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Tillinghast - Towers Perrin

June 30, 1999

Ms. Denise A. Lucciola
Executive Director
Massachusetts Workers Compensation
Advisory Council
600 Washington Street
Boston, MA 02111

Dear Ms. Lucciola:

Attached please find final copies of our analysis of the Workers Compensation Rating and Inspection Bureau (WCRIBM) and State Rating Bureau (SRB) rate filings. This work product is separated into two documents, reflecting the evolution of this project. Details on the two attachments are as follows:

- Appendix One – This letter focuses on the differences in the trend methodology between the WCRIBM and SRB rate filings. This analysis, which was contained in our June 4, 1999 draft report, was requested at the May Council meeting when we presented our May 7, 1999 report. All references to our prior report in this appendix refer to our report dated May 7, 1999.

- Appendix Two – This letter presents our review of the WCRIBM rate filing. It is unchanged from our May 7, 1999 report, except that we have provided the document in letter rather than report format.

It has been a pleasure to work on this assignment for the Council. Please do not hesitate to call should any questions arise.

Sincerely,

Ann M. Conway cem

Ann M. Conway, FCAS, MAAA
Consulting Actuary

AMC:cem

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APPENDIX ONE

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Tillinghast - Towers Perrin

June 30, 1999

Ms. Denise A. Lucciola
Executive Director
Massachusetts Workers Compensation
Advisory Council
600 Washington Street
Boston, MA 02111

Dear Ms. Lucciola:

As a follow-up to our May 7, 1999 draft analysis of the Workers Compensation Rating and Inspection Bureau (WCRIBM) rate filing effective August 1, 1999, the Massachusetts Workers Compensation Advisory Council (the Council) asked Tillinghast-Towers Perrin (Tillinghast) to review the rate filing prepared by the State Rating Bureau (SRB) with an effective date of September 1, 1999. Specifically, we were asked to focus on the loss trend component of this filing.

DISTRIBUTION AND USE

We have prepared this report for the Council to assist it in evaluating the reasonableness of the rate filings. It is not intended nor necessarily suitable for any other purpose. Please note that this analysis relies in part on the results of our prior analysis; both reports should be reviewed together for a more complete understanding of the findings presented here.

We understand that under the Freedom of Information Act, this report may become public information available on request to anyone. In such an instance, we request that a list of recipients be provided to Tillinghast periodically. Permission is hereby granted for this distribution on the condition that the entire report is distributed rather than any excerpt. Third parties should recognize that the furnishing of this report is not a substitute for their own due diligence and should place no reliance on this report or the data contained herein that would result in the creation of any duty or liability by Tillinghast to the third party.

Any reference to Tillinghast in relation to this report in any reports, accounts, or other published documents or any verbal reference issued by the Council is not authorized without our prior written consent.

The exhibits attached in support of our recommendations and findings are an integral part of this report. These sections have been prepared so that our actuarial assumptions and judgments are documented. Judgments about the conclusions drawn in this report should be made only after considering the report in its entirety. We remain available to answer any questions that may arise regarding this report. We assume that the user of this report will seek such explanation on any matter in question.

Our conclusions and recommendations are predicated on a number of assumptions as to future conditions and events. Those assumptions, which are documented in subsequent sections of this report, must be understood in order to place our conclusions in their appropriate context. In addition, our work is subject to inherent limitations, which are also discussed in the following section.

RELIANCES AND LIMITATIONS

In this review we relied without verification or audit, upon information supplied by the WCRIBM and the SRB. We did, however, review the information provided to us for reasonableness. Our results are dependent on the accuracy and completeness of the information contained in the WCRIBM and SRB filings. To the extent material errors or omissions are discovered in these filings, these corrections should be provided to us so we may determine their impact on the conclusions contained herein.

We have used what we consider to be reasonable actuarial methods and assumptions in our analysis. We have not anticipated any extraordinary changes to the legal, social or economic environment which might affect the frequency or severity of claims. Due to the nature and degree of uncertainties that attach to commercial insurance coverages, no assurance can be given that actual losses will emerge according to any projections contained herein.

BACKGROUND

The WCRIBM filed for a rate increase of 2.6% effective August 1, 1999, while the SRB filing is for a rate decrease of -31.7% effective September 1, 1999. The SRB filing represents a much more limited scope than the industry filing. The key differences between the two filings include:

- Loss trend
- Other acquisition and commission expenses
- Loss and expense constants
- Underwriting profit

FINDINGS

As requested by the Council, our analysis focuses on loss trend. Following the discussion on loss trend, we make several observations with respect to some of the other elements of difference between the two filings.

- Loss trend - The WCRIBM selects a net trend of 3.5% for accident year 1997 to policy year 1998 and then assumes a 5.0% trend prospectively. The SRB selects a net trend rate of -3.6% for all years. The WCRIBM selection is based on a combination of a long-term model of indemnity loss ratios and external medical trends. The SRB model relies on a linear regression of loss ratios over a five year period (1993-1997).

  Exhibits 1 and 2 present a comparison of the difference in the two approaches. Exhibit 1, which is taken directly from the WCRIBM rate filing, shows nearly thirty years of on-level paid indemnity loss ratios. The diamond points, which are actual results, show a gradual increase from 1970 to 1984, with a steeper increase from 1984 to 1990 and then a decrease from 1990 to 1996. The downward trend reverses in 1996 as the 1997 on-level indemnity loss ratio is more than two points higher than the 1996 level.

