

INDEPENDENT STUDY OF INSURANCE TABLES

**WASHINGTON STATE DEPARTMENT OF
LABOR & INDUSTRIES**

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Executive Summary

Oliver Wyman has reviewed Washington State Department of Labor & Industries (L&I's) work in revising the Insurance Tables and offers the following key conclusions:

Key Findings

1. L&I's revisions to the Actuarial Tables, including the hazard group assignments, change to the maximum loss ratio, and revised single loss limitations are reasonable and appropriate.
2. The selected Expected Loss Ratio Factors, Premium Administration Expense Factor and Loss Adjustment Expense Factors are reasonable and appropriate.
3. The revisions to the Tables will affect different Entities in different ways, although on an overall basis the revised tables will have no impact on retro premiums.
4. Based on L&I's assumptions (see caveat, below), most Entities will realize a decreased refund/increased assessment. This is offset by a limited number of Entities that will see an increased refund or decreased assessment. We note however that many of the differences are quite small.
5. The previous implementation of Hazard Groups has increased the equity of the Retro Program.

Recommendations

1. The Washington Administrative Code (WACs) should be revised to require all Entities¹ to take a minimum amount of downside risk. L&I's Chief Actuary believed that this number was intended to be 5%; otherwise the potential for Entities to lock in gains without risk will exist. All calculations done by L&I and reviewed by Oliver Wyman assume that this 5% rule will be in place.
2. L&I should consider requiring Entities to take even more than a 5% risk. A higher requirement would further encourage employers to make their workplaces safer.
3. L&I should consider increasing the minimum premium required for Entities to participate in the retro program.
4. L&I should consider revising the Tables to EXCLUDE non-optimal choices. For example, large Entities choosing a minimum loss ratio above 0% may experience no savings for doing so and should not be allowed to surrender a potential gain without realizing a premium savings.

¹ An Entity is either a single company participating in the Retro Program, or a Retro Group, as described in Washington WAC 296-17B-010

5. As we have noted in the past, further work should be done to determine whether the equity of the program would benefit from adding a fourth or fifth review to the three that are currently done.

Caveat

In order to understand the changes, assumptions were made by L&I regarding what parameters Entities would select under the revised Actuarial Tables. The ultimate accuracy of these assumptions affects any conclusions on how the overall refunds/assessments are distributed.

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Background

Engagement Scope

Oliver Wyman's work was guided by the engagement scope as repeated below. The analysis presented in this documentation responds to the first five points, as outlined in the Scope Document. (No response was required for the remaining points.)

1. Review proposed 2016 table of risk classification assignments to the nine hazard groupings.
2. Review proposed 2016 actuarial retrospective rating tables:
 - Insurance charge/savings.
 - Premium size groups.
 - Retrospective rating factors.
 - Expected loss ratio factors per fund.
 - Premium administration expense factor.
 - Loss adjustment expense factor.
3. Review proposed 2016 largest minimum loss ratios and the smallest maximum loss ratios used in the Retrospective Rating Insurance Charge Tables.
4. Review proposed 2016 minimum premium to participate as an Individual member.
5. Review the experience of 2011 and 2012 enrollments to see whether the use of hazard groups and increasing the number of development factors from the previous 5 factors used prior to 2008 have together improved the accuracy and fairness of Retrospective Rating.
6. Submit ongoing status reports via email every two weeks explaining work completed in relation to the total. Status reports should be brief and quantify progress toward completion of the deliverables, address barriers and summarize next steps.
7. Be available during the term of the Contract in order to present the findings as L&I may require. Presentations may require developing and providing, relevant to the audience, materials related to this Contract.
8. Be responsible for providing a final oral presentation(s) to L&I's staff and Executive Management and other appropriate staff and stakeholders as requested.

9. Be available to present findings to others outside L&I upon request with reasonable advance notice.

The review done by Oliver Wyman is in support of the statutory requirement in WAC 296-17B-010 which states in part:

“The department will evaluate and if necessary update the tables beginning at WAC 296-17B-910 every five years.”

The goal of these updates is also defined statutorily:

“...determine whether the results are consistent with the expectation of improved fairness in the distribution of the retrospective rating refunds among participants”.

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Oliver Wyman's Review

Risk Classification Assignments to the Nine Hazard Groupings

Introduction

The following are key steps in the process used to update the retrospective rating tables:

1. Assignment of Classifications to Hazard Groups
2. Assignment of a Hazard Group to an Account
3. Determination of the Severity Distribution by Hazard Group for Insurance Charges
4. Frequency Modeling
5. Table of Insurance Charges

Each of these steps is discussed individually in the following paragraphs.

Assignment of Classifications to Hazard Groups

Hazard grouping refers to the placement of each of the roughly 300 individual employee risk classifications into one of nine hazard groups. Placement into a specific hazard group is a reflection of the relative likelihood of a large claim. Employee risk classifications in hazard group 1 have a very low likelihood of a large claim, while placement into hazard group 9 indicates a very high likelihood of a large claim. The likelihood of a large claim is measured by the expected portion of total loss experience for a specific classification above various limits as well as the portion of the total loss experience for the classification expected to result in serious claims (these are the higher cost workers compensation claims).

The process utilizes various credibility (weighting mechanisms) as well as smoothing techniques to reduce volatility in results and better categorize lower risk classifications that have minimum excess loss experience.

The process utilized claims data with dates of loss occurring between January 1, 2001 and December 31, 2010; however all claims that occurred in 2008 were excluded. Data from fiscal years 2002 through 2006 was utilized to create the current mapping. Given that five years has passed since the design of the current tables, additional data from more recent years is now available.

Data from 2008 was excluded due to the impact of the economic disruption, at that time, on workers compensation claims experience. The impact on workers compensation claims experience, at that time, was generally a countrywide phenomenon where claim frequency decreased materially, and claim severity, or claim cost, increased materially. Generally, this was thought to be the result of employees avoiding filing claims due to concerns regarding job security. However, this impacted less costly/serious claims. More severe injuries, by definition, had to be reported. The result was a material change in claim mix, where the proportion of higher cost claims increased.

Given that the mix of claims is the primary determining factor to severity distributions, and severity distributions are key components to hazard grouping and the calculation of the table of insurance charges, the decision was made by the L&I actuaries to exclude data from this time period. Other concerns expressed by L&I included the change in the distribution of workplace exposure during that time, such as the large decrease in construction activity.

Classifications were ranked by likelihood of large losses. Hazard groups were partitioned in a manner such that the expected losses for each hazard group were approximately equal. Care was given to the impact of including or excluding a specific classification at the partition point.

Additional consideration was given towards classifications exhibiting large shifts in hazard grouping, in which case manual adjustments were made to reduce the change. Changes in hazard group by one unit in either direction (i.e. from Hazard Group 5 to Hazard Group 4 or Hazard Group 6) are not considered material.

