



**THE WORKERS' COMPENSATION
RATING AND INSPECTION BUREAU OF MASSACHUSETTS**
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November 5, 1990

CIRCULAR LETTER NO. 1549

To All Members and Subscribers of the Bureau:

**ITEM E-1235 -- REVISED EXPERIENCE RATING PLAN
EFFECTIVE JANUARY 1, 1991**

The Division of Insurance has approved a Revised Experience Rating Plan which will increase equity among employers whose premium is subject to experience rating, to become effective 12:01 A.M., January 1, 1991 on new and renewal business only, subject to the transition program contained in the filing. This will be accomplished by updating parameter values used in the plan, so that the resulting modification will more accurately reflect the hazard inherent in each employer's operation.

There will be no change in premium level associated with the adoption of this revised plan.

In order to lessen the initial impact on individual insureds a transition program will be put into effect.

The new Table of W and B Values EXHIBIT III-A and V-A (which determine the experience rating credibilities) will be an average of the current values and those indicated by Revised Experience Rating. This Table of W and B Values will remain in effect for one year, at which time the Table of W and B Values indicated by Revised Experience Rating will be put in place.

The impacts on individual insureds solely due to changing Experience Rating Plans will be cut approximately in half.

The attached EXHIBITS display the experience rating parameters under the current plan and the revised plan. EXHIBIT I-A is a Table of W and B Values calculated using the current method. EXHIBIT II-A is the Table of W Values indicated by the Revised Experience Rating Plan. EXHIBIT III-A is the Table of Transitional W Values, the result of averaging the current and revised figures. EXHIBIT IV-A displays the B Values resulting from the Revised Experience Rating calculations. EXHIBIT V-A is the Table of Transitional B Values, once again the result of averaging the current and revised values. Applicable Expected Loss Rates and Discount Ratios by class for the Revised Experience Rating Plan are contained in the January 1, 1991 rate revision filing and will be released upon approval by the Division of Insurance.

NOVEMBER 5, 1990

The W and B Values in EXHIBITS II-A and IV-A were calculated using a value of $g = 7$. This parameter g is the Massachusetts Average Cost Per Case of \$7,000 calculated in EXHIBIT VI-A, divided by \$1,000.

This value of g produces a State Reference Point of \$1,750,000. ($\$1,750,000 = \$250,000 g$)

This in turn produces a new State Per Claim Accident Limitation of \$175,000. (State Per Claim Accident Limitation = State Reference Point \div 10) The new State Multiple Claim Accident Limitation is set at \$350,000.

The National Council on Compensation Insurance will distribute manual pages reflecting the changes required in the Experience Rating Plan.

NORMAN R. FONTAINE
Vice President

Attachments

FILING MEMORANDUM

Item E-1235 -- Revised Experience Rating Plan

To become effective 12:01 A.M., JANUARY 1, 1991 on new and renewal business only, subject to transition program.

PURPOSE:

The purpose of this item is to increase equity among employers whose premium is subject to experience rating. This will be accomplished by updating parameter values used in the plan, so that the resulting modification will more accurately reflect the hazard inherent in each employer's operation.

There will be no expected change in premium level by state associated with the adoption of this filing.

BACKGROUND:

The formula modification within the current experience rating plan is the means by which the manual premium is tailored to more accurately predict the loss experience of an eligible individual employer. Past loss experience is given a credibility increasing with employer size as measured by expected losses. This credibility relation is inherent in the modification formula itself and its associated parameters B and W which vary by state as well as size of the insured.

In the past, proper credibility by size had to be determined using largely subjective criteria. Such elements as responsiveness of the modification to past loss experience and the impact of a single large claim on the modification of a small employer were used to develop formulas for the B and W values of the current plan. There was less attention to the impact of these values on other size groups.

Formula relations for plan parameters B and W, as well as the primary/excess split of individual actual losses used in the NCCI Experience Rating Plan, were last updated in 1977. Since that time, advances in credibility theory and data processing have made possible determination of these values using objective statistical criteria. The formula relations of the proposed changes to the experience rating plan are a direct result of applying recent advances in least squares Bayesian credibility theory to the issue of equity among employers. These have been reviewed by the NCCI Actuarial Committee and its Individual Risk Rating Plans Subcommittee, as well as the Rates and Underwriting Committees.

The proposal is based on sound theory, but has been developed through extensive empirical testing, also reviewed by the committees. Actuaries at the National Council on Compensation Insurance designed a test to measure the predictive power and performance of the experience rating plan. The test compares prospective experience modifications with the subsequent

experience from the policy period to which these experience modifications were applicable. For this purpose, we assembled data from the Experience Rating files for eligible insureds in 15 states. We started by recalculating individual modifications originally effective in 1981 based on the plan to be tested, using the 1977, 1978 and 1979 experience found in the 1981 Rating Year files. The emerged or subsequent actual loss experience for 1981 is then divided by the manual expected losses for 1981, first without using the modification, then again after application of the modification to the expected losses. These ratios are used in lieu of loss ratios to premium which is not available in the experience rating files. The 1981 expected and actual losses at first report were extracted from the data used for experience rating 1983 policies.

This test of the plans starts by grouping risks into five size categories with the intention that the responsiveness of the plan be optimized across the categories. Within each category, insureds are divided into strata so risks with the 20th percentile best experience modifications are in the first quality group, the next 20% in the second quality group and so on to the insureds with the highest 20% of experience modifications. The test statistic measures the ability of the mod to predict the subsequent experience, that is, the experience of the period for which the mod will be effective. A lower statistic shows that the plan is able to assign an equitable premium rate to more employers, making them equally desirable as insureds. More detail is found below.

Early testing revealed that the current experience modification does not predict which employers will have good or bad experience as compared to the average, and for a large group of employers, makes accurate adjustments for these differences. A plan which would increase the size of that group was desired. The testing centered on the design of an ideal modification formula. It would be undesirable and unnecessary to superimpose an adjustment formula on the existing plan; the desire was to build a complete plan.

Significant improvements in the current plan were found to be possible. Starting with values derived using theoretical considerations, iterative evaluations resulted in parameters which performed best. It was found that for small risks the modification could be more responsive. Currently, small risks with good experience are receiving somewhat less credit than deserve and small risks with poor experience are not debited enough. For the very large risks, on the other hand, the current modification is overly responsive to past loss history, giving credits or debits that are too large. Both of these shortcomings can be corrected, as reflected in the test statistic, by adoption of the proposed changes. Specifications for this more effective modification are found in the Proposal.

Results of the test comparing the proposed plan with the current can be seen in Exhibit 1. Column 2 contains the 1981 or subsequent experience of each stratum in the form of an aggregate ratio: 1981 actual losses divided by the 1981 manual expected losses. Column 4 is the ratio by stratum of total 1981 actual losses divided by the expected losses times the modification to be tested. These are two ways of looking at the predicted experience. Based on manual expected losses, the quality strata have very different subsequent results which track well with the average modification

indicating that experience rating does identify risks likely to have better than average or worse than average experience. If expected losses are adjusted by the experience modification the ratios of the strata converge substantially, showing that the modification largely corrects for the differences so identified. The test statistic represents the portion of original variation remaining after experience rating, so that lower statistics indicate superior performance.

PROPOSAL:

The formula for the modification is

$$M = \frac{Ad + WAe + (1-W)Ee + B}{E + B}$$

-where

- A = actual losses
- E = expected losses
- p = primary losses
- e = excess losses
- B and W are plan parameters

Under the proposed plan, experience rating will be applied much as it is currently. The largest noticeable differences are in the tables of B and p by risk size and the determination of the primary and excess portion of each loss. The Discount ratios by class will, of course, reflect the new split formula.

The current formulas for plan parameters are:

$$W = \begin{cases} 0 & \text{for } E < 25,000 \\ \frac{E - 25,000}{SRP - 25,000} & \text{for } 25,000 \leq E < SRP \\ 1 & \text{for } E \geq SRP \end{cases}$$

$$B = 20,000 (1-W)$$

where E = Expected losses of the risk and SRP = Self Rating Point by state. This is currently calculated as 25 times the average serious cost per case by state. Values of W and B are made available in tabular form.