  Exhibit 2 was derived directly from data in the SRB rate filing (specifically Column (9) of page 17 of the filing). The loss ratios shown in Exhibit 2 are significantly higher than those in Exhibit 1 for two reasons:

✓ The Exhibit 2 results also include medical costs, while Exhibit 1 results reflect only indemnity amounts.

✓ The Exhibit 2 results are adjusted to reflect the impact of cost containment, based on the SRB's assumptions with respect to this item.

Each of the two above factors represents about half of the difference between the loss ratios in Exhibits 1 and 2. We note that the Exhibit 2 results are based on the average of paid and paid plus case loss ratios while the Exhibit 1 results are based on paid loss ratios but this difference has a minimal impact on the results.

We note the following with respect to some of the differences between the two trend models. It should be noted that the SRB model is based on data from the WCRIBM filing (e.g., they did not assume differences in loss development, or on-level factors).

✓ Time period fitted – Using nearly thirty observations can produce a model that better fits the observed data. However, given the environmental changes that have occurred in this period, the goodness of fit and predictive accuracy of the model is highly dependent on the accuracy of the on-level adjustment factors (e.g., for changes in law effects). The SRB selected a five year experience period so that all of the data would be post Chapter 398 experience (i.e., the impact of this law reform would not need to be estimated). Five years is a relatively short period to fit to a model and the immaturity of the data makes it very sensitive to the development patterns selected (which are used to project the losses to an ultimate basis). Most other trend methodologies use a larger number of observations. We note that the regression statistics produced by the SRB are not unreasonable. However, given the actual observations in the five year period, it would be very difficult to derive a positive trend from the data.

✓ Adjustments for law impacts – The WCRIBM used two assumed impacts of Chapter 398 in their modeling process. A weakness in their filing, however, is that they did not update the assumed impact of the Widows' Bill (effective

January 24, 1983) or the Chapter 572 (effective October 1, 1986). Given that these statutes are over ten years old, a more refined estimate of their cost impact should have been included. These analyses could have a major impact on the trend model since the mid 1980's represents a significant change in the long term historical trend. The SRB model was not adjusted for the impact of Chapter 398, since all of the experience period was subsequent to this change.

✓ Adjustments for cost containment – The SRB explicitly assumes a 25% cost containment impact spread over a six year period while the WCRIBM reflects cost containment in the dummy variable in the trend model. We note that the WCRIBM approach assumes the impact of cost containment varies with the estimated impact of Chapter 398 (i.e., a greater assumed impact of Chapter 398 results in a lower assumed impact of cost containment). The differences in the WCRIBM and SRB approach do not have a significant impact on the trend calculation.

✓ Combined indemnity/medical trend – The WCRIBM looks at the two elements separately because they believe there is considerable uncertainty as to the impact of the reform laws, while the SRB develops trend indications on a combined basis. Analyzing both items together makes intuitive sense as often the impact of a shift in medical costs will affect indemnity costs (i.e., an increase in upfront medical expenditures may result in lower indemnity costs as workers return to work more quickly). We note that an even better approach would be to look at loss expense in parallel with these two items but the historical data with which to do so is not available.

✓ Model statistics – The WCRIBM model produces somewhat better measures of statistical significance (i.e., a higher R^2, which measures the goodness of fit of the regression). R^2 ranges from 0 to 1; the WCRIBM model produces an R^2 of .946 where the SRB model produces an R^2 of .787. This difference is due in part to:

- Number of observations – It can be difficult to achieve a high R^2 with fewer observations

- Number of model variables – The WCRIBM model also employs a dummy variable; using more variables can increase R^2.

Our conclusions with respect to loss trend in the two filings are as follows.

✓ The WCRIBM model potentially mis-states trend. Additional analyses which would better support their indications include:

- Updating the impact of significant law changes (i.e., the Widows' Bill, Chapter 572, and Chapter 398)
- Reviewing combined indemnity/medical trends.

✓ The SRB model potentially understates trend, given that they rely on five data points in a period in which loss ratios decreased significantly. A comparison of the last three data points suggests that the loss ratio may be turning (i.e., moving from a negative trend to a positive trend). The type of model and number of observations used by the SRB could not be expected to catch a turning point.

A more reasonable trend alternative to consider could be:

✓ Assume 0% indemnity trend, based on the 1995 through 1997 paid indemnity on-level loss ratios. This conclusion is consistent with both the WCRIBM and SRB data.

✓ Assume a 2.5% medical trend, or roughly half the level indicated in the WCRIBM filing. Given the external pressures on medical costs, it is unlikely that workers compensation medical costs will experience negative prospective trend. We note that this assumption may be optimistic as external data suggests a prospective medical trend in the range of 4 to 6% annually. The assumed trend rate of 2.5% considers the recent experience (in that medical trend has continued to decrease while indemnity trend has leveled off), and an ongoing impact of the medical fee schedule and utilization review.

The combined affect of these assumptions results in a net trend of approximately 1%. Substituting this trend rate in the two rate level calculations (as detailed in each of the filings) would result in the following:

INDICATIONS BASED ON NET TREND

Filing	Selected in Filing	of 1% Assumed
WCRIBM	+2.6	-5.7
SRB	-31.7	-20.3

With both filings using similar trend assumptions, the biggest remaining difference between the two filings relates to underwriting profit assumptions (this represents over ten points of the difference).

- Other acquisition and commission expenses - We commented in our prior report (dated May 7, 1999) that the WCRIBM's revised methodologies were not fully supported by the data provided. The SRB generally reaches similar conclusions and recalculates the indications using methodologies from the prior filing.

