.100	.
(18) Countrywide Lost-Time Claims:	9001.0	.	.
(19) Pure Premium Underlying Present Rate:	0.341	0.199	0.540
(20) Relativity to Underlying Present Rate:	0.454	0.484	.
(21) Credibility to Underlying Relativity:	0.230	0.100	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.455	0.468	.
(24) Balanced Formula Relativity:	0.451	0.468	0.458

Class(es):		Effective: 7/1/2020							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)
2013	1,889,931	2	195	266,334	1,032,557	47,170	769,941	2,116,002	0.687	0.432	1.120
2014	1,944,998	7	176	1,431,560	1,040,123	751,501	705,623	3,928,807	1.271	0.749	2.020
2015	1,985,435	2	178	156,378	1,148,167	87,234	852,510	2,244,290	0.657	0.473	1.130
2016	1,986,882	8	180	885,163	996,050	421,619	744,055	3,046,887	0.947	0.587	1.534
2017	2,173,314	7	182	319,965	1,742,315	172,526	733,043	2,967,849	0.949	0.417	1.366
MA Total:	9,980,559	26	911	3,059,401	5,959,213	1,480,050	3,805,172	14,303,835	0.904	0.530	1.433

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.095	1.136	.
(14) Massachusetts Credibility:	0.570	0.900	.
(15) Countrywide Pure Premium:	0.732	0.457	1.189
(16) Countrywide Indicated Relativity:	0.914	0.992	.
(17) Countrywide Credibility:	0.220	0.050	.
(18) Countrywide Lost-Time Claims:	5520.0	.	.
(19) Pure Premium Underlying Present Rate:	0.679	0.457	1.136
(20) Relativity to Underlying Present Rate:	0.905	1.109	.
(21) Credibility to Underlying Relativity:	0.210	0.050	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.015	1.127	.
(24) Balanced Formula Relativity:	1.008	1.128	1.051

IX 000215

Section IX - Classification Pricing
Subsection G - Class Relativities
7/1/2020

Section IX - G
Exhibit 144

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	1,395,293	1	21	53,080	139,295	17,226	60,669	270,270	0.138	0.056	0.194
2014	1,389,400	1	30	18,286	218,977	47,678	119,977	404,917	0.171	0.121	0.291
2015	1,431,421	0	9	0	970	0	5,754	6,724	0.001	0.004	0.005
2016	1,349,924	0	20	0	77,613	0	109,348	186,961	0.057	0.081	0.138
2017	1,380,056	2	15	169,050	9,637	677,268	64,771	920,726	0.129	0.538	0.667
MA Total:	6,946,094	4	95	240,416	446,491	742,172	360,519	1,789,598	0.099	0.159	0.258

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.120	0.340	.
(14) Massachusetts Credibility:	0.280	0.400	.
(15) Countrywide Pure Premium:	0.205	0.098	0.303
(16) Countrywide Indicated Relativity:	0.255	0.213	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	813.00	.	.
(19) Pure Premium Underlying Present Rate:	0.155	0.086	0.241
(20) Relativity to Underlying Present Rate:	0.207	0.208	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.200	0.263	.
(24) Balanced Formula Relativity:	0.199	0.263	0.222

Class(es):		Effective: 7/1/2020							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)
2013	12,429,302	37	1,099	3,536,115	2,813,386	1,493,784	2,470,766	10,314,050	0.511	0.319	0.830
2014	13,398,318	35	1,128	2,083,484	3,499,972	1,220,545	2,977,394	9,781,395	0.417	0.313	0.730
2015	14,139,306	36	1,160	2,859,545	3,852,918	1,935,853	2,749,796	11,398,112	0.475	0.331	0.806
2016	11,580,496	16	783	1,295,538	3,460,768	466,515	2,946,347	8,169,168	0.411	0.295	0.705
2017	12,157,393	21	808	2,492,561	3,856,284	527,759	2,581,223	9,457,827	0.522	0.256	0.778
MA Total:	63,704,815	145	4,978	12,267,244	17,483,328	5,644,456	13,725,525	49,120,552	0.467	0.304	0.771

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.566	0.652	.
(14) Massachusetts Credibility:	0.990	1.000	.
(15) Countrywide Pure Premium:	0.560	0.363	0.923
(16) Countrywide Indicated Relativity:	0.699	0.788	.
(17) Countrywide Credibility:	0.010	0.000	.
(18) Countrywide Lost-Time Claims:	31330	.	.
(19) Pure Premium Underlying Present Rate:	0.414	0.259	0.673
(20) Relativity to Underlying Present Rate:	0.551	0.629	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.567	0.652	.
(24) Balanced Formula Relativity:	0.563	0.652	0.596

IX 000216

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 145

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	3,413,993	27	718	3,110,920	3,337,262	1,216,136	2,050,416	9,714,734	1,889	0,957	2,846
2014	3,353,450	16	672	1,881,489	4,669,222	547,976	2,593,427	9,692,113	1,953	0,937	2,890
2015	3,665,234	20	618	1,465,921	4,765,953	528,481	2,296,157	9,056,511	1,700	0,771	2,471
2016	3,935,412	22	708	2,077,695	6,449,581	728,736	3,458,189	12,714,201	2,167	1,064	3,231
2017	4,280,690	37	862	2,370,405	6,408,085	898,438	3,217,115	12,894,044	2,051	0,961	3,012
MA Total:	18,648,780	122	3,578	10,906,429	25,630,103	3,919,766	13,615,305	54,071,603	1,959	0,940	2,899

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.375	2.016	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.249	0.646	1.895
(16) Countrywide Indicated Relativity:	1.560	1.401	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	24344	.	.
(19) Pure Premium Underlying Present Rate:	1.518	0.746	2.263
(20) Relativity to Underlying Present Rate:	2.023	1.809	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.375	2.016	.
(24) Balanced Formula Relativity:	2.358	2.018	2.235

Class(es):		Effective: 7/1/2020							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)
2013	821,450	6	91	629,721	961,200	135,914	623,717	2,350,553	1,937	0,925	2,861
2014	909,778	8	125	392,146	1,090,287	52,154	522,732	2,057,319	1,629	0,632	2,261
2015	964,794	7	144	631,224	1,205,102	440,903	549,469	2,826,697	1,903	1,027	2,930
2016	1,084,915	7	156	752,364	2,836,565	132,778	790,869	4,512,577	3,308	0,851	4,159
2017	1,084,462	5	133	327,591	1,728,819	119,586	1,053,862	3,229,858	1,896	1,082	2,978
MA Total:	4,865,400	33	649	2,733,046	7,821,973	881,336	3,540,650	14,977,005	2,169	0,909	3,078

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.630	1.949	.
(14) Massachusetts Credibility:	0.600	0.800	.
(15) Countrywide Pure Premium:	1.180	0.756	1.936
(16) Countrywide Indicated Relativity:	1.474	1.640	.
(17) Countrywide Credibility:	0.200	0.100	.
(18) Countrywide Lost-Time Claims:	3232.0	.	.
(19) Pure Premium Underlying Present Rate:	1.531	0.708	2.239
(20) Relativity to Underlying Present Rate:	2.040	1.718	.
(21) Credibility to Underlying Relativity:	0.200	0.100	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.280	1.895	.
(24) Balanced Formula Relativity:	2.264	1.896	2.131

IX 000217

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 146

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	196.932	2	21	267.161	75.681	164.820	123.919	631.581	1.741	1.466	3.207
2014	199.354	0	23	0	25.002	0	43.211	68.214	0.125	0.217	0.342
2015	206.367	1	16	127.643	33.146	74.349	45.370	280.508	0.779	0.580	1.359
2016	195.326	1	24	125.714	3.173	21.794	30.819	181.500	0.660	0.269	0.929
2017	218.657	0	17	0	9.731	0	19.973	29.704	0.045	0.091	0.136
MA Total:	1,016,635	4	101	520,519	146,734	260,963	263,291	1,191,507	0.656	0.516	1.172

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.796	1.106	.
(14) Massachusetts Credibility:	0.250	0.350	.
(15) Countrywide Pure Premium:	0.908	0.624	1.532
(16) Countrywide Indicated Relativity:	1.134	1.354	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	584.00	.	.
(19) Pure Premium Underlying Present Rate:	0.874	0.432	1.307
(20) Relativity to Underlying Present Rate:	1.165	1.049	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.061	1.169	.
(24) Balanced Formula Relativity:	1.053	1.170	1.095

Class(es):		Effective: 7/1/2020							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)
2013	294.095	0	31	0	9.455	0	27.552	37.007	0.032	0.094	0.126
2014	321.832	0	27	0	79.731	0	111.831	191.562	0.248	0.347	0.595
2015	255.534	0	29	0	16.995	0	41.534	58.528	0.067	0.163	0.229
2016	282.762	0	27	0	70.487	0	125.957	196.444	0.249	0.445	0.695
2017	284.922	1	15	79.149	32.362	16.923	50.853	179.286	0.391	0.238	0.629
MA Total:	1,439,145	1	129	79,149	209,029	16,923	357,727	662,828	0.200	0.260	0.461

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.243	0.558	.
(14) Massachusetts Credibility:	0.260	0.360	.
(15) Countrywide Pure Premium:	0.822	0.495	1.317
(16) Countrywide Indicated Relativity:	1.026	1.073	.
(17) Countrywide Credibility:	0.370	0.320	.
(18) Countrywide Lost-Time Claims:	1326.0	.	.
(19) Pure Premium Underlying Present Rate:	0.643	0.314	0.957
(20) Relativity to Underlying Present Rate:	0.857	0.762	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.760	0.788	.
(24) Balanced Formula Relativity:	0.754	0.789	0.767

IX 000218

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 147

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Goods and Services			
8033 STORE: MEAT, GROCERY & PROVISION COMBINED 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)	
2013	621.958	3	55	255.510	85.670	60.534	109.158	510.872	0.549	0.273	0.821	
2014	893.772	2	122	101.120	901.598	73.459	346.738	1,422.915	1.122	0.470	1.592	
2015	878.585	3	114	226.291	331.069	38.168	250.058	845.585	0.634	0.328	0.962	
2016	749.024	3	66	163.887	482.717	31.196	234.762	912.563	0.863	0.355	1.218	
2017	796.271	1	58	42.284	527.227	21.655	239.117	830.282	0.715	0.327	1.043	
MA Total:	3,939,611	12	415	789,092	2,328,280	225,011	1,179,833	4,522,216	0.791	0.357	1.148	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.959	0.765	.
(14) Massachusetts Credibility:	0.410	0.620	.
(15) Countrywide Pure Premium:	0.835	0.527	1.362
(16) Countrywide Indicated Relativity:	1.042	1.143	.
(17) Countrywide Credibility:	0.300	0.190	.
(18) Countrywide Lost-Time Claims:	21865	.	.
(19) Pure Premium Underlying Present Rate:	0.743	0.468	1.211
(20) Relativity to Underlying Present Rate:	0.990	1.135	.
(21) Credibility to Underlying Relativity:	0.290	0.190	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.993	0.907	.
(24) Balanced Formula Relativity:	0.986	0.908	0.958

Class(es):		Effective: 7/1/2020							Goods and Services			
8034 STORE: GROCERY STORES - 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)	
2013	621.782	1	76	89.925	429.430	15.551	247.429	782.335	0.835	0.423	1.258	
2014	648.976	4	97	277.825	953.115	22.564	469.264	1,722.769	1.897	0.758	2.655	
2015	535.081	8	61	903.899	900.830	203.042	564.614	2,572.385	3.373	1.435	4.807	
2016	355.499	1	44	108.069	315.326	10.418	233.791	667.604	1.191	0.687	1.878	
2017	440.083	0	70	0	387.558	0	171.001	558.560	0.881	0.389	1.269	
MA Total:	2,601,422	14	348	1,379,717	2,986,261	251,575	1,686,100	6,303,653	1.678	0.745	2.423	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.034	1.597	.
(14) Massachusetts Credibility:	0.480	0.640	.
(15) Countrywide Pure Premium:	1.470	0.522	1.992
(16) Countrywide Indicated Relativity:	1.836	1.132	.
(17) Countrywide Credibility:	0.260	0.180	.
(18) Countrywide Lost-Time Claims:	212.00	.	.
(19) Pure Premium Underlying Present Rate:	1.672	0.766	2.439
(20) Relativity to Underlying Present Rate:	2.229	1.859	.
(21) Credibility to Underlying Relativity:	0.260	0.180	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.033	1.561	.
(24) Balanced Formula Relativity:	2.019	1.562	1.854

IX 000219

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 148

Calculation of Class Relativities

Class(es): 8039 STORE: DEPARTMENT - RETAIL		Effective: 7/1/2020							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)
2013	620,608	4	98	137,429	102,059	121,627	122,351	483,466	0.386	0.393	0.779
2014	612,113	2	80	118,268	174,586	56,828	207,381	557,063	0.478	0.432	0.910
2015	617,977	3	71	223,702	196,003	145,925	136,736	702,366	0.679	0.457	1.137
2016	3,688,344	18	449	1,449,646	1,210,222	623,722	1,081,539	4,365,130	0.721	0.462	1.183
2017	3,343,672	10	416	725,982	1,175,616	291,241	1,405,022	3,597,860	0.569	0.507	1.076
MA Total:	8,882,714	37	1,114	2,655,027	2,858,486	1,239,343	2,953,029	9,705,885	0.621	0.472	1.093

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.752	1.012	.
(14) Massachusetts Credibility:	0.480	0.780	.
(15) Countrywide Pure Premium:	0.541	0.425	0.966
(16) Countrywide Indicated Relativity:	0.676	0.922	.
(17) Countrywide Credibility:	0.260	0.110	.
(18) Countrywide Lost-Time Claims:	4582.0	.	.
(19) Pure Premium Underlying Present Rate:	0.482	0.358	0.840
(20) Relativity to Underlying Present Rate:	0.643	0.868	.
(21) Credibility to Underlying Relativity:	0.260	0.110	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.704	0.986	.
(24) Balanced Formula Relativity:	0.699	0.987	0.803

Class(es): 8044 STORE: FURNITURE & DRIVERS		Effective: 7/1/2020							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)
2013	704,377	9	84	368,869	478,796	103,874	330,973	1,282,513	1.203	0.617	1.821
2014	846,948	9	103	628,624	707,037	206,738	502,965	2,045,364	1.577	0.838	2.415
2015	875,989	6	127	823,227	704,231	408,870	557,901	2,494,228	1.744	1.104	2.847
2016	818,410	5	115	732,394	1,273,536	176,957	512,360	2,695,247	2.451	0.842	3.293
2017	1,220,288	6	121	406,668	955,806	237,542	676,114	2,276,131	1.117	0.749	1.865
MA Total:	4,466,012	35	550	2,959,783	4,119,407	1,133,981	2,580,313	10,793,484	1.585	0.832	2.417

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.921	1.783	.
(14) Massachusetts Credibility:	0.550	0.790	.
(15) Countrywide Pure Premium:	1.292	0.677	1.969
(16) Countrywide Indicated Relativity:	1.613	1.469	.
(17) Countrywide Credibility:	0.230	0.110	.
(18) Countrywide Lost-Time Claims:	7161.0	.	.
(19) Pure Premium Underlying Present Rate:	1.359	0.748	2.107
(20) Relativity to Underlying Present Rate:	1.811	1.814	.
(21) Credibility to Underlying Relativity:	0.220	0.100	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.826	1.752	.
(24) Balanced Formula Relativity:	1.813	1.753	1.791

IX 000220

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 149

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	475,001	4	38	320,942	19,009	156,073	44,121	540,144	0.716	0.421	1.137
2014	312,083	3	33	269,310	305,635	138,839	163,720	877,504	1.842	0.969	2.812
2015	293,733	4	33	231,991	55,643	34,929	97,210	419,773	0.979	0.450	1.429
2016	310,381	2	30	355,127	17,879	253,402	43,942	670,350	1.202	0.958	2.160
2017	298,247	1	27	277,062	212,155	94,739	203,331	787,288	1.640	0.999	2.640
MA Total:	1,689,444	14	161	1,454,432	610,321	677,982	552,325	3,295,060	1.222	0.728	1.950

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.481	1.562	.
(14) Massachusetts Credibility:	0.300	0.450	.
(15) Countrywide Pure Premium:	0.897	0.595	1.492
(16) Countrywide Indicated Relativity:	1.120	1.291	.
(17) Countrywide Credibility:	0.350	0.280	.
(18) Countrywide Lost-Time Claims:	5963.0	.	.
(19) Pure Premium Underlying Present Rate:	0.801	0.488	1.289
(20) Relativity to Underlying Present Rate:	1.068	1.184	.
(21) Credibility to Underlying Relativity:	0.350	0.270	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.210	1.384	.
(24) Balanced Formula Relativity:	1.202	1.385	1.268

Class(es):		Effective: 7/1/2020							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)
2013	296,936	2	36	238,431	602,021	32,329	200,302	1,073,083	2.830	0.783	3.614
2014	362,325	2	48	58,596	47,319	42,808	46,543	195,265	0.292	0.247	0.539
2015	417,111	2	47	265,320	1,218,095	144,177	660,282	2,287,874	3.556	1.929	5.485
2016	478,144	2	54	374,460	284,222	124,229	214,150	997,061	1.378	0.708	2.085
2017	525,899	3	73	287,762	380,110	54,089	277,198	999,159	1.270	0.630	1.900
MA Total:	2,080,415	11	258	1,224,568	2,531,766	397,632	1,398,475	5,552,441	1.806	0.863	2.669

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.189	1.851	.
(14) Massachusetts Credibility:	0.400	0.530	.
(15) Countrywide Pure Premium:	0.608	0.500	1.108
(16) Countrywide Indicated Relativity:	0.759	1.085	.
(17) Countrywide Credibility:	0.260	0.240	.
(18) Countrywide Lost-Time Claims:	38,000	.	.
(19) Pure Premium Underlying Present Rate:	1.336	0.596	1.932
(20) Relativity to Underlying Present Rate:	1.780	1.445	.
(21) Credibility to Underlying Relativity:	0.340	0.230	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.678	1.574	.
(24) Balanced Formula Relativity:	1.666	1.575	1.633

IX 000221

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	311,495	0	49	0	149,934	0	119,413	269,347	0.481	0.383	0.865
2014	312,387	4	52	239,903	83,399	160,279	108,805	592,386	1.035	0.861	1.896
2015	311,612	0	38	0	70,438	0	166,888	237,327	0.226	0.536	0.762
2016	299,558	2	34	217,171	550,985	180,514	200,559	1,149,230	2.564	1.272	3.836
2017	330,077	2	46	53,923	217,545	56,391	367,501	695,360	0.822	1.284	2.107
MA Total:	1,565,128	8	219	510,998	1,072,300	397,184	963,166	2,943,649	1.012	0.869	1.881

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.226	1.864	.
(14) Massachusetts Credibility:	0.320	0.500	.
(15) Countrywide Pure Premium:	0.952	0.714	1.666
(16) Countrywide Indicated Relativity:	1.188	1.549	.
(17) Countrywide Credibility:	0.340	0.250	.
(18) Countrywide Lost-Time Claims:	5235.0	.	.
(19) Pure Premium Underlying Present Rate:	0.981	0.681	1.662
(20) Relativity to Underlying Present Rate:	1.308	1.652	.
(21) Credibility to Underlying Relativity:	0.340	0.250	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.241	1.732	.
(24) Balanced Formula Relativity:	1.232	1.733	1.413

Class(es):		Effective: 7/1/2020							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)
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
2016	1,075	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	1,660	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	3,725	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:	0.030	0.050	.
(15) Countrywide Pure Premium:	0.964	0.664	1.629
(16) Countrywide Indicated Relativity:	1.204	1.441	.
(17) Countrywide Credibility:	0.230	0.250	.
(18) Countrywide Lost-Time Claims:	30.000	.	.
(19) Pure Premium Underlying Present Rate:	1.325	0.697	2.022
(20) Relativity to Underlying Present Rate:	1.766	1.690	.
(21) Credibility to Underlying Relativity:	0.740	0.700	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.584	1.543	.
(24) Balanced Formula Relativity:	1.572	1.544	1.562

IX 000222

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 151

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	9.887	2	1	374.502	163.198	53.484	74.367	665.551	54.385	12.931	67.317	
2014	7.022	1	3	118.330	196.819	36.862	79.633	431.644	44.880	16.590	61.471	
2015	7.057	0	1	0	133	0	224	356	0.019	0.032	0.050	
2016	10.188	0	1	0	42.762	0	7.044	49.806	4.197	0.691	4.889	
2017	10.092	1	1	232.357	64.694	24.319	24.638	346.007	29.435	4.851	34.286	
MA Total:	44.245	4	7	725.188	467.606	114.665	185.905	1,493.365	26.959	6.793	33.752	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	32.677	14.567	.
(14) Massachusetts Credibility:	0.160	0.200	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	7.897	5.953	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	5.972	2.474	8.445
(20) Relativity to Underlying Present Rate:	7.959	6.000	.
(21) Credibility to Underlying Relativity:	0.840	0.800	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	11.913	7.714	.
(24) Balanced Formula Relativity:	11.829	7.719	10.345

Class(es):		Effective: 7/1/2020							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)	
2013	147.634	1	38	65	246.116	930	536.780	783.890	1.668	3.642	5.310	
2014	168.963	3	44	630.087	192.215	122.459	142.784	1,087.544	4.867	1.570	6.437	
2015	153.954	1	43	206.697	313.686	58.738	335.862	914.983	3.380	2.563	5.943	
2016	162.483	0	42	0	351.359	0	207.940	559.299	2.162	1.280	3.442	
2017	152.402	1	33	102.432	370.037	98.515	223.915	794.899	3.100	2.116	5.216	
MA Total:	785.436	6	200	939.281	1,473.413	280.641	1,447.281	4,140.616	3.072	2.200	5.272	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.723	4.717	.
(14) Massachusetts Credibility:	0.360	0.520	.
(15) Countrywide Pure Premium:	2.125	1.152	3.277
(16) Countrywide Indicated Relativity:	2.654	2.499	.
(17) Countrywide Credibility:	0.320	0.240	.
(18) Countrywide Lost-Time Claims:	2570.0	.	.
(19) Pure Premium Underlying Present Rate:	2.661	1.494	4.155
(20) Relativity to Underlying Present Rate:	3.547	3.623	.
(21) Credibility to Underlying Relativity:	0.320	0.240	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	3.325	3.922	.
(24) Balanced Formula Relativity:	3.301	3.925	3.526

IX 000223

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 152

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	579,063	2	58	98,174	108,366	37,936	267,225	511,701	0.357	0.527	0.884
2014	741,608	3	98	1,001,434	1,351,647	239,498	647,787	3,240,365	3.173	1.196	4.369
2015	830,069	1	114	254,554	1,097,438	22,096	791,497	2,165,584	1.629	0.980	2.609
2016	880,557	4	94	1,009,629	475,105	396,259	624,842	2,505,835	1.686	1.160	2.846
2017	956,999	1	74	65,202	481,777	100,768	443,311	1,091,058	0.572	0.569	1.140
MA Total:	3,988,296	11	438	2,428,992	3,514,333	796,556	2,774,662	9,514,543	1.490	0.895	2.386

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.806	1.920	.
(14) Massachusetts Credibility:	0.490	0.730	.
(15) Countrywide Pure Premium:	1.354	0.649	2.004
(16) Countrywide Indicated Relativity:	1.691	1.409	.
(17) Countrywide Credibility:	0.260	0.140	.
(18) Countrywide Lost-Time Claims:	5733.0	.	.
(19) Pure Premium Underlying Present Rate:	1.165	0.675	1.840
(20) Relativity to Underlying Present Rate:	1.552	1.637	.
(21) Credibility to Underlying Relativity:	0.250	0.130	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.713	1.812	.
(24) Balanced Formula Relativity:	1.701	1.813	1.741

Class(es):		Effective: 7/1/2020							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)
2013	742,338	6	87	785,003	340,356	283,552	247,065	1,655,976	1.516	0.715	2.231
2014	739,162	6	110	428,785	666,083	156,047	484,899	1,735,813	1.481	0.867	2.348
2015	811,891	5	122	557,441	1,200,171	260,316	875,056	2,892,983	2.165	1.398	3.563
2016	835,578	5	110	719,101	612,681	495,077	433,477	2,260,336	1.594	1.111	2.705
2017	1,003,914	3	124	554,691	1,323,761	301,756	562,385	2,742,593	1.871	0.861	2.732
MA Total:	4,132,883	25	553	3,045,020	4,143,053	1,496,747	2,602,881	11,287,701	1.739	0.992	2.731

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.108	2.127	.
(14) Massachusetts Credibility:	0.500	0.750	.
(15) Countrywide Pure Premium:	0.818	0.456	1.274
(16) Countrywide Indicated Relativity:	1.021	0.989	.
(17) Countrywide Credibility:	0.250	0.130	.
(18) Countrywide Lost-Time Claims:	1286.0	.	.
(19) Pure Premium Underlying Present Rate:	1.191	0.710	1.902
(20) Relativity to Underlying Present Rate:	1.588	1.723	.
(21) Credibility to Underlying Relativity:	0.250	0.120	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.706	1.931	.
(24) Balanced Formula Relativity:	1.694	1.932	1.780

IX 000224

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Goods and Services		
8203 ICE DEALER & 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)
2013	39,043	1	12	2,947	67,733	2,003	39,084	111,767	1,810	1,052	2,863
2014	39,245	0	13	0	393,412	0	223,556	616,968	10,024	5,696	15,721
2015	42,651	1	10	273,719	169,803	41,390	124,815	609,727	10,399	3,897	14,296
2016	45,974	0	5	0	4,609	0	8,291	12,899	0,100	0,180	0,281
2017	44,402	0	16	0	123,217	0	56,297	179,514	2,775	1,268	4,043
MA Total:	211,315	2	56	276,666	758,773	43,393	452,043	1,530,875	4,900	2,345	7,245

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.939	5.027	.
(14) Massachusetts Credibility:	0.210	0.300	.
(15) Countrywide Pure Premium:	2.690	1.269	3.959
(16) Countrywide Indicated Relativity:	3.360	2.752	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	368.00	.	.
(19) Pure Premium Underlying Present Rate:	2.749	1.446	4.195
(20) Relativity to Underlying Present Rate:	3.663	3.507	.
(21) Credibility to Underlying Relativity:	0.390	0.350	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	4.020	3.699	.
(24) Balanced Formula Relativity:	3.991	3.702	3.887

Class(es):		Effective: 7/1/2020							Goods and Services		
8204 BUILDING MATERIAL YARD & LOCAL MANAGERS, 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)
2013	21,974	0	4	0	372	0	23,690	24,062	0,017	1,078	1,095
2014	28,429	0	2	0	708	0	12,992	13,700	0,025	0,457	0,482
2015	56,005	5	8	1,359,073	70,977	815,794	65,740	2,311,584	25,534	15,740	41,275
2016	58,540	1	9	219,289	17,862	25,178	43,825	306,153	4,051	1,179	5,230
2017	63,555	1	7	37,374	21,396	13,691	9,211	81,672	0,925	0,360	1,285
MA Total:	228,502	7	30	1,615,736	111,315	854,663	155,458	2,737,171	7,558	4,421	11,979

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	9.161	9.479	.
(14) Massachusetts Credibility:	0.190	0.330	.
(15) Countrywide Pure Premium:	2.110	1.081	3.191
(16) Countrywide Indicated Relativity:	2.635	2.344	.
(17) Countrywide Credibility:	0.410	0.340	.
(18) Countrywide Lost-Time Claims:	191.00	.	.
(19) Pure Premium Underlying Present Rate:	1.810	1.630	3.441
(20) Relativity to Underlying Present Rate:	2.413	3.954	.
(21) Credibility to Underlying Relativity:	0.400	0.330	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	3.786	5.230	.
(24) Balanced Formula Relativity:	3.759	5.234	4.292

IX 000225

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	60,322	2	9	262,686	65,864	168,850	16,207	513,607	5,447	3,068	8,514
2014	71,516	0	11	0	12,963	0	31,230	44,193	0,181	0,437	0,618
2015	77,051	0	6	0	47,981	0	83,355	131,336	0,623	1,082	1,705
2016	79,200	0	19	0	378,279	0	156,530	534,809	4,776	1,976	6,753
2017	75,007	0	5	0	49,816	0	32,397	82,212	0,664	0,432	1,096
MA Total:	363,096	2	50	262,686	554,903	168,850	319,719	1,306,158	2,252	1,346	3,597

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.729	2.885	.
(14) Massachusetts Credibility:	0.210	0.320	.
(15) Countrywide Pure Premium:	1.606	0.895	2.501
(16) Countrywide Indicated Relativity:	2.005	1.942	.
(17) Countrywide Credibility:	0.400	0.340	.
(18) Countrywide Lost-Time Claims:	1837.0	.	.
(19) Pure Premium Underlying Present Rate:	1.574	0.973	2.547
(20) Relativity to Underlying Present Rate:	2.097	2.361	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.193	2.386	.
(24) Balanced Formula Relativity:	2.178	2.388	2.254

Class(es):		Effective: 7/1/2020							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)
2013	981,364	3	83	789,845	2,037,329	264,314	1,295,903	4,387,390	2,881	1,590	4,471
2014	1,080,540	6	96	1,901,189	1,214,170	1,037,083	688,269	4,840,711	2,883	1,597	4,480
2015	1,213,629	9	73	1,548,670	1,038,316	725,402	493,297	3,805,685	2,132	1,004	3,136
2016	1,243,282	2	65	926,547	1,241,576	220,816	703,835	3,092,773	1,744	0,744	2,488
2017	1,319,463	7	81	1,481,824	2,619,339	405,253	1,764,924	6,271,339	3,108	1,645	4,753
MA Total:	5,838,277	27	398	6,648,075	8,150,731	2,652,867	4,946,227	22,397,899	2,535	1,302	3,836

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.974	1.096	.
(14) Massachusetts Credibility:	0.770	1.000	.
(15) Countrywide Pure Premium:	1.886	0.860	2.745
(16) Countrywide Indicated Relativity:	0.736	0.746	.
(17) Countrywide Credibility:	0.120	0.000	.
(18) Countrywide Lost-Time Claims:	2900.0	.	.
(19) Pure Premium Underlying Present Rate:	2.413	1.126	3.539
(20) Relativity to Underlying Present Rate:	0.997	1.068	.
(21) Credibility to Underlying Relativity:	0.110	0.000	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	0.948	1.096	.
(24) Balanced Formula Relativity:	0.952	1.094	0.996

IX 000226

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 155

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Goods and Services		
8232 LUMBER YARD-NEW MATERIALS ONLY: A/O EMP INCL YRD & WHSE & 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)
2013	1,176,147	14	248	2,692,778	2,044,732	1,040,892	1,295,300	7,073,702	4,028	1,986	6,014
2014	1,292,189	12	223	1,634,606	2,460,693	592,145	1,650,962	6,338,406	3,169	1,736	4,905
2015	1,352,846	17	233	2,347,897	1,965,581	1,123,348	1,354,231	6,791,056	3,188	1,831	5,020
2016	1,395,888	7	229	2,057,713	2,967,961	543,692	1,322,812	6,892,179	3,600	1,337	4,937
2017	1,527,191	6	234	599,977	1,935,892	746,642	1,511,680	4,794,191	1,660	1,479	3,139
MA Total:	6,744,261	56	1,167	9,332,971	11,374,859	4,046,719	7,134,984	31,889,534	3,070	1,658	4,728

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.722	3.555	.
(14) Massachusetts Credibility:	0.870	1.000	.
(15) Countrywide Pure Premium:	2.202	1.128	3.330
(16) Countrywide Indicated Relativity:	2.750	2.446	.
(17) Countrywide Credibility:	0.070	0.000	.
(18) Countrywide Lost-Time Claims:	10185	.	.
(19) Pure Premium Underlying Present Rate:	2.882	1.551	4.433
(20) Relativity to Underlying Present Rate:	3.842	3.761	.
(21) Credibility to Underlying Relativity:	0.060	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	3.661	3.555	.
(24) Balanced Formula Relativity:	3.635	3.558	3.607

Class(es):		Effective: 7/1/2020							Goods and Services		
8233 COAL MERCHANT & LOCAL MANAGERS & 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)
2013	274,051	2	36	10,509	521,997	15,797	471,488	1,019,790	1,943	1,778	3,721
2014	275,466	1	19	472,460	402,675	36,439	149,205	1,060,779	3,177	0,674	3,851
2015	273,834	4	26	487,609	665,208	369,511	267,969	1,790,296	4,210	2,328	6,538
2016	276,760	3	22	321,106	149,770	673,192	95,549	1,239,617	1,701	2,778	4,479
2017	316,862	2	30	99,696	756,540	40,424	461,602	1,358,263	2,702	1,584	4,287
MA Total:	1,416,973	12	133	1,391,381	2,496,190	1,135,363	1,445,812	6,468,745	2,744	1,822	4,565

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.325	3.906	.
(14) Massachusetts Credibility:	0.480	0.670	.
(15) Countrywide Pure Premium:	2.565	1.275	3.840
(16) Countrywide Indicated Relativity:	3.203	2.765	.
(17) Countrywide Credibility:	0.260	0.170	.
(18) Countrywide Lost-Time Claims:	1870.0	.	.
(19) Pure Premium Underlying Present Rate:	3.031	1.575	4.606
(20) Relativity to Underlying Present Rate:	4.040	3.820	.
(21) Credibility to Underlying Relativity:	0.260	0.160	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	3.479	3.699	.
(24) Balanced Formula Relativity:	3.455	3.701	3.544

IX 000227

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 156

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	133,917	0	21	0	17,718	0	27,291	45,009	0.132	0.204	0.336
2014	140,195	0	27	0	244,779	0	80,988	325,767	1.746	0.578	2.324
2015	115,249	0	29	0	132,887	0	175,909	308,796	1.153	1.526	2.679
2016	125,943	1	39	2,498	564,829	8,262	323,228	898,817	4.505	2.632	7.137
2017	127,414	0	14	0	366,125	0	129,414	495,539	2.874	1.016	3.889
MA Total:	642,718	1	130	2,498	1,326,338	8,262	736,830	2,073,928	2.068	1.159	3.227

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.506	2.486	.
(14) Massachusetts Credibility:	0.290	0.400	.
(15) Countrywide Pure Premium:	2.110	1.118	3.228
(16) Countrywide Indicated Relativity:	2.635	2.424	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	576.00	.	.
(19) Pure Premium Underlying Present Rate:	1.961	0.973	2.934
(20) Relativity to Underlying Present Rate:	2.614	2.359	.
(21) Credibility to Underlying Relativity:	0.350	0.300	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.590	2.429	.
(24) Balanced Formula Relativity:	2.572	2.431	2.521

Class(es):		Effective: 7/1/2020							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)
2013	85,748	0	19	0	18,067	0	58,694	76,761	0.211	0.684	0.895
2014	93,772	1	23	34,135	382,582	10,385	122,219	549,320	4.444	1.414	5.858
2015	94,041	0	25	0	273,070	0	98,068	371,138	2.904	1.043	3.947
2016	91,393	0	13	0	229,839	0	138,551	368,390	2.515	1.516	4.031
2017	88,879	0	14	0	181,259	0	169,210	350,469	2.039	1.904	3.943
MA Total:	453,833	1	94	34,135	1,084,817	10,385	586,742	1,716,079	2.466	1.316	3.781

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.989	2.821	.
(14) Massachusetts Credibility:	0.240	0.380	.
(15) Countrywide Pure Premium:	2.521	1.551	4.072
(16) Countrywide Indicated Relativity:	3.149	3.363	.
(17) Countrywide Credibility:	0.380	0.310	.
(18) Countrywide Lost-Time Claims:	196.00	.	.
(19) Pure Premium Underlying Present Rate:	1.642	1.166	2.808
(20) Relativity to Underlying Present Rate:	2.189	2.828	.
(21) Credibility to Underlying Relativity:	0.380	0.310	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.745	2.991	.
(24) Balanced Formula Relativity:	2.726	2.994	2.823