The new plan uses the same modification formula, but with different formulas for its parameters:

$$B = E[.10 + 2,500g/(E + 700g)] \\ \text{subject to a minimum of 7,500.}$$

and the intermediate value

$$C = E[.75 + 200,000g/(E + 5,100g)] \\ \text{subject to a minimum 150,000.}$$

where $g = SRP/250,000$ and SRP = State Reference Point, calculated as 25 times the average cost per case by state.

Now

$$W = \frac{E + B}{E + C}$$

For each value of g we further require that the value of W not increase as E , the expected losses of an insured employer, decreases.

The above formulas are valid for all rated risks, with appropriate rounding for tabular presentation.

In particular, it will be noted that in all cases, $W < 1$ and $B > 0$. This means no risk's rate will be completely determined by its own experience. The SRP will be retained for use in calculating limitations on ratable individual losses and g , the scale factor, by state. It will not be a "self rating point" as no risk will have 100% credibility. It will now be called the State Reference Point. As a result of the above formulas, loss limitations will generally be lower than the current ones.

There will be a change to the primary/excess split formula and corresponding Discount-ratios by class. Currently, individual losses under \$2,000 are 100% primary. For losses over \$2,000, the primary amount is calculated as

$$L_p = \frac{10,000 \times L}{8,000 + L}$$

Actual excess losses are now calculated for individual losses L as $L_r - L_p$, where L_r is the total loss limited to 10% of the SRP and L_p is the primary portion as calculated above.

In the new plan, L_p is the first \$5,000 of every loss, which means the total loss for losses smaller than \$5,000. Excess losses, if any, are calculated as $L_r - 5,000$, where, as above, L_r is the loss limited by 10% of the new SRP.

Because of the responsiveness of the new modification formula, it was found necessary to establish maximum values for modifications of insureds in the small size categories. These smaller insureds can earn considerably more credit than previously for loss free experience, but there is a limit at the downside. It is only right that there be a limit to the debit. The following listing shows the applicable limit by size.

<u>Expected Losses</u>	<u>Modification Losses</u>
0 to 5,000	1.6
5,000 to 10,000	1.8
10,000 to 15,000	2.0

IMPACT:

The proposal is not expected or intended to produce a change in premium level, but rather a more equitable distribution of premium among employers. The testing shows that the new formula does not make a significant change in the average modification of any large, random group. In spite of this, the greatest care will be taken to assure no change in the state average modification. There will of course be changes in the modifications of individual employers.

The non-experience-rated employer is not affected by the changes to the plan. For all other employers the proposed changes increase the plan's accuracy in predicting subsequent experience by being appropriately responsive to the three-year experience period loss history. The proposed plan provides greater credits to most insureds with good experience and greater debits for most insureds whose experience is poor. Credits and debits may contract slightly for the largest risks, however.

Distributions of the changes in modifications found in Exhibit 3 are based on the 1986 rating year results for intrastate risks. It can be seen that for all but the largest size group, credits and debits are both increased in magnitude. This increase in responsiveness, while resulting from equity considerations, will in practice serve to increase the incentive for employers to enhance safety in the workplace. It will increase carriers' confidence in the Standard Premium, so that competition may stress service, such as loss control, rather than underwriting selection.

Exhibit 4 shows sample ratings. These are taken from the 1986 rating year and calculated with parameters and rating values appropriate for that time. The samples show the kinds of changes possible, including some extreme cases. There may be small discrepancies in the detailed calculations due to roundoff.

IMPLEMENTATION:

Rules for development of the experience modification are similar to those now in effect. The steps follow below:

Intrastate

1. Expected losses and expected excess losses are calculated as in the current system using the filed rating values, the Expected Loss Ratios (ELR's) and the Discount Ratios (D-ratios). These will reflect the new limitation on ratable losses and the new primary/excess split formula.
2. Actual Primary and Excess loss amounts are calculated using the applicable primary/excess split formula on individual losses.
3. W and B are taken from tables prepared according to the formulas as described above.
4. The values determined in the previous steps are entered in the experience rating formula to obtain the modification.

Interstate

1. Proceed with steps 1 and 2 as in the intrastate case, noting that primary/excess split of any loss will depend on the split formula in effect in the state of occurrence.
2. Using the risk's total expected losses and the tables of W and B, the appropriate W_i and B_i are found for each state i in which the risk has non-zero expected losses. These values are then weighted by the expected losses in each state to obtain the risk W and B values.

$$W = \frac{\sum W_i \times \text{Expected Losses}_i}{\text{Risk Total Expected Losses}}$$

$$B = \frac{\sum B_i \times \text{Expected Losses}_i}{\text{Risk Total Expected Losses}}$$

3. Substitute the weighted average values of W and B above, along with the actual primary and excess losses into the experience rating formula to determine the modification.

In order to implement this proposal, Exhibit 2 outlines the changes which will be required in the Experience Rating Plan Manual.

Exhibit 5 shows the plan parameters and rating values for the state manual page.

TEST OF RATING PLAN

1981 Rating Year - Multiple State Files

Insureds With Expected Losses \$2,500 - 5,000

Predicted Quality	Subsequent Experience				
	(1)	(2)	(3)	(4)	(5)
Quintile Stratum Determined by Prior Mod	Actual Subsequent Losses Divided by Manual Expected	Squared Deviation from Mean of (2) $((2)-(\bar{2}))^2 \times 10,000$	Actual Subsequent Losses Divided by Modified Expected	Squared Deviation from Mean of (4) $((4)-(\bar{4}))^2 \times 10,000$	

CURRENT PLAN

1	0.86	563	0.94	258
2	0.84	648	0.90	389
3	1.08	2	1.14	18
4	1.13	15	1.15	30
5	1.55	2116	1.29	391
Mean Total	1.09	3344	1.10	1086

$$\text{Test Statistic } (\bar{5}) + (\bar{3}) = 0.326$$

PROPOSED PLAN

1	0.80	848	0.92	327
2	0.92	313	1.02	65
3	1.01	60	1.10	0
4	1.14	19	1.13	10
5	1.58	2393	1.26	252
Mean Total	1.09	3633	1.10	654

$$\text{Test Statistic } (\bar{5}) + (\bar{3}) = 0.180$$

The test statistic measures how much of the individual risk variation identified by the plan remains after the experience modification is applied. The lower the statistic the better the plan.

Notes by column:

(1) Individual insureds are stratified according to the value of the particular modification formula tested. Group 1 includes the insureds with the best 20% of the modifications, Group 2 the next 20% and so on.

(3),(5) These entries are calculated using the unrounded values underlying entries in columns (2) and (4) respectively.

TEST OF RATING PLAN

1981 Rating Year - Multiple State Files

Insureds With Expected Losses \$5,000 - 10,000

Predicted Quality	Subsequent Experience				
	(1)	(2)	(3)	(4)	(5)
Quintile Stratum Determined by Prior Mod	Actual Subsequent Losses Divided by Manual Expected	Squared Deviation from Mean of (2) $((2)-(\bar{2}))^2 \times 10,000$	Actual Subsequent Losses Divided by Modified Expected	Squared Deviation from Mean of (4) $((4)-(\bar{4}))^2 \times 10,000$	

CURRENT PLAN

1	0.73	886	0.85	344
2	0.80	502	0.90	176
3	0.97	32	1.05	2
4	1.16	171	1.14	112
5	1.45	1773	1.15	139
Mean Total	1.03	3364	1.03	773

$$\text{Test Statistic } (\bar{5}) + (\bar{3}) = 0.230$$

PROPOSED PLAN

1	0.70	1057	0.86	291
2	0.85	312	0.99	18
3	0.95	61	1.03	0
4	1.12	91	1.08	24
5	1.48	2038	1.13	88
Mean Total	1.03	3559	1.03	421

$$\text{Test Statistic } (\bar{5}) + (\bar{3}) = 0.118$$

The test statistic measures how much of the individual risk variation identified by the plan remains after the experience modification is applied. The lower the statistic the better the plan.