- Loss and expense constants – In our prior analysis, we had observed that the inclusion of loss constants is essentially an equity issue among insureds of different sizes. The SRB rejects the WCRIBM proposal for a number of different reasons. We did not review expense constants in our analysis. The SRB proposes that the WCRIBM temper the proposed increase in the expense constants.

- Underwriting profit - There are a number of differences between the WCRIBM and the SRB filings with respect to the assumptions used in the profit model. The three most critical components include:

  ✓ Beta of liabilities - This variable measures the covariance between underwriting results and investment returns. A posititive relationship implies that when the stock market does poorly, favorable underwriting results (i.e. a reduction in losses and/or expenses) will offset relatively poor investment performance. A negative beta of liabilities implies that when the stock market does poorly, underwriting results are also unfavorable (i.e. losses and/or expenses increase). In this case, poor underwriting results would be exacerbated by poor investment results.

The WCRIBM filing recommends a value of -.21 for this variable, while the SRB selects a value of .13. The WCRIBM selection is unchanged from prior filings, having been approved for the January 1, 1988 filing. The SRB filing updated the calculation of the beta of liabilities using updated parameters. We have not reviewed the derivation of this variable in either of the filings.

✓ Market risk premium - This variable measures the amount of extra return investors expect for the risk of the stock market. The WCRIBM recommends a value of 9.4%, while the SRB uses a value of 7.1%. The differences between the two selections arise from the length of the historical periods used to select the model parameters. The two parties also have different opinions as to the predictive value of different historical periods with respect to the prospective investment horizon. The WCRIBM relies on results from 1926 through 1998, while the SRB estimate is based on the periods from 1960 through 1998. We note that the market risk premium is highly sensitive to the historical periods used; for example, using the results for the most recent four years (1995 through 1998) would imply a market risk premium of about 25%.

✓ Federal tax rate - The WCRIBM assumes an effective tax rate of 35.2% while the SRB assumes an effective tax rate of 26.2%. The WCRIBM selection is based on the marginal corporate income tax rate, while the SRB attempts to calculate an effective tax rate based on an aggregate distribution of insurance industry assets by class. It is unclear whether the SRB industry data is for the entire insurance industry (i.e., life and property/casualty). The most appropriate federal tax rate assumption would reflect the asset distribution for insurers writing workers compensation in Massachusetts, as well as the other key variables that affect their tax position (e.g., impact of Alternative Minimum Tax provision).

* * * * * * * * * * *

It has been a pleasure to work on this assignment for the Council. Please give me a call to discuss any questions you may have after reviewing this report.