Note that despite using significantly more new data, as well as older data that is five years more mature than when the original hazard grouping was constructed, more than 50% of the classifications exhibited no change, and 90% of classifications changed by a maximum of one unit either way.

Data from all accounts, not just retrospectively rated accounts, was used in this process, subject to certain minimum size requirements². This was reasonable, and necessary. The expectation is that the size of a specific claim will depend primarily on the underlying employment hazard, not the underlying insurance program. More importantly, data volume at relatively high claim values is very low. Use of statewide data significantly increases data volume and overall credibility.

Oliver Wyman reviewed the process, the spreadsheets, judgments and assumptions. They are reasonable and actuarially sound.

² Accounts with less than \$5,000 in pure premiums were excluded, as were individual claims less than \$10.

Assignment of Hazard Group to Account

Using the hazard grouping from the prior step, claims data was separated by hazard group. A series of mathematical curves were calculated using various statistics to ensure that the calculated curves were the best representation of empirical data. The end result is nine severity distributions (that is, claim cost probability distributions). The nine distributions are termed interim because they are only the first step towards determining the severity distributions that will be actually used to determine the table of insurance charges. The only purpose of the interim distributions is to assign a hazard group index to each hazard group. The index is the relative proportion of losses in each hazard group above \$550,000. Hazard Group 6 is assigned an index of 1.00. Hazard Groups less than 6 have indices less than 1.00 because by definition, the proportion of losses greater than \$550,000 decreases by Hazard Group below Hazard Group 6, and increases by Hazard Group for Hazard Groups above 6.

The indices are used to determine the hazard group index for every retro account. Depending on the value of the average index, each account is assigned a hazard group. The assigned hazard group by account determines the hazard group of every claim in the data base generated by that account.

Each claim under consideration is now associated with a specific hazard group, based on the hazard group index that generated the claim.

Based on data provided by L&I, only three Retro Entities would see their new hazard group differ by more than one hazard group from their old hazard group; the Entities that did not move more than one hazard group are responsible for over 99.6% of the standard premium and over 90% would have the same hazard group that they have today.

Severity Distributions for Insurance Charge Determination

Using the re-categorized data, a second series of mathematical curves were calculated using a process identical to the one that generated the interim distributions. The end result is nine severity distributions. The resulting severity distributions are used to determine the insurance charges. The reason for this step, which is identical to the process used to create the current tables, is that distributions based on claims data mapped to hazard groups based on the hazard group of the generating account, as opposed to the risk classification of the generating employee, may contain additional information that differentiates accounts by hazard group. Since insurance charges are calculated by account this approach will capture this additional information.

The resulting severity distributions are very similar to the original distributions used to determine the hazard group indices.

Review Proposed 2016 Actuarial Retrospective Rating Tables

Insurance Charge/Savings

Frequency Modeling

There are two key components to generating the table of insurance charge:

- The first is a series of severity distributions by hazard group, discussed previously.
- The second is a series of frequency, or claim occurrence distributions by size of account, and by hazard group.

Insurance charges depend on the severity distribution (that is, the likelihood of a large claim), the hazard group of the account, as well as the size of the account. The severity distribution describes the likelihood of large claims. The hazard group, besides determining the appropriate severity distribution to use, also impacts claim occurrence for equal sized employers.

Given two employers of equal size, the lower hazard employer will generate more claims, and therefore have more predictable experience than the higher hazard employer. However, account size also directly affects claim occurrence. Larger accounts generate a larger number of claims; this makes the loss experience more predictable and lowers the insurance charge.

Given two employers, identical in every respect except that one employer is 10 times the size of the other, the larger employer will have significantly more predictable loss experience (through the law of large numbers) than the smaller employer, and will have a much smaller insurance charge (as a percentage of standard premium).

The final product for the frequency distribution is materially different from the final product for the severity distribution. There are nine different severity distributions, one for each hazard group. Each hazard group's severity distribution is based on a detailed analysis of claim data specific to that hazard group. Ranges of claims sizes were examined separately, as was data by type of claim and benefit. The final product as respects claim frequency is 666 frequency distributions, one for each combination of size (74) and hazard group (9). Note that per occurrence limits do not affect frequency distributions. Only employer size and hazard group impact frequency distribution.

The approach this year is somewhat different than the approach taken when the tables were first created in 2008. In the prior exercise, frequency distributions were created using empirical data in a manner very similar to the fitting of the severity distributions. The selected frequency distributions and the account based severity distributions were then combined via a mathematical model to generate the various tables required. That approach was initially taken this year. However, the results were not satisfactory in that

the results of the process were not sufficiently similar to the empirical data. The approach was changed so that the frequency distributions were created not by directly modeling frequency data; rather, the frequency models were created by selecting frequency distributions that generated results that best fit the final distribution of loss ratios generated by the mathematical model. The basic frequency distribution used is a negative binomial, which was also used to generate the current tables.

Table of Insurance Charges

Insurance charges represent the expected portion of total costs above a specified maximum amount for a given account. Likewise, insurance savings is the expected portion of total costs below a specified minimum amount for an account. The insurance charge incorporates both the potential for the number of claims to be greater than expected, as well as for the average cost of those claims to be greater than expected. Insurance charges for a specific size group and hazard group must be calculated separately for each per occurrence limit. Election of a per occurrence limit (Single Loss Limitation) reduces the impact of individual claims on the overall losses that enter the retrospective rating calculation for the Entity. Therefore, insurance charges for a specific size group and hazard group will be lower when occurrences are limited to \$250,000 than when occurrences are limited to \$500,000, or when no limit is selected. The following table shows the current and the proposed Single Loss Limitations options.

| Present Options | Proposed Options |
|------------------------|-------------------------|
| \$120,000 | \$160,000 |
| \$250,000 | \$275,000 |
| \$500,000 | \$380,000 |
| \$1,000,000 | \$550,000 |
| Unlimited | \$800,000 |
| | Unlimited |

As with the current tables, a mathematical estimation approach called Heckman-Meyers³ was used to generate the tables of insurance charges.

We believe that the methodology selected by L&I, and the results from that methodology are both reasonable.

³ The Calculation of Aggregate Loss Distributions from Claim Severity and Claim Count Distributions
Philip E. Heckman and Glenn G. Meyers
PCAS LXX 1983

Premium size groups

The premium size groups are indexed to the rate changes made by L&I. The same 74 size groups, indexed for these rate changes, have existed for many years. It should be noted that for purposes of their analysis, L&I actuarial staff combines size groups, initially to form 15 groups of equal size. Due to the heterogeneity of the largest size groups, and the inclusion of Retro Group data⁴, the two largest groups are split in half to produce 17 size groups.