IX 000228

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 157

Calculation of Class Relativities

Class(es): 8264 BOTTLE DEALER-USED & DRIVERS		Effective: 7/1/2020							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)
2013	285.175	2	52	155.607	979.886	16.607	652.273	1,804.372	3.982	2.346	6.327
2014	271.367	4	45	386.231	229.926	212.131	217.928	1,046.216	2.271	1.585	3.855
2015	314.761	3	51	398.925	347.124	87.268	216.092	1,049.410	2.370	0.964	3.334
2016	344.271	2	66	248.225	847.055	210.252	432.632	1,738.163	3.181	1.867	5.049
2017	406.758	3	51	656.683	333.991	199.838	176.588	1,367.101	2.436	0.925	3.361
MA Total:	1,622,332	14	265	1,845,671	2,737,982	726,097	1,695,513	7,005,262	2,825	1,493	4,318

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.425	3.201	.
(14) Massachusetts Credibility:	0.450	0.650	.
(15) Countrywide Pure Premium:	1.978	1.247	3.225
(16) Countrywide Indicated Relativity:	2.470	2.705	.
(17) Countrywide Credibility:	0.280	0.180	.
(18) Countrywide Lost-Time Claims:	1286.0	.	.
(19) Pure Premium Underlying Present Rate:	2.247	1.268	3.514
(20) Relativity to Underlying Present Rate:	2.994	3.075	.
(21) Credibility to Underlying Relativity:	0.270	0.170	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	3.041	3.090	.
(24) Balanced Formula Relativity:	3.019	3.092	3.046

Class(es): 8279 STABLE OR BREEDING FARM & DRIVERS		Effective: 7/1/2020							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)
2013	166.624	1	21	39.022	71.075	2.897	209.265	322.258	0.661	1.273	1.934
2014	170.919	1	14	90.143	82.887	20.145	123.870	317.045	1.012	0.843	1.855
2015	167.040	1	24	125.909	20.972	48.375	65.766	261.023	0.879	0.683	1.563
2016	178.452	1	26	75.941	135.755	9.256	241.039	461.992	1.186	1.403	2.589
2017	191.080	1	25	17.131	114.234	24.411	194.071	349.846	0.687	1.143	1.831
MA Total:	874,116	5	110	348,146	424,922	105,084	834,011	1,712,163	0,884	1,074	1,959

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.072	2.304	.
(14) Massachusetts Credibility:	0.330	0.500	.
(15) Countrywide Pure Premium:	2.460	1.962	4.422
(16) Countrywide Indicated Relativity:	3.073	4.255	.
(17) Countrywide Credibility:	0.340	0.250	.
(18) Countrywide Lost-Time Claims:	949.00	.	.
(19) Pure Premium Underlying Present Rate:	1.993	1.206	3.199
(20) Relativity to Underlying Present Rate:	2.656	2.924	.
(21) Credibility to Underlying Relativity:	0.330	0.250	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.275	2.947	.
(24) Balanced Formula Relativity:	2.259	2.949	2.508

IX 000229

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 158

Calculation of Class Relativities

Class(es): 8291 STORAGE WAREHOUSE-COLD		Effective: 7/1/2020							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)
2013	120.802	1	32	126.496	214.930	46.927	101.350	489.703	2.826	1.227	4.054
2014	156.632	0	27	0	29.759	0	68.611	98.370	0.190	0.438	0.628
2015	156.003	1	29	22.223	106.238	9.561	115.239	253.261	0.823	0.800	1.623
2016	157.651	2	28	384.977	516.280	77.184	204.602	1,183.043	5.717	1.787	7.504
2017	179.489	1	31	117.941	534.272	66.564	435.868	1,154.645	3.634	2.799	6.433
MA Total:	770.577	5	147	651.637	1,401.477	200.235	925.671	3,179.021	2.664	1.461	4.126

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.230	3.133	.
(14) Massachusetts Credibility:	0.290	0.420	.
(15) Countrywide Pure Premium:	1.621	0.818	2.439
(16) Countrywide Indicated Relativity:	2.024	1.774	.
(17) Countrywide Credibility:	0.360	0.290	.
(18) Countrywide Lost-Time Claims:	1039.0	.	.
(19) Pure Premium Underlying Present Rate:	1.627	0.899	2.526
(20) Relativity to Underlying Present Rate:	2.169	2.179	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.424	2.462	.
(24) Balanced Formula Relativity:	2.407	2.464	2.428

Class(es): 8292 STORAGE WAREHOUSE NOC		Effective: 7/1/2020							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)
2013	599.165	11	115	890.666	427.786	388.763	444.898	2,152.112	2,200	1,391	3,592
2014	689.589	4	107	303.117	1,194.198	65.690	791.111	2,354.115	2,171	1,242	3,414
2015	768.405	7	105	370.978	1,323.966	98.682	474.106	2,267.731	2,206	0.745	2.951
2016	710.772	6	125	539.181	647.211	329.234	477.991	1,993.618	1,669	1,136	2,805
2017	804.282	8	158	465.223	1,088.039	209.183	631.030	2,393.476	1,931	1,045	2,976
MA Total:	3,572.212	36	610	2,569.166	4,681.200	1,091.552	2,819.135	11,161.052	2,030	1,095	3,124

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.460	2.348	.
(14) Massachusetts Credibility:	0.520	0.750	.
(15) Countrywide Pure Premium:	1.625	0.878	2.503
(16) Countrywide Indicated Relativity:	2.029	1.904	.
(17) Countrywide Credibility:	0.240	0.130	.
(18) Countrywide Lost-Time Claims:	7097.0	.	.
(19) Pure Premium Underlying Present Rate:	1.519	0.811	2.330
(20) Relativity to Underlying Present Rate:	2.024	1.966	.
(21) Credibility to Underlying Relativity:	0.240	0.120	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.252	2.244	.
(24) Balanced Formula Relativity:	2.236	2.246	2.240

IX 000230

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 159

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Goods and Services		
8293 STORAGE WAREHOUSE-FURNITURE & 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)
2013	495,658	6	102	757,247	1,340,330	399,686	669,530	3,166,792	4,232	2,157	6,389
2014	578,170	13	150	930,626	2,263,103	366,767	1,540,608	5,101,103	5,524	3,299	8,823
2015	595,646	16	120	1,690,722	1,729,174	752,933	712,973	4,885,803	5,741	2,461	8,203
2016	738,306	13	164	1,511,517	1,147,648	676,487	686,660	4,022,313	3,602	1,846	5,448
2017	760,740	13	144	810,355	1,122,199	443,712	1,124,499	3,500,765	2,540	2,061	4,602
MA Total:	3,168,519	61	680	5,700,467	7,602,454	2,639,584	4,734,270	20,676,776	4,198	2,327	6,526

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.089	4.990	.
(14) Massachusetts Credibility:	0.730	1.000	.
(15) Countrywide Pure Premium:	4.213	2.052	6.265
(16) Countrywide Indicated Relativity:	5.261	4.452	.
(17) Countrywide Credibility:	0.140	0.000	.
(18) Countrywide Lost-Time Claims:	4355.0	.	.
(19) Pure Premium Underlying Present Rate:	3.867	2.059	5.926
(20) Relativity to Underlying Present Rate:	5.154	4.993	.
(21) Credibility to Underlying Relativity:	0.130	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	5.121	4.990	.
(24) Balanced Formula Relativity:	5.085	4.994	5.052

Class(es):		Effective: 7/1/2020							Goods and Services		
8350 GASOLINE OR OIL DEALER & 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)
2013	1,566,520	15	278	2,048,689	2,488,512	618,806	1,831,388	6,987,394	2,896	1,564	4,460
2014	1,605,704	19	274	1,550,460	3,847,786	737,757	1,843,556	7,979,558	3,362	1,608	4,970
2015	1,581,981	16	212	4,353,861	3,583,779	1,296,649	1,592,589	10,826,878	5,018	1,826	6,844
2016	1,605,503	14	202	2,407,455	2,610,967	957,393	1,580,267	7,556,082	3,126	1,581	4,706
2017	1,619,075	12	209	1,954,838	4,498,085	929,043	2,393,998	9,775,963	3,986	2,052	6,038
MA Total:	7,978,782	76	1,175	12,315,303	17,029,128	4,539,648	9,241,798	43,125,875	3,678	1,727	5,405

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.458	3.704	.
(14) Massachusetts Credibility:	0.920	1.000	.
(15) Countrywide Pure Premium:	2.991	1.288	4.279
(16) Countrywide Indicated Relativity:	3.735	2.793	.
(17) Countrywide Credibility:	0.040	0.000	.
(18) Countrywide Lost-Time Claims:	3940.0	.	.
(19) Pure Premium Underlying Present Rate:	2.766	1.397	4.162
(20) Relativity to Underlying Present Rate:	3.686	3.388	.
(21) Credibility to Underlying Relativity:	0.040	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	4.398	3.704	.
(24) Balanced Formula Relativity:	4.367	3.706	4.128

IX 000231

Section IX - Classification Pricing
Subsection G - Class Relativities
7/1/2020

Section IX - G
Exhibit 160

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	7,895,269	38	1,085	4,070,608	7,359,294	1,436,066	5,001,422	17,867,389	1,448	0,815	2,263
2014	8,080,596	36	999	3,687,450	6,478,711	1,334,196	4,148,279	15,648,636	1,258	0,678	1,937
2015	8,512,170	46	1,000	5,716,301	7,839,693	2,076,223	4,161,911	19,794,127	1,593	0,733	2,325
2016	8,597,915	28	929	4,113,172	7,140,526	1,725,773	4,351,169	17,330,640	1,309	0,707	2,016
2017	8,857,671	29	902	3,953,862	8,593,881	2,196,313	4,325,700	19,069,756	1,417	0,736	2,153
MA Total:	41,943,620	177	4,915	21,541,393	37,412,105	8,768,571	21,988,480	89,710,549	1,406	0,733	2,139

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.704	1.572	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.199	0.603	1.802
(16) Countrywide Indicated Relativity:	1.497	1.308	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	26673	.	.
(19) Pure Premium Underlying Present Rate:	1.245	0.653	1.898
(20) Relativity to Underlying Present Rate:	1.659	1.584	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.704	1.572	.
(24) Balanced Formula Relativity:	1.692	1.574	1.649

Class(es):		Effective: 7/1/2020							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)
2013	178,080	0	8	0	560,605	0	251,245	811,850	3,148	1,411	4,559
2014	200,391	1	18	32,226	29,357	11,072	38,561	111,217	0,307	0,248	0,555
2015	179,806	1	6	3,715	130,189	216	95,395	229,515	0,745	0,532	1,276
2016	190,288	2	14	16,861	55,266	14,571	89,099	175,798	0,379	0,545	0,924
2017	168,934	1	8	99,427	193,052	40,877	61,865	395,222	1,731	0,608	2,340
MA Total:	917,499	5	54	152,230	968,469	66,737	536,165	1,723,600	1,221	0,657	1,879

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.481	1.409	.
(14) Massachusetts Credibility:	0.230	0.370	.
(15) Countrywide Pure Premium:	0.772	0.452	1.224
(16) Countrywide Indicated Relativity:	0.963	0.981	.
(17) Countrywide Credibility:	0.390	0.320	.
(18) Countrywide Lost-Time Claims:	532.00	.	.
(19) Pure Premium Underlying Present Rate:	0.742	0.531	1.272
(20) Relativity to Underlying Present Rate:	0.988	1.287	.
(21) Credibility to Underlying Relativity:	0.380	0.310	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.092	1.234	.
(24) Balanced Formula Relativity:	1.084	1.235	1.139

IX 000232

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 161

Calculation of Class Relativities

Class(es): 8385 BUS CO: GARAGE EMPLOYEES		Effective: 7/1/2020							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)
2013	413,494	0	78	0	242,256	0	223,421	465,676	0.586	0.540	1.126
2014	419,724	3	78	250,762	1,233,138	195,272	430,130	2,109,302	3.535	1.490	5.025
2015	446,275	4	45	535,931	694,898	170,346	195,675	1,596,851	2.758	0.820	3.578
2016	472,893	1	58	113,072	819,064	19,047	331,522	1,282,705	1.971	0.741	2.712
2017	513,131	5	101	332,898	1,149,281	175,617	620,822	2,278,618	2.889	1.552	4.441
MA Total:	2,265,517	13	360	1,232,663	4,138,637	560,282	1,801,570	7,733,152	2.371	1.043	3.413

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.874	2.236	.
(14) Massachusetts Credibility:	0.400	0.590	.
(15) Countrywide Pure Premium:	0.959	0.503	1.462
(16) Countrywide Indicated Relativity:	1.198	1.091	.
(17) Countrywide Credibility:	0.300	0.210	.
(18) Countrywide Lost-Time Claims:	1354.0	.	.
(19) Pure Premium Underlying Present Rate:	1.236	0.716	1.952
(20) Relativity to Underlying Present Rate:	1.647	1.737	.
(21) Credibility to Underlying Relativity:	0.300	0.200	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.003	1.896	.
(24) Balanced Formula Relativity:	1.989	1.897	1.955

Class(es): 8392 AUTOMOBILE STORAGE GARAGE OR PARKING STATION & DRIVERS		Effective: 7/1/2020							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)
2013	509,864	2	48	42,088	154,832	7,306	96,802	301,028	0.386	0.204	0.590
2014	575,119	1	46	70,473	50,106	483,104	229,357	833,040	0.210	1.239	1.448
2015	611,938	3	46	365,275	71,058	72,845	109,523	618,700	0.713	0.298	1.011
2016	517,861	0	32	0	27,762	0	84,352	112,113	0.054	0.163	0.216
2017	452,777	1	46	21,883	337,682	17,078	152,983	529,626	0.794	0.376	1.170
MA Total:	2,667,559	7	218	499,719	641,441	580,332	673,016	2,394,508	0.428	0.470	0.898

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.519	1.008	.
(14) Massachusetts Credibility:	0.320	0.510	.
(15) Countrywide Pure Premium:	0.976	0.622	1.598
(16) Countrywide Indicated Relativity:	1.219	1.349	.
(17) Countrywide Credibility:	0.340	0.250	.
(18) Countrywide Lost-Time Claims:	1478.0	.	.
(19) Pure Premium Underlying Present Rate:	0.612	0.411	1.023
(20) Relativity to Underlying Present Rate:	0.815	0.997	.
(21) Credibility to Underlying Relativity:	0.340	0.240	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.858	1.090	.
(24) Balanced Formula Relativity:	0.852	1.091	0.938

IX 000233

Calculation of Class Relativities

Class(es): 8393 AUTOMOBILE BODY REPAIR		Effective: 7/1/2020							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)
2013	2,042,224	7	161	1,098,176	1,380,050	229,688	691,451	3,399,365	1,213	0,451	1,665
2014	2,193,528	7	174	644,764	671,423	80,773	569,984	1,966,944	0,600	0,297	0,897
2015	2,004,763	2	126	238,600	806,110	80,660	407,574	1,532,944	0,521	0,244	0,765
2016	2,023,359	3	114	139,893	829,293	96,625	621,118	1,686,930	0,479	0,355	0,834
2017	2,186,423	4	98	104,377	402,740	76,802	309,262	893,180	0,232	0,177	0,409
MA Total:	10,450,296	23	673	2,225,809	4,089,617	564,547	2,599,390	9,479,364	0.604	0.303	0.907

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.733	0.649	.
(14) Massachusetts Credibility:	0.640	0.820	.
(15) Countrywide Pure Premium:	0.879	0.345	1.224
(16) Countrywide Indicated Relativity:	1.097	0.749	.
(17) Countrywide Credibility:	0.180	0.090	.
(18) Countrywide Lost-Time Claims:	2924.0	.	.
(19) Pure Premium Underlying Present Rate:	0.859	0.345	1.204
(20) Relativity to Underlying Present Rate:	1.145	0.838	.
(21) Credibility to Underlying Relativity:	0.180	0.090	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.872	0.675	.
(24) Balanced Formula Relativity:	0.866	0.676	0.797

Class(es): 8601 ARCHITECT OR ENGINEER-CONSULTING		Effective: 7/1/2020							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)
2013	13,405,562	1	151	554,650	574,009	126,355	500,360	1,755,374	0.084	0.047	0.131
2014	14,253,416	8	160	513,314	1,030,043	174,157	604,150	2,321,664	0.108	0.055	0.163
2015	15,127,832	6	157	516,041	890,585	221,259	881,189	2,509,075	0.093	0.073	0.166
2016	15,299,126	6	158	917,004	1,571,534	223,452	908,423	3,620,413	0.163	0.074	0.237
2017	15,814,145	5	175	332,567	552,348	208,405	608,013	1,701,333	0.056	0.052	0.108
MA Total:	73,900,081	26	801	2,833,577	4,618,519	953,628	3,502,135	11,907,858	0.101	0.060	0.161

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.454	1.416	.
(14) Massachusetts Credibility:	0.600	0.880	.
(15) Countrywide Pure Premium:	0.111	0.060	0.171
(16) Countrywide Indicated Relativity:	1.854	1.561	.
(17) Countrywide Credibility:	0.200	0.060	.
(18) Countrywide Lost-Time Claims:	2017.0	.	.
(19) Pure Premium Underlying Present Rate:	0.101	0.059	0.160
(20) Relativity to Underlying Present Rate:	1.558	1.523	.
(21) Credibility to Underlying Relativity:	0.200	0.060	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	1.555	1.431	.
(24) Balanced Formula Relativity:	1.562	1.434	1.513

IX 000234

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	8,440	0	1	0	14,275	0	3,468	17,743	1,691	0,411	2,102
2014	7,314	0	0	0	0	0	0	0	0,000	0,000	0,000
2015	2,259	0	1	0	7,828	0	2,212	10,040	3,464	0,979	4,444
2016	1,000	0	0	0	0	0	0	0	0,000	0,000	0,000
2017	1,453	0	0	0	0	0	0	0	0,000	0,000	0,000
MA Total:	20,467	0	2	0	22,103	0	5,681	27,783	1,080	0,278	1,357

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.309	0.595	.
(14) Massachusetts Credibility:	0.070	0.100	.
(15) Countrywide Pure Premium:	0.504	0.279	0.783
(16) Countrywide Indicated Relativity:	0.629	0.606	.
(17) Countrywide Credibility:	0.200	0.210	.
(18) Countrywide Lost-Time Claims:	20,000	.	.
(19) Pure Premium Underlying Present Rate:	2.029	0.875	2,904
(20) Relativity to Underlying Present Rate:	2.704	2.122	.
(21) Credibility to Underlying Relativity:	0.730	0.690	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1,291
(23) Formula Relativity:	2.191	1.651	.
(24) Balanced Formula Relativity:	2.176	1.652	1,987

Class(es):		Effective: 7/1/2020							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)
2013	1,690,087	7	57	102,351	61,071	56,479	162,059	381,961	0,097	0,129	0,226
2014	1,791,775	2	42	111,604	133,440	7,731	153,152	405,927	0,137	0,090	0,227
2015	1,829,717	4	49	1,327,328	893,884	266,416	376,760	2,864,388	1,214	0,352	1,565
2016	1,813,831	2	45	245,676	256,580	49,009	245,054	796,319	0,277	0,162	0,439
2017	2,061,932	2	53	160,211	390,851	34,567	412,445	998,074	0,267	0,217	0,484
MA Total:	9,187,342	17	246	1,947,170	1,735,827	414,202	1,349,470	5,446,669	0,401	0,192	0,593

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.486	0.412	.
(14) Massachusetts Credibility:	0.460	0.630	.
(15) Countrywide Pure Premium:	0.452	0.264	0,716
(16) Countrywide Indicated Relativity:	0.565	0.572	.
(17) Countrywide Credibility:	0.270	0.190	.
(18) Countrywide Lost-Time Claims:	1402.0	.	.
(19) Pure Premium Underlying Present Rate:	0.430	0.208	0,639
(20) Relativity to Underlying Present Rate:	0.574	0.505	.
(21) Credibility to Underlying Relativity:	0.270	0.180	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1,291
(23) Formula Relativity:	0.531	0.459	.
(24) Balanced Formula Relativity:	0.527	0.459	0,503

IX 000235

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	275,524	2	1	124,085	0	9,019	30	133,133	0.450	0.033	0.483
2014	328,957	0	2	0	0	0	794	794	0.000	0.002	0.002
2015	284,195	0	1	0	0	0	45	45	0.000	0.000	0.000
2016	292,653	0	4	0	2,697	0	19,125	21,822	0.009	0.065	0.075
2017	323,499	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	1,504,827	2	8	124,085	2,697	9,019	19,994	155,795	0.084	0.019	0.104

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.215	0.453	.
(14) Massachusetts Credibility:	0.150	0.270	.
(15) Countrywide Pure Premium:	0.093	0.058	0.151
(16) Countrywide Indicated Relativity:	1.563	1.501	.
(17) Countrywide Credibility:	0.360	0.370	.
(18) Countrywide Lost-Time Claims:	89,000	.	.
(19) Pure Premium Underlying Present Rate:	0.152	0.154	0.306
(20) Relativity to Underlying Present Rate:	2.348	3.963	.
(21) Credibility to Underlying Relativity:	0.490	0.360	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	1.895	2.104	.
(24) Balanced Formula Relativity:	1.903	2.108	1.981

Class(es):		Effective: 7/1/2020							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)
2013	96,997,220	29	509	3,465,721	3,434,798	1,108,713	2,481,479	10,490,711	0.071	0.037	0.108
2014	101,741,424	32	524	2,567,817	2,431,042	1,986,076	2,206,368	9,191,303	0.049	0.041	0.090
2015	107,257,436	19	568	1,203,788	4,291,190	808,891	3,229,860	9,533,729	0.051	0.038	0.089
2016	110,882,425	25	451	1,493,022	4,769,125	666,026	2,693,478	9,621,651	0.056	0.030	0.087
2017	115,561,256	19	526	1,205,597	2,254,170	599,299	2,689,873	6,748,939	0.030	0.028	0.058
MA Total:	532,439,762	124	2,578	9,935,945	17,180,325	5,169,005	13,301,059	45,586,333	0.051	0.035	0.086

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.734	0.815	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.097	0.057	0.154
(16) Countrywide Indicated Relativity:	1.622	1.486	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	14882	.	.
(19) Pure Premium Underlying Present Rate:	0.055	0.035	0.090
(20) Relativity to Underlying Present Rate:	0.852	0.896	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	0.734	0.815	.
(24) Balanced Formula Relativity:	0.738	0.816	0.768

IX 000236

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 165

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	123,877	2	34	446,954	86,646	384,597	138,021	1,056,217	4,307	4,219	8,526
2014	124,555	4	21	308,679	104,481	432,288	143,263	988,712	3,317	4,621	7,938
2015	129,116	0	30	0	899,142	0	309,242	1,208,384	6,964	2,395	9,359
2016	113,391	1	15	56,913	122,982	8,212	44,513	232,620	1,587	0,465	2,051
2017	81,736	0	12	0	136,269	0	78,566	214,835	1,667	0,961	2,628
MA Total:	572,676	7	112	812,546	1,349,519	825,097	713,605	3,700,768	3,775	2,687	6,462

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.576	5.762	.
(14) Massachusetts Credibility:	0.320	0.530	.
(15) Countrywide Pure Premium:	1.646	0.973	2.619
(16) Countrywide Indicated Relativity:	2.056	2.111	.
(17) Countrywide Credibility:	0.340	0.240	.
(18) Countrywide Lost-Time Claims:	299.00	.	.
(19) Pure Premium Underlying Present Rate:	2.683	2.189	4.872
(20) Relativity to Underlying Present Rate:	3.576	5.309	.
(21) Credibility to Underlying Relativity:	0.340	0.230	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	3.379	4.781	.
(24) Balanced Formula Relativity:	3.355	4.785	3.871

Class(es):		Effective: 7/1/2020							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)
2013	137,333	1	1	283,436	1,185	17,887	502	303,010	2,072	0,134	2,206
2014	143,668	0	0	0	0	0	0	0	0,000	0,000	0,000
2015	137,365	0	2	0	2,969	0	13,809	16,778	0,022	0,101	0,122
2016	147,459	0	2	0	7,737	0	5,105	12,842	0,052	0,035	0,087
2017	178,852	0	1	0	0	0	147	147	0,000	0,001	0,001
MA Total:	744,676	1	6	283,436	11,890	17,887	19,563	332,776	0,397	0,050	0,447

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.481	0.108	.
(14) Massachusetts Credibility:	0.170	0.220	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.573	0.419	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.433	0.174	0.607
(20) Relativity to Underlying Present Rate:	0.578	0.422	.
(21) Credibility to Underlying Relativity:	0.830	0.780	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.561	0.353	.
(24) Balanced Formula Relativity:	0.557	0.353	0.483

IX 000237

Section IX - Classification Pricing
Subsection G - Class Relativities
7/1/2020

Section IX - G
Exhibit 166

Calculation of Class Relativities

Class(es): 8748 AUTOMOBILE SALESPERSONS		Effective: 7/1/2020							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)
2013	2,767,272	7	97	786,349	442,704	249,685	242,028	1,720,766	0.444	0.178	0.622
2014	3,099,104	10	93	1,069,927	790,150	340,205	607,684	2,807,966	0.600	0.306	0.906
2015	3,102,988	2	66	94,270	986,236	39,136	371,795	1,491,436	0.348	0.132	0.481
2016	3,136,856	1	61	116,189	452,732	40,960	339,470	949,351	0.181	0.121	0.303
2017	3,217,247	7	86	625,719	1,031,664	184,278	685,373	2,527,034	0.515	0.270	0.785
MA Total:	15,323,467	27	403	2,692,454	3,703,486	854,263	2,246,350	9,496,553	0.417	0.202	0.620

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.019	4.753	.
(14) Massachusetts Credibility:	0.500	0.710	.
(15) Countrywide Pure Premium:	0.175	0.101	0.276
(16) Countrywide Indicated Relativity:	2.934	2.617	.
(17) Countrywide Credibility:	0.250	0.150	.
(18) Countrywide Lost-Time Claims:	1876.0	.	.
(19) Pure Premium Underlying Present Rate:	0.309	0.166	0.475
(20) Relativity to Underlying Present Rate:	4.784	4.278	.
(21) Credibility to Underlying Relativity:	0.250	0.140	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	4.939	4.366	.
(24) Balanced Formula Relativity:	4.960	4.374	4.737

Class(es): 8800 MAILING OR ADDRESSING CO & CLERICAL		Effective: 7/1/2020							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)
2013	412,553	2	14	131,754	60,977	36,776	52,562	282,068	0.467	0.217	0.684
2014	370,892	0	14	0	68,019	0	37,141	105,160	0.183	0.100	0.284
2015	404,358	1	15	152,959	41,599	18,887	47,949	261,394	0.481	0.165	0.646
2016	389,109	0	6	0	4,921	0	27,088	32,009	0.013	0.070	0.082
2017	345,228	0	12	0	159,910	0	98,280	258,190	0.463	0.285	0.748
MA Total:	1,922,140	3	61	284,713	335,425	55,663	263,020	938,821	0.323	0.166	0.488

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.653	3.894	.
(14) Massachusetts Credibility:	0.270	0.370	.
(15) Countrywide Pure Premium:	0.573	0.363	0.935
(16) Countrywide Indicated Relativity:	9.577	9.409	.
(17) Countrywide Credibility:	0.370	0.320	.
(18) Countrywide Lost-Time Claims:	816.00	.	.
(19) Pure Premium Underlying Present Rate:	0.516	0.258	0.775
(20) Relativity to Underlying Present Rate:	7.985	6.657	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	7.674	6.515	.
(24) Balanced Formula Relativity:	7.707	6.528	7.258

IX 000238

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 167

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Office and Clerical		
8803 AUDITORS, ACCOUNTANT OR FACTORY COST OR OFF SYSTEMZR-TRAV											
		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)
2013	29,068,523	3	48	209,356	323,957	100,768	208,314	842,394	0.018	0.011	0.029
2014	30,896,052	4	46	973,258	330,746	393,030	251,265	1,948,299	0.042	0.021	0.063
2015	32,200,931	1	41	51,178	315,486	66,929	214,009	647,601	0.011	0.009	0.020
2016	30,848,901	0	48	0	656,637	0	569,672	1,226,309	0.021	0.018	0.040
2017	31,627,618	3	37	351,404	59,766	85,082	254,127	750,378	0.013	0.011	0.024
MA Total:	154,642,024	11	220	1,585,197	1,686,591	645,809	1,497,386	5,414,982	0.021	0.014	0.035

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.305	0.326	.
(14) Massachusetts Credibility:	0.410	0.610	.
(15) Countrywide Pure Premium:	0.020	0.011	0.031
(16) Countrywide Indicated Relativity:	0.330	0.286	.
(17) Countrywide Credibility:	0.300	0.200	.
(18) Countrywide Lost-Time Claims:	865.00	.	.
(19) Pure Premium Underlying Present Rate:	0.019	0.011	0.030
(20) Relativity to Underlying Present Rate:	0.297	0.286	.
(21) Credibility to Underlying Relativity:	0.290	0.190	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	0.310	0.310	.
(24) Balanced Formula Relativity:	0.312	0.311	0.311

Class(es):		Effective: 7/1/2020							Office and Clerical		
8810 CLERICAL OFFICE EMPLOYEES 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)
2013	461,836,793	71	1,820	4,864,300	9,015,463	2,609,452	6,797,957	23,287,172	0.030	0.020	0.050
2014	487,268,308	85	1,974	8,268,369	11,083,938	2,557,141	9,030,950	30,940,398	0.040	0.024	0.063
2015	529,742,504	76	1,726	8,100,831	8,160,994	3,421,872	7,556,411	27,240,108	0.031	0.021	0.051
2016	549,577,578	73	1,641	7,717,383	7,505,511	2,735,477	7,101,355	25,059,726	0.028	0.018	0.046
2017	579,396,855	77	1,799	7,295,363	11,049,290	2,864,800	9,620,574	30,830,027	0.032	0.022	0.053
MA Total:	2,607,822,038	382	8,960	36,246,245	46,815,196	14,188,742	40,107,247	137,357,430	0.032	0.021	0.053

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.459	0.489	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.041	0.027	0.068
(16) Countrywide Indicated Relativity:	0.685	0.704	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	37458	.	.
(19) Pure Premium Underlying Present Rate:	0.031	0.018	0.050
(20) Relativity to Underlying Present Rate:	0.486	0.475	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	0.459	0.489	.
(24) Balanced Formula Relativity:	0.461	0.490	0.472

IX 000239

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 168

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	24,532,045	2	73	343,394	603,681	46,708	432,327	1,426,111	0.039	0.020	0.058
2014	24,326,195	2	67	437,098	884,808	241,457	555,746	2,119,110	0.054	0.033	0.087
2015	24,387,293	6	65	717,097	260,536	254,266	434,205	1,666,103	0.040	0.028	0.068
2016	26,503,297	5	42	45,075	302,927	37,086	322,844	707,933	0.013	0.014	0.027
2017	27,689,648	5	55	125,593	744,295	113,300	346,022	1,329,210	0.031	0.017	0.048
MA Total:	127,438,477	20	302	1,668,258	2,796,247	692,817	2,091,144	7,248,467	0.035	0.022	0.057

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.505	0.513	.
(14) Massachusetts Credibility:	0.500	0.730	.
(15) Countrywide Pure Premium:	0.038	0.023	0.062
(16) Countrywide Indicated Relativity:	0.642	0.609	.
(17) Countrywide Credibility:	0.250	0.140	.
(18) Countrywide Lost-Time Claims:	1505.0	.	.
(19) Pure Premium Underlying Present Rate:	0.039	0.021	0.060
(20) Relativity to Underlying Present Rate:	0.596	0.546	.
(21) Credibility to Underlying Relativity:	0.250	0.130	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	0.562	0.531	.
(24) Balanced Formula Relativity:	0.565	0.532	0.552

Class(es):		Effective: 7/1/2020							Goods and Services		
8824 ASSISTED LIVING RESIDENCES: PERSONAL CARE 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)
2013	648,464	4	134	99,812	314,977	22,051	251,115	687,955	0.640	0.421	1.061
2014	825,467	4	171	135,112	439,109	42,626	259,513	876,360	0.696	0.366	1.062
2015	907,845	2	215	107,763	996,758	92,772	663,838	1,861,131	1.217	0.833	2.050
2016	1,015,694	5	188	117,442	477,372	107,190	392,775	1,094,780	0.586	0.492	1.078
2017	1,313,722	6	272	313,335	728,161	172,137	512,795	1,726,429	0.793	0.521	1.314
MA Total:	4,711,191	21	980	773,464	2,956,377	436,776	2,080,036	6,246,653	0.792	0.534	1.326

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.960	1.146	.
(14) Massachusetts Credibility:	0.440	0.610	.
(15) Countrywide Pure Premium:	1.207	0.777	1.983
(16) Countrywide Indicated Relativity:	1.507	1.684	.
(17) Countrywide Credibility:	0.280	0.200	.
(18) Countrywide Lost-Time Claims:	10759	.	.
(19) Pure Premium Underlying Present Rate:	0.758	0.376	1.134
(20) Relativity to Underlying Present Rate:	1.010	0.913	.
(21) Credibility to Underlying Relativity:	0.280	0.190	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.127	1.209	.
(24) Balanced Formula Relativity:	1.119	1.210	1.152

IX 000240

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Goods and Services			
8826 ASSISTED LIVING RESIDENCES: ALL OTHER EMPLOYEES, SALESPERSONS &												
		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)	
2013	602,199	1	113	3,435	192,011	10,161	175,481	381,087	0.325	0.308	0.633	
2014	825,117	3	136	193,888	202,109	71,513	187,315	654,825	0.480	0.314	0.794	
2015	871,671	4	161	272,799	618,469	34,116	323,897	1,249,281	1.022	0.411	1.433	
2016	986,402	3	143	390,312	336,059	100,392	257,109	1,083,872	0.736	0.362	1.099	
2017	1,092,034	3	165	122,950	287,881	59,352	243,120	713,302	0.376	0.277	0.653	
MA Total:	4,377,423	14	718	983,383	1,636,529	275,534	1,186,922	4,082,368	0.599	0.334	0.933	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.725	0.716	.
(14) Massachusetts Credibility:	0.430	0.600	.
(15) Countrywide Pure Premium:	0.941	0.649	1.590
(16) Countrywide Indicated Relativity:	1.176	1.407	.
(17) Countrywide Credibility:	0.290	0.200	.
(18) Countrywide Lost-Time Claims:	3252.0	.	.
(19) Pure Premium Underlying Present Rate:	0.758	0.376	1.134
(20) Relativity to Underlying Present Rate:	1.010	0.913	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.936	0.894	.
(24) Balanced Formula Relativity:	0.929	0.894	0.916

Class(es):		Effective: 7/1/2020							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)	
2013	9,893,555	47	1,817	3,377,573	5,894,745	1,218,924	3,774,306	14,265,549	0.937	0.505	1.442	
2014	10,715,612	64	2,026	4,918,909	6,477,195	1,510,558	4,463,507	17,370,169	1.064	0.558	1.621	
2015	9,520,491	41	1,676	3,190,215	7,200,613	1,338,693	4,128,489	15,858,010	1.091	0.574	1.666	
2016	9,663,506	58	1,593	4,996,296	8,820,189	1,067,611	4,609,415	19,493,512	1.430	0.587	2.017	
2017	10,382,503	39	1,496	4,946,640	10,092,200	1,738,125	4,789,014	21,565,981	1.448	0.629	2.077	
MA Total:	50,175,667	249	8,608	21,429,634	38,484,942	6,873,913	21,764,731	88,553,220	1.194	0.571	1.765	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.447	1.224	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.925	0.545	1.470
(16) Countrywide Indicated Relativity:	1.156	1.182	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	20899	.	.
(19) Pure Premium Underlying Present Rate:	1.005	0.487	1.492
(20) Relativity to Underlying Present Rate:	1.339	1.181	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.447	1.224	.
(24) Balanced Formula Relativity:	1.437	1.225	1.360

IX 000241

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 170

Calculation of Class Relativities

Class(es): 8831 PET GROOMING & DRIVERS		Effective: 7/1/2020							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)
2013	2,741,235	6	623	666,447	595,091	80,536	914,251	2,256,325	0.460	0.363	0.823
2014	2,861,655	2	601	77,981	526,901	96,739	1,112,968	1,814,589	0.211	0.423	0.634
2015	3,125,595	13	628	1,078,943	332,265	321,409	1,144,857	2,877,475	0.452	0.469	0.921
2016	3,123,411	5	567	381,186	632,593	352,145	1,155,100	2,521,023	0.325	0.483	0.807
2017	3,688,353	9	694	387,199	1,100,210	193,026	1,372,281	3,052,716	0.403	0.424	0.828
MA Total:	15,540,248	35	3,113	2,591,756	3,187,060	1,043,856	5,699,457	12,522,128	0.372	0.434	0.806