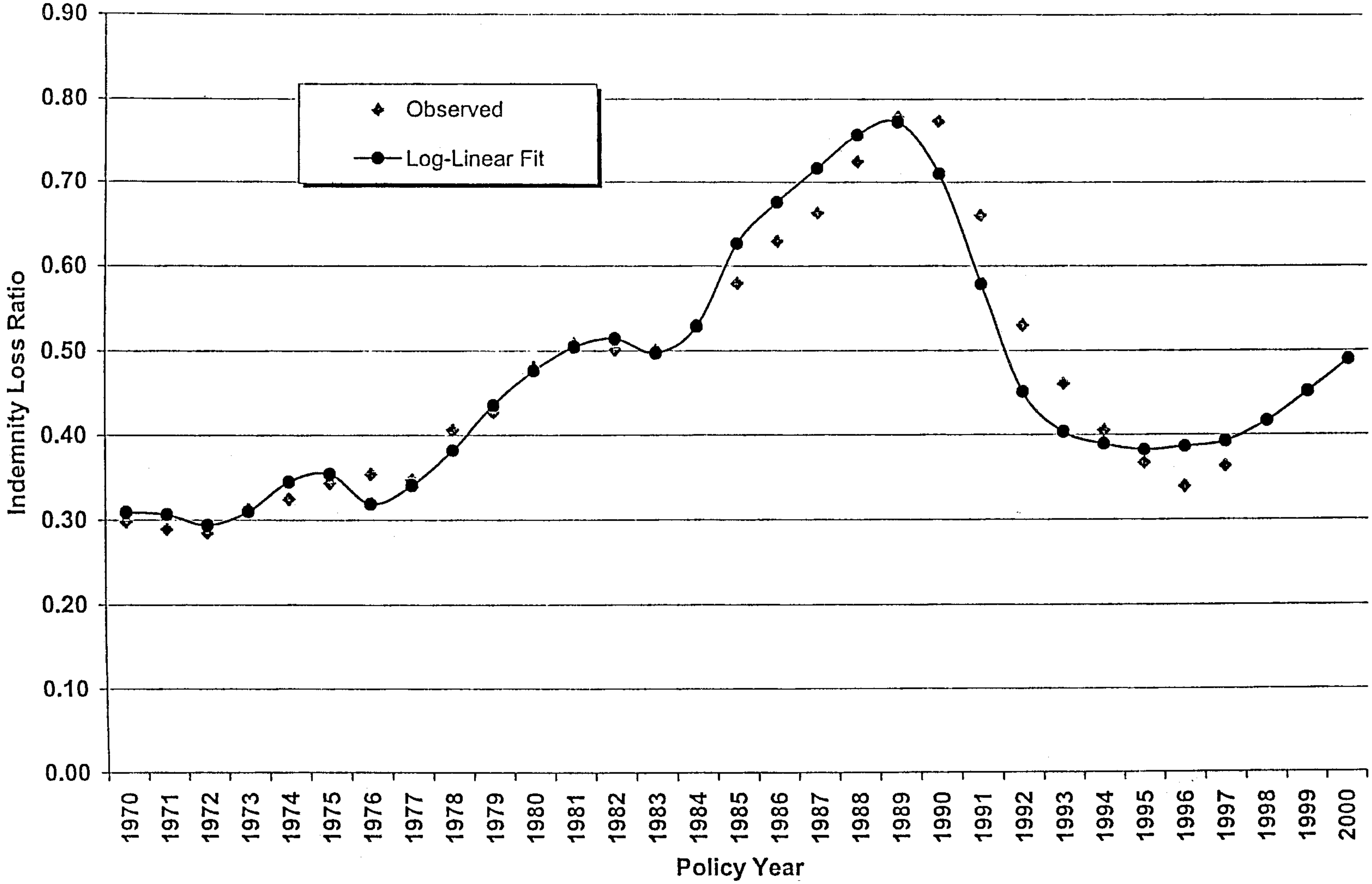
Sincerely,

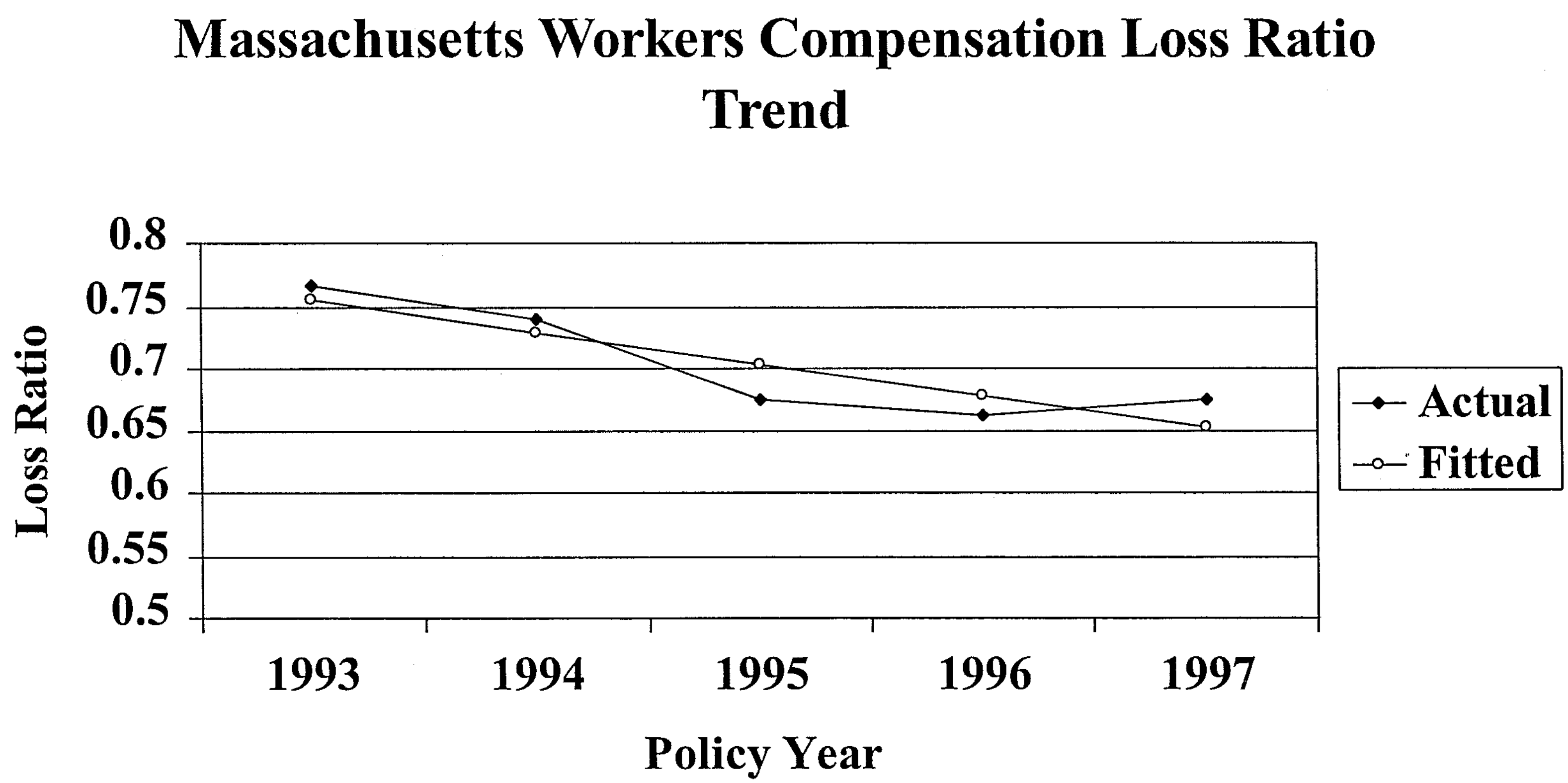
Ann M. Conway cem

Ann M. Conway, FCAS, MAAA
Consulting Actuary

AMC:cem

MASSACHUSETTS WORKERS' COMPENSATION
ECONOMETRIC TREND
Filed Law Effect




Massachusetts Workers Compensation Loss Ratio Trend
Loss Ratio
0.8
0.75
0.7
0.65
0.6
0.55
0.5
1993
1994
1995
1996
1997
Policy Year
Actual
Fitted

APPENDIX TWO

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Tillinghast - Towers Perrin

June 30, 1999

Ms. Denise A. Lucciola
Executive Director
Massachusetts Workers Compensation
Advisory Council
600 Washington Street
Boston, MA 02111

Dear Ms. Lucciola:

The Massachusetts Workers Compensation Advisory Council (the Council) engaged Tillinghast – Towers Perrin (Tillinghast) to evaluate sections of the August 1999 Workers Compensation Rating and Inspection Bureau of Massachusetts (WCRIBM) rate filing. The purpose of our review is to provide the Council with an objective analysis of the WCRIBM rate filing. Specifically, we are to review elements of the August 1999 rate filing. At the direction of the Council, our review is to focus on expense provisions and classification ratemaking. We also provide observations on other items, such as development and trend, to assist the Council in understanding the major issues associated with this filing.