The combination of size groups for this analysis is appropriate, as are the resulting 74 size groups. As we discuss in a subsequent section, there are administrative concerns surrounding the continued participation of the smallest size groups in the Retro Program.

Retrospective rating factors**Expected loss ratio factors per fund**

The Expected Loss Ratio Factors (ELRFs)⁵ are defined in the Washington Administrative Code (WACs) as

“(a) factor applied to case incurred loss amounts of claims and discounted loss development factors so that the ratio of discounted developed loss to standard premiums for the entire state fund used in the actuarial calculations equals the expected loss ratios.”

Separate ELRFs are applied to the Accident Fund and Medical Aid Fund. The purpose of the ELRFs is to keep the loss ratios at similar levels if L&I changes one fund’s rates in a significantly different manner than the other.

The ELRFs are one of three factors that are applied to case incurred losses in order to determine the final incurred losses (subject to capping) in the retro refund calculation.

The formula is as follows:

$$\begin{array}{r} \text{Case Incurred Losses} \\ \times \\ \text{Loss Development Factors (which differ by Type of Loss)} \\ \times \\ \text{Expected Loss Rating Factors (ELRF)} \\ \times \\ \text{Performance Adjustment Factors (PAF)} \end{array}$$

⁴ For employers participating in Retro Groups, their data was used twice in this process, both for the individual employer and for the Retro Group. This allowed for greater credibility for larger Size Groups. Since adjustments are done at the Retro Group level, this also meant that the group data would appropriately contribute to the savings/charges factors for these Retro Groups.

⁵ WAC 296-17B-830

As such, any change to these factors will impact each Entity’s ultimate Retro Refund.

It is important to understand that the ELRF and the PAF will generally move in opposite directions; as the ELRF rises, the PAF will fall if everything else is held equal.

L&I is proposing the following changes to the Expected Loss Ratio Factors (ELRFs):

| | Accident Fund (AF) | Medical Aid Fund (MF) | Ratio AF to MAF |
|----------|--------------------|-----------------------|-----------------|
| Present | 81.2% | 88.0% | 92.3% |
| Proposed | 76.6% | 88.0% | 87.0% |

The change will reduce the ratio between the ELRF’s from 92.3% to 87.0%, which is in accord with the latest rate changes in Washington. As such, we opine that this change is reasonable.

Premium administration expense factor

The premium administration expense factor calculates non-claim insurance expenses that have occurred within each coverage period. As such, this factor reduces the potential retro refunds to cover other expenses that need to be considered prior to awarding a refund.

L&I is proposing the following change to the Premium Adjustment Expense factor:

| | |
|----------|------|
| Present | 4.8% |
| Proposed | 4.3% |

The factor change is based on three years (2013-2015) of financial data prepared by L&I.

| <u>Fiscal Year</u> | <u>Premiums</u> | <u>Other expense</u> | <u>Other income</u> | <u>Other expense net of other income</u> | <u>Net other expense ratio</u> |
|--------------------|----------------------|----------------------|---------------------|--|--------------------------------|
| 2013 | 1,718,318,826 | 128,408,000 | 48,898,000 | 79,510,000 | 4.6% |
| 2014 | 1,833,141,161 | 127,932,000 | 54,814,000 | 73,118,000 | 4.0% |
| 2015 | 1,985,901,091 | 141,134,000 | 54,853,000 | 86,281,000 | 4.3% |
| | 5,537,361,078 | 397,474,000 | 158,565,000 | 238,909,000 | 4.3% |
| | | | | Selected | 4.3% |

Over the three-year period the expense ratios have ranged from 4.0% in 2014 to 4.6% in 2013. The 2015 ratio of 4.3% falls in between those figures and also produces a three-year average of 4.3%, which was selected by L&I.

The calculation is straight-forward, is consistent with similar calculations in prior periods (the most recent calculation used 2007-2009 data) and appears to be appropriate for the purpose as used in the Retrospective Rating calculations. As such, we accept L&I's judgment on this factor.

Loss adjustment expense factor

The Loss Adjustment Expense factor (also referred to by L&I as the Claim Administration Expense factor) covers the cost of administering all claims reported to L&I. As such, this factor reduces the potential retro refunds to cover claim administration expenses that need to be considered prior to awarding a refund.

L&I is proposing the following changes to the Loss (Claim) Adjustment Expense factor:

| | |
|----------|------|
| Present | 8.5% |
| Proposed | 9.0% |

The factor change is based on ten years (2006-2015) of financial data prepared by L&I.

Claims Administrative Expense to Losses Incurred

| Fiscal Year | (Accident+State Fund Pensions) Losses Incurred | Medical Aid Losses Incurred | Total State Fund Losses Incurred | Accident CAE Incurred | Medical Aid CAE Incurred | Total State Fund CAE Incurred | CAE to Losses Incurred |
|-------------|--|-----------------------------|----------------------------------|-----------------------|--------------------------|-------------------------------------|------------------------|
| 2006 | 757,407 | 560,029 | 1,317,436 | 56,352 | 85,280 | 141,631 | 10.8% |
| 2007 | 954,575 | 750,117 | 1,704,692 | 56,510 | 82,548 | 139,058 | 8.2% |
| 2008 | 1,088,133 | 666,215 | 1,754,349 | 57,020 | 86,883 | 143,903 | 8.2% |
| 2009 | 1,448,461 | 792,240 | 2,240,701 | 65,000 | 101,888 | 166,888 | 7.4% |
| 2010 | 1,350,328 | 629,810 | 1,980,138 | 58,759 | 89,487 | 148,246 | 7.5% |
| 2011 | 866,516 | 645,202 | 1,511,718 | 59,523 | 92,758 | 152,281 | 10.1% |
| 2012 | 1,043,507 | 767,609 | 1,811,115 | 72,547 | 109,233 | 181,779 | 10.0% |
| 2013 | 1,213,536 | 897,912 | 2,111,448 | 53,650 | 98,528 | 152,178 | 7.2% |
| 2014 | 1,339,182 | 678,616 | 2,017,798 | 58,498 | 103,396 | 161,894 | 8.0% |
| 2015 | 1,261,274 | 487,767 | 1,749,041 | 77,576 | 127,734 | 205,310 | 11.7% |
| | | | | | | Ten Year Average Selected CAE Ratio | 8.9% |
| | | | | | | | 9.0% |

Over the ten-year period the expense ratios have ranged from 7.2% in 2013 to 11.7% in 2015. The average of the ten expense ratios is 8.9%; L&I has selected a factor of 9.0%.

This calculation is also straight-forward, is consistent with similar calculations in prior periods (the most recent calculation used 2000-2009 data) and is appropriate for the purpose as used in the Retrospective Rating calculations.

We note that the Five Year Average is 9.4% and that this ratio has been at least 10% in three of the last five years. While it could be reasonable to select a slightly higher factor based on the shorter-term results, the judgment used by L&I is supportable and reasonable.