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.451	0.930	.
(14) Massachusetts Credibility:	0.510	0.970	.
(15) Countrywide Pure Premium:	0.426	0.388	0.815
(16) Countrywide Indicated Relativity:	0.533	0.842	.
(17) Countrywide Credibility:	0.250	0.020	.
(18) Countrywide Lost-Time Claims:	4744.0	.	.
(19) Pure Premium Underlying Present Rate:	0.320	0.354	0.674
(20) Relativity to Underlying Present Rate:	0.427	0.858	.
(21) Credibility to Underlying Relativity:	0.240	0.010	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.465	0.928	.
(24) Balanced Formula Relativity:	0.462	0.929	0.631

Class(es): 8832 PHYSICIAN & CLERICAL		Effective: 7/1/2020							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)
2013	53,334,152	39	1,341	3,304,437	3,055,362	1,206,180	3,416,132	10,982,111	0.119	0.087	0.206
2014	54,380,094	33	1,190	3,263,354	3,005,487	1,381,752	2,214,506	9,865,099	0.115	0.066	0.181
2015	55,165,373	25	1,176	3,078,401	5,359,021	1,782,707	3,096,287	13,316,417	0.153	0.088	0.241
2016	56,855,187	34	1,288	3,795,399	7,302,190	1,198,077	3,611,402	15,907,067	0.195	0.085	0.280
2017	57,789,960	30	1,295	3,625,412	5,221,138	925,154	3,236,513	13,008,217	0.153	0.072	0.225
MA Total:	277,524,766	161	6,290	17,067,003	23,943,199	6,493,869	15,574,840	63,078,911	0.148	0.080	0.227

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.131	1.868	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.095	0.056	0.151
(16) Countrywide Indicated Relativity:	1.589	1.445	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	13881	.	.
(19) Pure Premium Underlying Present Rate:	0.130	0.072	0.201
(20) Relativity to Underlying Present Rate:	2.005	1.850	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	2.131	1.868	.
(24) Balanced Formula Relativity:	2.140	1.871	2.038

IX 000242

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 171

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Office and Clerical		
8833 HOSPITAL: PROFESSIONAL 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)
2013	7,789,989	27	788	2,393,730	3,739,805	796,183	1,835,026	8,764,743	0.787	0.338	1.125
2014	8,554,257	21	890	1,468,409	3,481,796	343,591	1,621,764	6,915,560	0.579	0.230	0.808
2015	8,862,942	16	826	1,609,509	3,063,215	364,161	1,857,089	6,893,974	0.527	0.251	0.778
2016	9,957,925	30	942	2,872,845	4,119,608	1,061,480	2,425,099	10,479,032	0.702	0.350	1.052
2017	10,807,904	21	839	2,366,920	3,677,435	775,655	1,778,372	8,598,382	0.559	0.236	0.796
MA Total:	45,973,017	115	4,285	10,711,412	18,081,858	3,341,070	9,517,350	41,651,691	0.626	0.280	0.906

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	9.032	6.569	.
(14) Massachusetts Credibility:	0.980	1.000	.
(15) Countrywide Pure Premium:	0.275	0.169	0.444
(16) Countrywide Indicated Relativity:	4.600	4.378	.
(17) Countrywide Credibility:	0.010	0.000	.
(18) Countrywide Lost-Time Claims:	18008	.	.
(19) Pure Premium Underlying Present Rate:	0.561	0.276	0.837
(20) Relativity to Underlying Present Rate:	8.678	7.109	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	8.984	6.569	.
(24) Balanced Formula Relativity:	9.023	6.582	8.094

Class(es):		Effective: 7/1/2020							Goods and Services		
8835 NURSING-HOME HEALTH, PUBLIC & TRAVELING-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)
2013	7,555,110	52	847	3,234,978	3,089,684	974,336	1,975,831	9,274,828	0.837	0.390	1.228
2014	9,021,485	61	941	3,946,850	4,937,510	1,006,435	3,014,554	12,905,349	0.985	0.446	1.431
2015	10,618,896	59	963	4,220,901	7,145,859	1,694,904	3,398,383	16,460,047	1.070	0.480	1.550
2016	10,750,248	49	907	3,110,554	5,369,462	1,176,150	3,305,213	12,961,378	0.789	0.417	1.206
2017	10,349,237	48	834	6,983,321	8,827,742	1,529,357	3,517,799	20,858,218	1.528	0.488	2.015
MA Total:	48,294,977	269	4,492	21,496,603	29,370,256	6,381,181	15,211,779	72,459,819	1.053	0.447	1.500

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.277	0.959	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.971	0.481	1.453
(16) Countrywide Indicated Relativity:	1.213	1.044	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	17530	.	.
(19) Pure Premium Underlying Present Rate:	1.009	0.429	1.439
(20) Relativity to Underlying Present Rate:	1.345	1.041	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.277	0.959	.
(24) Balanced Formula Relativity:	1.268	0.959	1.156

IX 000243

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	36,950,557	76	3,180	4,275,377	6,176,646	1,635,183	7,276,224	19,363,429	0.283	0.241	0.524
2014	39,544,570	99	3,231	5,711,544	6,844,978	2,189,212	6,462,508	21,208,241	0.318	0.219	0.536
2015	42,009,143	68	3,319	4,648,249	7,800,039	1,703,470	7,330,064	21,481,822	0.296	0.215	0.511
2016	43,576,573	69	3,329	6,776,642	8,361,238	2,779,207	7,222,094	25,139,180	0.347	0.230	0.577
2017	45,053,203	76	3,517	6,175,636	13,083,451	2,314,658	9,145,748	30,719,492	0.427	0.254	0.682
MA Total:	207,134,046	388	16,576	27,587,447	42,266,351	10,621,729	37,436,637	117,912,164	0.337	0.232	0.569

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.863	5.450	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.098	0.084	0.182
(16) Countrywide Indicated Relativity:	1.638	2.188	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	16726	.	.
(19) Pure Premium Underlying Present Rate:	0.297	0.209	0.506
(20) Relativity to Underlying Present Rate:	4.595	5.389	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	4.863	5.450	.
(24) Balanced Formula Relativity:	4.884	5.460	5.103

Class(es):		Effective: 7/1/2020							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)
2013	5,555,110	29	474	2,291,312	4,778,959	875,409	2,593,126	10,538,805	1.273	0.624	1.897
2014	6,087,691	28	450	3,237,585	3,499,212	1,338,300	1,656,899	9,731,996	1.107	0.492	1.599
2015	6,775,187	28	524	2,654,047	3,838,817	919,969	2,593,942	10,006,776	0.958	0.519	1.477
2016	7,059,378	36	586	2,211,922	4,944,920	592,661	3,212,446	10,961,948	1.014	0.539	1.553
2017	7,195,483	32	574	3,330,915	7,001,630	1,929,739	4,736,132	16,998,416	1.436	0.926	2.362
MA Total:	32,672,849	153	2,608	13,725,781	24,063,537	5,656,078	14,792,546	58,237,942	1.157	0.626	1.782

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.402	1.342	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.329	0.728	2.058
(16) Countrywide Indicated Relativity:	1.660	1.580	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	18647	.	.
(19) Pure Premium Underlying Present Rate:	1.145	0.537	1.682
(20) Relativity to Underlying Present Rate:	1.526	1.303	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.402	1.342	.
(24) Balanced Formula Relativity:	1.392	1.343	1.374

IX 000244

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 173

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	5,565,723	27	796	2,717,135	6,231,736	737,694	4,211,501	13,898,065	1,608	0,889	2,497
2014	5,881,961	42	823	5,050,501	5,399,532	2,613,978	3,469,034	16,533,045	1,777	1,034	2,811
2015	6,102,121	24	775	2,986,456	6,701,117	1,253,841	4,332,271	15,273,685	1,588	0,915	2,503
2016	6,407,613	33	664	4,345,027	4,665,019	1,006,799	3,232,560	13,249,405	1,406	0,662	2,068
2017	6,581,900	35	710	4,495,233	6,864,028	1,832,395	3,429,468	16,621,125	1,726	0,799	2,525
MA Total:	30,539,318	161	3,768	19,594,351	29,861,434	7,444,707	18,674,833	75,575,325	1,619	0,855	2,475

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.963	1.834	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.436	0.744	2.180
(16) Countrywide Indicated Relativity:	1.793	1.613	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	15044	.	.
(19) Pure Premium Underlying Present Rate:	1.441	0.765	2.206
(20) Relativity to Underlying Present Rate:	1.921	1.856	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.963	1.834	.
(24) Balanced Formula Relativity:	1.949	1.835	1.908

Class(es):		Effective: 7/1/2020							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)
2013	595,743	5	102	285,078	408,348	177,838	192,825	1,064,090	1,164	0,622	1,786
2014	610,525	0	97	0	286,899	0	436,376	723,275	0,470	0,715	1,185
2015	629,829	2	88	47,388	409,179	6,222	389,743	852,532	0,725	0,629	1,354
2016	689,717	1	81	46,352	352,799	28,640	313,443	741,233	0,579	0,496	1,075
2017	770,597	1	92	87,485	233,187	31,155	285,735	637,562	0,416	0,411	0,827
MA Total:	3,296,411	9	460	466,303	1,690,411	243,854	1,618,123	4,018,692	0,654	0,565	1,219

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.793	1.211	.
(14) Massachusetts Credibility:	0.390	0.690	.
(15) Countrywide Pure Premium:	1.006	0.723	1.729
(16) Countrywide Indicated Relativity:	1.257	1.568	.
(17) Countrywide Credibility:	0.310	0.160	.
(18) Countrywide Lost-Time Claims:	1856.0	.	.
(19) Pure Premium Underlying Present Rate:	0.800	0.707	1.507
(20) Relativity to Underlying Present Rate:	1.066	1.716	.
(21) Credibility to Underlying Relativity:	0.300	0.150	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.019	1.344	.
(24) Balanced Formula Relativity:	1.011	1.345	1.132

IX 000245

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 174

Calculation of Class Relativities

Class(es):									Effective: 7/1/2020			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)		
2013	37,338	1	0	638,045	0	67,888	0	705,934	17,088	1,818	18,907		
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		
2016	34,723	0	0	0	0	0	0	0	0.000	0.000	0.000		
2017	31,783	0	0	0	0	0	0	0	0.000	0.000	0.000		
MA Total:	164,694	1	0	638,045	0	67,888	0	705,934	3,874	0,412	4,286		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.609	0.332	.
(14) Massachusetts Credibility:	0.150	0.180	.
(15) Countrywide Pure Premium:	1.816	1.149	2.965
(16) Countrywide Indicated Relativity:	0.794	0.984	.
(17) Countrywide Credibility:	0.360	0.380	.
(18) Countrywide Lost-Time Claims:	89.000	.	.
(19) Pure Premium Underlying Present Rate:	1.410	0.536	1.946
(20) Relativity to Underlying Present Rate:	0.647	0.510	.
(21) Credibility to Underlying Relativity:	0.490	0.440	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.844	0.658	.
(24) Balanced Formula Relativity:	0.842	0.662	0.781

Class(es):									Effective: 7/1/2020			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)		
2013	213,437	1	41	261	341,459	13,834	223,849	579,403	1,601	1,114	2,715		
2014	217,562	0	35	0	33,432	0	66,760	100,192	0,154	0,307	0,461		
2015	217,398	2	25	339,952	481,667	72,544	158,169	1,052,332	3,779	1,061	4,841		
2016	230,630	0	17	0	138,224	0	74,396	212,620	0,599	0,323	0,922		
2017	225,817	1	19	82,445	235,851	12,576	165,853	496,725	1,410	0,790	2,200		
MA Total:	1,104,844	4	137	422,658	1,230,633	98,955	689,027	2,441,272	1,496	0,713	2,210		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.814	1.529	.
(14) Massachusetts Credibility:	0.320	0.440	.
(15) Countrywide Pure Premium:	1.049	0.488	1.537
(16) Countrywide Indicated Relativity:	1.310	1.059	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	721.00	.	.
(19) Pure Premium Underlying Present Rate:	1.429	0.692	2.121
(20) Relativity to Underlying Present Rate:	1.905	1.678	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.673	1.439	.
(24) Balanced Formula Relativity:	1.661	1.440	1.582

IX 000246

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 175

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	621,328	5	191	310,509	623,399	254,793	620,031	1,808,732	1,503	1,408	2,911
2014	673,405	5	172	629,276	309,796	239,334	328,348	1,506,753	1,395	0,843	2,238
2015	756,686	4	232	386,474	440,466	191,252	342,765	1,360,958	1,093	0,706	1,799
2016	758,763	1	171	344,406	674,358	118,421	409,810	1,546,995	1,343	0,696	2,039
2017	788,699	5	152	502,342	1,120,508	441,979	367,299	2,432,127	2,058	1,026	3,084
MA Total:	3,598,881	20	918	2,173,007	3,168,527	1,245,778	2,068,253	8,655,565	1,484	0,921	2,405

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.799	1.975	.
(14) Massachusetts Credibility:	0.500	0.740	.
(15) Countrywide Pure Premium:	1.304	0.830	2,133
(16) Countrywide Indicated Relativity:	1.628	1.799	.
(17) Countrywide Credibility:	0.250	0.130	.
(18) Countrywide Lost-Time Claims:	6213.0	.	.
(19) Pure Premium Underlying Present Rate:	1.327	0.798	2,125
(20) Relativity to Underlying Present Rate:	1.769	1.936	.
(21) Credibility to Underlying Relativity:	0.250	0.130	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1,291
(23) Formula Relativity:	1.749	1.947	.
(24) Balanced Formula Relativity:	1.736	1.948	1,813

Class(es):		Effective: 7/1/2020							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)
2013	6,171,286	30	691	1,998,057	2,823,941	518,611	1,782,652	7,123,262	0,781	0,373	1,154
2014	6,293,499	26	645	1,291,711	3,422,320	415,111	2,036,606	7,165,747	0,749	0,390	1,139
2015	6,707,467	24	689	1,868,443	3,347,605	585,495	2,089,585	7,891,129	0,778	0,399	1,176
2016	6,909,105	26	628	1,709,063	3,557,593	586,390	1,946,451	7,799,497	0,762	0,367	1,129
2017	7,356,476	25	638	2,320,524	5,047,180	664,925	2,708,705	10,741,334	1,002	0,459	1,460
MA Total:	33,437,834	131	3,291	9,187,798	18,198,639	2,770,532	10,564,000	40,720,969	0,819	0,399	1,218

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.993	0.855	.
(14) Massachusetts Credibility:	0.970	1.000	.
(15) Countrywide Pure Premium:	0.882	0.532	1,414
(16) Countrywide Indicated Relativity:	1.102	1.153	.
(17) Countrywide Credibility:	0.020	0.000	.
(18) Countrywide Lost-Time Claims:	19355	.	.
(19) Pure Premium Underlying Present Rate:	0.758	0.376	1,134
(20) Relativity to Underlying Present Rate:	1.010	0.913	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1,291
(23) Formula Relativity:	0.995	0.855	.
(24) Balanced Formula Relativity:	0.988	0.856	0,940

IX 000247

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 176

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	2,307,649	7	433	665,650	1,514,828	171,772	961,970	3,314,220	0.945	0.491	1.436
2014	2,503,691	5	358	539,736	1,569,260	98,069	1,002,534	3,209,601	0.842	0.440	1.282
2015	2,550,024	9	361	477,382	1,501,130	140,845	835,835	2,955,192	0.776	0.383	1.159
2016	2,279,081	5	292	254,547	1,027,848	89,404	681,937	2,053,737	0.563	0.338	0.901
2017	2,291,820	11	329	613,320	1,136,100	216,943	817,008	2,783,371	0.763	0.451	1.214
MA Total:	11,932,265	37	1,773	2,550,636	6,749,167	717,033	4,299,285	14,316,120	0.779	0.420	1.200

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.945	0.901	.
(14) Massachusetts Credibility:	0.620	0.880	.
(15) Countrywide Pure Premium:	0.560	0.359	0.919
(16) Countrywide Indicated Relativity:	0.699	0.779	.
(17) Countrywide Credibility:	0.190	0.060	.
(18) Countrywide Lost-Time Claims:	6545.0	.	.
(19) Pure Premium Underlying Present Rate:	0.684	0.369	1.053
(20) Relativity to Underlying Present Rate:	0.912	0.895	.
(21) Credibility to Underlying Relativity:	0.190	0.060	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.892	0.894	.
(24) Balanced Formula Relativity:	0.885	0.894	0.889

Class(es):		Effective: 7/1/2020							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)
2013	2,972,869	5	329	376,449	799,693	151,237	920,312	2,247,690	0.396	0.360	0.756
2014	3,120,144	3	303	280,486	920,033	414,553	727,919	2,342,991	0.385	0.366	0.751
2015	3,281,438	4	281	287,555	976,757	266,439	1,003,495	2,534,246	0.385	0.387	0.772
2016	3,465,460	4	285	230,984	1,083,806	216,194	919,284	2,450,268	0.379	0.328	0.707
2017	3,617,514	5	289	342,764	1,082,742	347,031	1,274,536	3,047,072	0.394	0.448	0.842
MA Total:	16,457,425	21	1,487	1,518,237	4,863,030	1,395,455	4,845,545	12,622,267	0.388	0.379	0.767

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.470	0.813	.
(14) Massachusetts Credibility:	0.570	0.920	.
(15) Countrywide Pure Premium:	0.569	0.419	0.989
(16) Countrywide Indicated Relativity:	0.711	0.909	.
(17) Countrywide Credibility:	0.220	0.040	.
(18) Countrywide Lost-Time Claims:	4886.0	.	.
(19) Pure Premium Underlying Present Rate:	0.405	0.296	0.701
(20) Relativity to Underlying Present Rate:	0.539	0.719	.
(21) Credibility to Underlying Relativity:	0.210	0.040	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.538	0.813	.
(24) Balanced Formula Relativity:	0.534	0.814	0.635

IX 000248

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 177

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	739,596	1	40	63,472	126,961	58,440	148,538	397,411	0.257	0.280	0.537
2014	744,555	0	48	0	564,428	0	679,837	1,244,265	0.758	0.913	1.671
2015	735,005	1	27	348,914	16,926	29,317	39,459	434,616	0.498	0.094	0.591
2016	733,757	2	23	244,512	80,953	50,908	91,179	467,552	0.444	0.194	0.637
2017	724,614	1	29	940	111,114	2,898	68,877	183,830	0.155	0.099	0.254
MA Total:	3,677,526	5	167	657,839	900,383	141,564	1,027,890	2,727,674	0.424	0.318	0.742

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.514	0.682	.
(14) Massachusetts Credibility:	0.320	0.490	.
(15) Countrywide Pure Premium:	0.501	0.321	0.823
(16) Countrywide Indicated Relativity:	0.626	0.697	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	665.00	.	.
(19) Pure Premium Underlying Present Rate:	0.417	0.269	0.686
(20) Relativity to Underlying Present Rate:	0.556	0.652	.
(21) Credibility to Underlying Relativity:	0.340	0.250	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.566	0.678	.
(24) Balanced Formula Relativity:	0.562	0.679	0.604

Class(es):		Effective: 7/1/2020							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)
2013	5,094,628	7	329	273,708	1,040,267	402,363	961,554	2,677,891	0.258	0.268	0.526
2014	5,701,462	8	329	546,018	1,002,823	253,212	961,988	2,764,041	0.272	0.213	0.485
2015	6,261,898	4	383	103,330	522,113	98,489	1,168,716	1,892,648	0.100	0.202	0.302
2016	6,808,125	6	394	121,942	1,542,773	117,587	1,569,017	3,351,319	0.245	0.248	0.492
2017	6,961,299	6	356	325,703	1,360,173	175,165	1,412,201	3,273,243	0.242	0.228	0.470
MA Total:	30,827,411	31	1,791	1,370,701	5,468,149	1,046,816	6,073,476	13,959,142	0.222	0.231	0.453

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.269	0.495	.
(14) Massachusetts Credibility:	0.620	1.000	.
(15) Countrywide Pure Premium:	0.315	0.246	0.561
(16) Countrywide Indicated Relativity:	0.393	0.534	.
(17) Countrywide Credibility:	0.190	0.000	.
(18) Countrywide Lost-Time Claims:	3662.0	.	.
(19) Pure Premium Underlying Present Rate:	0.270	0.204	0.474
(20) Relativity to Underlying Present Rate:	0.359	0.495	.
(21) Credibility to Underlying Relativity:	0.190	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.310	0.495	.
(24) Balanced Formula Relativity:	0.307	0.496	0.375

IX 000249

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 178

Calculation of Class Relativities

Class(es): 9079 RESTAURANT NOC		Effective: 7/1/2020							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)
2013	25,501,892	75	3,341	3,837,918	8,997,798	1,579,587	6,946,523	21,361,826	0.503	0.334	0.838
2014	26,296,842	81	3,114	5,518,417	8,678,554	2,310,266	6,755,869	23,263,106	0.540	0.345	0.885
2015	28,415,506	77	3,079	5,665,454	9,834,967	2,800,748	7,467,951	25,769,120	0.545	0.361	0.907
2016	29,885,723	55	2,863	4,421,979	9,449,083	1,437,100	8,170,316	23,478,479	0.464	0.321	0.786
2017	31,213,213	58	2,775	3,793,761	10,859,133	1,393,230	8,898,719	24,944,844	0.469	0.330	0.799
MA Total:	141,313,176	346	15,172	23,237,530	47,819,535	9,520,932	38,239,377	118,817,374	0.503	0.338	0.841

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.609	0.725	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.423	0.325	0.748
(16) Countrywide Indicated Relativity:	0.528	0.705	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	3200.0	.	.
(19) Pure Premium Underlying Present Rate:	0.478	0.310	0.788
(20) Relativity to Underlying Present Rate:	0.637	0.752	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.609	0.725	.
(24) Balanced Formula Relativity:	0.605	0.725	0.649

Class(es): 9089 BILLIARD HALL		Effective: 7/1/2020							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)
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
2016	3,488	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	6,717	0	1	0	255	0	183	438	0.038	0.027	0.065
MA Total:	25,216	0	1	0	255	0	183	438	0.010	0.007	0.017

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.012	0.016	.
(14) Massachusetts Credibility:	0.040	0.070	.
(15) Countrywide Pure Premium:	0.380	0.288	0.668
(16) Countrywide Indicated Relativity:	0.475	0.624	.
(17) Countrywide Credibility:	0.150	0.160	.
(18) Countrywide Lost-Time Claims:	10.000	.	.
(19) Pure Premium Underlying Present Rate:	0.374	0.268	0.642
(20) Relativity to Underlying Present Rate:	0.499	0.650	.
(21) Credibility to Underlying Relativity:	0.810	0.770	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.476	0.602	.
(24) Balanced Formula Relativity:	0.472	0.602	0.519

IX 000250

Section IX - Classification Pricing
Subsection G - Class Relativities
7/1/2020

Section IX - G
Exhibit 179

Calculation of Class Relativities

Class(es): 9093 BOWLING LANE		Effective: 7/1/2020							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)
2013	167,732	1	20	1,724	16,175	23,105	16,485	57,489	0.107	0.236	0.343
2014	195,554	0	18	0	208,648	0	113,985	322,633	1.067	0.583	1.650
2015	236,174	2	24	79,014	52,285	69,250	33,004	233,553	0.556	0.433	0.989
2016	242,701	1	27	65,103	27,982	2,299	51,471	146,854	0.384	0.222	0.605
2017	266,587	3	29	157,396	14,618	144,084	40,030	356,129	0.645	0.691	1.336
MA Total:	1,108,749	7	118	303,236	319,709	238,738	254,975	1,116,658	0.562	0.445	1.007

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.681	0.955	.
(14) Massachusetts Credibility:	0.200	0.350	.
(15) Countrywide Pure Premium:	0.491	0.406	0.897
(16) Countrywide Indicated Relativity:	0.613	0.881	.
(17) Countrywide Credibility:	0.400	0.330	.
(18) Countrywide Lost-Time Claims:	434.00	.	.
(19) Pure Premium Underlying Present Rate:	0.425	0.385	0.809
(20) Relativity to Underlying Present Rate:	0.566	0.933	.
(21) Credibility to Underlying Relativity:	0.400	0.320	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.608	0.923	.
(24) Balanced Formula Relativity:	0.603	0.924	0.719

Class(es): 9101 COLLEGE: ALL OTHER EMPLOYEES		Effective: 7/1/2020							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)
2013	1,485,264	10	504	842,352	863,723	169,468	862,470	2,738,013	1.149	0.695	1.843
2014	1,515,707	7	631	425,680	1,086,202	282,350	1,210,502	3,004,734	0.997	0.985	1.982
2015	1,538,010	13	635	657,101	2,809,823	253,865	1,663,127	5,383,916	2.254	1.246	3.501
2016	1,594,092	17	786	1,350,443	2,682,075	399,385	1,945,487	6,377,389	2.530	1.471	4.001
2017	1,739,770	21	787	2,124,774	2,099,424	509,891	1,722,872	6,456,961	2.428	1.283	3.711
MA Total:	7,872,844	68	3,343	5,400,351	9,541,247	1,614,958	7,404,458	23,961,014	1.898	1.146	3.044

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.300	2.457	.
(14) Massachusetts Credibility:	0.660	1.000	.
(15) Countrywide Pure Premium:	1.346	0.897	2.243
(16) Countrywide Indicated Relativity:	1.681	1.946	.
(17) Countrywide Credibility:	0.170	0.000	.
(18) Countrywide Lost-Time Claims:	13411	.	.
(19) Pure Premium Underlying Present Rate:	1.245	0.923	2.168
(20) Relativity to Underlying Present Rate:	1.659	2.240	.
(21) Credibility to Underlying Relativity:	0.170	0.000	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.086	2.457	.
(24) Balanced Formula Relativity:	2.071	2.458	2.211

IX 000251

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous			
9102 PARK NOC- ALL EMPLOYEES & 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)	
2013	190.477	2	29	301.222	137.614	120.572	57.373	616.780	2.304	0.934	3.238	
2014	244.451	1	47	229.270	65.446	187.082	67.806	549.604	1.206	1.043	2.248	
2015	271.296	1	28	85	43.698	5.943	72.171	121.897	0.161	0.288	0.449	
2016	325.868	0	35	0	48.306	0	41.107	89.413	0.148	0.126	0.274	
2017	353.758	0	49	0	97.754	0	85.730	183.484	0.276	0.242	0.519	
MA Total:	1,385,851	4	188	530,577	392,818	313,596	324,186	1,561,177	0.666	0.460	1.127	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.277	0.371	.
(14) Massachusetts Credibility:	0.320	0.480	.
(15) Countrywide Pure Premium:	1.345	0.935	2.280
(16) Countrywide Indicated Relativity:	0.588	0.801	.
(17) Countrywide Credibility:	0.340	0.260	.
(18) Countrywide Lost-Time Claims:	7831.0	.	.
(19) Pure Premium Underlying Present Rate:	1.175	0.703	1.879
(20) Relativity to Underlying Present Rate:	0.540	0.669	.
(21) Credibility to Underlying Relativity:	0.340	0.260	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.472	0.560	.
(24) Balanced Formula Relativity:	0.470	0.563	0.502

Class(es):		Effective: 7/1/2020							Miscellaneous			
9154 THEATER NOC: ALL OTHER EMPLOYEES												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2013	682.326	0	92	0	191.292	0	229.425	420.717	0.280	0.336	0.617	
2014	645.332	0	63	0	611.510	0	221.857	833.367	0.948	0.344	1.291	
2015	662.833	1	62	6.719	387.110	2.186	389.091	785.106	0.594	0.590	1.184	
2016	695.650	1	88	199.806	129.655	83.967	241.157	654.584	0.474	0.467	0.941	
2017	836.756	1	99	3.499	394.021	2.884	351.317	751.721	0.475	0.423	0.898	
MA Total:	3,522,897	3	404	210,025	1,713,587	89,036	1,432,847	3,445,496	0.546	0.432	0.978	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.227	0.348	.
(14) Massachusetts Credibility:	0.390	0.610	.
(15) Countrywide Pure Premium:	0.702	0.516	1.217
(16) Countrywide Indicated Relativity:	0.307	0.441	.
(17) Countrywide Credibility:	0.310	0.200	.
(18) Countrywide Lost-Time Claims:	1527.0	.	.
(19) Pure Premium Underlying Present Rate:	0.748	0.500	1.249
(20) Relativity to Underlying Present Rate:	0.344	0.476	.
(21) Credibility to Underlying Relativity:	0.300	0.190	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.287	0.391	.
(24) Balanced Formula Relativity:	0.286	0.393	0.322

IX 000252

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 181

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	331,496	1	77	5,341	155,640	8,710	207,951	377,643	0.486	0.654	1.139
2014	345,310	1	78	5,612	127,032	3,045	195,402	331,091	0.384	0.575	0.959
2015	339,749	1	86	11,306	153,059	26,921	216,957	408,243	0.484	0.718	1.202
2016	370,079	0	100	0	315,911	0	263,295	579,206	0.854	0.711	1.565
2017	361,374	1	83	15,761	703,623	13,399	336,220	1,069,003	1.991	0.967	2.958
MA Total:	1,748,008	4	424	38,020	1,455,265	52,075	1,219,826	2,765,186	0.854	0.728	1.582

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	12.320	17.090	.
(14) Massachusetts Credibility:	0.270	0.460	.
(15) Countrywide Pure Premium:	0.727	0.514	1.240
(16) Countrywide Indicated Relativity:	12.153	13.323	.
(17) Countrywide Credibility:	0.370	0.270	.
(18) Countrywide Lost-Time Claims:	832.00	.	.
(19) Pure Premium Underlying Present Rate:	0.590	0.485	1.075
(20) Relativity to Underlying Present Rate:	9.124	12.480	.
(21) Credibility to Underlying Relativity:	0.360	0.270	.
(22) Industry Group Converted Pure Premium:	0.069	0.043	0.112
(23) Formula Relativity:	11.108	14.828	.
(24) Balanced Formula Relativity:	11.155	14.856	12.563

Class(es):		Effective: 7/1/2020							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)
2013	17,177	0	52	0	488,269	0	364,725	852,994	28.426	21.234	49.660
2014	37,959	0	68	0	77,656	0	236,161	313,817	2.046	6.222	8.267
2015	36,469	1	65	80,034	85,764	2,491	209,081	377,369	4.546	5.801	10.348
2016	33,943	0	75	0	310,756	0	605,709	916,465	9.155	17.845	27.000
2017	16,735	0	80	0	41,056	0	289,577	330,633	2.453	17.304	19.757
MA Total:	142,283	1	340	80,034	1,003,501	2,491	1,705,253	2,791,278	7.615	12.002	19.618

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.162	9.670	.
(14) Massachusetts Credibility:	0.200	0.440	.
(15) Countrywide Pure Premium:	0.895	1.949	2.844
(16) Countrywide Indicated Relativity:	0.391	1.669	.
(17) Countrywide Credibility:	0.400	0.280	.
(18) Countrywide Lost-Time Claims:	540.00	.	.
(19) Pure Premium Underlying Present Rate:	3.593	5.534	9.127
(20) Relativity to Underlying Present Rate:	1.649	5.261	.
(21) Credibility to Underlying Relativity:	0.400	0.280	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	1.449	6.195	.
(24) Balanced Formula Relativity:	1.444	6.234	3.073

IX 000253

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 182

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	29.955	5	111	147.998	640.708	119.350	520.201	1,428.257	26.330	21.350	47.680
2014	30.667	1	111	28.729	1,143.611	1,014	802.132	1,975.487	38.228	26.190	64.418
2015	26.083	4	103	196.521	1,581.284	582.357	885.535	3,245.698	68.159	56.278	124.44
2016	18.213	1	54	793	466.318	28	474.963	942.102	25.648	26.080	51.728
2017	21.062	0	77	0	72.429	0	567.576	640.005	3.439	26.947	30.386
MA Total:	125.980	11	456	374.041	3,904.350	702.750	3,250.407	8,231.548	33.961	31.379	65.340

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	14.101	25.282	.
(14) Massachusetts Credibility:	0.360	0.570	.
(15) Countrywide Pure Premium:	2.888	2.209	5.097
(16) Countrywide Indicated Relativity:	1.263	1.891	.
(17) Countrywide Credibility:	0.320	0.220	.
(18) Countrywide Lost-Time Claims:	1595.0	.	.
(19) Pure Premium Underlying Present Rate:	16.354	11.846	28.199
(20) Relativity to Underlying Present Rate:	7.507	11.263	.
(21) Credibility to Underlying Relativity:	0.320	0.210	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	7.883	17.192	.
(24) Balanced Formula Relativity:	7.859	17.298	11.070

Class(es):		Effective: 7/1/2020							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)
2013	185.482	0	41	0	136.785	0	262.965	399.750	0.737	1.418	2.155
2014	175.481	0	35	0	124.938	0	283.433	408.371	0.712	1.615	2.327
2015	198.278	1	38	27.187	126.452	1,737	336.787	492.163	0.775	1.707	2.482
2016	203.530	1	44	4.127	534.886	19.409	240.127	798.549	2.648	1.275	3.923
2017	218.128	2	54	31.949	167.824	56.653	248.543	504.969	0.916	1.399	2.315
MA Total:	980.898	4	212	63.263	1,090.885	77.799	1,371.855	2,603.803	1.177	1.478	2.655

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.489	1.191	.
(14) Massachusetts Credibility:	0.320	0.630	.
(15) Countrywide Pure Premium:	2.401	2.394	4.795
(16) Countrywide Indicated Relativity:	1.050	2.049	.
(17) Countrywide Credibility:	0.340	0.190	.
(18) Countrywide Lost-Time Claims:	2061.0	.	.
(19) Pure Premium Underlying Present Rate:	1.545	1.903	3.448
(20) Relativity to Underlying Present Rate:	0.709	1.810	.
(21) Credibility to Underlying Relativity:	0.340	0.180	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.754	1.465	.
(24) Balanced Formula Relativity:	0.752	1.474	0.998

IX 000254

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 183

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	247,268	3	83	276,943	684,518	92,873	222,715	1,277,050	3,888	1,276	5,165	
2014	297,302	3	53	346,221	157,445	196,766	145,032	845,464	1,694	1,150	2,844	
2015	306,206	2	40	27,043	195,343	43,099	174,440	439,925	0,726	0,710	1,437	
2016	274,308	0	34	0	223,744	0	227,094	450,838	0,816	0,828	1,644	
2017	247,447	1	42	390,553	742,243	366,471	509,682	2,008,948	4,578	3,541	8,119	
MA Total:	1,372,532	9	252	1,040,760	2,003,293	699,209	1,278,963	5,022,225	2,218	1,441	3,659	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.921	1.161	.
(14) Massachusetts Credibility:	0.330	0.530	.
(15) Countrywide Pure Premium:	0.635	0.659	1.293
(16) Countrywide Indicated Relativity:	0.277	0.564	.
(17) Countrywide Credibility:	0.340	0.240	.
(18) Countrywide Lost-Time Claims:	445.00	.	.
(19) Pure Premium Underlying Present Rate:	1.245	0.892	2.138
(20) Relativity to Underlying Present Rate:	0.572	0.848	.
(21) Credibility to Underlying Relativity:	0.330	0.230	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.587	0.946	.
(24) Balanced Formula Relativity:	0.585	0.952	0.710