Notes by column:

- (1) Individual insureds are stratified according to the value of the particular modification formula tested. Group 1 includes the insureds with the best 20% of the modifications, Group 2 the next 20% and so on.
- (3),(5) These entries are calculated using the unrounded values underlying entries in columns (2) and (4) respectively.

TEST OF RATING PLAN

1981 Rating Year - Multiple State Files

Insureds With Expected Losses \$ 10,000 - 25,000

Predicted Quality	Subsequent Experience				
	(1)	(2)	(3)	(4)	(5)
Quintile Stratum Determined by Prior Mod	Actual Subsequent Losses Divided by Manual Expected	Squared Deviation from Mean of (2) $((2) - (\bar{2}))^2 \times 10,000$	Actual Subsequent Losses Divided by Modified Expected	Squared Deviation from Mean of (4) $((4) - (\bar{4}))^2 \times 10,000$	

CURRENT PLAN

1	0.72	1135	0.91	229
2	0.96	96	1.11	31
3	1.06	0	1.12	40
4	1.15	82	1.09	11
5	1.40	1127	1.05	1
Mean Total	1.06	2440	1.06	312

$$\text{Test Statistic } (\bar{5}) + (\bar{3}) = 0.128$$

PROPOSED PLAN

1	0.72	1173	0.95	121
2	0.91	236	1.07	2
3	1.05	1	1.12	36
4	1.15	76	1.08	4
5	1.45	1500	1.05	0
Mean Total	1.06	2986	1.06	163

$$\text{Test Statistic } (\bar{5}) + (\bar{3}) = 0.055$$

The test statistic measures how much of the individual risk variation identified by the plan remains after the experience modification is applied. The lower the statistic the better the plan.

Notes by column:

(1) Individual insureds are stratified according to the value of the particular modification formula tested. Group 1 includes the insureds with the best 20% of the modifications, Group 2 the next 20% and so on.

(3),(5) These entries are calculated using the unrounded values underlying entries in columns (2) and (4) respectively.

TEST OF RATING PLAN

1981 Rating Year - Multiple State Files

Insureds With Expected Losses \$ 25,000 - 100,000

Predicted Quality	Subsequent Experience				
	(1)	(2)	(3)	(4)	(5)
Quintile Stratum Determined by Prior Mod	Actual Subsequent Losses Divided by Manual Expected	Squared Deviation from Mean of (2) $((2) - (\bar{2}))^2 \times 10,000$	Actual Subsequent Losses Divided by Modified Expected	Squared Deviation from Mean of (4) $((4) - (\bar{4}))^2 \times 10,000$	
<u>CURRENT PLAN</u>					
1	0.73	1213	1.00	37	
2	0.90	338	1.05	1	
3	0.97	112	1.01	22	
4	1.27	355	1.16	102	
5	1.48	1626	1.05	1	
Mean Total	1.08	3644	1.06	163	

$$\text{Test Statistic } (\bar{5}) + (\bar{3}) = 0.045$$

PROPOSED PLAN

1	0.73	1226	1.01	28
2	0.87	437	1.03	13
3	0.99	76	1.04	8
4	1.30	496	1.20	169
5	1.46	1423	1.03	11
Mean Total	1.08	3658	1.07	229

$$\text{Test Statistic } (\bar{5}) + (\bar{3}) = 0.063$$

The test statistic measures how much of the individual risk variation identified by the plan remains after the experience modification is applied. The lower the statistic the better the plan.

Notes by column:

- (1) Individual insureds are stratified according to the value of the particular modification formula tested. Group 1 includes the insureds with the best 20% of the modifications, Group 2 the next 20% and so on.
- (3),(5) These entries are calculated using the unrounded values underlying entries in columns (2) and (4) respectively.

TEST OF RATING PLAN

1981 Rating Year - Multiple State Files

Insureds With Expected Losses Over \$100,000

Predicted Quality	Subsequent Experience				
	(1)	(2)	(3)	(4)	(5)
Quintile Stratum Determined by Prior Mod	Actual Subsequent Losses Divided by Manual Expected	Squared Deviation from Mean of (2) $((2) - (\bar{2}))^2 \times 10,000$	Actual Subsequent Losses Divided by Modified Expected	Squared Deviation from Mean of (4) $((4) - (\bar{4}))^2 \times 10,000$	

CURRENT PLAN

1	0.84	197	1.30	962
2	0.85	167	1.01	3
3	0.91	50	0.94	21
4	1.05	51	0.95	14
5	1.25	740	0.88	123
Mean Total	0.98	1205	0.99	1123

Test Statistic $(\bar{5}) + (\bar{3}) = 0.932$ PROPOSED PLAN

1	0.77	431	1.10	105
2	0.89	76	1.06	49
3	0.91	52	0.95	17
4	1.08	103	1.00	0
5	1.25	717	0.93	48
Mean Total	0.98	1379	0.99	219

Test Statistic $(\bar{5}) + (\bar{3}) = 0.159$

The test statistic measures how much of the individual risk variation identified by the plan remains after the experience modification is applied. The lower the statistic the better the plan.

Notes by column:

(1) Individual insureds are stratified according to the value of the particular modification formula tested. Group 1 includes the insureds with the best 20% of the modifications, Group 2 the next 20% and so on.

(3), (5) These entries are calculated using the unrounded values underlying entries in columns (2) and (4) respectively.

EXPERIENCE RATING PLAN MANUAL

PRESENT PHRASEOLOGY:

Part Two - Operation of the Plan
 A. Experience Modification Formulas

The experience modification factor is determined from the following formula:

1. For the purpose of calculating the expected losses of \$25,000 of the weighting value is 1. The expected loss is determined by the following formula:

$$\frac{\text{Actual Primary Losses} + \text{Ballast Value} + \text{Expected Primary Losses}}{\text{Expected Primary Losses} + \text{Ballast Value}} \div \frac{\text{Total of Expected Losses}}{\text{Total of Expected Losses}} = \frac{\text{Total A}}{\text{Total B}}$$

For experience modification, divide Total A by Total B; round to two decimal places.

2. For risks pertaining to the expected loss of \$25,000 of the experience modification is determined by the following formula:

Actual	Weighting Value	(1 Minus Weighting Value)	
Primary + Ballast +	Times	+	Times
Losses Value	Actual Excess Losses	Expected Excess Losses	Total A
Expected Ballast	Weighting Value	(1 Minus Weighting Value)	Total B
Primary + Value +	Times	+	Times
Losses	Expected Excess Losses	Expected Excess Losses	

For experience modification, divide Total A by Total B; round to two decimal places.

PROPOSED PHRASEOLOGY:

Part Two - Operation of the Plan
 A. Experience Modification Formula

The experience modification for all risks is determined from the following formula.

Actual	Weighting Value	(1 Minus Weighting Value)	
Primary + Ballast +	Times	+	Times
Losses Value	Actual Excess Losses	Expected Excess Losses	Total A
Expected Ballast	Weighting Value	(1 Minus Weighting Value)	Total B
Primary + Value +	Times	+	Times
Losses	Expected Excess Losses	Expected Excess Losses	

For experience modification, divide Total A by Total B; round to two decimal places.

EXHIBIT C. 2.2

EXPERIENCE RATING PLAN MANUAL

PRESENT PHRASEOLOGY:

PROPOSED PHRASEOLOGY:

Part Two - Operation of the Plan
B. Explanation of Terms

Part Two - Operation of the Plan
B. Explanation of Terms

6. Actual Primary Losses

6. Actual Primary Losses

Actual/Primary/Losses/reflect/claim
frequency/and/are/given/full/weight
when/comparing/the/experience/of/the
risk/to/the/of/the/classification.
The/maximum/primary/value/for/each
loss/is/\$10,000.

Actual Primary Losses reflect cl
frequency. The maximum primary va
for each loss is \$5,000.