As such, we accept L&I's judgment on this factor.

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Review proposed 2016 largest minimum loss ratios and smallest maximum loss ratios

Under the current plan, insureds are allowed to select multiple parameters, which subject to some limitation are the following:

- Plan type: Premium-based or Loss-based
- Minimum Loss Ratio (between 0% and 60%)
- Maximum Loss Ratio (between 30% and 160%, but at least 10% greater than the Minimum Loss Ratio)⁶
- Single Loss Limitation (one of the following five values: \$120,000, \$250,000, \$500,000, \$1,000,000 or unlimited)

L&I will continue to offer premium-based and loss-based plans and will also continue to allow risks to select Minimum Loss Ratios between 0% and 60%.

However, L&I is proposing to revise the Maximum Loss Ratio as follows:

- Maximum Loss Ratio (between 40% and 160%, but at least 20% greater than the Minimum Loss Ratio)⁷

From our discussions with L&I, the increase in the smallest Maximum Loss Ratio (from 30% to 40%) and the increase in the minimum width of risk (from 10% to 20%) will have the desired effect of requiring these Entities to assume additional financial responsibility should they wish to participate in the Retro program.

L&I is also proposing to change the single loss limits (SLLs), as shown in the following table:

| Present Options | Proposed Options |
|-----------------|------------------|
| \$120,000 | \$160,000 |
| \$250,000 | \$275,000 |
| \$500,000 | \$380,000 |
| | \$550,000 |
| \$1,000,000 | \$800,000 |
| Unlimited | Unlimited |

As a result of this change, the number of SLL options will increase from five to six, subject to the existing limitations based on standard premium.

⁶ WAC 296-17B-300 (3)(b) & WAC 296-17B-300 (3)(d)

⁷ This would require revisions to both WAC 296-17B-300 (3)(b) & WAC 296-17B-300 (3)(d)

If you wish to select a single loss occurrence limit other than unlimited, the four most recent quarters of standard premiums must be at least twice the limit chosen. For example, you can only choose a single loss occurrence limit of two hundred fifty thousand dollars if your standard premiums in the four most recent calendar quarters were at least five hundred thousand dollars.⁸

Due to the change in options, every Entity that previously had a single loss limit will see a change in their SLL. For certain smaller Entities (those with annual standard premium of at least \$240,000 but less than \$320,000) the option to purchase a SLL would no longer be available. However for Entities with at least \$760,000 of standard premium, the change in limits would provide additional options for Entities. This is summarized in the following table:

| Standard Premium from Previous 4 Quarters | Current SLL Options | Proposed SLL Options |
|--|--|---|
| Under \$240,000 | Unlimited Only | Unlimited Only |
| \$240K-\$320K | \$120K or Unlimited | Unlimited Only |
| \$320K-\$500K | \$120K or Unlimited | \$160K or Unlimited |
| \$500K-\$550K | \$120K, \$250K or Unlimited | \$160K or Unlimited |
| \$550K-\$760K | \$120K, \$250K or Unlimited | \$160K, \$275K or Unlimited |
| \$760K-\$1,000K | \$120K, \$250K or Unlimited | \$160K, \$275K, \$380K or Unlimited |
| \$1,000K-\$1,100K | \$120K, \$250K, \$500K or Unlimited | \$160K, \$275K, \$380K or Unlimited |
| \$1,100K-\$1,600K | \$120K, \$250K, \$500K or Unlimited | \$160K, \$275K, \$380K, \$550K or Unlimited |
| \$1,600K-\$2,000K | \$120K, \$250K, \$500K or Unlimited | \$160K, \$275K, \$380K, \$550K, 800K or Unlimited |
| Over \$2,000K | \$120K, \$250K, \$500K, \$1000K or Unlimited | \$160K, \$275K, \$380K, \$550K, 800K or Unlimited |

From our discussions with L&I, the increase in the lowest SLL (from \$120,000 to \$160,000) will have the desired effect of requiring these Entities to assume more financial responsibility for each claimant's injury and care. The increase from \$250,000 to \$275,000 and from \$500,000 to \$550,000 was chosen by L&I to be roughly in line with inflation over the past five years. L&I is also proposing to introduce a \$380,000 SLL. This limit is designed to give another option for Entities, primarily those currently at either the \$250,000 or \$500,000 SLL.

⁸ WAC 296-17B-300 (3)(a)

L&I has proposed decreasing the highest available SLL from \$1,000,000 to \$800,000. We note that under the present table the charge to limit the losses to \$1,000,000 was generally very small and that the proposed \$800,000 limit will have a higher charge associated with it. Under the present tables, the \$1,000,000 SLL was 100% higher than the next highest limitation (\$500,000); under the proposed tables, the \$800,000 limitation will be only 45% higher than the next highest limitation (\$550,000). The smaller gap may entice more Entities to select the higher limit.

It should be understood that given the parameters that exist, the number of potential combinations that Entities might select is seemingly endless. Even if the Minimum Loss Ratio and Maximum Loss Ratio are restricted to whole percentages (20%, 48%, 75%, etc.), there are 7,171 valid combinations of just these two parameters, which then need to be considered alongside two plan types and, under L&I's proposal, six Single Loss Limitations. The program actually allows for Minimum Loss Ratios and Maximum Loss Ratios to be selected in hundredths of percentage points (19.40%, 31.42%, 99.44%, etc.)

Underwriting Considerations

Oliver Wyman has been advised by L&I that the following two underwriting rules will be in place on a going-forward basis:

1. The highest possible retrospective premiums cannot be more than twice the standard premiums, assuming a performance adjustment factor of 1.0 and the same size and hazard groups as your most recent coverage period. This provision currently exists as *WAC 296-17B-300 (3)(c)*
2. The highest possible retrospective premiums must be at least 105% the standard premium, assuming a performance adjustment factor of 1.0 and the same size and hazard groups as your most recent coverage period. A version of this underwriting rule was implied by prior WACs, but these were removed when the Tables were updated in 2011.

These rules could be viewed in combination as saying:

The highest possible retrospective premiums must be between 105% and 200% of standard premiums, assuming a performance adjustment factor of 1.0 and the same size and hazard groups as your most recent coverage period.

The existing rule limits the highest retrospective premium to 200% of standard premium (an assessment of 100%). The rule is relatively straight-forward and is designed to limit L&I's uncollected assessments should an Entity be unable or unwilling to pay.

The rule requiring a potential assessment of at least 5% merits further discussion. The purpose of the rule is to require Entities to have the potential for at least a 5% loss (as an example, an Entity with \$1,000,000 of standard premium would face the potential that poor experience would lead to an assessment of at least \$50,000); no set of parameters would be allowed that did not provide for at least this possibility. This is keeping in line

with Retro being a safety incentive program. While there is an incentive that better safety will lead to larger refunds, the program should also require that all Entities assume a minimum level of risk to ensure that Entities with greater than expected loss experience will pay a minimum assessment.