Class(es):		Effective: 7/1/2020							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)	
2013	197,407	0	32	0	45,058	0	61,809	106,867	0,228	0,313	0,541	
2014	198,182	1	33	45,518	71,913	6,548	105,939	229,918	0,593	0,568	1,160	
2015	192,924	1	28	10,851	350,881	5,675	129,688	497,095	1,875	0,702	2,577	
2016	200,731	1	25	215,575	155,844	54,288	135,864	561,571	1,850	0,947	2,798	
2017	196,367	0	32	0	423,533	0	278,438	701,971	2,157	1,418	3,575	
MA Total:	985,610	3	150	271,944	1,047,229	66,511	711,738	2,097,422	1,338	0,790	2,128	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.622	1.693	.
(14) Massachusetts Credibility:	0.300	0.420	.
(15) Countrywide Pure Premium:	2.172	1.216	3.387
(16) Countrywide Indicated Relativity:	2.712	2.637	.
(17) Countrywide Credibility:	0.350	0.290	.
(18) Countrywide Lost-Time Claims:	663.00	.	.
(19) Pure Premium Underlying Present Rate:	1.357	0.711	2.067
(20) Relativity to Underlying Present Rate:	1.808	1.724	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.069	1.976	.
(24) Balanced Formula Relativity:	2.054	1.977	2.026

IX 000255

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 184

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Miscellaneous		
9402 STREET CLEANING & 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)
2013	758,066	5	65	692,093	670,628	218,432	413,115	1,994,268	1,798	0,833	2,631
2014	963,210	8	68	272,306	1,986,678	115,989	556,381	2,931,353	2,345	0,698	3,043
2015	901,771	2	68	89,226	1,970,886	55,147	825,377	2,940,636	2,285	0,976	3,261
2016	953,380	1	70	13,085	1,122,183	18,032	1,018,875	2,172,176	1,191	1,088	2,278
2017	1,104,523	6	88	951,284	2,082,693	639,267	853,651	4,526,895	2,747	1,352	4,099
MA Total:	4,680,951	22	359	2,017,994	7,833,068	1,046,867	3,667,400	14,565,329	2,105	1,007	3,112

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.874	0.811	.
(14) Massachusetts Credibility:	0.660	0.860	.
(15) Countrywide Pure Premium:	2.556	1.438	3.994
(16) Countrywide Indicated Relativity:	1.117	1.231	.
(17) Countrywide Credibility:	0.170	0.070	.
(18) Countrywide Lost-Time Claims:	2106.0	.	.
(19) Pure Premium Underlying Present Rate:	2.083	0.885	2.968
(20) Relativity to Underlying Present Rate:	0.956	0.841	.
(21) Credibility to Underlying Relativity:	0.170	0.070	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	0.929	0.843	.
(24) Balanced Formula Relativity:	0.926	0.848	0.900

Class(es):		Effective: 7/1/2020							Miscellaneous		
9403 GARBAGE, ASHES OR REFUSE COLLECTION & 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)
2013	1,057,111	18	271	2,591,096	2,357,267	1,067,432	1,267,459	7,283,255	4,681	2,209	6,890
2014	1,082,258	11	234	1,680,841	2,929,666	313,967	1,584,146	6,508,619	4,260	1,754	6,014
2015	1,147,249	11	261	2,026,364	3,601,734	964,408	2,043,666	8,636,172	4,906	2,622	7,528
2016	1,124,339	10	211	2,519,427	4,075,477	613,853	2,011,812	9,220,568	5,866	2,335	8,201
2017	1,249,618	17	271	2,489,916	6,960,630	1,240,406	2,936,139	13,627,091	7,563	3,342	10,905
MA Total:	5,660,575	67	1,248	11,307,643	19,924,774	4,200,066	9,843,222	45,275,705	5,518	2,481	7,998

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.291	1.999	.
(14) Massachusetts Credibility:	0.980	1.000	.
(15) Countrywide Pure Premium:	3.936	1.983	5.919
(16) Countrywide Indicated Relativity:	1.721	1.697	.
(17) Countrywide Credibility:	0.010	0.000	.
(18) Countrywide Lost-Time Claims:	7757.0	.	.
(19) Pure Premium Underlying Present Rate:	4.531	2.061	6.592
(20) Relativity to Underlying Present Rate:	2.080	1.959	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	2.408	1.241	3.650
(23) Formula Relativity:	2.283	1.999	.
(24) Balanced Formula Relativity:	2.276	2.011	2.186

IX 000256

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	51,775	1	9	290,694	3,110	162,475	3,509	459,787	5,675	3,206	8,880
2014	51,706	0	17	0	261,049	0	92,373	353,422	5,049	1,786	6,835
2015	49,238	0	24	0	318,834	0	267,396	586,229	6,475	5,431	11,906
2016	47,525	0	19	0	275,235	0	63,759	338,994	5,791	1,342	7,133
2017	48,376	0	19	0	106,872	0	66,608	173,480	2,209	1,377	3,586
MA Total:	248,621	1	88	290,694	965,100	162,475	493,646	1,911,914	5,051	2,639	7,690

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.122	5.659	.
(14) Massachusetts Credibility:	0.160	0.250	.
(15) Countrywide Pure Premium:	0.996	0.571	1.567
(16) Countrywide Indicated Relativity:	1.244	1.239	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	870.00	.	.
(19) Pure Premium Underlying Present Rate:	1.205	0.783	1.987
(20) Relativity to Underlying Present Rate:	1.606	1.898	.
(21) Credibility to Underlying Relativity:	0.420	0.370	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	2.176	2.588	.
(24) Balanced Formula Relativity:	2.161	2.590	2.316

Class(es):		Effective: 7/1/2020							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)
2013	303,750	1	25	55,142	402,922	3,357	285,038	746,458	1,508	0,949	2,457
2014	304,396	0	37	0	54,651	0	90,679	145,330	0,180	0,298	0,477
2015	330,033	1	30	3,442	19,737	6,003	64,225	93,406	0,070	0,213	0,283
2016	369,499	2	39	328,756	297,228	22,888	154,677	803,549	1,694	0,481	2,175
2017	400,950	1	30	58,652	287,800	114,006	123,581	584,039	0,864	0,593	1,457
MA Total:	1,708,629	5	161	445,992	1,062,337	146,255	718,199	2,372,783	0,883	0,506	1,389

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.909	0.989	.
(14) Massachusetts Credibility:	0.320	0.470	.
(15) Countrywide Pure Premium:	1.186	0.659	1.845
(16) Countrywide Indicated Relativity:	1.328	1.408	.
(17) Countrywide Credibility:	0.340	0.270	.
(18) Countrywide Lost-Time Claims:	1369.0	.	.
(19) Pure Premium Underlying Present Rate:	0.927	0.530	1.457
(20) Relativity to Underlying Present Rate:	1.053	1.182	.
(21) Credibility to Underlying Relativity:	0.340	0.260	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.101	1.152	.
(24) Balanced Formula Relativity:	1.086	1.137	1.104

IX 000257

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 186

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	851,336	9	107	564,222	1,062,901	153,507	557,374	2,338,004	1,911	0,835	2,746	
2014	791,848	4	76	526,192	360,156	89,283	301,849	1,277,481	1,119	0,494	1,613	
2015	919,949	6	80	389,303	494,637	116,954	368,354	1,369,248	0,961	0,528	1,488	
2016	859,788	1	49	2,425	160,014	2,157	218,289	382,885	0,189	0,256	0,445	
2017	878,736	1	67	29,451	962,564	11,406	607,709	1,611,129	1,129	0,705	1,833	
MA Total:	4,301,657	21	379	1,511,593	3,040,273	373,307	2,053,575	6,978,747	1,058	0,564	1,622	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.283	1.210	.
(14) Massachusetts Credibility:	0.590	0.800	.
(15) Countrywide Pure Premium:	2.139	0.884	3.023
(16) Countrywide Indicated Relativity:	2.671	1.918	.
(17) Countrywide Credibility:	0.210	0.100	.
(18) Countrywide Lost-Time Claims:	2436.0	.	.
(19) Pure Premium Underlying Present Rate:	1.724	0.810	2.534
(20) Relativity to Underlying Present Rate:	2.298	1.966	.
(21) Credibility to Underlying Relativity:	0.200	0.100	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	1.777	1.356	.
(24) Balanced Formula Relativity:	1.765	1.357	1.617

Class(es):		Effective: 7/1/2020							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)	
2013	208,418	1	14	359,723	28,603	57,581	24,784	470,691	1,863	0,395	2,258	
2014	216,443	1	23	8,133	124,429	6,630	92,859	232,051	0,612	0,460	1,072	
2015	277,869	1	20	106,454	297,965	9,870	133,307	547,596	1,455	0,515	1,971	
2016	275,642	1	31	263,053	449,028	434,792	206,655	1,353,528	2,583	2,327	4,910	
2017	311,607	2	34	77,315	226,349	26,694	133,667	464,025	0,975	0,515	1,489	
MA Total:	1,289,978	6	122	814,679	1,126,373	535,567	591,272	3,067,891	1,505	0,874	2,378	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.550	1.707	.
(14) Massachusetts Credibility:	0.340	0.450	.
(15) Countrywide Pure Premium:	1.593	0.756	2.349
(16) Countrywide Indicated Relativity:	1.784	1.613	.
(17) Countrywide Credibility:	0.330	0.280	.
(18) Countrywide Lost-Time Claims:	693.00	.	.
(19) Pure Premium Underlying Present Rate:	1.378	0.641	2.019
(20) Relativity to Underlying Present Rate:	1.565	1.431	.
(21) Credibility to Underlying Relativity:	0.330	0.270	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	1.632	1.606	.
(24) Balanced Formula Relativity:	1.611	1.585	1.602

IX 000258

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 187

Calculation of Class Relativities

Class(es): 9522 UPHOLSTERING		Effective: 7/1/2020							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)
2013	139,128	0	16	0	137,734	0	82,699	220,433	0.990	0.594	1.584
2014	131,340	2	18	89,383	33,669	9,126	52,132	184,310	0.937	0.466	1.403
2015	145,716	0	13	0	1,222	0	3,695	4,917	0.008	0.025	0.034
2016	115,056	0	8	0	10,529	0	8,935	19,464	0.092	0.078	0.169
2017	121,508	0	5	0	0	0	6,841	6,841	0.000	0.056	0.056
MA Total:	652,747	2	60	89,383	183,155	9,126	154,302	435,965	0.418	0.250	0.668

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.430	0.489	.
(14) Massachusetts Credibility:	0.210	0.280	.
(15) Countrywide Pure Premium:	0.964	0.502	1.466
(16) Countrywide Indicated Relativity:	1.080	1.072	.
(17) Countrywide Credibility:	0.400	0.360	.
(18) Countrywide Lost-Time Claims:	1810.0	.	.
(19) Pure Premium Underlying Present Rate:	0.851	0.392	1.243
(20) Relativity to Underlying Present Rate:	0.966	0.875	.
(21) Credibility to Underlying Relativity:	0.390	0.360	.
(22) Industry Group Converted Pure Premium:	0.971	0.512	1.482
(23) Formula Relativity:	0.899	0.838	.
(24) Balanced Formula Relativity:	0.887	0.827	0.866

Class(es): 9533 SCAFFOLDING: SCAFFOLD INST, RPR OR REMOVAL- BUILT UP FROM GROUN		Effective: 7/1/2020							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)
2013	63,659	1	6	129,552	241,133	349,986	70,020	790,691	5.823	6.598	12.421
2014	56,454	1	4	26,752	157,188	13,477	87,115	284,532	3.258	1.782	5.040
2015	59,658	0	10	0	297,309	0	75,358	372,667	4.984	1.263	6.247
2016	58,633	1	8	305,194	573,930	65,531	275,868	1,220,523	14.994	5.823	20.816
2017	65,778	0	10	0	644,520	0	191,533	836,053	9.798	2.912	12.710
MA Total:	304,182	3	38	461,498	1,914,079	428,994	699,893	3,504,465	7.810	3.711	11.521

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.999	3.126	.
(14) Massachusetts Credibility:	0.360	0.470	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.737	2.637	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	6.934	2.963	9.896
(20) Relativity to Underlying Present Rate:	2.865	2.812	.
(21) Credibility to Underlying Relativity:	0.640	0.530	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	2.914	2.959	.
(24) Balanced Formula Relativity:	2.926	2.954	2.935

IX 000259

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 188

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)
2013	246.744	1	14	409.093	62.352	138.070	252.232	861.747	1.911	1.582	3.492
2014	272.846	4	15	1,695.991	383.824	383.642	208.404	2,671.861	7.623	2.170	9.793
2015	314.972	0	6	0	226.291	0	251.630	477.921	0.718	0.799	1.517
2016	361.773	2	21	486.101	931.939	57.808	408.905	1,884.753	3.920	1.290	5.210
2017	437.697	0	21	0	1,576.007	0	490.264	2,066.270	3.601	1.120	4.721
MA Total:	1,634.031	7	77	2,591,185	3,180,412	579,520	1,611,435	7,962,552	3.532	1.341	4.873

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.357	1.129	.
(14) Massachusetts Credibility:	0.480	0.640	.
(15) Countrywide Pure Premium:	2.615	0.818	3.433
(16) Countrywide Indicated Relativity:	1.021	0.710	.
(17) Countrywide Credibility:	0.260	0.180	.
(18) Countrywide Lost-Time Claims:	501.00	.	.
(19) Pure Premium Underlying Present Rate:	2.693	1.217	3.910
(20) Relativity to Underlying Present Rate:	1.113	1.155	.
(21) Credibility to Underlying Relativity:	0.260	0.180	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.206	1.058	.
(24) Balanced Formula Relativity:	1.211	1.057	1.163

Class(es):		Effective: 7/1/2020							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)
2013	30.660	0	8	0	11.259	0	6.643	17.902	0.367	0.217	0.584
2014	14.630	0	1	0	3.661	0	5.216	8.877	0.250	0.357	0.607
2015	15.820	0	2	0	0	0	1.284	1.284	0.000	0.081	0.081
2016	16.020	0	1	0	10.215	0	1.351	11.566	0.638	0.084	0.722
2017	6.455	0	1	0	0	0	626	626	0.000	0.097	0.097
MA Total:	83.585	0	13	0	25,135	0	15,120	40,255	0.301	0.181	0.482

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.115	0.152	.
(14) Massachusetts Credibility:	0.150	0.180	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.120	0.835	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.837	0.938	3.775
(20) Relativity to Underlying Present Rate:	1.172	0.890	.
(21) Credibility to Underlying Relativity:	0.850	0.820	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.014	0.757	.
(24) Balanced Formula Relativity:	1.018	0.756	0.936

IX 000260

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							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)	
2013	129,658	0	23	0	517,967	0	146,265	664,232	3,995	1,128	5,123	
2014	165,766	4	26	798,807	58,857	466,993	68,231	1,392,888	5,174	3,229	8,403	
2015	170,970	2	23	351,981	384,467	189,871	236,073	1,162,392	4,307	2,491	6,799	
2016	166,687	0	14	0	569,341	0	366,466	935,807	3,416	2,199	5,614	
2017	176,490	1	17	142,477	171,266	399,150	112,983	825,875	1,778	2,902	4,679	
MA Total:	809,571	7	103	1,293,265	1,701,898	1,056,014	930,018	4,981,194	3,700	2,453	6,153	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.421	2.066	.
(14) Massachusetts Credibility:	0.410	0.570	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.434	1.606	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	3.634	1.804	5.438
(20) Relativity to Underlying Present Rate:	1.502	1.712	.
(21) Credibility to Underlying Relativity:	0.590	0.430	.
(22) Industry Group Converted Pure Premium:	2.604	1.187	3.791
(23) Formula Relativity:	1.468	1.914	.
(24) Balanced Formula Relativity:	1.475	1.910	1.611

Class(es):		Effective: 7/1/2020							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)	
2013	4,389,883	6	74	75,402	179,938	15,919	185,440	456,699	0.058	0.046	0.104	
2014	4,604,461	2	67	454,806	453,781	96,401	232,324	1,237,311	0.197	0.071	0.269	
2015	4,832,930	1	86	21,372	794,015	5,618	426,732	1,247,737	0.169	0.089	0.258	
2016	5,120,563	3	82	89,963	288,843	23,743	359,662	762,211	0.074	0.075	0.149	
2017	5,404,502	0	79	0	1,098,750	0	369,836	1,468,586	0.203	0.068	0.272	
MA Total:	24,352,339	12	388	641,543	2,815,327	141,680	1,573,994	5,172,544	0.142	0.070	0.212	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.172	0.151	.
(14) Massachusetts Credibility:	0.460	0.590	.
(15) Countrywide Pure Premium:	0.214	0.113	0.327
(16) Countrywide Indicated Relativity:	0.267	0.246	.
(17) Countrywide Credibility:	0.270	0.210	.
(18) Countrywide Lost-Time Claims:	1698.0	.	.
(19) Pure Premium Underlying Present Rate:	0.158	0.066	0.224
(20) Relativity to Underlying Present Rate:	0.210	0.161	.
(21) Credibility to Underlying Relativity:	0.270	0.200	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.208	0.173	.
(24) Balanced Formula Relativity:	0.206	0.173	0.194

IX 000261

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2020

Section IX - G
 Exhibit 190

Calculation of Class Relativities

Class(es):		Effective: 7/1/2020							Goods and Services		
9620 FUNERAL DIRECTOR & 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)
2013	664,230	2	10	3,269	36,960	14,282	115,017	169,529	0.061	0.195	0.255
2014	664,027	0	16	0	203,784	0	78,441	282,226	0.307	0.118	0.425
2015	656,254	1	14	4,204	227,736	5,781	244,141	481,862	0.353	0.381	0.734
2016	704,217	0	10	0	0	0	16,790	16,790	0.000	0.024	0.024
2017	713,634	1	13	57,233	47,767	21,262	117,569	243,831	0.147	0.195	0.342
MA Total:	3,402,362	4	63	64,707	516,247	41,325	571,959	1,194,238	0.171	0.180	0.351

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.207	0.387	.
(14) Massachusetts Credibility:	0.270	0.410	.
(15) Countrywide Pure Premium:	0.557	0.344	0.901
(16) Countrywide Indicated Relativity:	0.695	0.747	.
(17) Countrywide Credibility:	0.370	0.300	.
(18) Countrywide Lost-Time Claims:	554.00	.	.
(19) Pure Premium Underlying Present Rate:	0.315	0.190	0.506
(20) Relativity to Underlying Present Rate:	0.420	0.462	.
(21) Credibility to Underlying Relativity:	0.360	0.290	.
(22) Industry Group Converted Pure Premium:	0.825	0.466	1.291
(23) Formula Relativity:	0.464	0.517	.
(24) Balanced Formula Relativity:	0.461	0.517	0.481

IX 000262

Section IX - Classification Pricing
Subsection H - Industry Group Rate Change and Rate Level Factors
7/1/2020

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	1.010	0.989	0.981	1.006	1.022
(2) Experience and Benefit Level Change - Overall	-3.8%	-3.8%	-3.8%	-3.8%	-3.8%
(3) Target Rate Change = (1) x [1.000 + (2)] - 1.000	-2.9%	-4.9%	-5.7%	-3.2%	-1.7%
(4) Maximum Rate Change = (3) + 20.0%	17.1%	15.1%	14.3%	16.8%	18.3%
(5) Minimum Rate Change = (3) - 20.0%	-22.9%	-24.9%	-25.7%	-23.2%	-21.7%
(6) Present Average Rate	1.814	4.742	0.143	1.591	4.412
(7) Uncapped Rate Level Factor = [1.000 + (3)] x (6)	1.762	4.511	0.135	1.540	4.336
(8) Capped Rate Level Factor	1.795	4.511	0.136	1.540	4.368

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 07/01/18 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) / 1.104 (9)
Manufacturing	417,050,933	465,373,385	1.116	9,515	12,000	0.890	1.115	1.010
Construction	1,190,730,580	1,299,496,008	1.091	13,328	12,000	1.000	1.091	0.989
Office & Clerical	421,327,644	455,659,419	1.081	11,158	12,000	0.964	1.082	0.981
Goods & Services	1,086,337,329	1,206,624,759	1.111	31,134	12,000	1.000	1.111	1.006
Miscellaneous	492,115,493	555,983,467	1.130	9,996	12,000	0.913	1.128	1.022
All	3,607,561,979	3,983,137,038	1.104			1.000	1.104	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 = $\text{sum} [(2) \times (8)] / (2) \text{ Total}$

IX 000264

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
0005	1.474	1.411	1.451	1.540	2.23
0008	1.471	1.835	1.602	1.540	2.47
0016	2.162	2.245	2.192	1.540	3.38
0034	1.782	2.176	1.924	1.540	2.96
0035	1.114	1.241	1.160	1.540	1.79
0036	1.782	2.176	1.924	1.540	2.96
0042	2.146	2.362	2.224	1.540	3.43
0046	1.540	2.131	1.753	1.540	2.70
0050	0.882	0.864	0.877	4.511	3.95
0079	1.328	2.003	1.572	1.540	2.42
0083	2.153	2.202	2.171	1.540	3.34
0106	1.863	2.763	2.169	4.336	9.41
0113	1.782	2.176	1.924	1.540	2.96
0170	1.782	2.176	1.924	1.540	2.96
0908	106.933	87.456	99.899	1.540	76.92
0909	177.779	318.470	228.586	1.540	176.01
0912	177.779	318.470	228.586	1.540	352.01
0913	106.933	87.456	99.899	1.540	153.84
0917	1.729	1.321	1.581	1.540	2.44
0918	0.345	0.212	0.297	1.540	0.46
1430	2.267	2.009	2.178	1.762	3.84
1438	1.838	1.652	1.774	1.762	3.13
1463	5.131	7.806	6.054	1.762	10.67
1624	0.787	0.883	0.820	4.336	3.56
1655	0.567	0.543	0.559	4.336	2.42
1701	1.234	1.132	1.199	1.762	2.11
1710	0.787	0.883	0.820	4.336	3.56
1747	1.508	1.625	1.549	1.762	2.73
1748	1.388	2.092	1.631	1.762	2.87
1853	0.832	0.470	0.707	1.762	1.25
1924	1.242	1.110	1.196	1.762	2.11
1925	2.180	26.831	10.688	1.762	18.83
2003	2.017	1.781	1.936	1.762	3.41
2014	2.105	1.834	2.011	1.762	3.54
2021	1.267	1.237	1.257	1.762	2.21
2039	1.908	1.922	1.913	1.762	3.37
2041	1.356	1.159	1.288	1.762	2.27
2070	2.015	1.671	1.896	1.762	3.34
2081	1.302	1.713	1.444	1.762	2.54
2089	1.528	1.220	1.422	1.762	2.51
2095	1.711	1.326	1.578	1.762	2.78
2101	1.528	1.220	1.422	1.762	2.51

IX 000265

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
2111	1.147	1.154	1.150	1.762	2.03
2114	1.528	1.220	1.422	1.762	2.51
2115	3.184	2.486	2.943	1.762	5.19
2121	0.758	0.734	0.750	1.762	1.32
2130	0.779	0.757	0.771	1.762	1.36
2131	1.541	1.517	1.533	1.762	2.70
2143	1.297	1.067	1.218	1.762	2.15
2150	2.046	2.059	2.050	1.762	3.61
2156	2.240	2.368	2.284	1.762	4.02
2157	2.277	1.762	2.099	1.762	3.70
2172	1.043	0.709	0.928	1.762	1.63
2211	3.112	3.212	3.146	1.762	5.54
2220	1.185	1.195	1.189	1.762	2.09
2260	3.045	2.481	2.851	1.762	5.02
2288	1.839	1.808	1.828	1.762	3.22
2305	2.049	1.742	1.943	1.762	3.42
2362	0.740	1.084	0.859	1.762	1.51
2380	1.109	1.140	1.119	1.762	1.97
2402	1.155	1.228	1.181	1.762	2.08
2413	1.748	1.757	1.751	1.762	3.09
2416	1.335	1.275	1.314	1.762	2.32
2417	1.101	0.818	1.003	1.762	1.77
2501	1.051	1.026	1.042	1.762	1.84
2503	0.689	0.512	0.628	1.762	1.11
2570	2.199	1.720	2.034	1.762	3.58
2576	1.062	1.181	1.103	1.762	1.94
2585	1.419	1.557	1.466	1.762	2.58
2586	0.978	1.094	1.018	1.762	1.79
2587	1.584	1.193	1.443	1.540	2.22
2623	2.589	2.580	2.586	1.762	4.56
2651	0.792	0.854	0.813	1.762	1.43
2660	1.089	1.175	1.119	1.762	1.97
2683	1.063	1.260	1.131	1.762	1.99
2688	0.933	1.094	0.988	1.762	1.74
2702	2.753	2.689	2.731	4.336	11.84
2710	3.107	3.431	3.219	1.762	5.67
2731	1.505	1.765	1.595	1.762	2.81
2747	3.005	2.761	2.920	1.762	5.15
2790	0.897	0.843	0.878	1.762	1.55
2802	1.919	1.974	1.938	1.762	3.41
2835	0.732	0.808	0.758	1.762	1.34
2836	1.114	1.038	1.088	1.762	1.92

IX 000266

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
2841	1.853	2.281	2.001	1.762	3.53
2883	1.787	1.651	1.740	1.762	3.07
2923	0.865	0.834	0.854	1.762	1.50
2942	0.863	0.975	0.902	1.762	1.59
3018	1.381	1.251	1.337	1.762	2.35
3022	1.783	1.951	1.841	1.762	3.24
3027	1.616	2.125	1.792	1.762	3.16
3028	1.459	1.601	1.508	1.762	2.66
3030	3.201	3.053	3.150	1.762	5.55
3040	2.747	1.951	2.472	1.762	4.36
3041	1.420	1.452	1.431	1.762	2.52
3042	2.350	2.321	2.340	1.762	4.12
3066	1.181	1.260	1.208	1.762	2.13
3076	1.117	1.049	1.094	1.762	1.93
3081	2.349	3.135	2.620	1.762	4.62
3082	2.349	3.135	2.620	1.762	4.62
3085	2.416	2.278	2.368	1.762	4.17
3110	4.180	4.387	4.251	1.762	7.49
3111	1.006	0.943	0.984	1.762	1.73
3113	0.827	0.852	0.836	1.762	1.47
3114	1.666	1.629	1.653	1.762	2.91
3118	0.935	0.753	0.872	1.762	1.54
3119	0.370	0.459	0.401	1.762	0.71
3120	0.719	0.592	0.675	1.762	1.19
3122	1.163	1.326	1.219	1.762	2.15
3127	0.951	0.987	0.964	1.762	1.70
3131	0.715	0.800	0.744	1.762	1.31
3132	1.285	1.475	1.351	1.762	2.38
3145	0.876	0.827	0.859	1.762	1.51
3146	1.134	1.256	1.176	1.762	2.07
3169	1.252	1.776	1.432	1.762	2.52
3179	0.642	0.540	0.607	1.762	1.07
3180	1.220	1.115	1.184	1.762	2.09
3188	1.271	1.215	1.252	1.762	2.21
3200	1.068	1.088	1.075	1.762	1.89
3220	1.593	1.532	1.572	1.762	2.77
3255	1.036	1.028	1.033	1.762	1.82
3257	1.152	1.225	1.177	1.762	2.07
3270	1.255	1.184	1.231	1.762	2.17
3300	1.478	2.012	1.662	1.762	2.93
3315	1.524	1.478	1.508	1.762	2.66
3336	1.734	1.352	1.602	1.762	2.82

IX 000267

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
3365	0.997	1.119	1.035	4.511	4.67
3372	1.050	1.112	1.072	1.762	1.89
3373	2.103	1.579	1.922	1.762	3.39
3381	1.096	1.019	1.070	1.762	1.88
3383	0.810	0.975	0.867	1.762	1.53
3385	0.349	0.380	0.360	1.762	0.63
3400	1.252	1.776	1.432	1.762	2.52
3507	1.490	1.275	1.416	1.762	2.49
3515	1.468	1.512	1.483	1.762	2.61
3558	0.344	0.563	0.420	1.762	0.74
3571	0.393	0.357	0.381	1.762	0.67
3574	0.864	0.869	0.866	1.762	1.53
3612	0.698	0.788	0.730	1.762	1.29
3620	1.704	2.042	1.821	1.762	3.21
3629	0.864	0.869	0.866	1.762	1.53
3632	0.864	0.869	0.866	1.762	1.53
3634	0.777	0.657	0.736	1.762	1.30
3635	1.414	1.787	1.543	1.762	2.72
3638	0.864	0.869	0.866	1.762	1.53
3642	0.586	0.568	0.579	1.762	1.02
3643	0.806	0.775	0.795	1.762	1.40
3647	1.140	1.072	1.117	1.762	1.97
3648	0.597	0.691	0.630	1.762	1.11
3681	0.376	0.317	0.356	1.762	0.63
3685	0.359	0.296	0.337	1.762	0.59
3724	1.076	1.072	1.075	4.511	4.85
3726	0.915	0.669	0.838	4.511	3.78
3807	1.252	1.776	1.432	1.762	2.52
3808	1.704	1.793	1.734	1.762	3.06
3821	2.961	3.436	3.133	1.540	4.82
3826	2.529	3.387	2.825	1.762	4.98
3830	0.864	0.869	0.866	1.762	1.53
3841	0.725	0.739	0.730	1.762	1.29
4000	1.130	1.139	1.133	4.336	4.91
4021	1.858	1.917	1.878	1.762	3.31
4024	1.776	1.629	1.725	1.762	3.04
4034	2.805	3.080	2.900	1.762	5.11
4036	1.049	1.099	1.066	1.762	1.88
4038	1.864	1.066	1.589	1.762	2.80
4053	1.150	1.224	1.175	1.762	2.07
4062	0.959	0.948	0.955	1.762	1.68
4112	0.209	0.220	0.213	1.762	0.37

IX 000268

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
4113	1.150	1.224	1.175	1.762	2.07
4114	1.461	1.046	1.318	1.762	2.32
4130	1.607	1.443	1.551	1.762	2.73
4133	0.789	0.690	0.755	1.762	1.33
4150	0.446	0.334	0.407	1.762	0.72
4239	1.105	1.081	1.097	1.762	1.93
4243	1.616	1.337	1.520	1.762	2.68
4244	1.427	1.153	1.332	1.762	2.35
4250	0.916	0.909	0.914	1.762	1.61
4251	1.200	0.843	1.077	1.762	1.90
4273	1.622	1.499	1.580	1.762	2.78
4279	1.155	1.051	1.119	1.762	1.97
4283	0.954	0.821	0.908	1.762	1.60
4299	0.927	0.948	0.934	1.762	1.65
4304	2.323	2.390	2.346	1.762	4.13
4307	0.777	0.870	0.809	1.762	1.43
4308	1.544	0.384	1.144	1.762	2.01
4351	0.471	0.469	0.470	1.762	0.83
4352	0.736	0.565	0.677	1.762	1.19
4360	0.324	0.300	0.316	1.762	0.56
4361	4.539	5.657	4.964	0.135	0.67
4362	0.327	0.300	0.317	1.540	0.49
4410	1.391	1.872	1.557	1.762	2.74
4432	0.346	0.445	0.380	1.762	0.67
4439	2.565	3.384	2.848	1.762	5.02
4452	1.445	1.320	1.402	1.762	2.47
4459	1.452	1.389	1.431	1.762	2.52
4470	1.082	1.055	1.073	1.762	1.89
4484	0.996	1.165	1.054	1.762	1.86
4493	1.006	0.981	0.997	1.762	1.76
4511	0.177	0.162	0.172	1.540	0.26
4512	0.059	0.055	0.058	1.540	0.09
4557	0.926	0.814	0.888	1.762	1.56
4558	0.747	0.863	0.787	1.762	1.39
4583	1.433	1.272	1.377	1.762	2.43
4611	0.388	0.384	0.387	1.762	0.68
4635	2.326	3.028	2.568	1.762	4.53
4653	0.950	0.819	0.905	1.762	1.59
4665	4.697	4.414	4.599	1.762	8.10
4692	0.277	0.239	0.264	1.762	0.46
4693	0.425	0.473	0.441	1.762	0.78
4720	0.917	0.898	0.910	1.762	1.60

IX 000269

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
4740	0.486	0.455	0.475	1.762	0.84
4741	1.201	0.946	1.113	1.762	1.96
4771	1.787	1.063	1.537	1.762	2.71
4777	1.433	1.272	1.377	1.762	2.43
4825	0.259	0.219	0.245	1.762	0.43
4828	0.508	0.474	0.496	1.762	0.87
4829	0.508	0.474	0.496	1.762	0.87
4902	0.863	0.975	0.902	1.762	1.59
4923	0.324	0.300	0.316	1.762	0.56
5020	1.021	0.787	0.948	4.511	4.27
5022	2.128	1.995	2.086	4.511	9.41
5037	3.772	3.163	3.582	4.511	16.16
5040	4.915	4.030	4.638	4.511	20.92
5057	4.168	6.500	4.899	4.511	22.10
5059	5.037	5.636	5.224	4.511	23.57
5102	1.555	1.154	1.429	4.511	6.45
5146	1.524	1.504	1.518	4.511	6.85
5160	0.538	0.516	0.531	4.511	2.40
5183	0.667	0.640	0.658	4.511	2.97
5188	0.934	0.677	0.853	4.511	3.85
5190	0.464	0.511	0.479	4.511	2.16
5191	0.513	0.463	0.495	1.540	0.76
5192	1.680	1.596	1.650	1.540	2.54
5213	2.505	2.280	2.434	4.511	10.98
5215	0.914	0.800	0.878	4.511	3.96
5221	1.517	1.239	1.430	4.511	6.45
5222	2.340	1.741	2.152	4.511	9.71
5223	0.853	0.855	0.854	4.511	3.85
5348	0.970	0.748	0.900	4.511	4.06
5402	1.286	1.269	1.280	4.511	5.78
5403	1.854	1.730	1.815	4.511	8.19
5437	0.914	0.863	0.898	4.511	4.05
5443	0.777	0.750	0.768	4.511	3.47
5445	1.408	1.091	1.309	4.511	5.90
5462	1.270	1.083	1.212	4.511	5.47
5472	1.862	1.513	1.753	4.511	7.91
5473	2.141	2.247	2.174	4.511	9.81
5474	0.879	0.840	0.867	4.511	3.91
5478	0.927	0.674	0.848	4.511	3.82
5479	1.204	1.020	1.147	4.511	5.17
5480	1.121	0.950	1.067	4.511	4.81
5506	1.050	0.927	1.012	4.511	4.56

IX 000270

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
5507	1.304	1.020	1.215	4.511	5.48
5508	0.882	0.864	0.877	4.511	3.95
5509	1.000	1.154	1.048	4.511	4.73
5538	0.909	0.911	0.910	4.511	4.10
5545	7.564	11.544	8.811	4.511	39.74
5547	2.113	2.829	2.337	4.511	10.54
5606	0.265	0.330	0.285	4.511	1.29
5610	1.014	0.712	0.919	4.511	4.15
5645	1.374	1.728	1.484	4.511	6.70
5701	3.929	5.281	4.353	4.511	19.64
5703	2.365	2.116	2.287	4.511	10.31
5705	2.229	2.175	2.212	4.511	9.98
6003	1.912	1.639	1.826	4.511	8.24
6005	0.882	0.864	0.877	4.511	3.95
6204	1.163	1.022	1.119	4.511	5.05
6217	0.941	0.891	0.925	4.511	4.17
6229	0.845	0.804	0.832	4.511	3.75
6233	0.520	0.397	0.482	4.511	2.17
6251	1.100	0.665	0.964	4.511	4.35
6252	1.179	0.941	1.105	4.511	4.98
6306	1.627	1.439	1.568	4.511	7.07
6319	0.673	0.621	0.657	4.511	2.96
6325	0.609	0.574	0.598	4.511	2.70
6400	0.981	1.142	1.032	4.511	4.65
6504	1.528	1.220	1.422	1.762	2.51
6834	0.490	0.656	0.547	4.336	2.37
6836	0.708	0.990	0.804	4.336	3.49
7219	1.984	1.699	1.887	4.336	8.18
7230	2.246	1.839	2.107	4.336	9.14
7231	2.545	2.779	2.625	4.336	11.38
7360	0.872	0.864	0.869	4.336	3.77
7370	0.812	0.992	0.873	4.336	3.79
7380	1.342	1.294	1.325	4.336	5.75
7382	0.795	0.842	0.811	4.336	3.52
7403	0.828	0.996	0.885	4.336	3.84
7405	0.273	0.257	0.268	4.336	1.16
7420	3.154	3.493	3.269	4.336	14.18
7421	0.288	0.239	0.272	4.336	1.18
7422	0.288	0.239	0.272	4.336	1.18
7425	0.623	0.386	0.542	4.336	2.35
7431	0.288	0.239	0.272	4.336	1.18
7502	0.390	0.363	0.381	4.336	1.65