For/each/loss/equal/to/or/less/than
\$2,000/the/entire/amount/is/used/as
the/primary/value//For/each/loss/gret
\$2,000/the/primary/value/is/obtained
by/using/the/following/formula:

For each loss equal to or less th
\$5,000, the entire amount is used
the primary value. For each loss o
\$5,000 the primary value is \$5,00

$$\text{Primary/Value} = \frac{\text{Actual/Loss} \times 10,000}{\text{Actual/Loss} + 8,000}$$

8. Weighting Value

8. Weighting Value

This value is a ratio that determines
the percentage of excess losses to
enter the experience rating calcu-
lation. It is applied to both actual
excess losses and expected excess
losses.

Same

The/Weighting/Value/is/0/for/risk
with/expected/losses/of/\$25,000/and
less//It/increases/to/a/maximum/of
1/00/as/expected/losses/increase/
These values may be obtained from
the Tables of Weighting and Ballast
Values in this Plan.

The Weighting Value is a value be
.07 and .63 which increases as ex
ed losses increase. These value
may be obtained from the Table
of Weighting and Ballast Valu
this Plan.

9. Ballast Value

9. Ballast Value

This value is a stabilizing element
designed to limit the effect of any
single loss on the experience modi-
fication. It is added to both the
actual primary losses and expected
primary losses.

Same

EXHIBIT C. 2
EXPERIENCE RATING PLAN MANUAL

PRESENT PHRASEOLOGY:

8. Ballast Value (Cont'd)

~~The Ballast Value is 20,000 for risks with expected losses of \$25,000 and less // If decreased to 0 as expected losses increase. These values may be obtained from the Tables of Weighting and Ballast Values.~~

D. Payrolls and Losses

2. Limitation on Total Losses Employed in a Rating

a. An Accident Involving One Person

An accident involving an injury to one person shall be limited to the accident limitation in the Tables of Weighting and Ballast Values. The actual primary loss for such an accident is subject to the maximum primary value of ~~\$10,000~~.

b. Accidents Involving Two or More Persons

Accidents involving injuries to two or more persons shall be limited to the multiple claim accident limitation in the Tables of Weighting and Ballast Values, which is twice the normal accident limitation. The actual primary loss for such accidents is limited to ~~\$20,000~~—twice the normal maximum primary value.

c. Disease Losses

Disease losses for each policy year shall be limited to triple the accident limitation shown in the Tables of Weighting and Ballast Values, plus 120% of the risk's total expected losses for the experience period. For each policy year, the actual primary loss for disease losses is limited to ~~\$20,000~~—twice the normal maximum primary value, plus 40% of the risk's total expected primary losses for the experience period.

PROPOSED PHRASEOLOGY:

9. Ballast Value (Cont'd)

The Ballast Value increases as expected losses increase. These values may be obtained from the Tables of Weighting and Ballast Values in this Plan.

D. Payrolls and Losses

3. Limitation on Total Losses Employed in a Rating

a. An Accident Involving One Person

An accident involving an injury to one person shall be limited to the accident limitation in the Tables of Weighting and Ballast Values. The actual primary loss for such an accident is subject to the maximum primary value of \$5,000.

b. Accidents Involving Two or More Persons

Accidents involving injuries to two or more persons shall be limited to the multiple claim accident limitation in the Tables of Weighting and Ballast Values, which is twice the normal accident limitation. The actual primary loss for such accidents is limited to \$10,000—twice the normal maximum primary value.

c. Disease Losses

Disease losses for each policy year shall be limited to triple the accident limitation shown in the Tables of Weighting and Ballast Values, plus 120% of the risk's total expected losses for the experience period. For each policy year, the actual primary loss for disease losses is limited to \$10,000—twice the normal maximum primary value plus 40% of the risk's total expected primary losses for the experience period.

**DISTRIBUTIONS OF MODIFICATIONS
FOR GROUPS DETERMINED BY RANGE OF CURRENT MODIFICATION
ALL SIZE GROUPS COMBINED**

Range of Current Mod	No. of Insureds	Average Current Mod	Average Revised Mod	Change
-----	-----	-----	-----	-----
BELOW 0.50	69	0.36	0.57	0.22
0.50 - 0.59	91	0.55	0.67	0.12
0.60 - 0.69	531	0.66	0.67	0.01
0.70 - 0.79	4,847	0.76	0.73	-0.03
0.80 - 0.84	9,816	0.83	0.78	-0.05
0.85 - 0.89	26,086	0.87	0.82	-0.05
0.90 - 0.94	54,495	0.92	0.88	-0.04
0.95 - 0.99	34,125	0.97	0.95	-0.02
1.00	3,928	1.00	1.00	0.00
1.01 - 1.05	16,467	1.03	1.03	0.00
1.06 - 1.10	13,219	1.08	1.10	0.02
1.11 - 1.15	10,938	1.13	1.15	0.02
1.16 - 1.20	9,037	1.18	1.21	0.03
1.21 - 1.30	12,854	1.25	1.30	0.05
1.31 - 1.40	7,159	1.35	1.41	0.06
1.41 - 1.50	3,979	1.45	1.51	0.06
1.51 - 1.60	2,398	1.55	1.62	0.07
1.61 - 1.70	1,365	1.65	1.71	0.06
1.71 - 1.80	799	1.75	1.83	0.08
1.81 - 1.90	508	1.85	1.83	-0.02
1.91 - 2.00	348	1.95	1.84	-0.11
OVER 2.00	636	2.35	2.29	-0.06
TOTALS	213,695	1.02	1.02	0.00

**CHANGES IN MODIFICATIONS
FOR GROUPS DETERMINED BY RANGE OF CURRENT MODIFICATION
EXPECTED LOSS SIZE : 2,500 - 5,000**

Range of Current Mod	No. of Insureds	Average Current Mod	Average Revised Mod	Change
0.80 - 0.84	18	0.83	0.79	-0.04
0.85 - 0.89	620	0.88	0.84	-0.04
0.90 - 0.94	10,951	0.93	0.88	-0.05
0.95 - 0.99	13,522	0.96	0.93	-0.03
1.00	682	1.00	1.02	0.02
1.01 - 1.05	2,307	1.03	1.08	0.05
1.06 - 1.10	1,675	1.08	1.20	0.12
1.11 - 1.15	1,278	1.13	1.26	0.13
1.16 - 1.20	1,066	1.18	1.31	0.13
1.21 - 1.30	1,782	1.25	1.40	0.15
1.31 - 1.40	951	1.35	1.54	0.20
1.41 - 1.50	371	1.45	1.60	0.15
1.51 - 1.60	217	1.55	1.60	0.05
1.61 - 1.70	117	1.65	1.60	-0.05
1.71 - 1.80	54	1.75	1.60	-0.15
1.81 - 1.90	36	1.85	1.60	-0.25
1.91 - 2.00	20	1.96	1.60	-0.36
OVER 2.00	28	2.24	1.60	-0.64
TOTALS	35,695	1.01	1.02	0.01

**CHANGES IN MODIFICATIONS
FOR GROUPS DETERMINED BY RANGE OF CURRENT MODIFICATION
EXPECTED LOSS SIZE : 5,000 - 10,000**

Range of Current Mod	No. of Insureds	Average Current Mod	Average Revised Mod	Change
0.70 - 0.79	50	0.78	0.77	-0.01
0.80 - 0.84	544	0.83	0.75	-0.08
0.85 - 0.89	7,170	0.88	0.80	-0.08
0.90 - 0.94	29,109	0.92	0.86	-0.06
0.95 - 0.99	10,074	0.97	0.95	-0.02
1.00	1,262	1.00	1.03	0.03
1.01 - 1.05	5,199	1.03	1.08	0.05
1.06 - 1.10	4,070	1.08	1.15	0.07
1.11 - 1.15	3,372	1.13	1.21	0.08
1.16 - 1.20	3,003	1.18	1.27	0.09
1.21 - 1.30	4,258	1.25	1.39	0.14
1.31 - 1.40	1,962	1.35	1.56	0.21
1.41 - 1.50	1,070	1.45	1.69	0.24
1.51 - 1.60	636	1.55	1.78	0.23
1.61 - 1.70	353	1.65	1.80	0.15
1.71 - 1.80	199	1.75	1.80	0.05
1.81 - 1.90	104	1.86	1.80	-0.06
1.91 - 2.00	75	1.95	1.80	-0.15
OVER 2.00	120	2.36	1.80	-0.56
TOTALS	72,630	1.02	1.02	0.00