This document presents a summary of our findings.

DISTRIBUTION AND USE

We have prepared this report for the Council to assist it in evaluating the impact of the rate filing. We understand that under the Freedom of Information Act, this report may become public information available on request to anyone. In such an instance, we request that a list of recipients be provided to Tillinghast periodically. Permission is hereby granted for this distribution on the condition that the entire report is distributed rather than any excerpt. Third parties should recognize that the furnishing of this report is not a substitute for their own due diligence and should place no reliance on this report or the data contained herein that would result in the creation of any duty or liability by Tillinghast to the third party.

Any reference to Tillinghast in relation to this report in any reports, accounts, or other published documents or any verbal reference issued by the Council is not authorized without our prior written consent.

The exhibits attached in support of our recommendations and findings are an integral part of this report. These sections have been prepared so that our actuarial assumptions and judgments are documented. Judgments about the conclusions drawn in this report should be made only after considering the report in its entirety. We remain available to answer any questions that may arise regarding this report. We assume that the user of this report will seek such explanation on any matter in question.

Our conclusions and recommendations are predicated on a number of assumptions as to future conditions and events. Those assumptions, which are documented in subsequent sections of this report, must be understood in order to place our conclusions in their appropriate context. In addition, our work is subject to inherent limitations, which are also discussed in the report.

RELIANCES AND LIMITATIONS

In this review we relied without verification or audit, upon information supplied by the WCRIBM. We did, however, review the information provided to us for reasonableness.

We have used what we consider to be reasonable actuarial methods and assumptions in our analysis. We have not anticipated any extraordinary changes to the legal, social or economic environment which might affect the frequency or severity of claims. Due to the nature and degree of uncertainties that attach to commercial insurance coverages, no assurance can be given that actual losses will emerge according to any projections contained herein.

We have reviewed previous WCRIBM filings for the Council. The current analysis includes discussion of issues raised in previous reviews. In particular, the Advisory Council should review our November 27, 1991, June 22, 1992 and January 11, 1994 letters for further background on the issues raised in this review.

FINDINGS

The following sections provide background on the key issues concerning our analysis and summarize our findings.

1. Background

The WCRIBM filing is for rates to be effective August 1, 1999. An overall rate increase of 2.6% is proposed, based principally on loss experience for policy year 1996 and accident year 1997. Since the WCRIBM proposes a 2% residual market surcharge, this would result in a 2.4% increase in voluntary market rates and a 4.4% increase in residual market rates.

The WCRIBM filing is a comprehensive document which includes substantial analysis of issues relating to the determination of the rate level indication. While we have identified a number of issues relating to the filing, we should also note that the WCRIBM filing is significantly more thorough and comprehensive than industry workers compensation filings we typically see in other states. Analysis of Massachusetts workers compensation experience is complicated by the system/market changes that have occurred in recent years, and the WCRIBM has developed some sophisticated "state of the art" methodologies for use in its analysis of the workers compensation experience.

2. Reconciliation with Prior Filing

Exhibit 1 documents our estimate of the rate level indications which would have been expected for the 1999 WCRIBM filing based solely upon information contained in the previous WCRIBM filing. The previous filing indicated a decrease of 11.1% as of January 1, 1998 and a 21.1% decrease was approved as of February 14, 1998, leaving a residual rate level need of 12.7%. This figure is based upon the WCRIBM's methodologies and assumptions. Adjusting this residual need for an additional nineteen months of trend and subsequent benefit changes leads to an expectation of a 21.1% rate level increase for the 1999 filing. The 1999 filing presents rate level indications of +2.6%, implying that the 1999 rate level indication was about 15.3% lower than expected based on the prior filing.

This substantially better than expected rate indication is consistent with what was observed with recent WCRIBM filings. In these previous filings, the rate level indications were better than what one would have expected based on the prior year's filing. This observation is supported by Exhibit 1, Page 1 of Section VII-A of the WCRIBM filing (attached) which demonstrates that historical accident year results from 1991 to 1997 turned out to be significantly better than expected (i.e., the positive "deficiency" for these years indicates that the incurred losses do not exceed the permissible losses).

The unanticipated significant improvement in the indications does not appear to be due to any major change in the WCRIBM's ratemaking methodology. If anything, some of the ratemaking changes introduced by the WCRIBM reduce the degree of improvement implied by the experience.

Rather, the improvement appears to be due to factors affecting the system itself, such as underlying data, benefit changes, administrative changes, and changes in policy coverage. However, the filing does not identify the possible causes of the improving experience.

The following sections discuss the most significant issues associated with the filing.

3. Expenses

The WCRIBM made two specific changes with respect to expenses in the current filing.

- Other acquisition expenses are treated as fixed expenses. Previously they had been treated as variable expenses.