The 5% requirement is consistent with historical practice; however, we recommend that the Department consider raising this requirement in the future. A higher requirement would further encourage employers to make their workplaces safer.

It is important to understand that while plan parameters (type of plan, minimum loss ratio, maximum loss ratio, and single loss limitation) are selected by the entity and fixed during the annual enrollment period, plans are selected based on expected hazard group and expected risk size. L&I does not calculate the actual hazard group and actual risk size until the time of the first adjustment. Because of that, it is possible that the indicated ultimate maximum assessment could fall outside of these bands due to changes in hazard group, risk size or both.

All else being equal:

Moving an Entity to a lower hazard group⁹ will DECREASE the maximum assessment in both dollars and percentage;

A higher standard premium will INCREASE the maximum assessment in dollars, but if it results in the Entity moving to a different size group¹⁰, will DECREASE the maximum assessment percentage.

In either case (or both), this could cause the indicated highest possible retrospective premium to fall below 105% of standard premium. L&I would need to further qualify their rules to determine whether an Entity that is subject to the maximum assessment would be required to pay an assessment of at least 5%.

Similar examples exist today, and will continue to exist at the high-end of the range. Increasing the hazard group and decreasing the standard premium will INCREASE (at least on a percentage basis) retrospective premiums, including the highest possible retrospective premiums. However, the rules would limit that maximum to 200% of standard premium, even if the results indicated a higher assessment.

A set of examples will further clarify these points.

⁹ Since Hazard Groups are calculated on an average basis, it is relatively simple for Entities to straddle the line between two hazard groups, leading an Entity to expect to be in hazard group 3 at enrollment but to ultimately be rated as hazard group 4 (for example).

¹⁰ With 74 Size Groups, Entities, particular smaller ones, can move several size groups from the estimate expected at enrollment to the standard premium that eventually determines their Size Group.

Example: Consider an Entity with \$800,000 of expected standard premium that is expected to be in Hazard Group 3 and selects the following parameters at enrollment:

| |
|---------------------------|
| Premium-Based Program |
| Minimum Loss Ratio : 35% |
| Maximum Loss Ratio: 55% |
| No Single Loss Limitation |

Based on their expected standard premium, this Entity would be expected to be in Size Group 60. The maximum retro premium is \$841,040, which is *105.1% of standard premium, and satisfies the rules of the program.*

However, should the actual standard premium be \$825,000 the Entity would be rated in Size Group 61. As a result, the indicated maximum retro premium would be \$864,353, which is 104.8% of standard premium, which is below the 105% requirement.

Example: Consider an Entity with \$600,000 of expected standard premium that is expected to be in Hazard Group 8 and selects the following parameters at enrollment:

| |
|----------------------------------|
| Loss-Based Program |
| Minimum Loss Ratio : 20% |
| Maximum Loss Ratio: 130% |
| \$275,000 Single Loss Limitation |

The maximum retro premium is \$1,160,137, which is *193.36% of standard premium, and satisfies the rules of the program.*

However, should the Entity's actual distribution of standard premium cause the hazard group to be Hazard Group 9, the indicated maximum retro premium would be \$1,212,084, which is 202.01% of standard premium, which is above the 200% requirement.

In this case, the Entity would be limited to the maximum retro premium of \$1,200,000.

While the 200% possibility is currently defined clearly in the rules, additional clarification would be needed to cover situations where changes in the risk profile produce the possibility of a maximum retrospective premium that is less than 105% of standard premium.

Importance of this rule with regards to calculations performed by L&I

In order to further study the Table changes, L&I staff prepared a series of spreadsheets that calculated the percentage changes to previous results that would have occurred if the new Tables had been used.

The purpose of these spreadsheets was to calculate the change in refund/assessment for each retro Entity, in order to better understand the impact of these changes.

It is important to understand that from L&I's perspective, the change in Tables is a revenue-neutral event. The table changes will impact the Performance Adjustment Factor (PAF) but after these new tables are in place, the resulting refund/assessment, in aggregate, will be unchanged.

L&I performed these calculations in two steps.

First, the Tables were substituted and the calculations were re-run. This step produced some significant changes, which was expected, since there are significant differences between the present tables and the proposed tables.

Second, the Tables were balanced, using recalculated PAFs and parameters selected by L&I for each Entity that would satisfy the 105% to 200% maximum possible retrospective premium band.

This second step only makes sense if the 105% to 200% maximum possible retrospective premium band exists going forward. The effect of these table changes was significant for some Entities as their previous plan selections were deemed invalid under the new tables.

The Entities that were most affected by this calculation were those Entities that were taking relatively little risk – in essence they were over-insuring themselves. As a result, their insurance charges were quite high, reducing their refund. The revised tables required these Entities to take additional risk, and in general they were rewarded for it, as their significant reduction in insurance charges increased their refunds (or reduced their assessments).

Examples of these changes in insurance charges are shown below:

| Entity | Present Maximum Loss Ratio | Revised Maximum Loss Ratio | Change in Risk Charge |
|-------------|----------------------------|----------------------------|-----------------------|
| A (premium) | 89% | 97% | -71% |
| B (premium) | 79% | 91% | -67% |
| C (loss) | 77% | 94% | -89% |
| D (loss) | 78% | 94% | -88% |

In all four cases, the Entities were rewarded for taking additional risk, as the change in tables required them to do in order to have a valid program. Even if the Entities had exceeded their Present Maximum Loss Ratio the savings that they would have received from increasing the maximum loss ratio would have offset, to some degree, their extra exposure to loss.

It should be understood that there are many ways that Entities will react to the change in the tables; among them, Entities could do nothing (effectively taking less risk than had previously), they could attempt to replicate their maximum exposure, change their single loss limitation, or some combination of the above.

For the purpose of this examination L&I attempted to make selections that left the percentage at risk (i.e. the maximum assessment percentage) unchanged. For example, larger Entities that choose the same parameters under the proposed tables will take significantly less risk than under the present tables, all else being equal. Of course, only after the new Tables are in place will it be known what parameters each retro Entity will actually select.