**CHANGES IN MODIFICATIONS
FOR GROUPS DETERMINED BY RANGE OF CURRENT MODIFICATION
EXPECTED LOSS SIZE : 10,000 - 25,000**

Range of Current Mod	No. of Insureds	Average Current Mod	Average Revised Mod	Change
0.60 - 0.69	8	0.68	0.58	-0.10
0.70 - 0.79	1,042	0.77	0.68	-0.09
0.80 - 0.84	5,021	0.83	0.75	-0.08
0.85 - 0.89	13,819	0.87	0.81	-0.06
0.90 - 0.94	10,174	0.92	0.88	-0.04
0.95 - 0.99	6,460	0.97	0.97	0.00
1.00	1,190	1.00	1.01	0.01
1.01 - 1.05	5,427	1.03	1.04	0.01
1.06 - 1.10	4,545	1.08	1.11	0.03
1.11 - 1.15	3,790	1.13	1.18	0.05
1.16 - 1.20	2,967	1.18	1.25	0.07
1.21 - 1.30	3,862	1.25	1.35	0.10
1.31 - 1.40	2,330	1.35	1.49	0.14
1.41 - 1.50	1,414	1.45	1.62	0.17
1.51 - 1.60	798	1.55	1.76	0.21
1.61 - 1.70	465	1.65	1.88	0.23
1.71 - 1.80	269	1.75	2.00	0.25
1.81 - 1.90	179	1.85	2.08	0.23
1.91 - 2.00	126	1.95	2.16	0.21
OVER 2.00	201	2.38	2.66	0.28
TOTALS	64,087	1.03	1.03	0.00

**CHANGES IN MODIFICATIONS
FOR GROUPS DETERMINED BY RANGE OF CURRENT MODIFICATION
EXPECTED LOSS SIZE : 25,000 - 100,000**

Range of Current Mod	No. of Insureds	Average Current Mod	Average Revised Mod	Change
BELOW 0.50	1	0.46	0.42	-0.04
0.50 - 0.59	12	0.57	0.51	-0.06
0.60 - 0.69	230	0.67	0.61	-0.06
0.70 - 0.79	2,983	0.76	0.70	-0.06
0.80 - 0.84	3,648	0.82	0.77	-0.05
0.85 - 0.89	3,853	0.87	0.83	-0.04
0.90 - 0.94	3,652	0.92	0.89	-0.03
0.95 - 0.99	3,485	0.97	0.95	-0.02
1.00	672	1.00	0.99	-0.01
1.01 - 1.05	2,968	1.03	1.03	0.00
1.06 - 1.10	2,456	1.08	1.09	0.01
1.11 - 1.15	2,142	1.13	1.15	0.02
1.16 - 1.20	1,678	1.18	1.20	0.02
1.21 - 1.30	2,499	1.25	1.29	0.04
1.31 - 1.40	1,611	1.35	1.41	0.06
1.41 - 1.50	921	1.45	1.53	0.08
1.51 - 1.60	609	1.55	1.64	0.09
1.61 - 1.70	355	1.65	1.76	0.11
1.71 - 1.80	222	1.75	1.89	0.14
1.81 - 1.90	153	1.85	1.98	0.13
1.91 - 2.00	95	1.95	2.13	0.18
OVER 2.00	226	2.33	2.53	0.20
TOTALS	34,471	1.04	1.04	0.00

**CHANGES IN MODIFICATIONS
FOR GROUPS DETERMINED BY RANGE OF CURRENT MODIFICATION
EXPECTED LOSS SIZE : Over 100,000**

Range of Current Mod	No. of Insureds	Average Current Mod	Average Revised Mod	Change
BELOW 0.50	68	0.37	0.57	0.20
0.50 - 0.59	79	0.55	0.67	0.12
0.60 - 0.69	293	0.65	0.68	0.03
0.70 - 0.79	772	0.75	0.76	0.01
0.80 - 0.84	585	0.82	0.81	-0.01
0.85 - 0.89	624	0.87	0.86	-0.01
0.90 - 0.94	609	0.92	0.91	-0.01
0.95 - 0.99	584	0.97	0.96	-0.01
1.00	122	1.00	1.00	0.00
1.01 - 1.05	566	1.03	1.02	-0.01
1.06 - 1.10	473	1.08	1.07	-0.01
1.11 - 1.15	356	1.13	1.11	-0.02
1.16 - 1.20	323	1.18	1.17	-0.01
1.21 - 1.30	453	1.25	1.24	-0.01
1.31 - 1.40	305	1.35	1.32	-0.03
1.41 - 1.50	203	1.45	1.40	-0.05
1.51 - 1.60	138	1.55	1.50	-0.05
1.61 - 1.70	75	1.66	1.58	-0.08
1.71 - 1.80	55	1.75	1.72	-0.03
1.81 - 1.90	36	1.85	1.65	-0.20
1.91 - 2.00	32	1.95	1.66	-0.29
OVER 1.20	61	2.35	2.11	-0.24
TOTALS	6,812	1.00	1.00	0.00

INTRASTATE INSUREDS

<u>Sample Insured</u>	<u>Current Plan Losses Expected</u>	<u>Actual</u>	<u>Current Mod</u>	<u>Revised Mo</u>
1	8,229	0	0.88	0.79
2	30,515	24,876	0.95	0.91
3	64,679	20,897	0.85	0.81
4	44,797	36,932	1.00	0.95
5	8,891	1,929	0.93	0.89
6 (A)	38,393	67,547	0.99	0.98
7	45,385	25,354	0.89	0.86
8	30,290	42	0.73	0.63
9 (B)	23,966	29,776	1.12	1.14
10	93,428	39,022	0.87	0.82
11	115,530	40,931	0.79	0.76
12	13,058	2,965	0.91	0.88
13	22,939	9,157	0.93	0.93
14 (C)	87,253	6,636	0.67	0.60
15	71,307	9,449	0.71	0.66
16	8,140	612	0.88	0.80
17	113,908	74,498	0.89	0.86
18	9,066	8,839	1.08	1.14
19	133,667	156,644	0.90	0.83
20 (D)	6,991	13,920	1.34	1.71
21	3,716	2,011	1.02	1.05
22	52,400	233,008	1.26	1.21
23	39,242	3,284	0.74	0.67
24	30,772	27,499	0.96	0.90

INTERSTATE INSUREDS

<u>Sample Insured</u>	<u>Current Plan - Total Loss</u>		<u>Current Mod</u>	<u>Revised Mo</u>
	<u>Expected</u>	<u>Actual</u>		
1	169,281	69,484	0.94	0.90
2 (I)	22,295	25,891	1.13	1.14
3	112,993	67,394	0.81	0.82
4 (J)	575,991	646,038	1.09	1.03
5	640,115	714,997	1.06	0.92
6	352,779	175,710	0.70	0.68