IX 000271

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
7515	0.503	1.494	0.840	4.336	3.64
7520	0.660	0.654	0.658	4.336	2.85
7538	1.359	1.372	1.363	4.511	6.15
7539	0.261	0.298	0.274	4.336	1.19
7580	0.755	0.646	0.718	4.336	3.11
7590	1.159	1.339	1.220	4.336	5.29
7600	0.863	0.655	0.793	4.336	3.44
7601	1.153	1.391	1.228	4.511	5.54
7610	4.420	2.789	3.800	0.135	0.51
7704	0.868	1.148	0.963	4.336	4.18
7720	0.308	0.343	0.320	4.336	1.39
7855	0.796	0.690	0.763	4.511	3.44
8001	0.942	1.215	1.041	1.540	1.60
8002	0.974	1.573	1.190	1.540	1.83
8006	0.701	0.882	0.766	1.540	1.18
8008	0.451	0.468	0.458	1.540	0.70
8010	1.008	1.128	1.051	1.540	1.62
8013	0.199	0.263	0.222	1.540	0.34
8017	0.563	0.652	0.596	1.540	0.92
8018	2.358	2.018	2.235	1.540	3.44
8021	2.264	1.896	2.131	1.540	3.28
8031	1.053	1.170	1.095	1.540	1.69
8032	0.754	0.789	0.767	1.540	1.18
8033	0.986	0.908	0.958	1.540	1.47
8034	2.019	1.562	1.854	1.540	2.85
8039	0.699	0.987	0.803	1.540	1.24
8044	1.813	1.753	1.791	1.540	2.76
8046	1.202	1.385	1.268	1.540	1.95
8048	1.666	1.575	1.633	1.540	2.52
8058	1.232	1.733	1.413	1.540	2.18
8103	1.572	1.544	1.562	1.540	2.41
8105	11.829	7.719	10.345	1.540	15.93
8106	3.301	3.925	3.526	1.540	5.43
8107	1.701	1.813	1.741	1.540	2.68
8111	1.694	1.932	1.780	1.540	2.74
8203	3.991	3.702	3.887	1.540	5.99
8204	3.759	5.234	4.292	1.540	6.61
8215	2.178	2.388	2.254	1.540	3.47
8227	0.952	1.094	0.996	4.511	4.49
8232	3.635	3.558	3.607	1.540	5.55
8233	3.455	3.701	3.544	1.540	5.46
8235	2.572	2.431	2.521	1.540	3.88

IX 000272

Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2020

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)		
8263	2.726	2.994	2.823	1.540	4.35
8264	3.019	3.092	3.046	1.540	4.69
8265	3.455	3.701	3.544	1.540	5.46
8279	2.259	2.949	2.508	1.540	3.86
8291	2.407	2.464	2.428	1.540	3.74
8292	2.236	2.246	2.240	1.540	3.45
8293	5.085	4.994	5.052	1.540	7.78
8350	4.367	3.706	4.128	1.540	6.36
8380	1.692	1.574	1.649	1.540	2.54
8381	1.084	1.235	1.139	1.540	1.75
8385	1.989	1.897	1.955	1.540	3.01
8392	0.852	1.091	0.938	1.540	1.44
8393	0.866	0.676	0.797	1.540	1.23
8500	3.455	3.701	3.544	1.540	5.46
8601	1.562	1.434	1.513	0.135	0.20
8710	2.176	1.652	1.987	1.540	3.06
8719	2.176	1.652	1.987	1.540	3.06
8720	0.527	0.459	0.503	1.540	0.77
8721	1.903	2.108	1.981	0.135	0.27
8742	0.738	0.816	0.768	0.135	0.10
8745	3.355	4.785	3.871	1.540	5.96
8747	0.557	0.353	0.483	1.540	0.74
8748	4.960	4.374	4.737	0.135	0.64
8800	7.707	6.528	7.258	0.135	0.98
8803	0.312	0.311	0.311	0.135	0.04
8810	0.461	0.490	0.472	0.135	0.06
8820	0.565	0.532	0.552	0.135	0.07
8824	1.119	1.210	1.152	1.540	1.77
8826	0.929	0.894	0.916	1.540	1.41
8829	1.437	1.225	1.360	1.540	2.09
8831	0.462	0.929	0.631	1.540	0.97
8832	2.140	1.871	2.038	0.135	0.27
8833	9.023	6.582	8.094	0.135	1.09
8835	1.268	0.959	1.156	1.540	1.78
8868	4.884	5.460	5.103	0.135	0.69
8901	0.461	0.490	0.472	0.135	0.06
9014	1.392	1.343	1.374	1.540	2.12
9015	1.949	1.835	1.908	1.540	2.94
9016	1.011	1.345	1.132	1.540	1.74
9019	0.842	0.662	0.781	4.336	3.39
9033	1.661	1.440	1.582	1.540	2.44
9040	1.736	1.948	1.813	1.540	2.79

IX 000273

Section IX - Classification Pricing
Subsection I - Average Uncapped Rates
7/1/2020

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)		
9052	0.988	0.856	0.940	1.540	1.45
9058	0.885	0.894	0.889	1.540	1.37
9060	0.534	0.814	0.635	1.540	0.98
9061	0.562	0.679	0.604	1.540	0.93
9063	0.307	0.496	0.375	1.540	0.58
9079	0.605	0.725	0.649	1.540	1.00
9089	0.472	0.602	0.519	1.540	0.80
9093	0.603	0.924	0.719	1.540	1.11
9101	2.071	2.458	2.211	1.540	3.40
9102	0.470	0.563	0.502	4.336	2.18
9154	0.286	0.393	0.322	4.336	1.40
9156	11.155	14.856	12.563	0.135	1.69
9178	1.444	6.234	3.073	4.336	13.33
9179	7.859	17.298	11.070	4.336	48.00
9180	0.752	1.474	0.998	4.336	4.33
9182	0.585	0.952	0.710	4.336	3.08
9186	0.752	1.474	0.998	4.336	4.33
9220	2.054	1.977	2.026	1.540	3.12
9402	0.926	0.848	0.900	4.336	3.90
9403	2.276	2.011	2.186	4.336	9.48
9410	2.161	2.590	2.316	1.540	3.57
9501	1.086	1.137	1.104	1.762	1.94
9505	1.086	1.137	1.104	1.762	1.94
9519	1.765	1.357	1.617	1.540	2.49
9521	1.611	1.585	1.602	1.762	2.82
9522	0.887	0.827	0.866	1.762	1.53
9533	2.926	2.954	2.935	4.511	13.24
9534	1.211	1.057	1.163	4.511	5.24
9549	1.018	0.756	0.936	4.511	4.22
9552	1.475	1.910	1.611	4.511	7.27
9586	0.206	0.173	0.194	1.540	0.30
9620	0.461	0.517	0.481	1.540	0.74

Notes:

(2), (3), (4): Section IX - G.

(5): Section IX - H, Exhibit 1.

(6) = (4) x (5)

IX 000274

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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	2.12	2.23	2.24
0008	2.24	2.47	2.47
0016	3.72	3.38	3.38
0034	3.65	2.96	2.96
0035	2.00	1.79	1.79
0036	3.65	2.96	2.96
0042	3.71	3.43	3.43
0046	1.78	2.70	2.08
0050	4.56	3.95	3.95
0079	3.26	2.42	2.50
0083	3.31	3.34	3.34
0106	10.50	9.41	9.47
0113	3.65	2.96	2.96
0170	3.65	2.96	2.96
0908	77.65	76.92	76.94
0909	162.95	176.01	176.05
0912	325.91	352.01	352.09
0913	155.29	153.84	153.87
0917	2.87	2.44	2.44
0918	0.53	0.46	0.46
1430	6.53	3.84	5.03
1438	3.09	3.13	3.18
1463	9.18	10.67	10.76
1624	3.76	3.56	3.58
1655	3.45	2.42	2.70
1701	2.70	2.11	2.15
1710	3.76	3.56	3.58
1747	3.05	2.73	2.78
1748	2.85	2.87	2.93
1853	1.41	1.25	1.27
1924	2.09	2.11	2.15
1925	4.90	18.83	5.74
2003	3.59	3.41	3.48
2014	3.25	3.54	3.61
2021	2.29	2.21	2.26
2039	3.15	3.37	3.43
2041	2.69	2.27	2.31
2070	3.85	3.34	3.40
2081	3.14	2.54	2.59
2089	2.82	2.51	2.55
2095	3.33	2.78	2.83
2101	2.82	2.51	2.55
2111	2.01	2.03	2.06
2114	2.82	2.51	2.55
2115	4.29	5.19	5.03
2121	1.20	1.32	1.35
2130	1.69	1.36	1.38
2131	2.50	2.70	2.75

IX 000275

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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)
2143	1.84	2.15	2.15
2150	4.30	3.61	3.68
2156	4.52	4.02	4.10
2157	3.64	3.70	3.77
2172	1.85	1.63	1.66
2211	6.22	5.54	5.65
2220	2.37	2.09	2.13
2260	5.68	5.02	5.12
2288	2.93	3.22	3.28
2305	2.80	3.42	3.28
2362	1.55	1.51	1.54
2380	2.34	1.97	2.01
2402	2.21	2.08	2.12
2413	3.27	3.09	3.14
2416	2.56	2.32	2.36
2417	2.69	1.77	2.07
2501	1.86	1.84	1.87
2503	1.23	1.11	1.13
2570	5.51	3.58	4.25
2576	1.80	1.94	1.98
2585	2.87	2.58	2.63
2586	1.68	1.79	1.83
2587	3.42	2.22	2.63
2623	4.78	4.56	4.64
2651	1.43	1.43	1.46
2660	1.83	1.97	2.01
2683	1.74	1.99	2.03
2688	2.18	1.74	1.77
2702	13.40	11.84	11.93
2710	6.66	5.67	5.78
2731	3.06	2.81	2.86
2747	5.57	5.15	5.24
2790	1.60	1.55	1.58
2802	3.83	3.41	3.48
2835	1.76	1.34	1.36
2836	1.85	1.92	1.95
2841	3.32	3.53	3.59
2883	3.02	3.07	3.12
2923	1.63	1.50	1.53
2942	1.84	1.59	1.62
3018	2.59	2.35	2.40
3022	3.48	3.24	3.30
3027	5.05	3.16	3.89
3028	2.72	2.66	2.71
3030	5.72	5.55	5.65
3040	4.72	4.36	4.44
3041	3.55	2.52	2.74
3042	5.60	4.12	4.32

IX 000276

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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)
3066	2.26	2.13	2.17
3076	2.16	1.93	1.96
3081	4.79	4.62	4.70
3082	4.79	4.62	4.70
3085	4.67	4.17	4.25
3110	8.71	7.49	7.63
3111	1.89	1.73	1.77
3113	1.44	1.47	1.50
3114	2.55	2.91	2.97
3118	1.77	1.54	1.57
3119	0.74	0.71	0.72
3120	1.40	1.19	1.21
3122	2.01	2.15	2.19
3127	1.00	1.70	1.17
3131	1.45	1.31	1.34
3132	2.97	2.38	2.43
3145	1.52	1.51	1.54
3146	1.97	2.07	2.11
3169	2.54	2.52	2.57
3179	1.13	1.07	1.09
3180	2.66	2.09	2.13
3188	1.93	2.21	2.25
3200	1.94	1.89	1.93
3220	2.83	2.77	2.82
3255	2.12	1.82	1.85
3257	2.51	2.07	2.11
3270	1.94	2.17	2.21
3300	3.96	2.93	3.05
3315	2.97	2.66	2.71
3336	3.39	2.82	2.88
3365	5.79	4.67	4.67
3372	2.16	1.89	1.92
3373	3.66	3.39	3.45
3381	2.21	1.88	1.92
3383	1.57	1.53	1.56
3385	0.67	0.63	0.65
3400	2.54	2.52	2.57
3507	2.53	2.49	2.54
3515	2.80	2.61	2.66
3558	0.83	0.74	0.75
3571	0.79	0.67	0.68
3574	1.59	1.53	1.55
3612	1.66	1.29	1.31
3620	4.53	3.21	3.49
3629	1.59	1.53	1.55
3632	1.59	1.53	1.55
3634	1.40	1.30	1.32
3635	2.64	2.72	2.77

IX 000277

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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)
3638	1.59	1.53	1.55
3642	1.10	1.02	1.04
3643	1.47	1.40	1.43
3647	1.88	1.97	2.00
3648	1.25	1.11	1.13
3681	0.67	0.63	0.64
3685	0.61	0.59	0.61
3724	5.14	4.85	4.85
3726	8.50	3.78	6.39
3807	2.54	2.52	2.57
3808	2.68	3.06	3.11
3821	4.28	4.82	4.83
3826	3.44	4.98	4.03
3830	1.59	1.53	1.55
3841	1.28	1.29	1.31
4000	4.69	4.91	4.95
4021	3.62	3.31	3.37
4024	2.87	3.04	3.10
4034	6.09	5.11	5.21
4036	2.29	1.88	1.91
4038	2.74	2.80	2.85
4053	1.99	2.07	2.11
4062	1.69	1.68	1.71
4112	0.48	0.37	0.38
4113	1.99	2.07	2.11
4114	2.16	2.32	2.37
4130	2.91	2.73	2.78
4133	1.55	1.33	1.35
4150	0.61	0.72	0.72
4239	2.23	1.93	1.97
4243	3.08	2.68	2.73
4244	2.26	2.35	2.39
4250	1.79	1.61	1.64
4251	2.17	1.90	1.93
4273	2.51	2.78	2.84
4279	2.06	1.97	2.01
4283	1.96	1.60	1.63
4299	1.78	1.65	1.68
4304	4.46	4.13	4.21
4307	1.53	1.43	1.45
4308	1.35	2.01	1.58
4351	0.87	0.83	0.84
4352	1.27	1.19	1.22
4360	0.74	0.56	0.57
4361	0.68	0.67	0.67
4362	0.53	0.49	0.49
4410	2.57	2.74	2.80
4432	0.85	0.67	0.68

IX 000278

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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)
4439	3.47	5.02	4.07
4452	2.87	2.47	2.52
4459	2.50	2.52	2.57
4470	1.97	1.89	1.93
4484	1.91	1.86	1.89
4493	2.03	1.76	1.79
4511	0.29	0.26	0.26
4512	0.09	0.09	0.09
4557	1.66	1.56	1.59
4558	1.30	1.39	1.41
4583	3.08	2.43	2.47
4611	0.90	0.68	0.69
4635	4.28	4.53	4.61
4653	1.78	1.59	1.62
4665	7.22	8.10	8.26
4692	0.58	0.46	0.47
4693	0.87	0.78	0.79
4720	1.83	1.60	1.63
4740	1.12	0.84	0.87
4741	2.20	1.96	2.00
4771	6.47	2.71	4.99
4777	3.08	2.43	2.47
4825	0.52	0.43	0.44
4828	1.03	0.87	0.89
4829	1.03	0.87	0.89
4902	1.84	1.59	1.62
4923	0.74	0.56	0.57
5020	4.26	4.27	4.27
5022	9.71	9.41	9.41
5037	17.05	16.16	16.15
5040	24.25	20.92	20.92
5057	21.84	22.10	22.10
5059	16.87	23.57	19.42
5102	6.19	6.45	6.45
5146	6.64	6.85	6.85
5160	2.78	2.40	2.40
5183	2.96	2.97	2.97
5188	4.37	3.85	3.85
5190	2.19	2.16	2.16
5191	0.76	0.76	0.76
5192	2.75	2.54	2.54
5213	12.09	10.98	10.98
5215	4.37	3.96	3.96
5221	7.04	6.45	6.45
5222	8.68	9.71	9.71
5223	4.23	3.85	3.85
5348	4.19	4.06	4.06
5402	6.34	5.78	5.78

IX 000279

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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)
5403	7.72	8.19	8.19
5437	4.54	4.05	4.05
5443	3.27	3.47	3.47
5445	6.15	5.90	5.90
5462	6.24	5.47	5.47
5472	8.85	7.91	7.91
5473	10.66	9.81	9.81
5474	4.30	3.91	3.91
5478	4.22	3.82	3.82
5479	7.00	5.17	5.26
5480	4.08	4.81	4.70
5506	5.25	4.56	4.56
5507	5.66	5.48	5.48
5508	4.56	3.95	3.95
5509	3.86	4.73	4.44
5538	3.86	4.10	4.10
5545	36.06	39.74	39.74
5547	11.57	10.54	10.54
5606	1.49	1.29	1.29
5610	5.72	4.15	4.30
5645	7.18	6.70	6.70
5701	22.23	19.64	19.63
5703	14.73	10.31	11.06
5705	12.55	9.98	9.98
6003	9.24	8.24	8.24
6005	4.56	3.95	3.95
6204	5.91	5.05	5.05
6217	4.07	4.17	4.17
6229	3.81	3.75	3.75
6233	2.91	2.17	2.18
6251	5.28	4.35	4.35
6252	8.37	4.98	6.29
6306	8.18	7.07	7.07
6319	3.59	2.96	2.96
6325	3.45	2.70	2.70
6400	4.76	4.65	4.65
6504	2.82	2.51	2.55
6834	2.23	2.37	2.39
6836	3.41	3.49	3.51
7219	8.79	8.18	8.24
7230	8.74	9.14	9.21
7231	8.87	11.38	10.50
7360	4.55	3.77	3.80
7370	3.28	3.79	3.81
7380	6.23	5.75	5.79
7382	3.53	3.52	3.54
7403	4.82	3.84	3.87
7405	1.15	1.16	1.17

IX 000280

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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)
7420	6.65	14.18	7.86
7421	1.30	1.18	1.19
7422	1.30	1.18	1.19
7425	2.44	2.35	2.37
7431	1.30	1.18	1.19
7502	2.17	1.65	1.70
7515	2.39	3.64	2.82
7520	2.89	2.85	2.88
7538	6.15	6.15	6.15
7539	1.18	1.19	1.20
7580	3.25	3.11	3.14
7590	3.65	5.29	4.32
7600	3.09	3.44	3.46
7601	5.60	5.54	5.54
7610	0.26	0.51	0.29
7704	2.53	4.18	2.99
7720	1.40	1.39	1.40
7855	4.29	3.44	3.44
8001	1.76	1.60	1.60
8002	1.41	1.83	1.65
8006	1.23	1.18	1.18
8008	0.74	0.70	0.70
8010	1.56	1.62	1.62
8013	0.33	0.34	0.34
8017	0.92	0.92	0.92
8018	3.10	3.44	3.44
8021	3.06	3.28	3.28
8031	1.79	1.69	1.69
8032	1.31	1.18	1.18
8033	1.66	1.47	1.48
8034	3.34	2.85	2.86
8039	1.15	1.24	1.24
8044	2.94	2.76	2.76
8046	1.77	1.95	1.95
8048	2.64	2.52	2.52
8058	2.28	2.18	2.18
8103	2.77	2.41	2.41
8105	5.75	15.93	6.72
8106	5.69	5.43	5.43
8107	2.52	2.68	2.68
8111	2.61	2.74	2.74
8203	5.74	5.99	5.99
8204	4.69	6.61	5.48
8215	3.49	3.47	3.47
8227	4.84	4.49	4.49
8232	6.07	5.55	5.56
8233	6.31	5.46	5.46
8235	4.02	3.88	3.88

IX 000281

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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)
8263	4.01	4.35	4.35
8264	4.81	4.69	4.69
8265	6.31	5.46	5.46
8279	4.38	3.86	3.86
8291	3.46	3.74	3.74
8292	3.19	3.45	3.45
8293	8.11	7.78	7.78
8350	5.70	6.36	6.36
8380	2.60	2.54	2.54
8381	1.75	1.75	1.75
8385	2.67	3.01	3.01
8392	1.40	1.44	1.44
8393	1.65	1.23	1.26
8500	6.31	5.46	5.46
8601	0.22	0.20	0.21
8710	3.09	3.06	3.06
8719	3.09	3.06	3.06
8720	0.87	0.77	0.77
8721	0.23	0.27	0.27
8742	0.13	0.10	0.10
8745	4.65	5.96	5.43
8747	0.83	0.74	0.74
8748	0.63	0.64	0.64
8800	1.07	0.98	0.99
8803	0.04	0.04	0.04
8810	0.07	0.06	0.06
8820	0.08	0.07	0.07
8824	1.55	1.77	1.77
8826	1.55	1.41	1.41
8829	2.04	2.09	2.10
8831	0.93	0.97	0.97
8832	0.28	0.27	0.28
8833	1.16	1.09	1.10
8835	1.97	1.78	1.78
8868	0.71	0.69	0.69
8901	0.07	0.06	0.06
9014	2.30	2.12	2.12
9015	3.02	2.94	2.94
9016	2.07	1.74	1.74
9019	2.69	3.39	3.18
9033	2.90	2.44	2.44
9040	2.91	2.79	2.79
9052	1.55	1.45	1.45
9058	1.44	1.37	1.37
9060	0.96	0.98	0.98
9061	0.94	0.93	0.93
9063	0.65	0.58	0.58
9079	1.08	1.00	1.00

IX 000282

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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)
9089	0.88	0.80	0.80
9093	1.11	1.11	1.11
9101	2.98	3.40	3.41
9102	2.60	2.18	2.19
9154	1.68	1.40	1.41
9156	1.50	1.69	1.71
9178	12.73	13.33	13.42
9179	29.73	48.00	35.17
9180	4.50	4.33	4.36
9182	2.96	3.08	3.10
9186	4.50	4.33	4.36
9220	2.83	3.12	3.12
9402	4.10	3.90	3.93
9403	9.11	9.48	9.55
9410	2.73	3.57	3.18
9501	2.07	1.94	1.98
9505	2.07	1.94	1.98
9519	3.47	2.49	2.66
9521	2.86	2.82	2.88
9522	1.76	1.53	1.56
9533	13.53	13.24	13.24
9534	5.35	5.24	5.24
9549	5.14	4.22	4.22
9552	7.44	7.27	7.27
9586	0.31	0.30	0.30
9620	0.69	0.74	0.74

Notes:

(2) = (4) from Section IX - J, Exhibit 1 of the 07/01/2018 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.)

IX 000283

Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2020

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	569,381,923	553,129,980	-2.9%	-2.9%	1.795
Construction	1,625,579,492	1,546,259,732	-4.9%	-4.9%	4.511
Office & Clerical	581,030,799	548,096,555	-5.7%	-5.7%	0.136
Goods & Services	1,486,387,142	1,438,972,341	-3.2%	-3.2%	1.540
Miscellaneous	672,200,144	660,608,462	-1.7%	-1.7%	4.368
All Groups	4,934,579,500	4,747,067,070	-3.8%		

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.

IX 000284

Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
7/1/2020

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:

$$\text{Proposed Manual Rate} = [\text{Proposed Average Rate} / (\text{Factor 1} \times \text{Factor 2} \times \text{Factor 3})] \times [1.000 / (1.000 - \text{Factor 4})]$$

(1)	Factor 1 =	0.997	The offset for Merit Rating and Average Experience Modification
(2)	Factor 2 =	1.053	The offset for ARAP
(3)	Factor 3 =	0.967	For eligible classes, the offset for the Construction Classification Premium Adjustment Program
(4)	Factor 4 =	-0.0053	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)
2013	66	Non Rated	88,399	43%	21,044,129	2%	21,042,225	1.000	
		Merit Rated	78,744	38%	147,031,464	15%	143,913,784	0.979	
		Intrastate Rated	19,592	10%	434,888,376	43%	446,997,406	1.028	
		Interstate Rated	18,985	9%	401,543,086	40%	372,761,291	0.928	
		Total	205,720	100%	1,004,507,055	100%	984,714,706	0.980	
2014	54	Non Rated	93,326	44%	22,203,492	2%	22,197,398	1.000	
		Merit Rated	79,807	37%	150,879,178	14%	147,469,063	0.977	
		Intrastate Rated	20,625	10%	466,139,280	43%	470,219,476	1.009	
		Interstate Rated	20,334	9%	439,524,734	41%	403,186,057	0.917	
		Total	214,092	100%	1,078,746,684	100%	1,043,071,994	0.967	
2015	42	Non Rated	97,482	44%	23,296,046	2%	23,287,775	1.000	
		Merit Rated	80,259	36%	154,880,296	13%	151,389,610	0.977	
		Intrastate Rated	22,278	10%	498,235,994	43%	497,884,943	0.999	
		Interstate Rated	21,639	10%	477,785,788	41%	438,227,250	0.917	
		Total	221,658	100%	1,154,198,124	100%	1,110,789,578	0.962	
2016	30	Non Rated	100,752	44%	22,943,440	2%	22,937,175	1.000	
		Merit Rated	80,590	35%	157,342,069	13%	153,821,737	0.978	
		Intrastate Rated	23,452	10%	528,803,874	44%	528,591,178	1.000	
		Interstate Rated	23,395	10%	492,851,416	41%	453,991,474	0.921	
		Total	228,189	100%	1,201,940,799	100%	1,159,341,564	0.965	
2017	18	Non Rated	98,939	43%	23,279,972	2%	23,273,269	1.000	
		Merit Rated	79,747	35%	158,025,185	12%	154,496,276	0.978	
		Intrastate Rated	24,405	11%	560,248,438	44%	559,229,645	0.998	
		Interstate Rated	24,976	11%	536,020,849	42%	492,828,029	0.919	
		Total	228,067	100%	1,277,574,444	100%	1,229,827,219	0.963	
Total		Non Rated	478,898	44%	112,767,079	2%	112,737,842	1.000	1.000
		Merit Rated	399,147	36%	768,158,192	13%	751,090,470	0.978	0.978
		Intrastate Rated	110,352	10%	2,488,315,962	44%	2,502,922,648	1.006	1.000
		Interstate Rated	109,329	10%	2,347,725,873	41%	2,160,994,101	0.920	1.000
		Total	1,097,726	100%	5,716,967,106	100%	5,527,745,061	0.967	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.

IX 000285

IX 000286

Section IX - Classification Pricing
 Subsection K - Adjustments to Derive Final Manual Rates
 7/1/2020

Section IX - K
 Exhibit 3

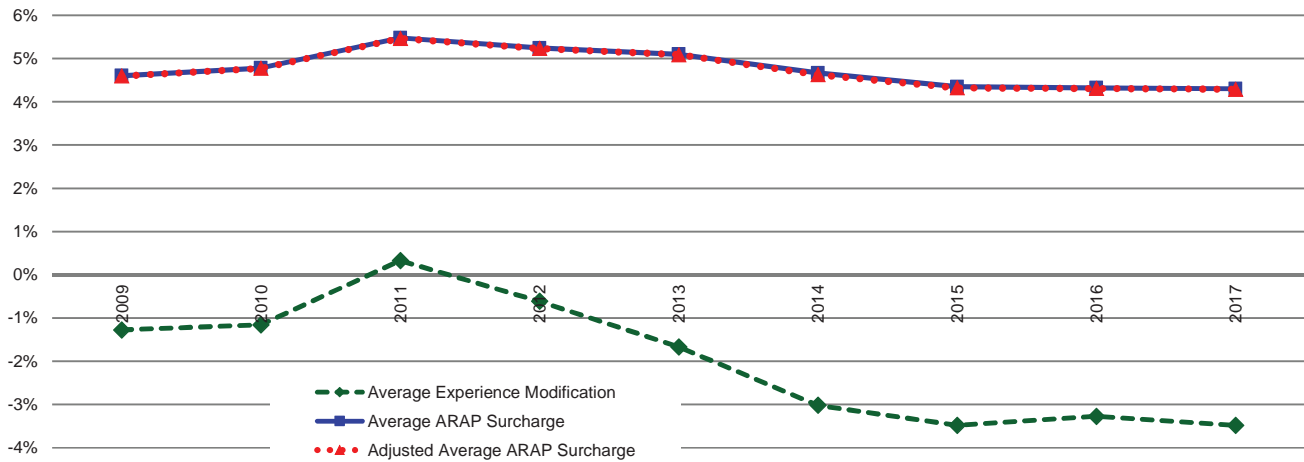
Offset for ARAP Estimate of Average ARAP Surcharge for Prospective Effective Period

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)
2009	802,162,104	791,916,957	36,467,853	36,389,208	4.6%	-1.3%	4.6%
2010	870,439,876	860,369,383	41,142,127	41,055,216	4.8%	-1.2%	4.8%
2011	914,835,972	917,838,669	50,256,579	50,160,670	5.5%	0.3%	5.5%
2012	943,228,958	937,458,017	49,160,807	49,039,440	5.2%	-0.6%	5.2%
2013	1,001,429,321	984,714,706	50,226,560	50,118,307	5.1%	-1.7%	5.1%
2014	1,075,515,151	1,043,071,994	48,660,831	48,283,294	4.7%	-3.0%	4.6%
2015	1,150,861,001	1,110,789,578	48,300,350	48,021,491	4.3%	-3.5%	4.3%
2016	1,198,587,020	1,159,341,564	50,085,298	49,954,194	4.3%	-3.3%	4.3%
2017	1,274,198,347	1,229,827,219	52,872,306	52,764,752	4.3%	-3.5%	4.3%

Regression of Average ARAP Surcharge on Average Experience Modification

(9) R-Squared	0.802
(10) Slope	0.274
(11) Intercept	0.053
(12) Projected Average ARAP Surcharge = (11)	0.053



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.

IX 000287

Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
7/1/2020

Section IX - K
Exhibit 4

Construction Class Premium Adjustment Program

Policy Year (1)	Manual Premium for Eligible Class Codes (2)	Construction Credit (3)	Percent (4)
2016	422,523,160	14,283,334	3.4%
2017	460,013,428	15,355,258	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)

IX 000288

Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
7/1/2020

Section IX - K
Exhibit 5
Page 1

Loading for Recoupment of Insolvency Fund Assessments

Unanticipated Insolvency Assessment Recoupments

(1)	Estimated Written Premium for the Policy Period beginning 7/1/19 and ending 6/30/20, absent Insolvency loads	1,018,558,814
(2)	Unanticipated Insolvency Assessment Recoupment Rate (As a % of premium absent insolvency loads)	0.26%
(3)	Unanticipated Insolvency Assessment Recoupments	2,648,253
(4)	Interest Adjustment Factor	1.018
(5)	Adjusted Unanticipated Insolvency Assessment Recoupments	2,696,708

Net Assessments

(6)	Amount Sufficient to Recoup Assessment	(2,540,903)
(7)	Net Assessments	(5,237,612)

Loading for Recoupment

(8)	Estimated Written Premium in the Prospective Effective Period, absent insolvency loads	997,300,674
(9)	Indicated Loading for Recoupment of Insolvency Fund Assessments	-0.53%

Notes:

- (1): Page 2.
- (2): loading for insolvency fund in 07/01/2018 effective rates.
- (3) = (1) x (2)
- (4): 1.8% 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): Page 3.
- (7) = (6) - (5)
- (8): Page 2.
- (9) = (7) / [(7) + (8)]

IX 000289

Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
7/1/2020

Section IX - K
Exhibit 5
Page 2

Expected Workers' Compensation Written Premium in Prospective Effective Period

(1)	2018 Calendar Year Written Premium, absent insolvency loads	1,072,190,537
(2)	Estimated Exposure Growth Factor from Calendar Year 2018 to Policy Period ending 6/30/20	1.027
(3)	Rate Change from Calendar Year 2018 Written to the Policy Period ending 6/30/20	-7.5%
(4)	Estimated Written Premium for the Policy Period ending 6/30/20, absent Insolvency Loads = (1) x (2) x [1.0 + (3)]	1,018,558,814
(5)	Estimated Exposure Growth Factor from the Policy Period ending 6/30/20 to the Prospective Effective Period	1.018
(6)	Average Indicated Rate Change	-3.8%
(7)	Estimated Written Premium in Prospective Effective Period, absent insolvency loads = (4) x (5) x [1.0 + (6)]	997,300,674

Notes:

(1): Adjusted to remove any loading for recoupment of insolvency fund assessments.

(2): Assumes a 1.8% (from Section V-H, Exhibit 3).

(3): The 7/1/18 rate change was -12.9%.

(5): Assumes a 1.8% annual change (from Section V-H, Exhibit 3) compounded for 1 year.

(6): Section I-A, Exhibit 1.

IX 000290

Section IX - Classification Pricing
 Subsection K - Adjustments to Derive Final Manual Rates
 7/1/2020

Section IX - K
 Exhibit 5
 Page 3

Insolvency Fund Assessments Yet to Be Reflected in the Rates by Workers' Compensation Carriers

Assessment Base Year (1)	Workers' Compensation Calendar Year Written Premium (2)	Assessment Base (3)	Percentage Charged to Workers' Compensation = (2) / (3) (4)	11/18/2019	
				Assessment (5)	Assessment Charged to Workers' Compensation = (4) x (5) (6)
2002	1,270,355,928	9,481,535,538	13.40%		
2003	1,248,676,750	10,132,906,831	12.32%		
2004	1,222,962,359	10,622,095,111	11.51%		
2005	1,335,681,276	10,811,968,884	12.35%		
2006	1,355,363,793	10,785,092,254	12.57%		
2007	1,318,054,939	10,488,212,970	12.57%		
2008	1,018,962,508	10,672,774,843	9.55%		
2009	969,294,389	9,681,198,602	10.01%		
2010	944,881,049	n/a			
2011	1,058,311,174	n/a			
2012	1,112,222,053	10,857,336,715	10.24%	(20,000,000)	(2,048,794)
(7)	Estimated Total Assessment Charged to Workers' Compensation Carriers				(2,048,794)
(8)	Interest Adjustment Factor				1.027
(9)	Interested-Adjusted Assessment = (7) x (8)				(2,105,044)
(10)	Adjusted Total Assessments				(2,105,044)
(11)	Premium Discount				5.3%
(12)	Premium Tax Rate				2.2%
(13)	Commission Rate				9.7%
(14)	Amounts Sufficient to Recoup Assessment = (10) / [1.0 - (11) - (12) - (13)]				(2,540,903)

Notes:

(2),(3): Information from Guaranty Fund Management Services.

(5): Information from Guaranty Fund Management Services, see Page 3.

(7) = Sum (6)

(8): 1.8% is the risk-free rate of interest, shown in Section VII-J Exhibit 1, Page 1 compounded from the expected payment date of the assessment to the average date the assessment will be recouped or returned.

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

(12): Section VI-A, Exhibit 1.

(13): The average commission is 9.1% (Section VI-G, Exhibit 1).

Since the average premium discount is 5.3% (Section VI-E, Exhibit 1), the average commission as a percent of net premium is

9.1% / (1.0 - 5.3%) = 9.7%. The assessments of each insurer are in the proportion that the net direct written premiums of the insurer for the calendar year preceding the assessment bears to the net direct written premiums of all insurers for the calendar year preceding the assessment. MGL. Ch. 175D.