Consider the following Entities – each was attempting to limit their maximum assessment to approximately 10%. For simplicity, we assumed that each risk is in Hazard Group 5, selected a 20% minimum loss ratio and selected no Single Loss Limitation.

| 2014 Program | | | | |
|---|-----------------------|---------------------------------|-----------------------|-------------------|
| Standard Premium | Max Loss Ratio | Losses at Max Assessment | Max Assessment | Max Refund |
| \$100,000 | 0.40 | \$42,800 | (\$10,100) | \$11,300 |
| \$250,000 | 0.48 | \$128,400 | (\$24,850) | \$50,050 |
| \$1,200,000 | 0.57 | \$731,880 | (\$120,313) | \$699,343 |
| \$5,000,000 | 0.73 | \$3,905,500 | (\$505,786) | \$3,317,319 |
| 2016 Program With Same Selections | | | | |
| Standard Premium | Max Loss Ratio | Losses at Max Assessment | Max Assessment | Max Refund |
| \$100,000 | 0.40 | \$43,600 | (\$11,710) | \$10,090 |
| \$250,000 | 0.48 | \$130,800 | (\$29,000) | \$47,300 |
| \$1,200,000 | 0.57 | \$745,560 | (\$126,060) | \$701,221 |
| \$5,000,000 | 0.73 | \$3,978,500 | (\$191,308) | \$3,421,628 |
| 2016 Program With 10% Risk and 20 point Minimum/Maximum Difference | | | | |
| Standard Premium | Max Loss Ratio | Losses at Max Assessment | Max Assessment | Max Refund |
| \$100,000 | 0.40 | \$43,660 | (\$11,710) | \$10,090 |
| \$250,000 | 0.45 | \$122,625 | (\$25,275) | \$42,850 |
| \$1,200,000 | 0.56 | \$732,480 | (\$121,051) | \$694,864 |
| \$5,000,000 | 0.87 | \$4,741,500 | (\$498,453) | \$3,570,413 |

In the top section of the table, we are calculating results based on 2014 parameters, as shown in L&I's Retro calculator. Each Entity has been assigned a maximum loss ratio

that limits their maximum assessment to approximately 10% (for simplicity, we are using only whole percentages).

In the middle section of the table, we are calculating results based on 2016 parameters, as shown in L&I's revised Retro calculator. Each Entity has been assigned the same maximum loss ratio that they were using in 2014.

The change from the prior tables to the proposed tables has the following effects:

- For the smaller Entities (\$100,000 and \$250,000 of standard premium) the maximum assessments have increased (to approximately 12%) while the maximum refund has decreased by about 10% and 6% respectively.
- For the \$1,200,000 standard premium Entity, the results are very similar to the 2014 program.
- For the \$5,000,000 standard premium Entity, the maximum assessment has decreased by over 60%, while the maximum refund has increased by about 3%.

These results are consistent with the changes in the Tables, which showed that larger Entities had been overcharged in the past.

In the bottom section of the table, we are again calculating results based on 2016 parameters, as shown in L&I's revised Retro calculator. However, we have now adjusted the maximum loss ratio so that the maximum assessment is approximately 10%.

Changing from the prior tables to the proposed tables, and adjusting selections to maintain the 10% maximum assessment, has the following effects:

- For the \$100,000 standard premium Entity, the selected maximum loss ratio remains .40. This illustrates the effect of the proposed L&I restriction that the minimum loss ratio and maximum loss ratio differ by 0.20. Had this restriction difference remained 10%, the maximum loss ratio would have been reduced by 0.03, restoring the maximum assessment to the 2014 level; however the maximum refund would have fallen by about 23%.
- For the \$250,000 standard premium Entity, the selected maximum loss ratio has been reduced by 0.03. While the maximum assessments are now similar to the 2014 level, the maximum refund has fallen by about 14%.
- For the \$1,200,000 standard premium Entity, the results remain very similar to the 2014 program
- For the \$5,000,000 standard premium Entity, the maximum assessment is back to the 2014 level, while the maximum refund has increased by about 8%. Note that this Entity can assume 14 additional loss ratio points of risk and still have the same maximum assessment as they had under the 2014 table.

Of course, many Entities do not hit either the maximum loss ratio or the minimum loss ratio. Let's examine these same programs at a selected loss ratio within the range, both before and after the application of a PAF of .900.

| 2014 Program | | | | |
|---|---------------------------------|-------------------------|---|-------------------------|
| Standard Premium | Selected Pure Loss Ratio | Indicated Refund | Selected Loss Ratio w PAF = .900 | Indicated Refund |
| \$100,000 | 0.350 | (\$4,750) | 0.315 | (1,105) |
| \$250,000 | 0.400 | (\$3,450) | 0.360 | \$7,250 |
| \$1,200,000 | 0.400 | \$256,286 | 0.360 | \$344,897 |
| \$5,000,000 | 0.600 | \$431,957 | 0.540 | \$864,761 |
| 2016 Program With Same Selections (Maximum Loss Ratio same as 2014) | | | | |
| Standard Premium | Selected Pure Loss Ratio | Indicated Refund | Selected Loss Ratio w PAF = .900 | Indicated Refund |
| \$100,000 | 0.350 | (\$6,260) | 0.315 | (\$2,445) |
| \$250,000 | 0.400 | (\$7,200) | 0.360 | \$3,700 |
| \$1,200,000 | 0.400 | \$254,042 | 0.360 | \$343,478 |
| \$5,000,000 | 0.600 | \$694,884 | 0.540 | \$1,103,896 |
| 2016 Program With 10% Risk and 20 point Minimum/Maximum Difference (Maximum Risk Tolerance same as 2014) | | | | |
| Standard Premium | Selected Pure Loss Ratio | Indicated Refund | Selected Loss Ratio w PAF = .900 | Indicated Refund |
| \$100,000 | 0.350 | (\$6,260) | 0.315 | (\$2,445) |
| \$250,000 | 0.400 | (\$11,650) | 0.360 | (\$750) |
| \$1,200,000 | 0.400 | \$241,328 | 0.360 | \$332,035 |
| \$5,000,000 | 0.600 | \$1,141,239 | 0.540 | \$1,505,615 |

For the smaller Entities, refunds would be reduced (or assessments increased) under the 2016 program. Note again that the \$100,000 Entity is being required to maintain 20 points of potential risk under the new program. For the \$1,200,000 Entity, the results are essentially unchanged.

However, for the \$5,000,000 Entity, the indicated refund will increase significantly:

- If the Entity uses a 73% maximum loss ratio (same maximum as 2014), the refund will increase 61% assuming a constant PAF of 1.000 and 28% assuming a constant PAF of 0.900.
- If the Entity uses an 87% maximum loss ratio (same risk tolerance as 2014), the refund will increase 165% assuming a constant PAF of 1.000 and 74% assuming a constant PAF of 0.900.

It is important to understand that the PAF is not expected to remain constant. Rather, expectations are that the changes made by L&I will increase the PAF, moving it closer to 1.000. This will have the effect, all else being equal, of reducing refunds or increasing assessments.