SAMPLE RISK A

1) MODIFICATION FORMULA

$$M = \frac{AP + WAE + (1 - W)EE + B}{E + B}$$

2) CURRENT MODIFICATION

$$M_c = \frac{(21.2) + (0.02)(46.3) + (1 - 0.02)(16.0) + (19.6)}{(38.4) + (19.6)}$$

$$M_c = 0.99$$

3) PROPOSED MODIFICATION

$$M_s = \frac{(12.4) + (0.15)(47.5) + (1 - 0.15)(17.1) + (7.5)}{(35.0) + (7.5)}$$

$$M_s = 0.98$$

SAMPLE RISK B

1) MODIFICATION FORMULA

$$M = \frac{AP + WAE + (1 - W)EE + B}{E + B}$$

2) CURRENT MODIFICATION

$$Mc = \frac{(16.5) + (0.00)(13.3) + (1 - 0.00)(12.6) + (20)}{(24.0) + (20.0)}$$

$$Mc = 1.12$$

3) PROPOSED MODIFICATION

$$Ms = \frac{(12.8) + (0.12)(17.0) + (1 - 0.12)(12.8) + (7.5)}{(21.8) + (7.5)}$$

$$Ms = 1.14$$

SAMPLE RISK C

1) MODIFICATION FORMULA

$$M = \frac{AP + WAE + (1 - W)EE + B}{E + B}$$

2) CURRENT MODIFICATION

$$M_c = \frac{(6.6) + (0.07)(0.0) + (1 - 0.07)(48.8) + (18.6)}{(87.3) + (18.6)}$$

$$M_c = 0.67$$

3) PROPOSED MODIFICATION

$$M_s = \frac{(6.6) + (0.24)(0.0) + (1 - 0.24)(48.7) + (11.1)}{(79.5) + (11.1)}$$

$$M_s = 0.60$$

SAMPLE RISK D

1) MODIFICATION FORMULA

$$M = \frac{AP + WAE + (1 - W)EE + B}{E + B}$$

2) CURRENT MODIFICATION

$$Mc = \frac{(12.5) + (0.00)(1.5) + (1 - 0.00)(3.6) + (20)}{(7.0) + (20)}$$

$$Mc = 1.34$$

3) PROPOSED MODIFICATION

$$Ms = \frac{(12.7) + (0.09)(1.2) + (1 - 0.09)(3.7) + (7.5)}{(6.4) + (7.5)}$$

$$Ms = 1.71$$

SAMPLE INTERSTATE RISK I

1) MODIFICATION FORMULA

$$M = \frac{AP + WAE + (1 - W)EE + B}{E + B}$$

2) CURRENT MODIFICATION

$$M_c = \frac{(12.8) + (0.00)(13.1) + (1 - 0.00)(14.9) + (20)}{(22.3) + (20.0)}$$

$$M_c = 1.13$$

3) PROPOSED MODIFICATION

$$M_s = \frac{(9.2) + (0.09)(16.7) + (1 - 0.09)(14.4) + (7.5)}{(19.9) + (7.5)}$$

$$M_s = 1.14$$

SAMPLE INTERSTATE RISK J

1) MODIFICATION FORMULA

$$M = \frac{AP + WAE + (1 - W)EE + B}{E + B}$$

2) CURRENT MODIFICATION

$$M_c = \frac{(282.3) + (.60)(363.7) + (.40)(313.6) + (8)}{(576) + (8)}$$

$$M_c = 1.09$$

3) PROPOSED MODIFICATION

$$M_s = \frac{(213.0) + (.47)(341.5) + (.53)(322.0) + (56.8)}{(527.4) + (56.8)}$$

$$M_s = 1.03$$

Massachusetts Workers' Compensation

W and B Values, under Current Experience Rating System

Rates Effective January 1, 1990

Expected Losses	W	B	Expected Losses	W	B	Expected Losses	W	B
0 - 25,000	0.00	20,000	792,625 - 814,875	0.35	13,000	1,571,375 - 1,593,625	0.70	6,000
25,000 - 58,375	0.01	19,800	814,875 - 837,125	0.36	12,800	1,593,625 - 1,615,875	0.71	5,800
58,375 - 80,625	0.02	19,600	837,125 - 859,375	0.37	12,600	1,615,875 - 1,638,125	0.72	5,600
80,625 - 102,875	0.03	19,400	859,375 - 881,625	0.38	12,400	1,638,125 - 1,660,375	0.73	5,400
102,875 - 125,125	0.04	19,200	881,625 - 903,875	0.39	12,200	1,660,375 - 1,682,625	0.74	5,200
125,125 - 147,375	0.05	19,000	903,875 - 926,125	0.40	12,000	1,682,625 - 1,704,875	0.75	5,000
147,375 - 169,625	0.06	18,800	926,125 - 948,375	0.41	11,800	1,704,875 - 1,727,125	0.76	4,800
169,625 - 191,875	0.07	18,600	948,375 - 970,625	0.42	11,600	1,727,125 - 1,749,375	0.77	4,600
191,875 - 214,125	0.08	18,400	970,625 - 992,875	0.43	11,400	1,749,375 - 1,771,625	0.78	4,400
214,125 - 236,375	0.09	18,200	992,875 - 1,015,125	0.44	11,200	1,771,625 - 1,793,875	0.79	4,200
236,375 - 258,625	0.10	18,000	1,015,125 - 1,037,375	0.45	11,000	1,793,875 - 1,816,125	0.80	4,000
258,625 - 280,875	0.11	17,800	1,037,375 - 1,059,625	0.46	10,800	1,816,125 - 1,838,375	0.81	3,800
280,875 - 303,125	0.12	17,600	1,059,625 - 1,081,875	0.47	10,600	1,838,375 - 1,860,625	0.82	3,600
303,125 - 325,375	0.13	17,400	1,081,875 - 1,104,125	0.48	10,400	1,860,625 - 1,882,875	0.83	3,400
325,375 - 347,625	0.14	17,200	1,104,125 - 1,126,375	0.49	10,200	1,882,875 - 1,905,125	0.84	3,200
347,625 - 369,875	0.15	17,000	1,126,375 - 1,148,625	0.50	10,000	1,905,125 - 1,927,375	0.85	3,000
369,875 - 392,125	0.16	16,800	1,148,625 - 1,170,875	0.51	9,800	1,927,375 - 1,949,625	0.86	2,800
392,125 - 414,375	0.17	16,600	1,170,875 - 1,193,125	0.52	9,600	1,949,625 - 1,971,875	0.87	2,600
414,375 - 436,625	0.18	16,400	1,193,125 - 1,215,375	0.53	9,400	1,971,875 - 1,994,125	0.88	2,400
436,625 - 458,875	0.19	16,200	1,215,375 - 1,237,625	0.54	9,200	1,994,125 - 2,016,375	0.89	2,200
458,875 - 481,125	0.20	16,000	1,237,625 - 1,259,875	0.55	9,000	2,016,375 - 2,038,625	0.90	2,000
481,125 - 503,375	0.21	15,800	1,259,875 - 1,282,125	0.56	8,800	2,038,625 - 2,060,875	0.91	1,800
503,375 - 525,625	0.22	15,600	1,282,125 - 1,304,375	0.57	8,600	2,060,875 - 2,083,125	0.92	1,600
525,625 - 547,875	0.23	15,400	1,304,375 - 1,326,625	0.58	8,400	2,083,125 - 2,105,375	0.93	1,400
547,875 - 570,125	0.24	15,200	1,326,625 - 1,348,875	0.59	8,200	2,105,375 - 2,127,625	0.94	1,200
570,125 - 592,375	0.25	15,000	1,348,875 - 1,371,125	0.60	8,000	2,127,625 - 2,149,875	0.95	1,000
592,375 - 614,625	0.26	14,800	1,371,125 - 1,393,375	0.61	7,800	2,149,875 - 2,172,125	0.96	800
614,625 - 636,875	0.27	14,600	1,393,375 - 1,415,625	0.62	7,600	2,172,125 - 2,194,375	0.97	600
636,875 - 659,125	0.28	14,400	1,415,625 - 1,437,875	0.63	7,400	2,194,375 - 2,216,625	0.98	400
659,125 - 681,375	0.29	14,200	1,437,875 - 1,460,125	0.64	7,200	2,216,625 - 2,238,875	0.99	200
681,375 - 703,625	0.30	14,000	1,460,125 - 1,482,375	0.65	7,000	2,238,875 & Over	1.00	0
703,625 - 725,875	0.31	13,800	1,482,375 - 1,504,625	0.66	6,800			
725,875 - 748,125	0.32	13,600	1,504,625 - 1,526,875	0.67	6,600			
748,125 - 770,375	0.33	13,400	1,526,875 - 1,549,125	0.68	6,400			
770,375 - 792,625	0.34	13,200	1,549,125 - 1,571,375	0.69	6,200			

Notes: W = (E - 25,000) / (SRP - 25,000);
 SRP = 25 x Serious Average Cost per Case
 = 25 x 90,000.