IX 000291

Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
7/1/2020

Section IX - K
Exhibit 5
Page 4

Insolvency Fund Assessments Yet to Be Reflected in the Rates

Assessment Date	Insolvent Company	Assessment by Base Year
		2012
11/18/2019	Assessment by Account	(20,000,000)
		(20,000,000)

Notes:

From Massachusetts Insurers Insolvency Fund Annual Assessment Levied Report

IX 000292

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	2013	0	0	0	0	0	
2014	0		0	0	0	0	3,528	0	0
2015	0		0	0	0	79,225	0	337	0
2016	0		0	0	0	0	0	427	0
2017	0		0	0	0	0	0	1,058	0
Medical	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	22,860	0	1,274	113
	2016	0	0	0	0	0	0	749	2,254
	2017	0	0	0	0	0	0	2,419	313

(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	2013	0.925	0.921	0.926	0.953	0.949	
2014	0.886		0.885	0.888	0.912	0.911	0.873	0.873	0.000
2015	1.010		1.003	1.018	1.041	1.033	1.004	0.996	0.000
2016	1.173		1.145	1.181	1.203	1.174	1.167	1.139	0.000
2017	1.756		1.543	1.766	1.791	1.574	1.749	1.536	0.000
Medical	2013	0.800	0.843	0.800	0.800	0.843	0.800	0.843	0.695
	2014	0.744	0.785	0.744	0.744	0.785	0.744	0.785	0.763
	2015	0.822	0.865	0.822	0.822	0.865	0.822	0.865	0.805
	2016	0.886	0.900	0.886	0.886	0.900	0.886	0.900	0.847
	2017	0.935	0.911	0.935	0.935	0.911	0.935	0.911	0.843

(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	2013	0	0	0	0	0	
2014	0		0	0	0	0	3,082	0	0
2015	0		0	0	0	81,837	0	336	0
2016	0		0	0	0	0	0	486	0
2017	0		0	0	0	0	0	1,626	0
Medical	2013	0	0	0	0	0	0	6,032	0
	2014	0	0	0	0	0	1,325	0	249
	2015	0	0	0	0	19,772	0	1,102	91
	2016	0	0	0	0	0	0	674	1,910
	2017	0	0	0	0	0	0	2,205	264

IX 000293

Section IX - Classification Pricing
 Subsection L - Pricing Example
 7/1/2020

Section IX - L
 Exhibit 1
 Page 2

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	2013	0	0	0	0	0	0	175	0
	2014	0	0	0	0	0	393	0	0
	2015	0	0	0	0	10,426	0	43	0
	2016	0	0	0	0	0	0	62	0
	2017	0	0	0	0	0	0	207	0
Medical	2013	0	0	0	0	0	0	768	0
	2014	0	0	0	0	0	169	0	32
	2015	0	0	0	0	2,519	0	140	12
	2016	0	0	0	0	0	0	86	243
	2017	0	0	0	0	0	0	281	34

		(E). Adjusted Excess Losses							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2013	0	0	0	0	0	0	123	0
	2014	0	0	0	0	0	275	0	0
	2015	0	0	0	0	7,298	0	30	0
	2016	0	0	0	0	0	0	43	0
	2017	0	0	0	0	0	0	145	0
Medical	2013	0	0	0	0	0	0	821	0
	2014	0	0	0	0	0	287	0	32
	2015	0	0	0	0	5,647	0	153	12
	2016	0	0	0	0	0	0	104	243
	2017	0	0	0	0	0	0	343	34

		(F). Secondary Conversion Factors				
		Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical Only
Indemnity		0.949	0.883	1.235	1.247	0.000
Medical		1.187	0.889	1.243	1.255	1.187

		(G). Converted Unlimited Losses							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2013	0	0	0	0	0	0	1,867	0
	2014	0	0	0	0	0	4,187	0	0
	2015	0	0	0	0	110,110	0	456	0
	2016	0	0	0	0	0	0	661	0
	2017	0	0	0	0	0	0	2,209	0
Medical	2013	0	0	0	0	0	0	8,601	0
	2014	0	0	0	0	0	2,023	0	333
	2015	0	0	0	0	31,598	0	1,575	122
	2016	0	0	0	0	0	0	977	2,556
	2017	0	0	0	0	0	0	3,198	353

		(H). Total				
Policy Year	Exposure	Indemnity		Medical		
		LD	NLD	LD	NLD	
2013	44,048	0	1,867	0	8,601	
2014	46,156	4,187	0	2,023	333	
2015	44,779	0	110,566	0	33,295	
2016	37,929	0	661	0	3,533	
2017	52,045	0	2,209	0	3,551	
Total	224,957	4,187	115,302	2,023	49,313	

	Indemnity	Medical
(I). Indicated Pure Premium	0.531	0.228
(J). Manufacturing Industry Group Pure Premium	0.971	0.512
(K). MA Indicated Relativity	0.547	0.446

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 000294

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	713
Arizona	2	0	0	0	16,381	0	0	7,661,571
Arkansas	3	1,232	54,903	1,945	127,115	1	12	65,090,031
Colorado	5	0	0	0	480	0	0	5,241,983
Connecticut	6	0	0	0	0	0	0	87,392
D.C.	8	0	0	0	0	0	0	0
Florida	9	12,846	0	17,921	5,199	1	0	6,021,247
Georgia	10	0	32,538	0	13,078	0	1	2,781,296
Idaho	11	0	0	0	0	0	0	941,482
Illinois	12	32,326	90,325	35,729	157,226	1	11	17,316,279
Indiana	13	0	6,849	0	38,742	0	2	1,617,045
Iowa	14	0	0	0	0	0	0	664,271
Kansas	15	0	0	0	0	0	0	0
Kentucky	16	0	0	0	0	0	0	2,005
Louisiana	17	0	0	0	0	0	0	0
Maine	18	364,752	1,204,120	1,095,533	1,306,597	10	80	140,160,592
Maryland	19	0	0	0	0	0	0	184,413
Michigan	21	0	125,983	0	186,396	0	8	61,910,183
Minnesota	22	0	131,016	0	133,723	0	5	6,338,812
Mississippi	23	0	0	0	0	0	0	0
Missouri	24	79,493	644,604	140,933	1,425,967	3	64	76,146,874
Montana	25	0	0	0	0	0	0	690,502
Nebraska	26	0	0	0	89	0	0	761,216
Nevada	27	0	624	0	1,648	0	1	648,534
New Hampshire	28	0	549	0	28,684	0	1	1,025,511
New Mexico	30	0	0	0	0	0	0	0
North Carolina	32	21,182	29,814	29,916	92,762	2	5	22,350,219
Oklahoma	35	0	0	0	0	0	0	0
Oregon	36	498,680	317,979	151,204	359,423	4	30	71,548,218
Rhode Island	38	0	0	0	0	0	0	100,735
South Carolina	39	0	0	0	0	0	0	0
South Dakota	40	0	0	0	0	0	0	0
Tennessee	41	0	61,070	0	204,716	0	6	25,595,130
Utah	43	0	0	0	3,693	0	0	2,554,381
Vermont	44	0	0	0	0	0	0	0
Virginia	45	44,129	14,679	68,555	14,903	1	1	8,752,249
West Virginia	47	0	0	0	0	0	0	82,806
Wisconsin	48	216,861	509,078	960,376	1,595,980	6	43	76,170,487
Hawaii	52	0	158	0	2,862	0	1	2,370,690
Alaska	54	0	0	0	0	0	0	0
Total		1,271,501	3,224,289	2,502,112	5,715,664	29	271	604,816,867

Note:

(3) - (9): Data are total for latest three policy years. See Section IX-D, Exhibit 3.

IX 000295

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	2.311	0.610	0.000	0.000	
Arizona	2	3.368	0.499	0.000	0.107	
Arkansas	3	3.860	1.170	0.333	0.232	
Colorado	5	1.913	0.626	0.000	0.006	
Connecticut	6	0.979	0.497	0.000	0.000	
D.C.	8	0.791	0.483	0.000	0.000	
Florida	9	1.967	0.421	0.420	0.162	
Georgia	10	1.461	0.707	1.710	0.332	
Idaho	11	1.474	0.408	0.000	0.000	
Illinois	12	1.052	0.480	0.745	0.535	
Indiana	13	4.022	0.710	1.704	1.701	
Iowa	14	1.136	0.386	0.000	0.000	
Kansas	15	2.411	0.610	0.000	0.000	
Kentucky	16	1.988	0.816	0.000	0.000	
Louisiana	17	1.943	0.576	0.000	0.000	
Maine	18	1.319	0.601	1.476	1.030	
Maryland	19	1.482	0.734	0.000	0.000	
Michigan	21	2.321	0.832	0.472	0.250	
Minnesota	22	1.585	0.705	3.275	1.488	
Mississippi	23	1.783	0.698	0.000	0.000	
Missouri	24	1.351	0.528	1.285	1.087	
Montana	25	1.399	0.393	0.000	0.000	
Nebraska	26	1.967	0.493	0.000	0.006	
Nevada	27	1.071	0.554	0.103	0.141	
New Hampshire	28	2.280	0.530	0.122	1.483	
New Mexico	30	0.931	0.356	0.000	0.000	
North Carolina	32	1.675	0.972	0.382	0.533	
Oklahoma	35	1.307	0.529	0.000	0.000	
Oregon	36	2.231	0.896	2.546	0.639	
Rhode Island	38	0.633	0.613	0.000	0.000	
South Carolina	39	0.938	0.667	0.000	0.000	
South Dakota	40	3.275	0.579	0.000	0.000	
Tennessee	41	3.204	0.757	0.765	0.605	
Utah	43	4.331	0.790	0.000	0.114	
Vermont	44	0.818	0.368	0.000	0.000	
Virginia	45	2.459	0.536	1.652	0.511	
West Virginia	47	2.706	0.826	0.000	0.000	
Wisconsin	48	2.182	0.448	2.080	1.504	
Hawaii	52	0.869	0.397	0.006	0.048	
Alaska	54	1.279	0.202	0.000	0.000	
(8)	Average of (5), (6) weighted by Payroll from Page 1, respectively			1.294	0.787	2.082
(9)	CW Manufacturing Pure Premium			0.882	0.463	1.345
(10)	CW Relativity = (8) / (9)			1.467	1.701	1.547
(11)	CW Relativity, balanced to unity			1.449	1.681	

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.

IX 000296

Section IX - Classification Pricing
 Subsection L - Pricing Example
 7/1/2020

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
0.547	0.446
1.449	1.681
0.917	1.072

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
0.925	1.081
0.873	0.444
0.808	0.480
181,705	108,008
27,200,000	6,000,000
13%	20%

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
300	300
1,150	1,000
44%	40%
43%	40%
1.103	1.191
1.013	1.013

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
1.089	1.175	1.119

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 000297

Section IX - Classification Pricing
Subsection L - Pricing Example
7/1/2020

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	1.119
(2) Capped Rate Level Factor	1.795
(3) Proposed Average Capped Rate = (1) x (2)	2.01
(4) Offset for Merit Rating	0.997
(5) Offset for ARAP	1.053
(6) Offset for Construction Classification Premium Adjustment Program	1.000
(7) Provision for Insolvency Fund Assessment Recoupment	-0.0053
(8) Proposed Manual Rate = {(3) / [(4) x (5) x (6)]} x {1.000 / [1.000 - (7)]}	1.90
(9) Minimum Premium	226
(10) Loss Constant	0
(11) Expected Loss Rate	0.96
(12) D-Ratio	0.15

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.

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 then calculate final D-Ratios by class as a weighted average of the partial D-Ratios using the formula:

$$"D" \text{ Ratio} = \frac{[(P_i)(D_i) + (P_m)(D_m)]}{[P_i + P_m]}$$

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 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 would appear 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 10.0 would be replaced with a value of 12.0. 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 7/1/2018 to 6/30/2019	A	0.618	0.011	1.013	0.942	1.426	1.046	1.038	0.413
	B	0.618	0.040	1.013	0.942	1.448	1.050	1.032	0.396
	C	0.618	0.043	1.013	0.942	1.461	1.054	1.035	0.389
	D	0.618	0.044	1.013	0.942	1.462	1.054	1.032	0.389
	E	0.618	0.087	1.013	0.942	1.470	1.058	1.014	0.375
	F	0.618	0.135	1.013	0.942	1.479	1.061	1.007	0.354
	G	0.618	0.197	1.013	0.942	1.493	1.066	0.969	0.337
2nd Report 7/1/2017 to 6/30/2018	A	0.618	0.017	1.019	0.914	1.154	1.046	1.038	0.520
	B	0.618	0.059	1.019	0.914	1.171	1.050	1.032	0.491
	C	0.618	0.064	1.019	0.914	1.181	1.054	1.035	0.481
	D	0.618	0.066	1.019	0.914	1.183	1.054	1.032	0.481
	E	0.618	0.129	1.019	0.914	1.189	1.058	1.014	0.453
	F	0.618	0.199	1.019	0.914	1.196	1.061	1.007	0.415
	G	0.618	0.291	1.019	0.914	1.208	1.066	0.969	0.377
3rd Report 7/1/2016 to 6/30/2017	A	0.618	0.023	1.026	0.888	1.051	1.046	1.038	0.581
	B	0.618	0.080	1.026	0.888	1.067	1.050	1.032	0.540
	C	0.618	0.086	1.026	0.888	1.076	1.054	1.035	0.528
	D	0.618	0.088	1.026	0.888	1.077	1.054	1.032	0.528
	E	0.618	0.173	1.026	0.888	1.083	1.058	1.014	0.483
	F	0.618	0.268	1.026	0.888	1.090	1.061	1.007	0.426
	G	0.618	0.391	1.026	0.888	1.100	1.066	0.969	0.364
1st - 3rd Report Average	A								0.505
	B								0.476
	C								0.466
	D								0.466
	E								0.437
	F								0.399
	G								0.359

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, Page 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	66,266,725	1,175,014	0.018	88,497,773	0.018	0.15	0.15
B	231,885,194	14,364,607	0.062	279,432,198	0.062	0.51	0.51
C	436,736,483	29,315,172	0.067	569,141,019	0.067	0.55	0.55
D	197,679,601	13,533,799	0.068	271,267,872	0.068	0.56	0.56
E	298,782,620	40,264,612	0.135	422,652,336	0.135	1.10	1.10
F	419,386,479	87,395,993	0.208	557,166,994	0.208	1.71	1.71
G	77,129,278	23,449,909	0.304	101,697,010	0.304	2.49	2.49
Total	1,727,866,380	209,499,107	0.121	2,289,855,203	0.122	1.00	1.00

Loss Elimination Ratio by Hazard Group

Hazard Group	First Report	Second Report	Third Report
(9)	(10)	(11)	(12)
A	0.011	0.017	0.023
B	0.040	0.059	0.080
C	0.043	0.064	0.086
D	0.044	0.066	0.088
E	0.087	0.129	0.173
F	0.135	0.199	0.268
G	0.197	0.291	0.391
Total	0.079	0.117	0.157

Notes:

- (2): Unit Statistical Plan losses, PYs 2015 - 2017. Adjusted by factors from Section X - B, Exhibit 1, Page 2.
- (3): Adjusted losses above per claim limit of \$300,000
- (5): PYs 2015 - 2017, 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 \$300,000

Report (1)	Injury Type (2)	Adjusted Total Losses (3)	Adjusted Excess Losses (4)	Loss Elimination Ratio = (4) / (3) (5)
1st	Fatal	6,650,014	2,329,179	0.350
1st	Permanent Total	12,452,598	9,292,664	0.746
1st	Permanent Partial	176,333,910	14,848,765	0.084
1st	Temporary Total	266,051,174	12,237,605	0.046
1st	Medical Only	28,720,521	0	0.000
1st	Total	490,208,216	38,708,213	0.079
2nd	Fatal	10,855,577	5,165,143	0.476
2nd	Permanent Total	31,499,932	18,145,283	0.576
2nd	Permanent Partial	281,698,620	36,880,686	0.131
2nd	Temporary Total	234,855,040	8,237,026	0.035
2nd	Medical Only	26,685,721	0	0.000
2nd	Total	585,594,890	68,428,139	0.117
3rd	Fatal	16,999,636	8,214,097	0.483
3rd	Permanent Total	70,864,438	43,721,536	0.617
3rd	Permanent Partial	327,974,055	40,995,726	0.125
3rd	Temporary Total	209,668,325	9,431,396	0.045
3rd	Medical Only	26,556,820	0	0.000
3rd	Total	652,063,275	102,362,756	0.157

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 \$300,000

800000 X

X 000009

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2020

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	18,431,965	0.974	0.974	1.426
1st to 10th	B	64,541,588	0.988	0.988	1.448
1st to 10th	C	125,747,925	0.997	0.997	1.461
1st to 10th	D	54,523,263	0.998	0.998	1.462
1st to 10th	E	76,361,833	1.003	1.003	1.470
1st to 10th	F	115,487,347	1.010	1.010	1.479
1st to 10th	G	14,492,624	1.019	1.019	1.493
1st to 10th	Total	469,586,545	1.000	1.000	1.465
2nd to 10th	A	20,448,445	0.974	0.973	1.154
2nd to 10th	B	75,931,019	0.988	0.988	1.171
2nd to 10th	C	142,361,564	0.997	0.997	1.181
2nd to 10th	D	68,299,056	0.998	0.998	1.183
2nd to 10th	E	93,846,812	1.003	1.003	1.189
2nd to 10th	F	142,564,612	1.010	1.009	1.196
2nd to 10th	G	23,008,575	1.019	1.019	1.208
2nd to 10th	Total	566,460,083	1.000	1.000	1.185
3rd to 10th	A	24,954,828	0.974	0.973	1.051
3rd to 10th	B	82,961,839	0.988	0.988	1.067
3rd to 10th	C	152,488,462	0.997	0.996	1.076
3rd to 10th	D	67,579,651	0.998	0.998	1.077
3rd to 10th	E	114,918,379	1.003	1.003	1.083
3rd to 10th	F	145,795,399	1.010	1.009	1.090
3rd to 10th	G	39,656,455	1.019	1.019	1.100
3rd to 10th	Total	628,355,013	1.001	1.000	1.080

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	0.976	0.952	0.974	0.974
B	0.994	0.989	0.982	0.988	0.988
C	0.997	0.998	0.996	0.997	0.997
D	1.001	0.995	0.999	0.998	0.998
E	1.002	1.009	0.999	1.003	1.003
F	1.005	1.006	1.018	1.010	1.010
G	1.001	1.015	1.042	1.019	1.019

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	0.996	0.993	0.990	0.993	0.993
E	1.001	1.005	0.992	0.999	0.999
F	1.004	1.002	1.011	1.006	1.006
G	0.999	1.010	1.036	1.015	1.015

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 2017 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	2,014,822	3,908,407	6,790,844	11,489,591	1,207,547	1,458,241	8,418,752	8,835,718	18,431,965	25,691,957	1.394
B	10,012,998	19,423,487	23,696,471	40,092,625	5,940,413	7,173,681	24,891,706	26,124,548	64,541,588	92,814,340	1.438
C	21,575,484	41,852,713	46,938,154	79,415,783	13,897,325	16,782,499	43,336,962	45,483,364	125,747,925	183,534,359	1.460
D	8,246,472	15,996,732	22,203,509	37,566,647	5,900,772	7,125,810	18,172,510	19,072,562	54,523,263	79,761,750	1.463
E	12,228,661	23,721,491	29,624,215	50,121,916	10,325,331	12,468,936	24,183,626	25,381,398	76,361,833	111,693,741	1.463
F	21,322,092	41,361,176	44,841,713	75,868,764	20,285,285	24,496,640	29,038,257	30,476,470	115,487,347	172,203,051	1.491
G	3,604,103	6,991,337	5,109,647	8,645,134	2,678,705	3,234,821	3,100,169	3,253,715	14,492,624	22,125,007	1.527
A, B, C, D, E, F, G	79,004,632	153,255,342	179,204,553	303,200,460	60,235,378	72,740,628	151,141,982	158,627,775	469,586,545	687,824,205	1.465
C, E, F, G	58,730,340	113,926,717	126,513,729	214,051,597	47,186,646	56,982,896	99,659,014	104,594,947	332,089,729	489,556,157	1.474

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, Page 5.

X 000011

Loss Development of Schedule Z to Tenth Report by Hazard Group

Policy Year 2016 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	3,521,496	4,581,996	7,480,668	9,369,769	1,230,688	1,374,301	8,215,593	8,327,878	20,448,445	23,653,943	1.157
B	14,285,546	18,587,643	29,727,709	37,234,880	8,273,766	9,239,255	23,643,998	23,967,147	75,931,019	89,028,925	1.172
C	32,478,815	42,259,820	55,916,642	70,037,333	12,858,926	14,359,471	41,107,181	41,669,004	142,361,564	168,325,628	1.182
D	15,449,699	20,102,381	25,334,483	31,732,228	8,129,231	9,077,854	19,385,643	19,650,592	68,299,056	80,563,055	1.180
E	23,580,434	30,681,689	39,231,387	49,138,532	9,271,868	10,353,829	21,763,123	22,060,566	93,846,812	112,234,616	1.196
F	34,219,996	44,525,358	52,652,170	65,948,480	29,308,782	32,728,908	26,383,664	26,744,257	142,564,612	169,947,003	1.192
G	5,485,587	7,137,573	9,896,350	12,395,486	3,923,922	4,381,816	3,702,716	3,753,322	23,008,575	27,668,197	1.203
A, B, C, D, E, F, G	129,021,573	167,876,459	220,239,409	275,856,708	72,997,183	81,515,433	144,201,918	146,172,766	566,460,083	671,421,367	1.185
C, E, F, G	95,764,832	124,604,441	157,696,549	197,519,831	55,363,498	61,824,023	92,956,684	94,227,149	401,781,563	478,175,444	1.190

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, Page 5.

X 000012

Loss Development of Schedule Z to Tenth Report by Hazard Group

Policy Year 2015 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	5,408,995	6,058,825	9,371,533	10,364,881	2,550,994	2,693,836	7,623,306	7,662,350	24,954,828	26,779,891	1.073
B	16,548,120	18,536,191	30,818,548	34,085,199	12,580,740	13,285,192	23,014,431	23,132,304	82,961,839	89,038,886	1.073
C	36,146,244	40,488,810	59,648,400	65,970,908	15,166,867	16,016,127	41,526,951	41,739,639	152,488,462	164,215,485	1.077
D	17,568,924	19,679,633	26,871,016	29,719,244	7,356,920	7,768,867	15,782,791	15,863,626	67,579,651	73,031,369	1.081
E	30,974,117	34,695,310	43,251,176	47,835,640	18,857,632	19,913,555	21,835,454	21,947,288	114,918,379	124,391,793	1.082
F	44,261,804	49,579,364	57,618,791	63,726,168	16,875,172	17,820,088	27,039,632	27,178,121	145,795,399	158,303,741	1.086
G	10,112,350	11,327,236	10,055,533	11,121,382	16,012,923	16,909,558	3,475,649	3,493,450	39,656,455	42,851,626	1.081
A, B, C, D, E, F, G	161,020,554	180,365,369	237,634,997	262,823,422	89,401,248	94,407,222	140,298,214	141,016,778	628,355,013	678,612,791	1.080
C, E, F, G	121,494,515	136,090,720	170,573,900	188,654,098	66,912,594	70,659,328	93,877,686	94,358,499	452,858,695	489,762,644	1.081

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, Page 5.

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	14,549,227	31,224,241	5,526,378	24,825,946	1.046	1.046
B	56,547,321	111,412,704	29,698,128	73,223,999	1.050	1.050
C	124,601,343	215,424,024	47,158,097	128,892,008	1.054	1.054
D	55,778,746	99,018,118	23,972,531	54,586,780	1.054	1.054
E	89,098,490	147,096,088	42,736,319	69,389,252	1.058	1.058
F	135,465,898	205,543,413	75,045,636	84,398,848	1.061	1.061
G	25,456,146	32,162,002	24,526,195	10,500,487	1.066	1.066
TOTAL	501,497,171	841,880,589	248,663,283	445,817,319	1.056	1.056

Notes:

(2) - (5): Exhibit 4, Pages 3-5.

(6): Weighted Average of Development Factors from Page 2.

(Likely to Dev. Ind. 1.154, Not Likely to Dev. Ind.1.023, Likely to Dev. Med. 1.057, Not Likely to Dev. Med. 1.008)

(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
 7/1/2020

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					
2017	456,455,802	1.048	1.023	489,337,499	1.072
2016	443,733,168	1.048	1.023	475,698,365	1.072
2015	443,188,791	1.048	1.023	475,114,772	1.072
Total	1,343,377,760			1,440,150,636	1.072
Medical					
2017	231,368,403	1.026	1.000	237,296,051	1.026
2016	227,688,199	1.026	1.000	233,521,560	1.026
2015	235,424,000	1.026	1.000	241,455,552	1.026
Total	694,480,602			712,273,163	1.026
Ind.+ Med.					
2017	687,824,205			726,633,550	1.056
2016	671,421,367			709,219,925	1.056
2015	678,612,791			716,570,324	1.056
Total	2,037,858,363			2,152,423,799	1.056

(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	501,497,171	1.154	a. Likely to Develop	248,663,283	1.057
b. Not Likely to Develop	841,880,589	1.023	b. Not Likely to Develop	445,817,319	1.008
c. Total	1,343,377,760	1.072	c. Total	694,480,602	1.026

Notes:

(2): Page 4.

(3): Page 3.

(4): Page 8.

(8),(11): Page 4.

(9), (12): Likely to Develop Factor = 1 + (Total Losses/Likely to Develop Losses) x ("Appropriate Column 6 Factor" - 1) x 0.8

(9), (12): Not Likely to Develop Factor = 1 + (Total Losses/Not Likely to Develop Losses) x ("Appropriate Column 6 Factor" - 1) x (1 - 0.8)

X 000016

Section X - Experience Rating
Subsection A - Expected Loss Rates
7/1/2020

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) Development Factor based on Paid + Case 132 Months to Ult.	1.026	1.029
(2) Est. Ultimate Losses (Prior to Escalation Adj.) based on Paid + Case Develop. Method		
(a) PY2016	446,484,826	229,455,014
(b) PY2017	457,733,094	234,863,448
(c) Average	452,108,960	232,159,231
(3) Est. Ultimate Losses (Prior to Escalation Adj.) based on Paid Develop. Method		
(a) PY2016	461,700,199	225,856,310
(b) PY2017	480,873,274	235,313,949
(c) Average	471,286,736	230,585,130
(4) Ratio of Est. Ultimate Losses based on average of Paid and Paid + Case indications to Est. Ultimate Losses based on Paid + Case = { [(2c) + (3c)] / 2.000 } / (2c)	1.021	0.997
(5) Development Factor to bring Unit Statistical Plan Data 10th report to Aggregate Financial Ultimate Level = (1) x (4)	1.048	1.026

Notes:

- (1): 132 Months to 252 Months LDF from Section II-B, Exhibit 1.
x 252 Months to Ult LDF from Section II-C, Exhibit 2, Page 1.
(2),(3): 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)
2017	Likely	79,004,632	60,235,378	153,255,342	72,740,628
2017	Not Likely	179,204,553	151,141,982	303,200,460	158,627,775
2017	TOTALS	258,209,185	211,377,360	456,455,802	231,368,403
2016	Likely	129,021,573	72,997,183	167,876,459	81,515,433
2016	Not Likely	220,239,409	144,201,918	275,856,708	146,172,766
2016	TOTALS	349,260,982	217,199,101	443,733,168	227,688,199
2015	Likely	161,020,554	89,401,248	180,365,369	94,407,222
2015	Not Likely	237,634,997	140,298,214	262,823,422	141,016,778
2015	TOTALS	398,655,551	229,699,462	443,188,791	235,424,000

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,

Page 5.

X 000017

X 000018

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2020

Section X - A
 Exhibit 5
 Page 5

Summary of Development Factors 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								
5yr Weighted Average		1.491	1.162	1.068	1.025	1.010	1.002	1.001	1.006	1.003
Cumulative		1.940	1.301	1.120	1.049	1.023	1.013	1.011	1.010	1.003
		(2) Medical Paid + Case Losses								
5yr Weighted Average		1.081	1.057	1.020	0.999	0.990	1.008	1.014	0.994	1.030
Cumulative		1.208	1.117	1.056	1.036	1.036	1.047	1.039	1.024	1.030
		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								
5yr Weighted Average		1.351	1.132	1.059	1.024	1.012	1.002	1.004	1.000	1.002
Cumulative		1.692	1.253	1.106	1.045	1.020	1.008	1.006	1.003	1.002
		(4) Medical Paid + Case Losses								
5yr Weighted Average		1.035	1.009	1.009	1.000	0.997	1.000	0.999	1.000	1.000
Cumulative		1.050	1.014	1.005	0.996	0.996	0.999	0.999	1.000	1.000

Notes:
 (1),(2): Page 6.
 (3),(4): Page 7.

X 000019

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2020

Section X - A
 Exhibit 5
 Page 6

Calculation of Likely to Develop Development Factors 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	
2012	72,592,949	110,154,027	1.517	67,440,687	80,243,708	1.190
2013	75,447,306	108,428,019	1.437	56,729,552	58,412,964	1.030
2014	91,728,472	134,224,683	1.463	88,396,095	89,641,025	1.014
2015	82,330,125	124,160,083	1.508	74,142,912	79,646,484	1.074
2016	78,991,564	121,001,106	1.532	58,835,910	65,732,913	1.117
Weighted Average			1.491			1.081
	30	42		30	42	
2011	109,071,188	129,441,450	1.187	69,129,682	78,720,145	1.139
2012	116,050,975	133,411,210	1.150	82,148,744	83,328,048	1.014
2013	116,194,590	132,513,621	1.140	60,914,924	62,761,312	1.030
2014	143,223,586	167,374,457	1.169	93,863,650	98,771,578	1.052
2015	130,491,509	151,678,656	1.162	81,532,681	86,287,197	1.058
Weighted Average			1.162			1.057
	42	54		42	54	
2010	128,649,774	135,971,767	1.057	68,242,188	71,437,322	1.047
2011	134,290,248	147,228,955	1.096	80,467,196	82,586,012	1.026
2012	141,366,615	151,161,530	1.069	86,378,260	89,488,941	1.036
2013	139,218,862	148,178,637	1.064	64,627,115	63,815,175	0.987
2014	174,606,387	184,348,097	1.056	101,458,080	101,739,214	1.003
Weighted Average			1.068			1.020
	54	66		54	66	
2009	137,899,884	141,780,302	1.028	69,366,355	68,936,702	0.994
2010	139,203,913	143,821,420	1.033	72,663,773	73,562,700	1.012
2011	153,927,635	157,073,907	1.020	85,572,549	84,737,956	0.990
2012	160,072,635	164,117,097	1.025	91,904,791	90,800,024	0.988
2013	155,468,977	158,659,993	1.021	65,825,124	67,082,391	1.019
Weighted Average			1.025			0.999
	66	78		66	78	
2008	147,209,691	147,616,547	1.003	62,180,762	61,454,082	0.988
2009	143,003,812	144,893,753	1.013	69,253,666	68,032,178	0.982
2010	146,293,316	145,897,691	0.997	74,728,785	76,162,770	1.019
2011	160,483,394	163,789,405	1.021	86,097,304	87,065,780	1.011
2012	171,455,546	173,933,228	1.014	92,820,231	88,389,239	0.952
Weighted Average			1.010			0.990
	78	90		78	90	
2007	166,676,186	168,263,320	1.010	78,360,429	81,327,947	1.038
2008	148,815,195	148,382,645	0.997	61,766,844	60,186,275	0.974
2009	146,177,245	145,924,671	0.998	68,389,319	68,582,870	1.003
2010	148,210,924	148,736,255	1.004	76,807,744	78,973,462	1.028
2011	165,376,684	165,660,045	1.002	87,353,078	86,485,174	0.990
Weighted Average			1.002			1.008
	90	102		90	102	
2006	176,920,736	177,890,848	1.005	89,553,673	96,484,091	1.077
2007	168,573,320	167,495,002	0.994	81,512,166	80,771,074	0.991
2008	149,073,543	149,080,438	1.000	60,583,065	59,919,449	0.989
2009	149,409,557	149,058,409	0.998	69,343,516	69,881,377	1.008
2010	148,495,068	149,873,827	1.009	78,573,467	77,997,459	0.993
Weighted Average			1.001			1.014
	102	114		102	114	
2005	179,562,899	180,497,859	1.005	90,620,737	89,093,107	0.983
2006	179,190,854	181,060,586	1.010	96,843,838	98,818,269	1.020
2007	167,832,664	168,286,340	1.003	80,791,981	80,638,159	0.998
2008	148,613,968	149,257,000	1.004	59,604,481	59,447,227	0.997
2009	149,229,129	150,415,101	1.008	69,825,760	67,299,222	0.964
Weighted Average			1.006			0.994
	114	126		114	126	
2004	196,792,062	196,917,701	1.001	100,260,313	100,476,987	1.002
2005	180,497,859	180,793,941	1.002	89,093,107	89,473,888	1.004
2006	180,330,402	180,524,178	1.001	98,586,453	97,044,058	0.984
2007	168,286,340	169,602,704	1.008	80,638,159	94,835,773	1.176
2008	149,517,000	150,491,753	1.007	59,472,227	59,217,046	0.996
Weighted Average			1.003			1.030

Note:
 Unit Statistical Plan Data, Excluding Large Deductible Policies.