- The commission allowance has been adjusted to reflect the estimated impact of rate deviations. Prior WCRIBM filings had not considered the impact of deviations in this calculation.

The WCRIBM states that the change in the other acquisition expense methodology was made to reflect the impact of recent rate decreases; the filing states that these costs, as measured by policy count rather than premium, would be expected to remain about the same from one year to the next. While this may be a reasonable assumption, they do not provide any information on policy counts that would allow us to evaluate its reasonableness.

With respect to commissions, the WCRIBM makes several assumptions which are not supported within the filing. These include:

- A large deductible policy and a full coverage policy with the same net premium would incur the same dollar amount of commission.
- The increase in competition in the market has a tendency to increase commission rates.
- Dollars of commission per policy would not decrease proportionately with the February 1998 rate level change.
- Continued migration from the involuntary market would occur.

The direct impact of these two changes in the expense methodology, with respect to the indicated rate level change, is as follows.

1.	Proposed Rate Level Change	+2.6%
2.	Estimated Rate Level Change with:	
a.	Variable Other Acquisition Expense	+1.2%
b.	Fixed Other Acquisition Expense; No Competitive Effect on Commissions	+1.0%
c.	Fixed Other Acquisition Expense, No Competitive Effect on Commissions and No Deviation Adjustment	0.8%
d.	Variable Other Acquisition Expenses, No Competitive Effect on Commissions and No Deviation Adjustment	-0.6%

Thus the direct effect of the combined changes in the methodology increases the rate indications by about three points. This actually understates the impact of this change, as the increase in the expense provision also impacts other aspects of the filing, such as the profit calculation (i.e., shifting more dollars to expense increases (makes less negative) the indicated underwriting profit provision produced from the model).

Two other expense items that have a less significant impact are:

- **Loss Adjustment Expense (LAE) Loading** – This loading (as a percentage of losses) increased from 21% to 25.5% in the current filing. The 25.5% loading is based on an average of the three most recent years' results, while the prior filing relied on the latest two years to capture a change in trend. We note that the calendar year LAE percentage peaked in 1996 (at 28.0%) and decreased in 1997 to 25.8%. To the extent the reduction from 1996 to 1997 is representative of future trend, the LAE provision (and thus the rates) will be overstated.

- The loading for pool administrative expenses is unchanged from the prior filing. Although this has a minor impact on the indications, we would expect some reduction in this amount given that the pool is shrinking.

4. Classification Rates

The Bureau has made several significant changes in the derivation of classification rates.

- Updated the groupings of classes for the miscellaneous and goods and services industry groups.

- Expanded the years of data used in the classification analysis from three to five.

- Modified the credibility calculation.

- Proposed a 2% residual market surcharge

- Proposed a $100 loss constant for each classification

- Revised the expected loss rates (ELR's) and d-ratios used for experience rating.

A number of these items, such as the revised groupings of classes, had been proposed in prior filings but not approved. Most of these items do not affect the overall rate level but they do affect the allocation of costs by insured. Our observations on the above changes are as follows.

- **Updated Class Groupings** – The current proposal represents an expansion of a proposal submitted with the prior rate filing. About 45 classes were evaluated for the purposes of updating the groupings. Of the classes reviewed, the WCRIBM proposed to ungroup about twenty-five classes for the purpose of developing classification rates. The remaining classes would be regrouped (i.e., if there were four classes previously grouped and one class was proposed to be ungrouped, the remaining three would be grouped) or combined into new groupings (i.e., two previously ungrouped classes would be grouped). The revised groupings were based on a judgmental consideration of class size, similarity of risk profile to other classes in the grouping, class experience and class growth. The WCRIBM approach is not unreasonable, although it has the potential to magnify the impact of rate level changes for classes with better or worse than average experience relative to their prior groupings. This would be somewhat offset by the indicated rate level changes for classes which had been previously grouped with a better or worse than average class (i.e., ungrouping a class with higher losses, relative to those classes in its prior grouping, should have a favorable effect on the rate for the remaining classes).

- **Expanded Years of Data** – The WCRIBM expanded the number of years of data used in the classification rate analysis from three to five years. All things being equal this should increase the responsiveness of the calculation to Massachusetts experience since a longer experience period will generally produce more credible results. We note two limitations, however, with respect to the current filing.

- The experience period used is composite policy years 1990/91 to 1994/95. This experience is relatively dated for a 1999 filing. It also includes only three years of post Chapter 398 experience.

- The revised credibility approach adopted by the WCRIBM (see below) significantly limited the responsiveness to the inclusion of additional data.

- **Modified Credibility Calculation** – The WCRIBM updated the credibility calculations, which affect the weights placed on the various data components (Massachusetts relativity, countrywide relativity, and the relativity underlying current rates) in the calculation of the formula relativity for each class (which flows into the calculation of the individual class rate).

  Page 1084 of the filing (attached) lists some of the general features of the new credibility calculation. Overall this is a more refined calculation than is typically used in other states' rate filings. We note that there are some cross purposes in the general features (i.e., giving data from more recent years more credibility contradicts giving more credibility to data for more mature years (which are less recent).

  The overall effect of this proposed change is to reduce the credibilities associated with the Massachusetts and countrywide relativities and to place more weight on the relativities produced by the prior rates (i.e., it increases stability but reduces responsiveness). For example, there were a number of classes whose Massachusetts experience was considered 100% credible in the prior filing; the revised credibility method does not result in 100% credibility for Massachusetts experience for any class. Similarly, the indicated countrywide credibilities are generally reduced from the prior filing, so that the balance of credibility (which is assigned to the relativity underlying the present rate) is increased.