Massachusetts Workers' Compensation
Weighting Values, under Revised Experience Rating System

Expected Losses	W	Expected Losses	W
0 - 43,009	0.07	1,033,093 - 1,106,869	0.37
43,010 - 62,608	0.08	1,106,870 - 1,186,699	0.38
62,609 - 81,298	0.09	1,186,700 - 1,273,360	0.39
81,299 - 100,030	0.10	1,273,361 - 1,367,769	0.40
100,031 - 119,130	0.11	1,367,770 - 1,471,015	0.41
119,131 - 138,766	0.12	1,471,016 - 1,584,400	0.42
138,767 - 159,046	0.13	1,584,401 - 1,709,497	0.43
159,047 - 180,058	0.14	1,709,498 - 1,848,219	0.44
180,059 - 201,878	0.15	1,848,220 - 2,002,922	0.45
201,879 - 224,578	0.16	2,002,923 - 2,176,537	0.46
224,579 - 248,231	0.17	2,176,538 - 2,372,758	0.47
248,232 - 272,911	0.18	2,372,759 - 2,853,332	0.49
272,912 - 298,698	0.19	2,853,333 - 3,151,949	0.50
298,699 - 325,675	0.20	3,151,950 - 3,503,149	0.51
325,676 - 353,934	0.21	3,503,150 - 3,922,163	0.52
353,935 - 383,574	0.22	3,922,164 - 4,430,733	0.53
383,575 - 414,703	0.23	4,430,734 - 5,061,008	0.54
414,704 - 447,441	0.24	5,061,009 - 5,862,615	0.55
447,442 - 481,918	0.25	5,862,616 - 6,916,408	0.56
481,919 - 518,279	0.26	6,916,409 - 8,363,612	0.57
518,280 - 556,688	0.27	8,363,613 - 10,475,100	0.58
556,689 - 597,322	0.28	10,475,101 - 13,844,488	0.59
597,323 - 640,385	0.29	13,844,489 - 20,072,740	0.60
640,386 - 686,101	0.30	20,072,741 - 35,479,449	0.61
686,102 - 734,725	0.31	35,479,450 - 137,163,671	0.62
734,726 - 786,547	0.32	137,163,672 - Over	0.63
786,548 - 841,893	0.33		
841,894 - 901,136	0.34		
901,137 - 964,705	0.35		
964,706 - 1,033,092	0.36		

Massachusetts Workers' Compensation
 Weighting Values Under Revised Experience Rating System
 50% Current Weighting Values, 50% Revised Weighting Values
 Effective JANUARY 1, 1991

Expected Losses	W	Expected Losses	W	Expected Losses	W
0 - 43,009	0.04	786,548 - 814,875	0.34	1,848,220 - 1,882,875	0.64
43,010 - 62,608	0.05	814,876 - 841,893	0.35	1,882,876 - 1,927,375	0.65
62,609 - 81,298	0.06	841,894 - 881,625	0.36	1,927,376 - 1,971,875	0.66
81,299 - 102,875	0.07	881,626 - 903,875	0.37	1,971,876 - 2,002,922	0.67
102,876 - 125,125	0.08	903,876 - 948,375	0.38	2,002,923 - 2,038,625	0.68
125,126 - 147,375	0.09	948,376 - 970,625	0.39	2,038,626 - 2,083,125	0.69
147,376 - 169,625	0.10	970,626 - 1,015,125	0.40	2,083,126 - 2,127,625	0.70
169,626 - 191,875	0.11	1,015,126 - 1,037,375	0.41	2,127,626 - 2,172,125	0.71
191,876 - 214,125	0.12	1,037,376 - 1,081,875	0.42	2,172,126 - 2,194,375	0.72
214,126 - 236,375	0.13	1,081,876 - 1,106,869	0.43	2,194,376 - 2,238,875	0.73
236,376 - 258,625	0.14	1,106,870 - 1,148,625	0.44	2,238,876 - 2,596,311	0.74
258,626 - 280,875	0.15	1,148,626 - 1,186,699	0.45	2,596,312 - 3,151,949	0.75
280,876 - 303,125	0.16	1,186,700 - 1,215,375	0.46	3,151,950 - 3,922,163	0.76
303,126 - 325,675	0.17	1,215,376 - 1,259,875	0.47	3,922,164 - 5,061,008	0.77
325,676 - 353,934	0.18	1,259,876 - 1,282,125	0.48	5,061,009 - 6,916,408	0.78
353,935 - 383,574	0.19	1,282,126 - 1,326,625	0.49	6,916,409 - 10,475,100	0.79
383,575 - 414,375	0.20	1,326,626 - 1,367,769	0.50	10,475,101 - 20,072,740	0.80
414,376 - 436,625	0.21	1,367,770 - 1,393,375	0.51	20,072,741 - 137,163,671	0.81
436,626 - 458,875	0.22	1,393,376 - 1,437,875	0.52	137,163,672 & Over	0.82
458,876 - 481,918	0.23	1,437,876 - 1,471,015	0.53		
481,919 - 518,279	0.24	1,471,016 - 1,504,625	0.54		
518,280 - 547,875	0.25	1,504,626 - 1,549,125	0.55		
547,876 - 570,125	0.26	1,549,126 - 1,584,400	0.56		
570,126 - 597,322	0.27	1,584,401 - 1,615,875	0.57		
597,323 - 636,875	0.28	1,615,876 - 1,660,375	0.58		
636,876 - 659,125	0.29	1,660,376 - 1,704,875	0.59		
659,126 - 686,101	0.30	1,704,876 - 1,727,125	0.60		
686,102 - 725,875	0.31	1,727,126 - 1,771,625	0.61		
725,876 - 748,125	0.32	1,771,626 - 1,816,125	0.62		
748,126 - 786,547	0.33	1,816,126 - 1,848,219	0.63		

Massachusetts Workers' Compensation
Ballast Values, under Revised Experience Rating Plan