X 000020

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2020

Section X - A
 Exhibit 5
 Page 7

Calculation of Not-Likely to Develop Development Factors 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	
2012	136,991,457	186,664,031	1.363	127,389,350	133,099,299	1.045
2013	152,427,947	198,591,886	1.303	136,353,826	139,584,850	1.024
2014	156,555,405	212,882,105	1.360	140,638,878	144,512,812	1.028
2015	168,723,700	225,664,011	1.337	141,130,694	145,004,317	1.027
2016	164,142,835	228,259,876	1.391	143,769,681	151,466,188	1.054
Weighted Average			1.351			1.035
	30	42		30	42	
2011	182,423,875	207,424,945	1.137	132,619,060	133,793,821	1.009
2012	180,767,083	205,297,031	1.136	131,194,263	133,535,146	1.018
2013	190,825,315	214,867,981	1.126	137,082,890	137,525,412	1.003
2014	203,883,202	232,139,898	1.139	140,290,187	141,855,862	1.011
2015	219,332,585	246,976,895	1.126	143,118,120	143,412,265	1.002
Weighted Average			1.132			1.009
	42	54		42	54	
2010	186,837,849	197,547,930	1.057	126,570,211	127,383,313	1.006
2011	202,576,147	213,336,342	1.053	132,046,770	133,277,846	1.009
2012	197,341,626	209,682,267	1.063	130,484,934	131,056,604	1.004
2013	208,162,740	221,047,784	1.062	135,659,609	137,605,660	1.014
2014	224,907,968	238,251,348	1.059	139,169,360	140,637,827	1.011
Weighted Average			1.059			1.009
	54	66		54	66	
2009	181,501,319	182,639,419	1.006	121,128,153	120,791,673	0.997
2010	194,315,784	199,697,316	1.028	126,156,862	127,082,177	1.007
2011	206,637,662	212,100,667	1.026	130,291,309	130,083,727	0.998
2012	200,771,162	206,396,339	1.028	128,640,754	126,769,187	0.985
2013	213,757,444	220,076,085	1.030	135,595,711	136,896,691	1.010
Weighted Average			1.024			1.000
	66	78		66	78	
2008	186,887,497	188,184,396	1.007	118,176,397	116,862,121	0.989
2009	181,415,909	184,329,980	1.016	120,474,709	121,019,428	1.005
2010	197,179,370	199,817,729	1.013	125,857,559	125,527,173	0.997
2011	208,691,180	209,715,937	1.005	128,724,379	128,111,560	0.995
2012	199,057,890	202,505,083	1.017	124,748,980	124,898,671	1.001
Weighted Average			1.012			0.997
	78	90		78	90	
2007	178,385,335	179,591,974	1.007	124,234,760	123,665,002	0.995
2008	186,985,748	186,856,470	0.999	116,549,359	116,820,041	1.002
2009	183,046,488	183,915,034	1.005	120,662,287	120,663,813	1.000
2010	197,504,496	196,982,144	0.997	124,882,199	125,327,244	1.004
2011	208,128,658	208,703,874	1.003	127,824,262	127,843,423	1.000
Weighted Average			1.002			1.000
	90	102		90	102	
2006	167,463,961	168,536,777	1.006	112,548,671	112,259,572	0.997
2007	179,281,974	179,969,621	1.004	123,480,783	123,564,406	1.001
2008	186,165,572	186,474,061	1.002	116,423,251	115,988,622	0.996
2009	180,430,148	180,632,763	1.001	119,903,167	119,916,873	1.000
2010	197,223,331	198,160,537	1.005	125,727,239	125,657,898	0.999
Weighted Average			1.004			0.999
	102	114		102	114	
2005	176,656,210	176,662,285	1.000	114,469,714	114,588,846	1.001
2006	167,236,771	167,322,886	1.001	111,899,825	112,370,808	1.004
2007	179,631,959	179,728,191	1.001	123,543,499	123,029,750	0.996
2008	186,940,531	187,245,197	1.002	116,303,590	116,528,878	1.002
2009	180,462,043	180,218,461	0.999	119,972,490	119,744,664	0.998
Weighted Average			1.000			1.000
	114	126		114	126	
2004	172,286,453	172,802,563	1.003	112,376,378	112,415,845	1.000
2005	176,662,285	176,795,303	1.001	114,588,846	114,565,630	1.000
2006	168,053,070	168,914,320	1.005	112,602,624	112,666,572	1.001
2007	179,728,191	180,208,721	1.003	123,029,750	122,785,675	0.998
2008	186,985,197	187,091,798	1.001	116,503,878	116,471,507	1.000
Weighted Average			1.002			1.000

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	2017	1.008
	2016	1.008
	2015	1.008
Paid	2017	1.038
	2016	1.038
	2015	1.038
Average of Paid and Paid Plus Case	2017	1.023
	2016	1.023
	2015	1.023

Notes:

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

X 000021

X 000022

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2020

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	253,394	0.799	1,562	1.000	
A	Permanent Total	1,241,658	0.744	248,197	0.749	
A	Permanent Partial	21,862,281	1.041	9,131,697	1.047	
A	Temporary Total	25,374,874	1.051	14,669,103	1.057	
A	Medical Only	0		6,815,375	1.000	
A	TOTAL	48,732,207	1.037	30,865,934	1.039	1.038
B	Fatal	2,428,640	0.799	147,699	1.000	
B	Permanent Total	3,624,916	0.744	6,884,377	0.749	
B	Permanent Partial	85,061,580	1.041	31,358,767	1.047	
B	Temporary Total	88,115,669	1.051	48,328,221	1.057	
B	Medical Only	0		18,481,648	1.000	
B	TOTAL	179,230,804	1.036	105,200,712	1.024	1.032
C	Fatal	4,332,882	0.799	148,433	1.000	
C	Permanent Total	10,900,176	0.744	3,994,787	0.749	
C	Permanent Partial	184,842,621	1.041	63,087,118	1.047	
C	Temporary Total	164,093,048	1.051	84,773,512	1.057	
C	Medical Only	0		27,765,403	1.000	
C	TOTAL	364,168,727	1.034	179,769,253	1.038	1.035
D	Fatal	4,263,176	0.799	449,092	1.000	
D	Permanent Total	5,062,786	0.744	2,363,543	0.749	
D	Permanent Partial	84,077,416	1.041	33,763,474	1.047	
D	Temporary Total	72,260,830	1.051	35,528,762	1.057	
D	Medical Only	0		8,257,569	1.000	
D	TOTAL	165,664,207	1.030	80,362,439	1.038	1.032
E	Fatal	3,526,695	0.799	232,324	1.000	
E	Permanent Total	19,117,931	0.744	16,671,071	0.749	
E	Permanent Partial	126,980,492	1.041	37,836,802	1.047	
E	Temporary Total	103,673,837	1.051	49,412,953	1.057	
E	Medical Only	0		10,963,505	1.000	
E	TOTAL	253,298,955	1.019	115,116,656	1.004	1.014
F	Fatal	20,346,100	0.799	1,921,415	1.000	
F	Permanent Total	31,635,497	0.744	19,925,435	0.749	
F	Permanent Partial	188,120,670	1.041	69,834,538	1.047	
F	Temporary Total	126,496,290	1.051	64,961,847	1.057	
F	Medical Only	0		7,754,041	1.000	
F	TOTAL	366,598,558	1.005	164,397,275	1.012	1.007
G	Fatal	4,181,928	0.799	20,171	1.000	
G	Permanent Total	6,210,065	0.744	15,702,351	0.749	
G	Permanent Partial	35,140,754	1.041	11,660,588	1.047	
G	Temporary Total	16,745,373	1.051	8,323,258	1.057	
G	Medical Only	0		802,311	1.000	
G	TOTAL	62,278,121	0.998	36,508,679	0.920	0.969

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	94,168,254	945,935,952	0.100
Medical	143,196,079	572,431,322	0.250

Notes:

Data at the individual claim level for PYs 2015 - 2017 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 \$300,000 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 000023

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									
2015	1.032	1.032	1.032	1.032	1.023	1.023	1.023	1.023	1.046
2016	1.018	1.018	1.018	1.018	1.034	1.034	1.034	1.034	1.060
2017	1.039	1.039	1.039	1.039	1.034	1.034	1.034	1.034	1.034
(2) State Benefit Level Adjustment Factors									
2015	1.009	1.011	1.016	1.007	1.000	1.000	1.000	1.000	1.000
2016	1.010	1.012	1.019	1.008	1.000	1.000	1.000	1.000	1.000
2017	1.010	1.013	1.019	1.008	1.000	1.000	1.000	1.000	1.000
(3) Combined Severity Trend and State Benefit Level Adjustment Factors									
2015	1.041	1.043	1.049	1.039	1.023	1.023	1.023	1.023	1.046
2016	1.028	1.030	1.036	1.026	1.034	1.034	1.034	1.034	1.060
2017	1.049	1.052	1.058	1.047	1.034	1.034	1.034	1.034	1.034

Notes:

(1): Exhibit 2.

(2): Section IV-A, Exhibit 1. PY 2015 to CPY 2016_07. PY 2016 to CPY 2017_07. PY 2017 to CPY 2018_07.

(3) = (1) x (2)

X 000024

Severity Trend Factors

(1)			(2) Historical Values		
Schedule Z Policy Year			Indemnity Severity	Lost Time Medical Severity	Medical Only Severity
01/01/2015	-	12/31/2015	29,773	11,494	887
01/01/2016	-	12/31/2016	30,644	11,625	906
01/01/2017	-	12/31/2017	30,789	11,890	949
(3) Selected Annual Trend			2.6%	2.3%	2.3%
(4) Trend Period Length [Years between (1) and (5)]				1.496	

(5)			(6) Trend Factors from Sched Z PYs to Pol Eff Periods		
Policy Effective Period			Indemnity Severity	Lost Time Medical Severity	Medical Only Severity
07/01/2016	-	06/30/2017	1.032	1.023	1.046
07/01/2017	-	06/30/2018	1.018	1.034	1.060
07/01/2018	-	06/30/2019	1.039	1.034	1.034

Notes:

(2): Section V-A Exhibit 2, Pages 1, 3, and 5.

(3): Section V-A Exhibit 1, Page 1.

(6): For 7/1/2016 effective period, average of 1/1/2016 and 1/1/2017 divided by 1/1/2015.

For 7/1/2017 effective period, 1/1/2017 divided by 1/1/2017, then (3) for .5 years.

For 7/1/2018 effective period, (3) for (4).

X 000025

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	0.618	0.062	0.043	1.004	0.942	1.708	1.035	0.333
7/1/2018	E	0.618	0.062	0.087	1.004	0.942	1.713	1.014	0.323
to	F	0.618	0.062	0.135	1.004	0.942	1.717	1.007	0.308
6/30/2019	G	0.618	0.062	0.197	1.004	0.942	1.724	0.969	0.296
2nd Report	C	0.618	0.062	0.064	1.006	0.914	1.292	1.035	0.443
7/1/2017	E	0.618	0.062	0.129	1.006	0.914	1.294	1.014	0.420
to	F	0.618	0.062	0.199	1.006	0.914	1.296	1.007	0.388
6/30/2018	G	0.618	0.062	0.291	1.006	0.914	1.298	0.969	0.356
3rd Report	C	0.618	0.062	0.086	1.008	0.888	1.167	1.035	0.492
7/1/2016	E	0.618	0.062	0.173	1.008	0.888	1.168	1.014	0.454
to	F	0.618	0.062	0.268	1.008	0.888	1.169	1.007	0.404
6/30/2017	G	0.618	0.062	0.391	1.008	0.888	1.170	0.969	0.349
1st - 3rd Report Average	C E F G								0.423 0.399 0.367 0.334

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 000026

X 000027

Section X - Experience Rating
 Subsection C - Expected Loss Rates for F-Class
 7/1/2020

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	125,747,925	0.993	0.993	1.708
1st	E	76,361,833	0.999	0.999	1.713
1st	F	115,487,347	1.006	1.006	1.717
1st	G	14,492,624	1.015	1.015	1.724
1st	Total	332,089,729	1.000	1.000	1.713
2nd	C	142,361,564	0.993	0.993	1.292
2nd	E	93,846,812	0.999	0.999	1.294
2nd	F	142,564,612	1.006	1.005	1.296
2nd	G	23,008,575	1.015	1.015	1.298
2nd	Total	401,781,563	1.000	1.000	1.294
3rd	C	152,488,462	0.993	0.992	1.167
3rd	E	114,918,379	0.999	0.999	1.168
3rd	F	145,795,399	1.006	1.005	1.169
3rd	G	39,656,455	1.015	1.014	1.170
3rd	Total	452,858,695	1.001	1.000	1.168

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	2.239	2.480	2.480	29.9%	12.1%	
1st	Indemnity	Not Likely to Develop	1.731	1.785	1.785	35.9%	20.1%	
1st	Medical	Likely to Develop	1.277	1.703	1.703	13.2%	7.8%	
1st	Medical	Not Likely to Develop	1.058	1.136	1.136	20.9%	18.4%	
1st	Total					100.0%	58.4%	1.713
2nd	Indemnity	Likely to Develop	1.502	1.528	1.528	29.9%	19.6%	
2nd	Indemnity	Not Likely to Develop	1.281	1.241	1.241	35.9%	28.9%	
2nd	Medical	Likely to Develop	1.181	1.435	1.435	13.2%	9.2%	
2nd	Medical	Not Likely to Develop	1.022	1.071	1.071	20.9%	19.5%	
2nd	Total					100.0%	77.3%	1.294
3rd	Indemnity	Likely to Develop	1.293	1.329	1.329	29.9%	22.5%	
3rd	Indemnity	Not Likely to Develop	1.131	1.095	1.095	35.9%	32.8%	
3rd	Medical	Likely to Develop	1.116	1.288	1.288	13.2%	10.3%	
3rd	Medical	Not Likely to Develop	1.013	1.044	1.044	20.9%	20.0%	
3rd	Total					100.0%	85.6%	1.168

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 2.

X 000028

X 000029

Section X - Experience Rating
Subsection D - State Reference Point
7/1/2020

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	2017	43,184	469,586,545	10,874
2nd	2016	42,230	566,460,083	13,414
3rd	2015	43,615	628,355,013	14,407
Total		129,029	1,664,401,641	12,899
(6)	Indicated State Reference Point = [Total (5)] x 250			3,224,860
(7)	Average Annual Severity Trend			2.46%
(8)	Length of Trending Period in Years			1.496
(9)	Trend Factor = [1.000 + (7)] ^ (8)			1.037
(10)	Trended State Reference Point = (6) x (9)			3,344,374
(11)	Selected State Reference Point			3,000,000
(12)	G = (11) / 250,000			12.00
(13)	State Per Claim Accident Limitation = (11) x 0.1			300,000
(14)	Multiple State Claim Accident Limitation = (13) x 2			600,000

Notes:

(3), (4): Unit Statistical Plan Data, Excluding Large Deductible Policies.

(7): Credibility Weighted Severity Trends from Section V-A, Exhibit 1, Page 1 weighted by Injury Type Weights at Ultimate from Section IV-E, Exhibit 2, Pages 1 and 2.

(8): Section X-B, Exhibit 2.

(11): Current State Reference Point is 2,500,000. Propose to cap change at 20%.

EXPERIENCE RATING PLAN MANUAL

MASSACHUSETTS

Proposed Effective July 1, 2020

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	1.04	.15	2115	2.20	.14	3041	1.28	.15	3634	0.63	.15	4439	1.78	.16
0008	1.15	.16	2121	0.63	.15	3042	2.01	.15	3635	1.29	.16	4452	1.17	.15
0016	1.48	.16	2130	0.65	.15	3066	1.01	.15	3638	0.74	.15	4459	1.20	.15
0034	1.38	.16	2131	1.28	.15	3076	0.93	.15	3642	0.48	.15	4470	0.90	.15
0035	0.85	.16	2143	1.02	.15	3081D	2.06	.16	3643	0.67	.15	4484	0.88	.16
0036	1.38	.16	2150	1.72	.15	3082D	2.06	.16	3647	0.93	.15	4493	0.83	.15
0042	1.60	.16	2156	1.91	.15	3085D	1.86	.15	3648	0.54	.16	4511	0.12	.15
0046	0.97	.17	2157	1.76	.14	3110	3.56	.15	3681	0.30	.15	4512	0.04	.15
0050	1.84	.15	2172	0.78	.14	3111	0.82	.15	3685	0.29	.15	4557	0.76	.15
0059D	.	.	2211	2.47	.15	3113	0.70	.15	3724	1.93	.15	4558	0.66	.16
0065D	.	.	2220	0.99	.15	3114	1.38	.15	3726	2.29	.14	4583	0.99	.15
0066D	.	.	2260	2.24	.15	3118	0.75	.14	3807	1.22	.16	4611	0.33	.15
0067D	.	.	2288	1.56	.15	3119	0.36	.16	3808	1.45	.15	4635	1.66	.16
0079	1.09	.17	2305	1.53	.15	3120	0.61	.15	3821	2.25	.16	4653	0.77	.15
0083	1.56	.15	2362	0.72	.17	3122	1.04	.16	3826	1.88	.16	4665	3.61	.15
0106	3.78	.16	2380	0.94	.15	3127	0.55	.15	3830	0.72	.15	4692	0.23	.15
0113	1.38	.16	2402	0.93	.15	3131	0.62	.16	3841	0.61	.15	4693	0.37	.16
0170	1.38	.16	2413	1.46	.15	3132	1.13	.16	4000	1.98	.15	4720	0.76	.15
0771	.	.	2416	1.10	.15	3145	0.72	.15	4021	1.47	.15	4740	0.38	.15
0908	35.85	.15	2417	0.97	.14	3146	0.98	.16	4024	1.35	.15	4741	0.93	.14
0909	83.80	.18	2501	0.87	.15	3169	1.20	.16	4034	2.28	.15	4771	1.79	.14
0912	167.60	.18	2503	0.54	.14	3179	0.52	.15	4036	0.84	.15	4777	0.89	.15
0913	71.71	.15	2570	2.03	.14	3180	1.01	.15	4038	1.44	.13	4825	0.19	.15
0917	1.16	.15	2576	0.94	.16	3188	1.07	.15	4053	0.98	.15	4828	0.42	.15
0918	0.21	.14	2585	1.25	.15	3200	0.90	.15	4062	0.80	.15	4829	0.36	.15
1430	2.20	.15	2586	0.85	.16	3220	1.31	.15	4112	0.18	.15	4902	0.77	.16
1438	1.27	.15	2587	1.25	.14	3223	(a)	(a)	4113	0.98	.15	4923	0.27	.15
1463	4.29	.17	2623	2.16	.15	3255	0.94	.15	4114	1.10	.14	5020	1.87	.14
1624D	1.43	.15	2651	0.69	.15	3257	0.98	.15	4130	1.30	.15	5022	3.75	.14
1655	1.18	.15	2660	0.96	.15	3270	1.03	.15	4133	0.64	.15	5037	5.80	.14
1701	0.94	.15	2683	0.97	.16	3300	1.42	.16	4150	0.36	.14	5040	7.51	.14
1710D	1.57	.15	2688	0.84	.16	3305	(a)	(a)	4239	0.86	.15	5057	7.93	.16
1747	1.21	.15	2702	4.28	.15	3315	1.29	.15	4243	1.27	.15	5059	6.97	.15
1748	1.28	.17	2710	2.31	.16	3336	1.26	.14	4244	1.11	.14	5102	2.57	.14
1853	0.59	.13	2731	1.25	.16	3365	2.04	.15	4250	0.76	.15	5146	2.99	.15
1924	1.02	.15	2747	2.65	.15	3372	0.90	.15	4251	0.90	.14	5160	0.96	.15
1925	2.67	.23	2790	0.75	.15	3373	1.61	.14	4273	1.32	.15	5183	1.30	.15
2003	1.62	.15	2802	1.62	.15	3381	0.89	.15	4279	0.94	.15	5188	1.68	.14
2014	1.58	.15	2835	0.69	.16	3383	0.74	.16	4283	0.76	.15	5190	0.94	.15
2021	1.05	.15	2836	0.99	.15	3385	0.31	.15	4299	0.80	.15	5191	0.36	.15
2039	1.63	.15	2841	1.71	.16	3400	1.20	.16	4304	1.96	.15	5192	1.18	.15
2041	1.10	.15	2883	1.46	.15	3507	1.18	.15	4307	0.73	.16	5213	4.38	.14
2070	1.59	.15	2923	0.73	.15	3515	1.24	.15	4308	0.75	.12	5215	1.85	.14
2081	1.21	.16	2942	0.82	.16	3558	0.35	.17	4351	0.39	.15	5221	2.82	.14
2089	1.19	.14	3018	1.05	.15	3571	0.33	.15	4352	0.58	.14	5222	3.87	.14
2095	1.32	.14	3022	1.57	.15	3574	0.74	.15	4360	0.27	.15	5223	1.68	.15
2101	1.22	.14	3027	1.70	.16	3612	0.61	.16	4361	0.32	.17	5348	1.77	.14
2105	(a)	(a)	3028	1.26	.15	3620	1.53	.16	4362	0.23	.15	5402	2.75	.15
2111	0.98	.15	3030	2.47	.15	3629	0.74	.15	4410	1.30	.16	5403	3.27	.14
2114	1.22	.14	3040	1.94	.14	3632	0.72	.15	4432	0.34	.16	5437	1.77	.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, 2020

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	1.61	.15	7016M	1.12	.79	7704	1.19	.16	8719	1.10	.15	9179	16.74	.18
5445	2.36	.14	7024M	1.40	.79	7720	0.61	.15	8720	0.34	.15	9180	1.90	.18
5462	2.39	.14	7038M	2.12	.76	7855	1.50	.14	8721	0.12	.16	9182	1.44	.17
5472	2.84	.14	7046M	3.02	.58	8001	0.76	.16	8726F	1.85	.18	9186	1.74	.18
5473	3.52	.15	7047M	1.76	.69	8002	0.77	.17	8734M	0.21	.54	9220	1.45	.15
5474	1.56	.15	7050M	3.32	.67	8006	0.55	.16	8737M	0.17	.54	9402	1.72	.15
5478	1.67	.14	7090M	2.65	.76	8008	0.34	.16	8738M	0.26	.53	9403	3.81	.15
5479	2.45	.14	7098M	3.55	.58	8010	0.77	.16	8742	0.05	.16	9410	1.48	.16
5480	1.87	.14	7099M	4.45	.51	8013	0.16	.16	8745	2.53	.17	9501	0.92	.15
5506	1.64	.14	7133	(a)	(a)	8017	0.44	.16	8747	0.35	.14	9505	0.92	.15
5507	2.19	.14	7151M	3.96	.52	8018	1.64	.15	8748	0.30	.15	9519	1.16	.15
5508D	1.73	.15	7152M	6.22	.52	8021	1.53	.15	8800	0.50	.15	9521	1.26	.15
5509	1.77	.15	7153M	4.96	.52	8031	0.79	.16	8803	0.02	.16	9522	0.72	.15
5538	1.79	.15	7219	3.29	.15	8032	0.56	.16	8805M	0.09	.60	9533	5.28	.15
5545	14.27	.16	7230	4.29	.14	8033	0.69	.15	8810	0.03	.16	9534	2.09	.14
5547	3.78	.16	7231	4.89	.15	8034	1.33	.15	8814M	0.07	.60	9549	1.85	.14
5606	0.51	.15	7309F	3.83	.16	8039	0.59	.17	8815M	0.11	.59	9552	3.18	.16
5610	2.00	.14	7313F	4.64	.13	8044	1.29	.15	8820	0.03	.15	9586	0.15	.15
5645	2.67	.15	7317F	6.04	.16	8046	0.91	.16	8824	0.83	.16	9620	0.35	.16
5701	7.05	.16	7327F	8.65	.16	8048	1.20	.15	8826	0.67	.15			
5703	4.84	.14	7333M	4.51	.70	8058	1.01	.17	8829	0.98	.15			
5705	4.36	.15	7335M	5.30	.70	8103	1.12	.15	8831	0.45	.18			
6003	3.60	.14	7337M	6.65	.61	8105	3.20	.14	8832	0.13	.15			
6005	1.73	.15	7350F	7.85	.14	8106	2.37	.16	8833	0.51	.15			
6204	2.01	.14	7360	1.66	.15	8107	1.17	.16	8835	0.83	.14			
6217	1.67	.15	7370	1.78	.16	8111	1.28	.16	8837	(a)	(a)			
6229	1.50	.15	7380	2.70	.15	8203	2.79	.15	8868	0.33	.16			
6233	0.87	.14	7382	1.65	.15	8204	2.39	.17	8901	0.03	.16			
6251D	1.73	.13	7394M	5.80	.84	8215	1.52	.16	9014	0.99	.15			
6252D	2.26	.14	7395M	7.41	.84	8227	1.61	.15	9015	1.37	.15			
6306	2.82	.14	7398M	9.29	.74	8232	2.43	.15	9016	0.81	.16			
6319	1.18	.14	7403	1.69	.16	8233	2.39	.16	9019	1.39	.14			
6325	1.08	.15	7405	0.51	.15	8235	1.81	.15	9033	1.14	.15			
6400	2.17	.15	7420	2.82	.15	8263	2.03	.16	9040	1.33	.16			
6504	1.22	.14	7421	0.47	.14	8264	2.05	.15	9044	0.62	.15			
6702M	(a)	(a)	7422	0.43	.14	8265	2.18	.16	9052	0.69	.15			
6703M	(a)	(a)	7425	0.85	.14	8279	1.54	.16	9058	0.69	.15			
6704M	(a)	(a)	7431	0.43	.14	8291	1.74	.15	9060	0.47	.17			
6801F	2.94	.15	7445	.	.	8292	1.61	.15	9061	0.47	.16			
6811	2.55	.15	7453	.	.	8293	3.40	.15	9062	0.47	.16			
6824F	4.12	.17	7502	0.74	.15	8350	2.54	.15	9063	0.28	.17			
6826F	2.50	.16	7515	1.01	.19	8380	1.18	.15	9077F	2.50	.20			
6834	1.11	.16	7520	1.34	.15	8381	0.82	.16	9079	0.50	.16			
6836	1.53	.16	7538	2.21	.15	8385	1.32	.15	9089	0.38	.16			
6843F	3.66	.16	7539	0.48	.16	8392	0.67	.16	9093	0.53	.17			
6854	3.18	.16	7580	1.37	.15	8393	0.59	.15	9101	1.62	.16			
6872F	5.13	.16	7590	2.01	.16	8500	2.39	.16	9102	1.02	.16			
6874F	5.60	.15	7600	1.51	.14	8601	0.10	.15	9154	0.66	.16			
6882	4.45	.16	7601	2.21	.15	8709F	1.80	.16	9156	0.79	.17			
6884	4.86	.15	7610	0.14	.14	8710	1.34	.15	9178	6.78	.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).

X 000032

EXPERIENCE RATING PLAN MANUAL

Proposed Effective July 1, 2020

TABLE OF WEIGHTING VALUES

Expected Losses	Weighting Values	Expected Losses	Weighting Values	Expected Losses	Weighting Values
0 - 2,513	0.04	710,921 - 767,041	0.24	2,930,567 - 3,168,376	0.44
2,514 - 10,158	0.05	767,042 - 826,145	0.25	3,168,377 - 3,433,581	0.45
10,159 - 17,967	0.06	826,146 - 888,479	0.26	3,433,582 - 3,731,206	0.46
17,968 - 73,730	0.07	888,480 - 954,322	0.27	3,731,207 - 4,067,586	0.47
73,731 - 107,328	0.08	954,323 - 1,023,982	0.28	4,067,587 - 4,450,819	0.48
107,329 - 139,368	0.09	1,023,983 - 1,097,803	0.29	4,450,820 - 4,891,427	0.49
139,369 - 171,481	0.10	1,097,804 - 1,176,173	0.30	4,891,428 - 5,403,342	0.50
171,482 - 204,224	0.11	1,176,174 - 1,259,530	0.31	5,403,343 - 6,005,399	0.51
204,225 - 237,884	0.12	1,259,531 - 1,348,367	0.32	6,005,400 - 6,723,708	0.52
237,885 - 272,651	0.13	1,348,368 - 1,443,245	0.33	6,723,709 - 7,595,543	0.53
272,652 - 308,672	0.14	1,443,246 - 1,544,805	0.34	7,595,544 - 8,676,014	0.54
308,673 - 346,077	0.15	1,544,806 - 1,653,780	0.35	8,676,015 - 10,050,198	0.55
346,078 - 384,992	0.16	1,653,781 - 1,771,016	0.36	10,050,199 - 11,856,701	0.56
384,993 - 425,539	0.17	1,771,017 - 1,897,490	0.37	11,856,702 - 14,337,622	0.57
425,540 - 467,848	0.18	1,897,491 - 2,034,341	0.38	14,337,623 - 17,957,315	0.58
467,849 - 512,054	0.19	2,034,342 - 2,182,903	0.39	17,957,316 - 23,733,409	0.59
512,055 - 558,300	0.20	2,182,904 - 2,344,747	0.40	23,733,410 - 34,410,411	0.60
558,301 - 606,744	0.21	2,344,748 - 2,521,740	0.41	34,410,412 - 60,821,914	0.61
606,745 - 657,556	0.22	2,521,741 - 2,716,115	0.42	60,821,915 - 235,137,723	0.62
657,557 - 710,920	0.23	2,716,116 - 2,930,566	0.43	235,137,723 - 999,999,999	0.63

- | | |
|---|-----------|
| (a) State Per Claim Accident Limitation | \$300,000 |
| (b) State Multiple Claim Accident Limitation | \$600,000 |
| (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 | 15.2% |
| (g) Cap on Modifications = 1 + (0.00005) [(Expected Losses) + (2) (Expected Losses) / (12)] | |

X 000033

Proposed Effective July 1, 2020

TABLE OF BALLAST VALUES

Expected Losses	Ballast Values	Expected Losses	Ballast Values	Expected Losses	Ballast Values
0 - 61,204	30,000	1,726,453 - 1,776,411	205,000	3,475,724 - 3,525,713	380,000
61,205 - 98,560	35,000	1,776,412 - 1,826,373	210,000	3,525,714 - 3,575,703	385,000
98,561 - 141,779	40,000	1,826,374 - 1,876,337	215,000	3,575,704 - 3,625,693	390,000
141,780 - 187,841	45,000	1,876,338 - 1,926,302	220,000	3,625,694 - 3,675,684	395,000
187,842 - 235,338	50,000	1,926,303 - 1,976,269	225,000	3,675,685 - 3,725,674	400,000
235,339 - 283,629	55,000	1,976,270 - 2,026,238	230,000	3,725,675 - 3,775,665	405,000
283,630 - 332,394	60,000	2,026,239 - 2,076,208	235,000	3,775,666 - 3,825,657	410,000
332,395 - 381,463	65,000	2,076,209 - 2,126,180	240,000	3,825,658 - 3,875,648	415,000
381,464 - 430,738	70,000	2,126,181 - 2,176,153	245,000	3,875,649 - 3,925,640	420,000
430,739 - 480,158	75,000	2,176,154 - 2,226,127	250,000	3,925,641 - 3,975,632	425,000
480,159 - 529,683	80,000	2,226,128 - 2,276,103	255,000	3,975,633 - 4,025,624	430,000
529,684 - 579,287	85,000	2,276,104 - 2,326,079	260,000	4,025,625 - 4,075,617	435,000
579,288 - 628,953	90,000	2,326,080 - 2,376,056	265,000	4,075,618 - 4,125,609	440,000
628,954 - 678,667	95,000	2,376,057 - 2,426,035	270,000	4,125,610 - 4,175,602	445,000
678,668 - 728,420	100,000	2,426,036 - 2,476,014	275,000	4,175,603 - 4,225,595	450,000
728,421 - 778,203	105,000	2,476,015 - 2,525,994	280,000	4,225,596 - 4,275,588	455,000
778,204 - 828,012	110,000	2,525,995 - 2,575,975	285,000	4,275,589 - 4,325,581	460,000
828,013 - 877,843	115,000	2,575,976 - 2,625,956	290,000	4,325,582 - 4,375,574	465,000
877,844 - 927,692	120,000	2,625,957 - 2,675,938	295,000	4,375,575 - 4,425,568	470,000
927,693 - 977,555	125,000	2,675,939 - 2,725,921	300,000	4,425,569 - 4,475,562	475,000
977,556 - 1,027,432	130,000	2,725,922 - 2,775,905	305,000	4,475,563 - 4,525,555	480,000
1,027,433 - 1,077,321	135,000	2,775,906 - 2,825,889	310,000	4,525,556 - 4,575,549	485,000
1,077,322 - 1,127,219	140,000	2,825,890 - 2,875,873	315,000	4,575,550 - 4,625,543	490,000
1,127,220 - 1,177,125	145,000	2,875,874 - 2,925,858	320,000	4,625,544 - 4,675,538	495,000
1,177,126 - 1,227,039	150,000	2,925,859 - 2,975,844	325,000	4,675,539 - 4,725,532	500,000
1,227,040 - 1,276,960	155,000	2,975,845 - 3,025,830	330,000	4,725,533 - 4,775,526	505,000
1,276,961 - 1,326,887	160,000	3,025,831 - 3,075,817	335,000	4,775,527 - 4,825,521	510,000
1,326,888 - 1,376,819	165,000	3,075,818 - 3,125,804	340,000	4,825,522 - 4,875,515	515,000
1,376,820 - 1,426,755	170,000	3,125,805 - 3,175,791	345,000	4,875,516 - 4,925,510	520,000
1,426,756 - 1,476,696	175,000	3,175,792 - 3,225,779	350,000	4,925,511 - 4,975,505	525,000
1,476,697 - 1,526,641	180,000	3,225,780 - 3,275,767	355,000		
1,526,642 - 1,576,589	185,000	3,275,768 - 3,325,755	360,000		
1,576,590 - 1,626,541	190,000	3,325,756 - 3,375,744	365,000		
1,626,542 - 1,676,495	195,000	3,375,745 - 3,425,733	370,000		
1,676,496 - 1,726,452	200,000	3,425,734 - 3,475,723	375,000		

For Expected Losses (E) greater than \$4,975,505, the Ballast Value is calculated using the following formula (rounded to the nearest 1):

$$\text{Ballast} = (0.1E + 2,500GE / (E + 700G))$$

G = 12

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

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 2013, 2012, 2011, 2010, and 2009 at fifth report. Each loss is multiplied by appropriate trend, law amendment and development factors. Claim costs are trended to 7/1/2021, the average accident date (assuming the proposed small deductible credits will be in effect for one year starting 7/1/2020). 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
7/1/2020

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	2.5%	0.618	0.90	0.197	0.017	1.8%
1,000	4.2%	0.618	0.90	0.197	0.017	3.0%
2,000	6.4%	0.618	0.90	0.197	0.017	4.5%
2,500	7.3%	0.618	0.90	0.197	0.017	5.2%
5,000	10.9%	0.618	0.90	0.197	0.017	7.7%

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 5.2% is estimated for a \$2,500 per claim deductible (not subject to an aggregate limit). The 5.2% 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 2013, 2012, 2011, 2010, and 2009 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.

XI 000007

Section XI - Miscellaneous Rating Values
Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
7/1/2020

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) / \$25,884 (2)	Aggregate Limit (3)	Selected Adjustment Factor for Aggregate Limit (4)	Premium Credit = (4) x 5.2% (5)
0 - 75,000	1.4	\$10,000	0.99	5.1%
75,000 - 100,000	3.4	\$10,000	0.97	5.0%
100,000 - 125,000	4.3	\$10,000	0.95	4.9%
125,000 - 150,000	5.3	\$10,000	0.93	4.8%
150,000 - 200,000	6.8	\$10,000	0.88	4.6%
Over 200,000	8 or more	5% of the 'Basis for the Aggregate Limit at Policy Inception'	0.83	4.3%

Notes:

(2): Based on \$25,884 in standard premium (no ARAP) per expected claim.

(4): Selected based on the simulation results shown in Exhibit 2.

(5): The 5.2% is based on the \$2,500 per claim deductible without any aggregate limit, from Section XI-B, Exhibit 1.

XI 000008

Section XI - Miscellaneous Rating Values
 Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
 7/1/2020

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	7.30%	7.30%	3.68%	1.00	0.50
2	1,000,000	7.29%	7.28%	4.89%	1.00	0.67
3	1,000,000	7.37%	7.29%	5.38%	0.99	0.73
4	1,000,000	7.31%	7.12%	5.63%	0.97	0.77
5	1,000,000	7.30%	6.93%	5.82%	0.95	0.80
6	1,000,000	7.33%	6.70%	5.98%	0.91	0.82
7	1,000,000	7.34%	6.42%	6.10%	0.87	0.83
8	1,000,000	7.32%	6.07%	6.18%	0.83	0.84
9	1,000,000	7.32%	5.72%	6.25%	0.78	0.85
10	1,000,000	7.35%	5.40%	6.34%	0.73	0.86
12	1,000,000	7.35%	4.74%	6.43%	0.64	0.87
14	1,000,000	7.33%	4.16%	6.50%	0.57	0.89
16	1,000,000	7.34%	3.69%	6.57%	0.50	0.90
18	1,000,000	7.32%	3.28%	6.61%	0.45	0.90
20	1,000,000	7.32%	2.97%	6.65%	0.41	0.91
25	1,000,000	7.33%	2.38%	6.75%	0.32	0.92
30	1,000,000	7.33%	1.98%	6.81%	0.27	0.93
40	1,000,000	7.33%	1.49%	6.90%	0.20	0.94
50	1,000,000	7.33%	1.19%	6.96%	0.16	0.95
75	1,000,000	7.33%	0.79%	7.05%	0.11	0.96
100	1,000,000	7.33%	0.59%	7.11%	0.08	0.97
150	1,000,000	7.33%	0.40%	7.16%	0.05	0.98
200	1,000,000	7.33%	0.30%	7.20%	0.04	0.98
300	1,000,000	7.33%	0.20%	7.24%	0.03	0.99
400	1,000,000	7.33%	0.15%	7.26%	0.02	0.99
500	1,000,000	7.33%	0.12%	7.28%	0.02	0.99

Notes:

(5): The Aggregate Limit is based on the average claim severity of the simulated losses, \$16,835 and the permissible loss ratio of 0.618. One claim is assumed to be expected for each \$25,884 of standard premium.

XI 000009

Section XI - Miscellaneous Rating Values
 Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
 7/1/2020

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 2009	1.063	1.068	1.111	1.041	1.002
PY 2010	1.063	1.069	1.112	1.042	1.000
PY 2011	1.060	1.064	1.102	1.040	1.000
PY 2012	1.055	1.057	1.090	1.036	1.000
PY 2013	1.053	1.054	1.085	1.034	1.000

(2) Loss Development Factors - Fifth Report to Ultimate

Loss Development Category	Indemnity	Medical
Likely to Develop	1.085	1.033
Not Likely to Develop	1.017	1.005

(3) Severity Trend Factors

We apply three distinct trend factors.

Trend to PY 2013 is based on empirical USR data at 5th report.

Trend from PY 2013 to PY 2017 is based on severities from Section V-A, Exhibit 2.

Trend from PY 2017 to the Prospective Effective Period is based on the projected severity trends from Section V-A, Exhibit 1.