- **Residual Market Surcharge** – The WCRIBM has proposed a 2% surcharge on insureds in the assigned risk market. The historical loss ratio differential for the residual market (when it was much greater in size) is about 30% to 40%. Using the historical data, the WCRIBM derived an indicated surcharge of about 20%. The filed surcharge, 2%, was selected so as not to disrupt the market. At the proposed level, however, it would provide minimal incentive for insureds to move out of this market, to the extent they were able to.
  It has been our experience that a differential between voluntary and involuntary market rates is justified, as the distinctions between worse than average and better than average risks are not fully captured by the classification system and experience rating plans. However, it is also our experience that the magnitude of the appropriate differential between the voluntary and involuntary markets is a function of the size of two markets. This issue is not addressed in detail by the WCRIBM in its filing. When the involuntary market is relatively small (i.e., less than 10% of the total market), the indicated rate for the involuntary market is much higher than the market average, and the indicated voluntary market rate is just below the market average rate. As the involuntary market increases relative to the total market, the indicated involuntary market rate is closer to the total market average, and the indicated voluntary market rate is further away from the market average.

  Also, the WCRIBM does not explain how the differential will be implemented. For example, will it be implemented as an adjustment to base rates or as an adjustment to the experience rating plan? Depending on the method of implementation, other rating factors may require adjustment.

- **Loss Constant of $100** – The WCRIBM proposes to implement a loss constant of $100 for all risks. Their stated purpose is to reduce the level of subsidization of small firms by large firms. This is essentially an equity issue and has been the subject of prior filings. If this provision is not approved the indicated rate change would be about 1.5% higher than the proposed indications.

- **Modified ELR's and D-ratios** – In general, ELR's are expected to decrease more than rates, which, all things being equal, will tend to increase experience modification factors (mods). A key factor underlying this increase is the change in the expense assumptions (discussed above). If the expense loading had not changed as significantly, the ELR's for a number of classes would have remained stable or increased. This change has the most impact on individual insureds, particularly in classes where the rates increased but the ELR's decreased.

  D ratios (which are used to calculate primary losses in the mod calculation) increased (i.e., suggesting that an increasing proportion of losses are represented by claims valued at $5,000 or less). The impact of this change will vary by insured.

5. **Loss Development**

The WCRIBM filing takes historical reported (paid plus case) and paid losses by year at various evaluation points and develops those losses to an estimated ultimate value through the use of loss development factors.

There are five key observations with respect to the development factor analysis.

- The WCRIBM filing indicates improvement in loss development since the previous filing. This improvement applies to older policy/accident years that pre-date Chapter 398, which still comprise the majority of data in the development "triangles" (i.e., the post Chapter 398 experience represents less than 10% of the development data).

- The filing would be significantly enhanced by the inclusion of claim count data for both reported and closed claims, since a significant portion of the development data is compiled and analyzed on an individual carrier basis.

This would allow better analysis of trends in development due to:

- ✓ Changes in claims settlement rates
- ✓ Changes in case reserving practices.

Given the level of changes in the marketplace, some of the observed improvement in development patterns may be attributable to these factors.

Also, identifying the source of the shifts in observed loss development would better measure if there is a potential bias in the loss development factors used in the filing. If the observed improvement is an aberration, and will be reversed in future years, then the rate indications may be significantly understated. If the observed improvement is due to a systematic shift that will continue in future years, then the rate indications may be significantly overstated.

- Although the WCRIBM separately analyzes development data for the largest carriers, the rest of industry category increased significantly for this filing relative to the prior filing (about 50% currently versus about 35% previously). This appears to reflect changes in carriers' market shares. However, it limits the ability of the WCRIBM to analyze trends in the underlying data.

- The WCRIBM revised the tail factor calculation (which measures loss development beyond the 16th evaluation point) to rely on paid plus case losses, rather than incurred losses, which include IBNR reserves. This represents an improvement in the methodology in that the prior method is subject to distortion in that it is affected by the way carriers allocate their IBNR to state, line and year.

- Finally, the WCRIBM continues to adjust reported losses for the escalation of benefits. The escalation factors in the current filing (average 1.025) are about half the level of the prior filing (average 1.05) but still contribute about one to two points to the rate indication. We have questioned this methodology in previous reviews, and still question whether the methodology results in an overlap with the other aspects of the loss development methodology. (Inadequate reserves for claims subject to benefit escalation contribute to the loss development observed in the loss development data.). We also note that the Schedule Z data underlying the WCRIBM's analysis of the benefit escalation claims does not match the basic loss development data in terms of time period, and may result in adjustments that are inconsistent with the data.

6. Trend/Law Amendments

We have noted in previous reviews that the WCRIBM trend methodology can be distorted by major changes in historical benefit levels. Both the Chapter 572 and the Chapter 398 revisions still have a potentially distorting impact on the trend analysis.

In general, the trend methodology is similar to the prior rate filing. They use econometric models to estimate indemnity net trend (5.8%) and lost-time frequency (3.8%) trend. The lost-time frequency trend is combined with an external severity trend (1.3%) to derive a net medical trend (5.1%). They then select a slightly lower net trend (3.5% for accident year 1997 to policy year 1998 and 5% from policy year 1998 to the effective period). The net trend for 1999 and subsequent increased somewhat from the prior filing (3.8%).

We make the following observations on the trend methodology:

- The WCRIBM assumes that there will be no improvements in cost containment subsequent to 1998. While this may be reasonable, they do not provide evidence to support this assumption. To the extent this assumption is incorrect, the projected loss ratios (and consequently the rates) will be overstated.