L&I stratified the change in Risk Charge in the following manner:

| | | Standard Premium | |
|--------------|---------------|-------------------|------------------|
| | | Under \$1 Million | Over \$1 Million |
| Program Type | Loss Based | INCREASED 8% | DECREASED 34% |
| | Premium Based | INCREASED 2% | DECREASED 17% |

Large risks (those with at least \$1 million of standard premium) saw large decreases in risk charges; prior to the change, nearly 90% of the risk charge for large risks was in loss based programs

Risks under \$1 Million of standard premium saw increases; prior to the change over 75% of the risk charge for these risks was in premium based programs.

All else being equal, increases in risk charges lead to lower PAFs; decreases in risk charges result in higher PAFs.

The effect of these changes in aggregate is that larger risks would see a significant decrease in their risk charges; as a result the overall PAF would increase to a level close to 1.000.

The impact on individual Entities varies. However, those Entities that were now required to take more risk to satisfy the minimum risk tolerance were the ones that in general benefited the most from the changes.

Review proposed 2016 minimum premium to participate as an Individual member

The table below, obtained from L&I's 2016 Retro Calculator, shows the minimum premium changes over the last six years. Note that the minimum premium was unchanged from 2012 to 2013 as L&I left the premium rates unchanged between those years.

| Year | Size Group | Min Premium |
|------|------------|-------------|
| 2011 | 1 | 5,610 |
| 2012 | 1 | 5,690 |
| 2013 | 1 | 5,690 |
| 2014 | 1 | 5,900 |
| 2015 | 1 | 5,970 |
| 2016 | 1 | 6,070 |

The decision to permit Entities with premiums at this level to participate in retro is a policy issue, not an actuarial issue. However, it is helpful to understand what such a program might look like.

Smaller programs are almost exclusively premium-based programs (although many of the recent Size Group 1's are loss-based); using the calculator we have determined that the following are among the riskiest programs allowed by the calculator.

(Premium based program with Standard Premium of \$6,070, which is Size Group 1; a minimum loss ratio of 20% and a PAF of 1.000 are used for all examples)

| Hazard Group | Max Loss Ratio | Losses at Max Assessment | Max Assessment | Max Refund |
|--------------|----------------|--------------------------|----------------|------------|
| 1 | 1.23 | \$8,138 | (\$6,029) | \$785 |
| 5 | 1.19 | \$7,873 | (\$6,012) | \$538 |
| 9 | 1.16 | \$7,675 | (\$6,046) | \$306 |

As noted above, a relatively small loss will trigger the maximum assessment; even in Hazard Group 1, the Entity would then need eight years, each with a loss ratio below 20% to get even.

Now it could be argued that small Entities might not want to take that level of downside risk; here's the same table with the maximum loss ratio set to 50%.

| Hazard Group | Max Loss Ratio | Losses at Max Assessment | Max Assessment | Max Refund |
|--------------|----------------|--------------------------|----------------|------------|
| 1 | .50 | \$3,308 | (\$1,675) | \$310 |
| 5 | .50 | \$3,308 | (\$1,782) | \$203 |
| 9 | .50 | \$3,308 | (\$1,871) | \$114 |

An Entity with a single \$3,308 loss in Hazard Group 1 would need nearly six years with loss ratios below 20% just to break even.

There are also L&I costs that should be considered; an Entity that size generates only \$261 of premium administration expense.

Given these factors, it would seem appropriate to raise the minimum premium required to participate in Retro to a higher level.

Here is what the same tables look like for a \$50,000 Entity, which is at the bottom end of size group 24:

| Hazard Group | Max Loss Ratio | Losses at Max Assessment | Max Assessment | Max Refund |
|--------------|----------------|--------------------------|----------------|------------|
| 1 | 1.23 | \$67,035 | (\$39,755) | \$16,380 |
| 5 | 1.19 | \$64,855 | (\$40,510) | \$13,445 |
| 9 | 1.16 | \$63,320 | (\$43,125) | \$9,195 |
| Hazard Group | Max Loss Ratio | Losses at Max Assessment | Max Assessment | Max Refund |
| 1 | .50 | \$27,250 | (\$9,860) | \$6,490 |
| 5 | .50 | \$27,250 | (\$11,095) | \$5,255 |
| 9 | .50 | \$27,250 | (\$12,835) | \$3,515 |

Note that the relation between the maximum assessment and maximum refund are significantly different than for the Size Group 1 Entity. (For simplicity, we used the same selections as the smaller Entity; the maximum loss ratios permitted without changing other parameters are approximately 1.45, 1.39 and 1.30 respectively.) Entities of this size will have a premium administrative expense charge of \$2,150.

Given these figures, and after consideration of other program goals, L&I should consider increasing the minimum premium for Entities to participate in the retro program. However, again, we view this as a policy decision, not an actuarial decision.

Reduction of Options for Entities Participating in Retro

In addition to the Size Group issue previously discussed, there are other changes that L&I should consider making to the Tables.

The most important of these is the elimination of sub-optimal choices, particularly in selecting minimum loss ratios.

Example: Consider an Entity with \$5,000,000 of expected standard premium that selects the following parameters:

| |
|----------------------------------|
| Loss-Based Program |
| Minimum Loss Ratio: Varies |
| Maximum Loss Ratio: 100% |
| \$550,000 Single Loss Limitation |
| Hazard Group 5 |

| Minimum Loss Ratio | Maximum Loss Ratio | Losses at Max Assessment | Maximum Assessment | Maximum Refund |
|--------------------|--------------------|--------------------------|--------------------|----------------|
| 0 | 1.00 | \$5,450,000 | (\$981,645) | \$4,785,000 |
| .15 | 1.00 | \$5,450,000 | (\$981,645) | \$3,920,003 |
| .30 | 1.00 | \$5,450,000 | (\$981,645) | \$3,055,007 |
| .45 | 1.00 | \$5,450,000 | (\$977,285) | \$2,191,972 |
| .60 | 1.00 | \$5,450,000 | (\$942,405) | \$1,348,557 |

By choosing a minimum loss ratio greater than 0, Entities theoretically reduce their insurance charge in exchange for a limitation on the maximum refund that they may obtain.

However, due to the low possibility of losses below that level, the Tables give Entities little (or even no) credit on their possible maximum assessment. For the example shown, if an Entity used a 30% Minimum Loss Ratio, they would face the same maximum assessment as a risk that used a 0% Minimum Loss Ratio. However, they would see their potential maximum refund drop significantly. By raising their minimum loss ratio from 30% to 45%, cutting their maximum assessment by \$3,560, they would be reducing their maximum refund by over \$863,000. This imbalance of risk and reward is something that we would recommend be eliminated in the new Tables.

Eliminating these sub-optimal choices would benefit the program as a whole as it would make the program more fair and reduce the potential that an Entity could complain that they were allowed (or not dissuaded) to make such a choice. However, it should be understood that this will potentially reduce the refund going-forward for risks that previously made more optimal selections.

Have hazard groups and additional development factors improved the accuracy and fairness of Retrospective Rating?