Trend Period		Indemnity	Lost Time Medical	Medical Only
From	To			
PY 2009	PY 2013	1.026	0.969	1.101
PY 2010	PY 2013	1.077	1.024	1.095
PY 2011	PY 2013	1.014	0.948	1.074
PY 2012	PY 2013	1.001	0.916	1.027
PY 2013	PY 2017	1.123	1.129	1.095
PY 2017	Prosp. Eff. Period	1.093	1.081	1.082

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, 2020</i>	Page RA-5

MISCELLANEOUS VALUES

Basis of Premium applicable in accordance with the footnote instructions for Code 7370 - "Taxicab Co.":	
Employee operated vehicles.....	\$111,700.00
Leased or rented vehicles.....	\$74,400.00
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.....	
	\$52,100.00
Payroll Limitations:	
For Executive Officers - in accordance with Rule IX-A-3-a and b	
Minimum individual payroll for an executive officer per week.....	\$230.00
Maximum individual payroll for an executive officer per week.....	\$1,140.00
For Spouses of Individuals, Co-Partners or Corporate Officers - in accordance with Rule IX-A-4	
Minimum individual payroll for a spouse per week.....	\$230.00
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.....	\$230.00
Maximum individual payroll for an elected or appointed officer per week.....	\$1,140.00
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.....	\$340.00
Code 9179 - Athletic Sports Or Park: Contact Sports.....	\$340.00
Code 9178 - Athletic Sports Or Park: Non-Contact Sports.....	\$340.00
Terrorism Insurance Program —Certified Loss:.....	0.03

BENEFITS DEDUCTIBLE COVERAGE PROGRAM

Medical and Indemnity Deductible Amount	Premium Reduction Percentage
\$500	1.8%
\$1,000	3.0%
\$2,000	4.5%
\$2,500	5.2%
\$5,000	7.7%

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	5.1%
\$75,001 to \$100,000	\$2,500	\$10,000	5.0%
\$100,001 to \$125,000	\$2,500	\$10,000	4.9%
\$125,001 to \$150,000	\$2,500	\$10,000	4.8%
\$150,001 to \$200,000	\$2,500	\$10,000	4.6%
over \$200,000	\$2,500	5% of Basis for the Aggregate Limit	4.3%

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, 2020	
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.....			21.0%
(Multiply an eligible Non-F classification rate by a factor of 1.21)			
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 the 2003 Rate Decision. This year, consistent with the previous filings, 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.

XII 000003

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

**MASSACHUSETTS
 RR1**

Proposed Effective July 1, 2020

1. Hazard Group Differentials

A	B	C	D	E	F	G
1.96	1.59	1.37	1.17	0.97	0.75	0.60

2. Tax Multipliers

a. State (non-F Classes)	1.023*
b. Federal Classes, or non-F classes where rate is increased by the USL&HW Act Percentage	1.065*

* Includes 0.13% residual market subsidy provision and -0.53% insolvency fund assessment provision

3. Expected Loss Ratio

0.620

Expected Loss and Allocated Loss Adjustment Expense Ratio (ALAE Option)

0.673

4. Loss Conversion Factor

1.187

Loss Conversion Factor for Allocated Loss Adjustment Expense Option (ALAE Option)

1.094

5. Table of Expense Ratios Excluding Taxes and Including Profit

Type A Company

Massachusetts
 Effective July 1, 2020

Type B Company

Massachusetts
 Effective July 1, 2020

Table of Expense Ratios Excluding Allocated Loss Adjustment Expense and Taxes and Including Profit (ALAE Option)

Type A Company

Massachusetts
 Effective July 1, 2020

Type B Company

Massachusetts
 Effective July 1, 2020

6. 2013—Table of Expected Loss Ranges

April 1, 2014

7a.

Excess Loss Factors

(Applicable to New and Renewal Policies)

Per Accident Limitation	Hazard Groups						
	A	B	C	D	E	F	G
\$25,000	0.395	0.419	0.443	0.463	0.483	0.511	0.542
30,000	0.377	0.403	0.427	0.449	0.469	0.499	0.533
35,000	0.361	0.388	0.413	0.437	0.457	0.488	0.525
40,000	0.347	0.374	0.400	0.425	0.446	0.477	0.517
50,000	0.322	0.350	0.377	0.404	0.426	0.458	0.503
75,000	0.274	0.302	0.331	0.362	0.385	0.418	0.472
100,000	0.237	0.265	0.294	0.329	0.352	0.385	0.444
125,000	0.209	0.234	0.264	0.300	0.323	0.355	0.420
150,000	0.186	0.209	0.239	0.276	0.297	0.329	0.398
175,000	0.167	0.188	0.217	0.254	0.275	0.305	0.378
200,000	0.151	0.170	0.198	0.235	0.255	0.284	0.359
250,000	0.125	0.141	0.167	0.203	0.221	0.248	0.326
300,000	0.106	0.120	0.143	0.178	0.194	0.219	0.297
500,000	0.063	0.071	0.088	0.114	0.125	0.144	0.215
1,000,000	0.029	0.033	0.042	0.057	0.063	0.073	0.120
2,000,000	0.013	0.015	0.019	0.026	0.029	0.034	0.061
3,000,000	0.008	0.009	0.012	0.016	0.018	0.021	0.039
4,000,000	0.005	0.006	0.008	0.011	0.013	0.015	0.028
5,000,000	0.004	0.005	0.006	0.009	0.010	0.011	0.022

XII 000004

**MASSACHUSETTS
 RR2**

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

Proposed Effective July 1, 2020

**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	0.437	0.463	0.488	0.510	0.530	0.561	0.593
30,000	0.418	0.445	0.471	0.495	0.516	0.548	0.583
35,000	0.401	0.430	0.456	0.481	0.503	0.536	0.574
40,000	0.386	0.415	0.443	0.469	0.491	0.525	0.566
50,000	0.360	0.390	0.419	0.447	0.470	0.505	0.552
75,000	0.308	0.339	0.370	0.403	0.427	0.463	0.519
100,000	0.269	0.299	0.331	0.368	0.392	0.428	0.491
125,000	0.238	0.267	0.299	0.338	0.362	0.398	0.466
150,000	0.213	0.239	0.272	0.311	0.335	0.370	0.443
175,000	0.192	0.216	0.248	0.288	0.312	0.345	0.422
200,000	0.174	0.196	0.227	0.268	0.290	0.322	0.402
250,000	0.146	0.165	0.193	0.233	0.253	0.283	0.367
300,000	0.124	0.140	0.167	0.205	0.224	0.251	0.337
500,000	0.074	0.085	0.104	0.134	0.147	0.168	0.248
1,000,000	0.035	0.040	0.050	0.067	0.074	0.086	0.141
2,000,000	0.015	0.018	0.023	0.031	0.035	0.041	0.072
3,000,000	0.009	0.011	0.014	0.020	0.022	0.026	0.046
4,000,000	0.007	0.008	0.010	0.014	0.015	0.018	0.034
5,000,000	0.005	0.006	0.007	0.011	0.012	0.014	0.026

8. Retrospective Development Factors

<u>With Loss Limit</u>				<u>Without Loss Limit</u>			
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 000005

Section XII - Retrospective Rating
Subsection A - Expenses
7/1/2020

Section XII - A
Exhibit 3

Expense Provisions Underlying the Proposed Retrospective Rating Plans

Total Expenses:

(1) Commission and Other Acquisition Expenses	12.2%
(2) Fixed Expenses	4.9%
(3) Premium Discount	5.3%
(4) Underwriting Profit Provision	<u>1.7%</u>
(5) Total Expenses Excluding Taxes and Assessments (= (1) + (2) + (3) + (4))	24.2%
(6) Current Premium Tax Rate	2.28%
(7) Miscellaneous Taxes	0.33%
(8) Retro Provision for the Residual Market Subsidy	0.13%
(9) Insolvency Fund Assessment	<u>-0.53%</u>
(10) Tax Multiplier (= $1.0 / \{ 1.0 - [(6) + (7) + (8) + (9)] \}$)	1.023
(11) Expected Loss and LAE Ratio (adjusted for Residual Market Subsidy) (= $[1.0 / (10)] - (5)$)	73.6%
(12) Loss Adjustment Expense (as percentage of losses)	18.7%
(13) Loss Conversion Factor (= $1.0 + (12)$)	1.187
(14) Expected Loss without LAE (= $(11) / (13)$)	62.0%
(15) Expenses excluding Premium Taxes but including LAE (= $(5) + [(12) \times (14)]$)	35.8%

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 000006

Section XII - Retrospective Rating
Subsection A - Expenses
7/1/2020

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)	62.0%
(2) Provision for ALAE Expenses (as percentage of losses)	8.5%
(3) Expected Loss plus ALAE Ratio (= (1) x [1.0 + (2)])	67.3%
(4) Loss Adjustment Expense (as percentage of losses)	18.7%
(5) Loss Conversion Factor (= [1.0 + (4)] / [1.0 + (2)])	1.094
(6) Tax Multiplier	1.023
(7) Expenses excluding Premium Taxes but including LAE (as percentage of Standard Premium plus ARAP)	35.8%
(8) Expenses including all AO Expenses but excluding ALAE Expenses and Premium Taxes (= (7) - [(1) x (2)])	30.5%

Notes:

(1): Exhibit 3, line (14)

(2): Section VI-H, Exhibit 1, Page 1, line (5), DCC assumed a proxy for ALAE.

(4), (6), (7): Exhibit 3, lines (12), (10) and (15) respectively.

XII 000007

Section XII - Retrospective Rating
Subsection B - Residual Market Subsidy
7/1/2020

Section XII - B
Exhibit 1

Calculation of the Provision for the Residual Market Subsidy

(1) Voluntary Market Implied Rate Factor Equivalent	0.998
(2) Factor to Take into Account Basic Premium	0.800
(3) Retro Provision for the Residual Market Subsidy	0.13%

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
 RR5**

Proposed Effective July 1, 2020

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	0.358	17,988	18,358	0.318	94,092	105,221	0.278
10,058	10,172	0.357	18,359	18,745	0.317	105,222	119,336	0.277
10,173	10,289	0.356	18,746	19,149	0.316	119,337	137,827	0.276
10,290	10,410	0.355	19,150	19,570	0.315	137,828	163,097	0.275
10,411	10,533	0.354	19,571	20,010	0.314	163,098	199,715	0.274
10,534	10,659	0.353	20,011	20,471	0.313	199,716	207,962	0.273
10,660	10,788	0.352	20,472	20,953	0.312	207,963	216,642	0.272
10,789	10,921	0.351	20,954	21,458	0.311	216,643	226,078	0.271
10,922	11,057	0.350	21,459	21,989	0.310	226,079	236,373	0.270
11,058	11,196	0.349	21,990	22,546	0.309	236,374	247,651	0.269
11,197	11,338	0.348	22,547	23,133	0.308	247,652	260,058	0.268
11,339	11,485	0.347	23,134	23,750	0.307	260,059	273,775	0.267
11,486	11,635	0.346	23,751	24,402	0.306	273,776	289,019	0.266
11,636	11,789	0.345	24,403	25,090	0.305	289,020	306,061	0.265
11,790	11,948	0.344	25,091	25,818	0.304	306,062	325,238	0.264
11,949	12,110	0.343	25,819	26,590	0.303	325,239	346,979	0.263
12,111	12,277	0.342	26,591	27,409	0.302	346,980	371,836	0.262
12,278	12,449	0.341	27,410	28,281	0.301	371,837	400,528	0.261
12,450	12,626	0.340	28,282	29,209	0.300	400,529	434,019	0.260
12,627	12,808	0.339	29,210	30,201	0.299	434,020	473,621	0.259
12,809	12,995	0.338	30,202	31,262	0.298	473,622	521,176	0.258
12,996	13,187	0.337	31,263	32,401	0.297	521,177	579,346	0.257
13,188	13,386	0.336	32,402	33,626	0.296	579,347	652,134	0.256
13,387	13,590	0.335	33,627	34,947	0.295	652,135	745,839	0.255
13,591	13,801	0.334	34,948	36,376	0.294	745,840	870,992	0.254
13,802	14,019	0.333	36,377	37,927	0.293	870,993	1,046,615	0.253
14,020	14,243	0.332	37,928	39,616	0.292	1,046,616	1,310,949	0.252
14,244	14,475	0.331	39,617	41,463	0.291	1,310,950	1,750,912	0.251
14,476	14,714	0.330	41,464	43,490	0.290	1,750,913	1,900,121	0.250
14,715	14,962	0.329	43,491	45,725	0.289	1,900,122	2,077,130	0.249
14,963	15,218	0.328	45,726	48,203	0.288	2,077,131	2,290,506	0.248
15,219	15,483	0.327	48,204	50,965	0.287	2,290,507	2,552,739	0.247
15,484	15,757	0.326	50,966	54,062	0.286	2,552,740	2,882,780	0.246
15,758	16,041	0.325	54,063	57,560	0.285	2,882,781	3,310,835	0.245
16,042	16,336	0.324	57,561	61,543	0.284	3,310,836	3,888,179	0.244
16,337	16,641	0.323	61,544	66,117	0.283	3,888,180	4,709,404	0.243
16,642	16,958	0.322	66,118	71,426	0.282	4,709,405	5,970,423	0.242
16,959	17,288	0.321	71,427	77,662	0.281	5,970,424	8,153,709	0.241
17,289	17,631	0.320	77,663	85,090	0.280	8,153,710	12,854,325	0.240
17,632	17,987	0.319	85,091	94,091	0.279	12,854,326	OVER	0.239

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

0.620

Tax Multiplier

1.023

**MASSACHUSETTS
 RR6**

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

Proposed Effective July 1, 2020

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	10,101	0.358	19,664	20,471	0.333	230,478	248,154	0.308
10,102	10,310	0.357	20,472	21,347	0.332	248,155	268,767	0.307
10,311	10,528	0.356	21,348	22,302	0.331	268,768	293,115	0.306
10,529	10,755	0.355	22,303	23,347	0.330	293,116	322,314	0.305
10,756	10,992	0.354	23,348	24,494	0.329	322,315	357,973	0.304
10,993	11,240	0.353	24,495	25,760	0.328	357,974	402,505	0.303
11,241	11,499	0.352	25,761	27,163	0.327	402,506	459,690	0.302
11,500	11,771	0.351	27,164	28,728	0.326	459,691	535,815	0.301
11,772	12,055	0.350	28,729	30,485	0.325	535,816	642,157	0.300
12,056	12,354	0.349	30,486	32,471	0.324	642,158	801,162	0.299
12,355	12,668	0.348	32,472	34,733	0.323	801,163	1,064,822	0.298
12,669	12,998	0.347	34,734	37,334	0.322	1,064,823	1,587,149	0.297
12,999	13,346	0.346	37,335	40,356	0.321	1,587,150	1,881,130	0.296
13,347	13,714	0.345	40,357	43,911	0.320	1,881,131	2,072,812	0.295
13,715	14,101	0.344	43,912	48,152	0.319	2,072,813	2,307,991	0.294
14,102	14,512	0.343	48,153	53,300	0.318	2,307,992	2,603,365	0.293
14,513	14,947	0.342	53,301	59,681	0.317	2,603,366	2,985,439	0.292
14,948	15,409	0.341	59,682	67,797	0.316	2,985,440	3,498,949	0.291
15,410	15,900	0.340	67,798	78,468	0.315	3,498,950	4,225,810	0.290
15,901	16,424	0.339	78,469	93,125	0.314	4,225,811	5,333,846	0.289
16,425	16,984	0.338	93,126	114,517	0.313	5,333,847	7,229,460	0.288
16,985	17,583	0.337	114,518	148,666	0.312	7,229,461	11,215,306	0.287
17,584	18,226	0.336	148,667	201,737	0.311	11,215,307	OVER	0.286
18,227	18,917	0.335	201,738	215,152	0.310			
18,918	19,663	0.334	215,153	230,477	0.309			

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

0.620

Tax Multiplier

1.023

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

**MASSACHUSETTS
 RR7**

Proposed Effective July 1, 2020

**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	0.305	17,988	- 18,358	0.265	94,092	- 105,221	0.225
10,058	- 10,172	0.304	18,359	- 18,745	0.264	105,222	- 119,336	0.224
10,173	- 10,289	0.303	18,746	- 19,149	0.263	119,337	- 137,827	0.223
10,290	- 10,410	0.302	19,150	- 19,570	0.262	137,828	- 163,097	0.222
10,411	- 10,533	0.301	19,571	- 20,010	0.261	163,098	- 199,715	0.221
10,534	- 10,659	0.300	20,011	- 20,471	0.260	199,716	- 207,962	0.220
10,660	- 10,788	0.299	20,472	- 20,953	0.259	207,963	- 216,642	0.219
10,789	- 10,921	0.298	20,954	- 21,458	0.258	216,643	- 226,078	0.218
10,922	- 11,057	0.297	21,459	- 21,989	0.257	226,079	- 236,373	0.217
11,058	- 11,196	0.296	21,990	- 22,546	0.256	236,374	- 247,651	0.216
11,197	- 11,338	0.295	22,547	- 23,133	0.255	247,652	- 260,058	0.215
11,339	- 11,485	0.294	23,134	- 23,750	0.254	260,059	- 273,775	0.214
11,486	- 11,635	0.293	23,751	- 24,402	0.253	273,776	- 289,019	0.213
11,636	- 11,789	0.292	24,403	- 25,090	0.252	289,020	- 306,061	0.212
11,790	- 11,948	0.291	25,091	- 25,818	0.251	306,062	- 325,238	0.211
11,949	- 12,110	0.290	25,819	- 26,590	0.250	325,239	- 346,979	0.210
12,111	- 12,277	0.289	26,591	- 27,409	0.249	346,980	- 371,836	0.209
12,278	- 12,449	0.288	27,410	- 28,281	0.248	371,837	- 400,528	0.208
12,450	- 12,626	0.287	28,282	- 29,209	0.247	400,529	- 434,019	0.207
12,627	- 12,808	0.286	29,210	- 30,201	0.246	434,020	- 473,621	0.206
12,809	- 12,995	0.285	30,202	- 31,262	0.245	473,622	- 521,176	0.205
12,996	- 13,187	0.284	31,263	- 32,401	0.244	521,177	- 579,346	0.204
13,188	- 13,386	0.283	32,402	- 33,626	0.243	579,347	- 652,134	0.203
13,387	- 13,590	0.282	33,627	- 34,947	0.242	652,135	- 745,839	0.202
13,591	- 13,801	0.281	34,948	- 36,376	0.241	745,840	- 870,992	0.201
13,802	- 14,019	0.280	36,377	- 37,927	0.240	870,993	- 1,046,615	0.200
14,020	- 14,243	0.279	37,928	- 39,616	0.239	1,046,616	- 1,310,949	0.199
14,244	- 14,475	0.278	39,617	- 41,463	0.238	1,310,950	- 1,750,912	0.198
14,476	- 14,714	0.277	41,464	- 43,490	0.237	1,750,913	- 1,900,121	0.197
14,715	- 14,962	0.276	43,491	- 45,725	0.236	1,900,122	- 2,077,130	0.196
14,963	- 15,218	0.275	45,726	- 48,203	0.235	2,077,131	- 2,290,506	0.195
15,219	- 15,483	0.274	48,204	- 50,965	0.234	2,290,507	- 2,552,739	0.194
15,484	- 15,757	0.273	50,966	- 54,062	0.233	2,552,740	- 2,882,780	0.193
15,758	- 16,041	0.272	54,063	- 57,560	0.232	2,882,781	- 3,310,835	0.192
16,042	- 16,336	0.271	57,561	- 61,543	0.231	3,310,836	- 3,888,179	0.191
16,337	- 16,641	0.270	61,544	- 66,117	0.230	3,888,180	- 4,709,404	0.190
16,642	- 16,958	0.269	66,118	- 71,426	0.229	4,709,405	- 5,970,423	0.189
16,959	- 17,288	0.268	71,427	- 77,662	0.228	5,970,424	- 8,153,709	0.188
17,289	- 17,631	0.267	77,663	- 85,090	0.227	8,153,710	- 12,854,325	0.187
17,632	- 17,987	0.266	85,091	- 94,091	0.226	12,854,326	- OVER	0.186

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)

0.673

Tax Multiplier

1.023

XII 000011

MASSACHUSETTS	RETROSPECTIVE RATING PLAN MANUAL
RR8	STATE SPECIAL RATING VALUES
<i>Proposed Effective July 1, 2020</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	10,101	0.305	19,664	20,471	0.280	230,478	248,154	0.255
10,102	10,310	0.304	20,472	21,347	0.279	248,155	268,767	0.254
10,311	10,528	0.303	21,348	22,302	0.278	268,768	293,115	0.253
10,529	10,755	0.302	22,303	23,347	0.277	293,116	322,314	0.252
10,756	10,992	0.301	23,348	24,494	0.276	322,315	357,973	0.251
10,993	11,240	0.300	24,495	25,760	0.275	357,974	402,505	0.250
11,241	11,499	0.299	25,761	27,163	0.274	402,506	459,690	0.249
11,500	11,771	0.298	27,164	28,728	0.273	459,691	535,815	0.248
11,772	12,055	0.297	28,729	30,485	0.272	535,816	642,157	0.247
12,056	12,354	0.296	30,486	32,471	0.271	642,158	801,162	0.246
12,355	12,668	0.295	32,472	34,733	0.270	801,163	1,064,822	0.245
12,669	12,998	0.294	34,734	37,334	0.269	1,064,823	1,587,149	0.244
12,999	13,346	0.293	37,335	40,356	0.268	1,587,150	1,881,130	0.243
13,347	13,714	0.292	40,357	43,911	0.267	1,881,131	2,072,812	0.242
13,715	14,101	0.291	43,912	48,152	0.266	2,072,813	2,307,991	0.241
14,102	14,512	0.290	48,153	53,300	0.265	2,307,992	2,603,365	0.240
14,513	14,947	0.289	53,301	59,681	0.264	2,603,366	2,985,439	0.239
14,948	15,409	0.288	59,682	67,797	0.263	2,985,440	3,498,949	0.238
15,410	15,900	0.287	67,798	78,468	0.262	3,498,950	4,225,810	0.237
15,901	16,424	0.286	78,469	93,125	0.261	4,225,811	5,333,846	0.236
16,425	16,984	0.285	93,126	114,517	0.260	5,333,847	7,229,460	0.235
16,985	17,583	0.284	114,518	148,666	0.259	7,229,461	11,215,306	0.234
17,584	18,226	0.283	148,667	201,737	0.258	11,215,307	OVER	0.233
18,227	18,917	0.282	201,738	215,152	0.257			
18,918	19,663	0.281	215,153	230,477	0.256			

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)

0.673

Tax Multiplier

1.023

XII 000012

Section XII - Retrospective Rating
 Subsection D - NCCI's Item R-1413
 7/1/2020

Section XII - D
 Exhibit 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	37,282
	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	A	30,223	= $(0.712)(27,361) + (0.288)(37,282)$
Weighted	B	37,223	
Severities	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	1.26	
	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.

XII 000013

Section XII - Retrospective Rating
 Subsection E - State Hazard Group Relativities
 7/1/2020

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	24,304	37,292	30,783
B	30,702	45,689	37,715
C	39,581	51,116	42,195
D	46,874	60,165	49,664
E	60,491	71,093	58,685
F	92,501	87,212	71,991
G	149,780	100,004	82,550
Overall	49,310	59,736	49,310

Step 2, Credibility:

(5) Massachusetts Claim Count =	45,279
(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	30,272
B	37,589
C	44,882
D	52,981
E	65,363
F	90,071
G	126,907

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	1.97	1.94	1.96	1.96
B	1.59	1.58	1.59	1.59
C	1.33	1.42	1.37	1.37
D	1.13	1.20	1.17	1.17
E	0.91	1.02	0.97	0.97
F	0.66	0.83	0.75	0.75
G	0.47	0.72	0.60	0.60

Notes:

- (2), (5): Lost Time Claim Data for Policy Years 2017 at 1st report, 2016 at 2nd report, 2015 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)] }

EXCESS LOSS FACTORS

This Section proposes new Excess Loss Factors (ELFs) to be effective July 1, 2020. 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 62.0%, 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 since the 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.

XII 000015

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, 2016 and 2018 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, $R(150,000)$) \times (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 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

XII 000016

Section XII – Retrospective Rating Plans
Subsection F – Excess Loss Factors
7/1/2020

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 67.3%, 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:

$$R(\$500,000) = \frac{\text{HG3 Losses Excess of } \$500,000}{\text{HG3 Losses Excess of } \$150,000} \times \frac{\text{HG3 Losses Excess of } \$150,000}{\text{Total HG3 Losses}}$$

XII 000018

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:

$$\begin{aligned} R(L) &= \frac{\int_L^{\infty} (x - L) f(x) dx}{\int_0^{\infty} x f(x) dx} \\ &= \frac{p \int_L^{\infty} (x - L) g(x) dx + (1-p) \int_L^{\infty} (x - L) h(x) dx}{pm_g + (1-p)m_h} \end{aligned}$$

XII 000019

$$= \frac{pm_g R_g(L) + (1-p)m_h R_h(L)}{pm_g + (1-p)m_h}$$

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.

XII 00022

Section XII - Retrospective Rating
Subsection F - Excess Loss Factors
7/1/2020

Section XII - F
Exhibit 1
Page 1

Excess Loss Factors Proposed to be Effective 07/01/2020

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.395	0.419	0.443	0.463	0.483	0.511	0.542
\$30,000	0.377	0.403	0.427	0.449	0.469	0.499	0.533
\$35,000	0.361	0.388	0.413	0.437	0.457	0.488	0.525
\$40,000	0.347	0.374	0.400	0.425	0.446	0.477	0.517
\$50,000	0.322	0.350	0.377	0.404	0.426	0.458	0.503
\$75,000	0.274	0.302	0.331	0.362	0.385	0.418	0.472
\$100,000	0.237	0.265	0.294	0.329	0.352	0.385	0.444
\$125,000	0.209	0.234	0.264	0.300	0.323	0.355	0.420
\$150,000	0.186	0.209	0.239	0.276	0.297	0.329	0.398
\$175,000	0.167	0.188	0.217	0.254	0.275	0.305	0.378
\$200,000	0.151	0.170	0.198	0.235	0.255	0.284	0.359
\$250,000	0.125	0.141	0.167	0.203	0.221	0.248	0.326
\$300,000	0.106	0.120	0.143	0.178	0.194	0.219	0.297
\$500,000	0.063	0.071	0.088	0.114	0.125	0.144	0.215
\$1,000,000	0.029	0.033	0.042	0.057	0.063	0.073	0.120
\$2,000,000	0.013	0.015	0.019	0.026	0.029	0.034	0.061
\$3,000,000	0.008	0.009	0.012	0.016	0.018	0.021	0.039
\$4,000,000	0.005	0.006	0.008	0.011	0.013	0.015	0.028
\$5,000,000	0.004	0.005	0.006	0.009	0.010	0.011	0.022

Notes:

Exhibit 3, page 1 times the Expected Loss Ratio without LAE of 62.0% from Section XII-A, Exhibit 3.

XII 000023

Section XII - Retrospective Rating
Subsection F - Excess Loss Factors
7/1/2020

Section XII - F
Exhibit 1
Page 2

Excess Loss and ALAE Factors Proposed to be Effective 07/01/2020

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.437	0.463	0.488	0.510	0.530	0.561	0.593
\$30,000	0.418	0.445	0.471	0.495	0.516	0.548	0.583
\$35,000	0.401	0.430	0.456	0.481	0.503	0.536	0.574
\$40,000	0.386	0.415	0.443	0.469	0.491	0.525	0.566
\$50,000	0.360	0.390	0.419	0.447	0.470	0.505	0.552
\$75,000	0.308	0.339	0.370	0.403	0.427	0.463	0.519
\$100,000	0.269	0.299	0.331	0.368	0.392	0.428	0.491
\$125,000	0.238	0.267	0.299	0.338	0.362	0.398	0.466
\$150,000	0.213	0.239	0.272	0.311	0.335	0.370	0.443
\$175,000	0.192	0.216	0.248	0.288	0.312	0.345	0.422
\$200,000	0.174	0.196	0.227	0.268	0.290	0.322	0.402
\$250,000	0.146	0.165	0.193	0.233	0.253	0.283	0.367
\$300,000	0.124	0.140	0.167	0.205	0.224	0.251	0.337
\$500,000	0.074	0.085	0.104	0.134	0.147	0.168	0.248
\$1,000,000	0.035	0.040	0.050	0.067	0.074	0.086	0.141
\$2,000,000	0.015	0.018	0.023	0.031	0.035	0.041	0.072
\$3,000,000	0.009	0.011	0.014	0.020	0.022	0.026	0.046
\$4,000,000	0.007	0.008	0.010	0.014	0.015	0.018	0.034
\$5,000,000	0.005	0.006	0.007	0.011	0.012	0.014	0.026

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.

XII 000024

XII 000025

Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2020

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	0.637	0.676	0.714	0.747	0.779	0.825	0.874
\$30,000	0.608	0.649	0.689	0.724	0.757	0.805	0.860
\$35,000	0.583	0.625	0.666	0.704	0.737	0.787	0.846
\$40,000	0.560	0.603	0.645	0.685	0.719	0.770	0.834
\$50,000	0.520	0.564	0.608	0.652	0.687	0.739	0.811
\$75,000	0.441	0.487	0.534	0.585	0.620	0.675	0.761
\$100,000	0.383	0.427	0.475	0.530	0.567	0.620	0.717
\$125,000	0.337	0.378	0.426	0.484	0.521	0.573	0.678
\$150,000	0.300	0.337	0.385	0.444	0.480	0.531	0.642
\$175,000	0.269	0.303	0.350	0.410	0.443	0.492	0.609
\$200,000	0.243	0.274	0.319	0.379	0.411	0.458	0.579
\$250,000	0.202	0.228	0.270	0.328	0.356	0.400	0.526
\$300,000	0.170	0.193	0.231	0.286	0.312	0.353	0.479
\$500,000	0.101	0.115	0.142	0.184	0.202	0.232	0.347
\$1,000,000	0.047	0.054	0.068	0.091	0.101	0.118	0.194
\$2,000,000	0.021	0.024	0.031	0.042	0.047	0.055	0.098
\$3,000,000	0.013	0.014	0.019	0.026	0.029	0.035	0.063
\$4,000,000	0.009	0.010	0.013	0.019	0.021	0.024	0.045
\$5,000,000	0.007	0.008	0.010	0.014	0.016	0.019	0.035

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	0.111	0.897	0.109	0.899	0.098	0.908	0.083	0.922	0.081	0.924	0.076	0.928	0.053	0.949
\$200,000	0.222	0.810	0.218	0.813	0.197	0.829	0.166	0.853	0.161	0.856	0.152	0.863	0.105	0.902
\$250,000	0.444	0.672	0.436	0.676	0.394	0.700	0.331	0.737	0.322	0.742	0.305	0.754	0.210	0.819
\$300,000	0.666	0.568	0.654	0.573	0.591	0.600	0.497	0.645	0.484	0.651	0.457	0.665	0.315	0.747
\$500,000	1.554	0.337	1.526	0.342	1.378	0.368	1.158	0.415	1.129	0.422	1.066	0.438	0.736	0.541
\$1,000,000	3.774	0.157	3.706	0.159	3.346	0.176	2.813	0.206	2.741	0.211	2.589	0.222	1.786	0.303
\$2,000,000	8.215	0.069	8.066	0.071	7.283	0.079	6.123	0.096	5.965	0.098	5.634	0.105	3.888	0.152
\$3,000,000	12.655	0.042	12.426	0.043	11.219	0.048	9.433	0.059	9.190	0.061	8.680	0.065	5.990	0.098
\$4,000,000	17.096	0.029	16.786	0.030	15.156	0.034	12.743	0.042	12.414	0.043	11.725	0.046	8.091	0.071
\$5,000,000	21.536	0.022	21.146	0.023	19.093	0.026	16.052	0.032	15.639	0.033	14.771	0.035	10.193	0.054

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 \$165,517 for HGA, \$168,570 for HGB, \$186,703 for HGC, \$222,061 for HGD, \$227,939 for HGE, \$241,326 for HGF and \$349,728 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).

XII 000026

XII 000027

Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2020

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	0.637	0.676	0.714	0.747	0.779	0.825	0.874
\$30,000	0.608	0.649	0.689	0.724	0.757	0.805	0.860
\$35,000	0.583	0.625	0.666	0.704	0.737	0.787	0.846
\$40,000	0.560	0.603	0.645	0.685	0.719	0.770	0.834
\$50,000	0.520	0.564	0.608	0.652	0.687	0.739	0.811
\$75,000	0.441	0.487	0.534	0.585	0.620	0.675	0.761
\$100,000	0.383	0.427	0.475	0.530	0.567	0.620	0.717
\$125,000	0.337	0.378	0.426	0.484	0.521	0.573	0.678
\$150,000	0.300	0.337	0.385	0.444	0.480	0.531	0.642
\$175,000	0.270	0.304	0.350	0.410	0.443	0.492	0.610
\$200,000	0.244	0.275	0.320	0.380	0.410	0.457	0.580
\$250,000	0.202	0.230	0.272	0.330	0.355	0.397	0.528
\$300,000	0.171	0.197	0.235	0.292	0.309	0.347	0.485
\$500,000	0.103	0.119	0.148	0.197	0.194	0.217	0.362
\$1,000,000	0.048	0.050	0.079	0.124	0.094	0.105	0.232
\$2,000,000	0.017	0.021	0.044	0.088	0.043	0.049	0.130
\$3,000,000	0.006	0.015	0.033	0.077	0.028	0.029	0.081
\$4,000,000	0.002	0.013	0.028	0.073	0.023	0.020	0.055
\$5,000,000	0.000	0.012	0.024	0.069	0.020	0.014	0.037

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.

XII 000028

Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2020

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.

XII 000029

Section XII - Retrospective Rating
Subsection F - Excess Loss Factors
7/1/2020

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	25,927	10,208	801	
(2) PY 2017 Average Severity	30,789	11,890	949	
(3) Annual Severity Trend - From PY 2017 to Prospective Effective Period	2.6%	2.3%	2.3%	
(4) Trend Factor from PY 9/1/2008 to Prospective Effective Period = [(2) / (1)] x [1.000 + (3)] ^ 3.5	1.298	1.259	1.282	
(5) Injury Type Weight at Ultimate	65.86%	30.00%	4.14%	
(6) Total Severity Trend Factor from PY 9/1/2008 to Prospective Effective Period = (4) Weighted by (5)				1.286
(7) Total Benefit Level Change Factor from PY 9/1/2008 to Prospective Effective Period				1.058
(8) Combined Trend and Benefit Factor from PY 9/1/2008 to Prospective Effective Period = (6) x (7)				1.361

Notes:

(1),(2) : From Section V-A, Exhibit 2, Pages 1, 3, and 5. PY9/1/2008 is a weighted average of PY2008 and PY2009. = (1/3) x PY2008 + (2/3) x PY2009

(3): From Section V-A, Exhibit 1.

(5): From Section IV-E, Exhibit 2, Pages 1 and 2.

(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, Massachusetts Financial Data Reporting Application (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 from the reporting entity.

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

XIII 000002

diagnostic reports to larger writers of workers' compensation in Massachusetts. Carriers 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.

XIII 000003

In preparation for this rate filing, WCRIBMA actuarial staff assessed the available data to determine what it deemed suitable for ratemaking. For example, if a carrier has anomalous data or negative expenses due to accounting or other allocation processes, there will be a consideration of that data's suitability for ratemaking for the Industry as a whole. As a consequence, the 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.

As has been done since the 2003 filing, this filing excludes Aggregate Financial losses associated with the catastrophic events of September 11, 2001. Additionally, in this filing, loss data from Travelers Group for a single large loss with a Calendar Year change in excess of \$10 million, has been excluded from the Aggregate Financial Data. Had the WCRIBMA not excluded this one claim of the Travelers Group from Aggregate Financial Data, the rate indication would have been slightly lower.

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

XIII 000004

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.

Aggregate Financial data from Travelers Group was excluded from the estimation of expenses. Adjusting and other expenses reported by Travelers are considered outliers. For calendar year 2018, Travelers Group reported negative values for adjusting and other expenses on their Massachusetts Calendar Year Expense Data Call, Call #6 (Expense Call). Had the WCRIBMA not excluded the data of the Travelers Group from expenses, the rate indication would have been lower.

Aggregate Financial data reported by AIG was not used in the expense section of this filing. For calendar year 2017, AIG reported negative adjusting and other expenses on their Expense Call. Had the WCRIBMA not excluded the data of AIG Group from expenses, the rate indication would have been slightly lower.

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.

Aggregate Financial data from Zurich Insurance Group was not used in the expense section of this filing. For calendar years 2016, 2017, and 2018, Zurich Group reported negative values for general expenses on their Expense Call. Had the WCRIBMA

XIII 000005

not excluded the data of Zurich Insurance Group from expenses, the rate indication would have been lower.

Aggregate Financial data from Atlantic Charter Insurance Group was not used in the expense section of this filing. For calendar year 2018, Atlantic Charter Insurance Group's reported adjusting and other expenses were an outlier compared to the balance of the industry. Had the WCRIBMA not excluded the data of Atlantic Charter Insurance Group from expenses, the rate indication would have been higher.