- The simulation models used to evaluate the impact of the law changes have not been updated (with the exception of the wage distributions). These models have a significant impact on the rate change, particularly as they relate to Chapters 572 and 398. As we stated in our prior reviews, "If, in retrospect, the implementation of Chapter 572 had a more adverse impact on losses than was originally estimated, then the WCRIBM's trend estimates are probably overstated. If one assumes that the Chapter 572 revisions in retrospect were more costly than originally estimated, then the indicated trends would be "flatter or lower." Conversely, if the Chapter 398 benefit changes turn out in the future to produce lower costs than originally estimated, then the WCRIBM trend methodology will in the future produce trend indications that may prove to be understated.

The WCRIBM appears to recognize this issue in their evaluation of medical trends where they rely on external data, and state that "there is considerable doubt as to what the actual impact of these reform laws were." Although it may be too early to definitively restate the impact of Chapter 398, the impact of Chapter 572 could be more precisely measured. Conversely, the WCRIBM tests the sensitivity of the fitted trends to varying assumptions with respect to the impact of Chapter 398; they do not test the sensitivity of the model to various impacts of Chapter 572.

- Nearly thirty years are included in the fitted model. The model is highly sensitive to the number of years and the specific years used in the fit. The use of this amount of data increases the need to use appropriate adjustment factors; it may also be appropriate to consider the use of additional variables to reflect the impact of other factors over the modeled period. We note that, depending on the years chosen, the model could imply negative trend (for example if the most recent nine points, beginning in 1986, of the indemnity loss ratio were fitted).

7. Profit Provision

The underwriting profit provision decreased from –0.045 to –0.017. This reflects a decrease in investment yields, an increase in the expense ratio (which is paid out more quickly than losses) and a speed up in the payment patterns.

Although the direction of the change appears reasonable, the individual assumptions need further analysis. Had this provision remained unchanged, the indicated rate level change would have been –0.6%.

As we have noted previously, the WCRIBM filing recognizes in its profit model the loss of investment income associated with the payout of policyholder dividends. We cannot determine if this approach is consistent with the requirements of Chapter 398 that prohibit any provision for policyholder dividends in the filing. The inclusion of this provision by the WCRIBM increases the indications slightly. The WCRIBM's estimate of dividend payouts is based on long term historical experience, which may not be predictive of future dividend payouts given changes in dividend plans and profitability.

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It has been a pleasure to work on this report for the Council. Please give me a call to discuss any questions you may have after reviewing this report.

Sincerely,

Ann M. Conway cem

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AMC:cem

Exhibit 1

RECONCILIATION OF RATE REQUESTS
EFFECTIVE FEBRUARY 14, 1998
AND TO BE EFFECTIVE AUGUST 1, 1999

1. Proposed 1998 Rate Increase*	-11.1%
2. Approved 1998 Rate Increase*	-21.1%
3. Residual WCRIBM Rate Need in 1998	+12.7%
4. Adjustment based on 1998 WCRIBM Filing to develop 1999 WCRIBM Rate need:	
a. Inflation in Loss Costs	+12.1%
b. Inflation in Wages	-5.4%
c. Impact of Subsequent Law Amendments	+1.3%
5. Expected WCRIBM Rate Need in 1999 based on WCRIBM 1998 Rate Filing Documentation	+21.1%
6. Rate Change Proposed for 1999	2.6%
7. Difference Versus that Projected from 1998 Rate Filing Documentation	-15.3%

*Filing proposed 1/1/98 effective date, but was implemented on 2/14/98.

Massachusetts Workers' Compensation

Accident Year	Deficiency in Loss Provisions ($million)
1987	-288
1988	-347
1989	-320
1990	-208
1991	27
1992	411
1993	442
1994	435
1995	363
1996	344
1997	263

Source: Loss deficiency from Section VII-B, Exhibit 1.
Negative deficiency indicates that the incurred losses exceed the permissible losses.

MASSACHUSETTS WORKERS' COMPENSATION

CLASSIFICATION CREDIBILITIES

In estimating classification relativities (within Industry Group) weight is assigned to recent Massachusetts experience for that class, recent experience for that class in other states (so-called countrywide data) and the relativity underlying the current rate. These weights are referred to as credibilities.[1]

The Bureau has performed a new analysis of classification credibilities, as explained in the Supplement of this section.

The credibilities resulting from our calculations are shown in Section X-N.

The general features are as follows:

1. All other things being equal, larger volumes of data receive more credibility.
2. All other things being equal, a given volume of Massachusetts data receives more credibility than the same volume of data from another state.
3. All other things being equal, Massachusetts data from more recent years receives more credibility than Massachusetts data from less recent years.
4. All other things being equal, Massachusetts data from more mature years receive a little more credibility than Massachusetts data from less mature years.
5. All other things being equal, a given volume of data (as measured by expected losses) for serious losses receives less credibility than a similar volume of data for non-serious or medical losses.

An example of a very large class is 7219, Trucking. As can be seen, the most recent year of Massachusetts experience receives a lot of weight. For large classes the method is more responsive, while for smaller classes the method is more stable.

[1] It is important to note that a given change in credibilities usually has a much smaller impact on the estimated class relativity. This is the case since for most classes we are weighting together similar relativities from separate sources. Changing the weights used has a muted impact on the resulting weighted average. Thus, the goal in this section is to calculate a set of credibilities within this large range of reasonableness.