Expected Losses	B	Expected Losses	B	Expected Losses	B
0 - 9,035	10,500	1,138,251 - 1,173,227	133,000	2,362,863 - 2,397,856	255,500
9,036 - 18,753	14,000	1,173,228 - 1,208,206	136,500	2,397,857 - 2,432,851	259,000
18,754 - 37,651	17,500	1,208,207 - 1,243,187	140,000	2,432,852 - 2,467,846	262,500
37,652 - 64,802	21,000	1,243,188 - 1,278,168	143,500	2,467,847 - 2,502,841	266,000
64,803 - 95,998	24,500	1,278,169 - 1,313,150	147,000	2,502,842 - 2,537,837	269,500
95,999 - 128,908	28,000	1,313,151 - 1,348,133	150,500	2,537,838 - 2,572,832	273,000
128,909 - 162,618	31,500	1,348,134 - 1,383,117	154,000	2,572,833 - 2,607,828	276,500
162,619 - 196,752	35,000	1,383,118 - 1,418,102	157,500	2,607,829 - 2,642,823	280,000
196,753 - 231,132	38,500	1,418,103 - 1,453,088	161,000	2,642,824 - 2,677,819	283,500
231,133 - 265,669	42,000	1,453,089 - 1,488,074	164,500	2,677,820 - 2,712,815	287,000
265,670 - 300,309	45,500	1,488,075 - 1,523,061	168,000	2,712,816 - 2,747,811	290,500
300,310 - 335,022	49,000	1,523,062 - 1,558,048	171,500	2,747,812 - 2,782,807	294,000
335,023 - 369,788	52,500	1,558,049 - 1,593,036	175,000	2,782,808 - 2,817,803	297,500
369,789 - 404,594	56,000	1,593,037 - 1,628,025	178,500	2,817,804 - 2,852,800	301,000
404,595 - 439,429	59,500	1,628,026 - 1,663,014	182,000	2,852,801 - 2,887,796	304,500
439,430 - 474,289	63,000	1,663,015 - 1,698,003	185,500	2,887,797 - 2,922,792	308,000
474,290 - 509,168	66,500	1,698,004 - 1,732,993	189,000	2,922,793 - 2,957,789	311,500
509,169 - 544,062	70,000	1,732,994 - 1,767,983	192,500	2,957,790 - 2,992,786	315,000
544,063 - 578,968	73,500	1,767,984 - 1,802,974	196,000	2,992,787 - 3,027,782	318,500
578,969 - 613,885	77,000	1,802,975 - 1,837,965	199,500	3,027,783 - 3,062,779	322,000
613,886 - 648,811	80,500	1,837,966 - 1,872,956	203,000	3,062,780 - 3,097,776	325,500
648,812 - 683,745	84,000	1,872,957 - 1,907,948	206,500	3,097,777 - 3,132,773	329,000
683,746 - 718,685	87,500	1,907,949 - 1,942,940	210,000	3,132,774 - 3,167,770	332,500
718,686 - 753,630	91,000	1,942,941 - 1,977,932	213,500	3,167,771 - 3,202,767	336,000
753,631 - 788,580	94,500	1,977,933 - 2,012,924	217,000	3,202,768 - 3,237,764	339,500
788,581 - 823,535	98,000	2,012,925 - 2,047,917	220,500	3,237,765 - 3,272,761	343,000
823,536 - 858,493	101,500	2,047,918 - 2,082,910	224,000	3,272,762 - 3,307,758	346,500
858,494 - 893,454	105,000	2,082,911 - 2,117,903	227,500	3,307,759 - 3,342,750	350,000
893,455 - 928,418	108,500	2,117,904 - 2,152,897	231,000		
928,419 - 963,385	112,000	2,152,898 - 2,187,891	234,500		
963,386 - 998,354	115,500	2,187,892 - 2,222,884	238,000		
998,355 - 1,033,325	119,000	2,222,885 - 2,257,878	241,500		
1,033,326 - 1,068,299	122,500	2,257,879 - 2,292,873	245,000		
1,068,300 - 1,103,273	126,000	2,292,874 - 2,327,867	248,500		
1,103,274 - 1,138,250	129,500	2,327,868 - 2,362,862	252,000		

Note: For Expected Losses (E) greater than \$3,342,500, B is calculated using the formula: $0.1E + \frac{2500GE}{E + 700G}$
rounded to the nearest whole dollar. G is equal to State Average Cost per Case/1000.
In Massachusetts, $G = 7000/1000 = 7$.

Massachusetts Workers' Compensation
Ballast Values Under Revised Experience Rating System
50% Current Ballast Value, 50% Revised Ballast Value
Effective JANUARY 1, 1991

Expected Losses		B	Expected Losses		B
0 -	1,614	10,500	1,700,488 -	1,778,465	98,000
1,615 -	7,753	14,000	1,778,466 -	1,854,446	101,500
7,754 -	32,756	17,500	1,854,447 -	1,932,427	105,000
32,757 -	94,602	21,000	1,932,428 -	2,008,410	108,500
94,603 -	166,974	24,500	2,008,411 -	2,086,395	112,000
166,975 -	243,437	28,000	2,086,396 -	2,162,380	115,500
243,438 -	318,635	31,500	2,162,381 -	2,240,366	119,000
318,636 -	396,123	35,000	2,240,367 -	2,310,355	122,500
396,124 -	471,783	38,500	2,310,356 -	2,380,344	126,000
471,784 -	549,531	42,000	2,380,345 -	2,450,334	129,500
549,532 -	625,345	45,500	2,450,335 -	2,520,324	133,000
625,346 -	701,199	49,000	2,520,325 -	2,590,315	136,500
701,200 -	779,078	52,500	2,590,316 -	2,660,306	140,000
779,079 -	854,982	56,000	2,660,307 -	2,730,298	143,500
854,983 -	932,899	59,500	2,730,299 -	2,800,290	147,000
932,900 -	1,008,830	63,000	2,800,291 -	2,870,283	150,500
1,008,831 -	1,086,770	66,500	2,870,284 -	2,940,276	154,000
1,086,771 -	1,162,719	70,000	2,940,277 -	3,010,269	157,500
1,162,720 -	1,240,673	73,500	3,010,270 -	3,080,262	161,000
1,240,674 -	1,316,633	77,000	3,080,263 -	3,150,256	164,500
1,316,634 -	1,392,598	80,500	3,150,257 -	3,220,250	168,000
1,392,599 -	1,470,566	84,000	3,220,251 -	3,290,245	171,500
1,470,567 -	1,546,537	87,500	3,290,246 -	3,342,500	175,000
1,546,538 -	1,624,511	91,000			
1,624,512 -	1,700,487	94,500			

Note: For Expected Losses (E) greater than \$3,342,500, B is calculated using the formula:

$$0.5 \cdot (0.1E + 2,500GE / (E + 700G))$$

rounded to the nearest whole dollar. G is equal to State Average Cost per Case/1000.
In Massachusetts, G = 7000/1000 = 7.

Massachusetts Workers' Compensation

Review of 1988 Experience (86/87 Schedule Z)

Composite Policy Year 1986/87 at First Report

Indemnity Losses

	Injury Kind 1 -----	Injury Kind 2 -----	Injury Kind 3 -----	Injury Kind 4 -----	Injury Kind 5 -----
Losses*	5,894,473	11,226,560	513,101,838	26,778,042	356,276,587
Law Factor, Ch. 572	1.011	2.842	0.916	0.811	0.959
Law Factor, Widow Bill	5.000	1.000	1.000	1.000	1.000
Losses, Developed, On-Level, Trended to 12/31/88	29,796,561	31,905,884	470,001,284	21,716,992	341,669,247
Severity Trend to PY 1990	1.1525	1.1525	1.2034	1.2034	1.2250
Frequency Trend to PY 1990	0.6800	0.8276	1.0266	1.0266	1.0476
Ultimate Losses	23,351,565	30,432,119	580,644,493	26,829,399	438,467,561

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Indemnity Losses	1,099,725,137
Medical Losses	283,761,400
Total Losses	1,383,486,537
Claims	194,046
Average Claim Cost	7,130
Selected Average Claim Cost	7,000

* Section V-B, losses developed, on-level, trended to 12/31/88.

Massachusetts Workers' Compensation

Review of 1988 Experience (86/87 Schedule Z)

Composite Policy Year 1986/87 at First Report

Medical Losses

	Injury Kind 1 -----	Injury Kind 2 -----	Injury Kind 3 -----	Injury Kind 4 -----	Injury Kind 5 -----	Injury Kind 6 -----
Losses*	306,649	6,256,420	69,939,513	7,264,004	86,569,246	19,384,941
Law Factor, Ch. 572	1.227	1.227	1.227	1.227	1.227	1.227
Law Factor, Widow Bill	1.000	1.000	1.000	1.000	1.000	1.000
Losses, Developed, On-Level, Trended to 12/31/88	376,258	7,676,627	85,815,782	8,912,933	106,220,465	23,785,323
Severity Trend to PY 1990	1.1799	1.1799	1.1644	1.1644	1.2175	1.1635
Frequency Trend to PY 1990	0.6800	0.8276	1.0266	1.0266	1.0476	0.9846
Ultimate Losses	301,884	7,496,113	102,581,872	10,654,280	135,479,211	27,248,040
Claims	56	19	6,483	4,129	52,801	117,526
Frequency Trend to 12/31/88*	0.8048	0.8837	1.0204	1.0204	1.0371	0.9886
Frequency Trend to Policy Year 1990	0.6800	0.8276	1.0266	1.0266	1.0476	0.9846
Claim Development Factor	1.1612	3.0728	1.0633	1.0633	1.0424	1.0695
Ultimate Claims	36	43	7221	4599	59799	122348

* Section V-B, losses developed, on-level, trended to 12/31/88.