Hazard Groups

The fundamental difference between severity distributions by hazard group is the necessary and sufficient evidence that the introduction of hazard groups materially increased equity between Retro Entities and therefore materially increased the accuracy and fairness of retrospective rating. The use of hazard groups is standard throughout the industry. The introduction of hazard groups has improved fairness as defined in the Actuarial Standards of Practice, ASOP 12. A portion of that Standard is excerpted below:

2.2.1 Rates within a risk classification system would be considered equitable if differences in rates reflect material differences in expected cost for risk characteristics. In the context of rates, the word fair is often used in place of the word equitable.

The actuary should consider the interdependence of risk characteristics. To the extent the actuary expects the interdependence to have a material impact on the operation of the risk classification system, the actuary should make appropriate adjustments.

We note that the testing done by L&I also follows a subsequent section of ASOP 12.

3.3.4 Reasonableness of Results

When establishing risk classes, the actuary should consider the reasonableness of the results that proceed from the intended use of the risk classes (for example, the consistency of the patterns of rates, values, or factors among risk classes).

Adjustments to calculations were made by L&I actuaries to ensure that the appropriate patterns existed. For example, the charges and savings for limiting losses within a range of results increased and decreased monotonically.

It may be easier to understand the importance of this practice by understanding what previously existed in Washington, prior to this change.

Prior to 2011, hazard groups did not exist in Washington and only one single loss limitation (\$500,000) existed for all Entities.

This produced significant inequities, as we noted in our 2009 report:¹¹

¹¹ The 2009 report referred to "Entities" as "risks". In this context, the terms are interchangeable.

- *The \$500,000 limitation is too large for smaller insureds. Smaller insureds will never benefit from the limitation because a large loss will hit their maximum premium before it ever hits the \$500,000 threshold. Consider a risk with an expected loss of \$300,000 and a 150% maximum premium. The maximum premium of \$450,000 (regardless of Plan) is below this threshold. These insureds would benefit from lower optional limitations because there would at least be the possibility of coverage.*
- *The \$500,000 limitation is too small for larger insureds. Larger insureds can hit this limitation fairly frequently; in some cases several times a year. Those losses can be planned for, and thus the limitation is not performing the function that it was designed. These insureds would benefit from higher optional limitations because the charge for a higher limitation would be lower than it is for the current \$500,000 limitation.*
- *Beyond the value of the limitation being \$500,000 for all insureds, there are other equity issues. There is no distinct charge/credit for the limitation, so essentially all insureds are paying the same amount for it. As demonstrated above, this is unfair to small risks, as they are paying for coverage from which they will never collect as well as to large risks, which are paying for coverage that they don't need.*
- *Even if the \$500,000 level was appropriate for an insured, Hazard Groups, which are utilized by the NCCI in other jurisdictions, do not apply in Washington. Two Entities could have identical expected losses, but one Entity may be in a more hazardous group and thus more likely to have a large loss.*
- *For example consider the following:*
 - *Risk A expects 100 losses of \$10,000 each.*
Total expected loss \$1,000,000
Loss for retro rating calculation \$1,000,000
 - *Risk B expects 20 losses of \$10,000 each and one loss of \$800,000*
Total expected loss \$1,000,000
Loss for retro rating calculation \$700,000

An actuarially appropriate loss limitation must recognize the difference in expected losses entering the retro rating calculation. The current program in Washington does not.

Following the publication of this report, Washington introduced nine Hazard Groups and also permitted Entities to choose from 5 different single loss limitations (\$120,000, \$250,000, \$500,000, \$1,000,000 and Unlimited).

This allowed Entities with similar risk characteristics to be charged (and credited) appropriately for limiting their loss ratios and also allowed Entities to avoid being overcharged (or under-protected) by purchasing a single loss limitation that was appropriate for their size and their risk tolerance.

In conclusion, the introduction of Hazard Groups materially increased the accuracy of pricing within the retrospective rating program in Washington.

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Loss Development Factors

In 1999 Washington's **Joint Legislative Audit and Review Committee** (JLARC) performed an audit of L&I. Among their recommendations at the time was that L&I use loss development factors (LDFs) at a more precise level than the Accident/pension, accident/non-pension and medical factors that were then used.

L&I agreed to this recommendation and following an internal review of what had been done nationally (by NCCI) and in Pennsylvania and Delaware (by PCRB and DCRB) they began using eleven different factors for ratemaking purposes in 2005; these factors were incorporated into retrospective refund calculations beginning with the January 1, 2008 enrollments.

Since that point, separate accident fund and medical aid fund development factors have been applied based on the type of loss, with the Types defined on a hierarchical basis:

| Type of Loss | Accident Fund | Medical Aid Fund |
|--|---------------|------------------|
| Fatalities | ✓ | ✓ |
| Total Permanent Disability Pension (TPD Pension) | ✓ | ✓ |
| Permanent Partial Disability (PPD) | ✓ | ✓ |
| Time Loss | ✓ | ✓ |
| Miscellaneous Accident | ✓ | ✓ |
| Medical Only | | ✓ |

(Development Factors for Fatalities are set at 1.000 as a single value for fatalities (currently \$294,000) is established under Washington Law; factors for TPD Pension claims are set to 1.000 for the accident fund; by definition, medical only claims generate no losses for the accident fund).

The revised method for determining factors is more equitable, and ultimately produces results that are fairer than the previous method because claims will develop significantly differently by type.

The following factors were calculated by L&I in July 2015 and illustrate the difference in development factors by these various types (for brevity, only the January enrollments are reproduced here):

| Enroll Date | Fatalities | | TPD Pension | | PPD | | Timeloss | | Misc. Accident | | Med Only |
|----------------|------------|--------|-------------|--------|--------|--------|----------|--------|----------------|--------|----------|
| | AF | MAF | AF | MAF | AF | MAF | AF | MAF | AF | MAF | MAF |
| 1/2011 | 1.0000 | 1.0000 | 1.0000 | 1.1329 | 1.6510 | 1.4426 | 1.6477 | 1.4247 | 8.0000 | 1.5211 | 1.0820 |
| 1/2012 | 1.0000 | 1.0000 | 1.0000 | 1.1227 | 1.9174 | 1.4636 | 2.0263 | 1.4329 | 8.0000 | 1.5818 | 1.0907 |
| 1/2013 | 1.0000 | 1.0000 | 1.0000 | 1.0175 | 2.4140 | 1.6479 | 2.8968 | 1.6432 | 8.0000 | 1.9339 | 1.2829 |
| 1/2014 | 1.0000 | 1.0000 | 1.0000 | 1.2937 | 2.9286 | 1.7354 | 4.5000 | 2.5219 | 8.0000 | 2.4506 | 1.8226 |
| 1/2015 | 1.0000 | 1.0000 | 1.0000 | 1.8505 | 4.2928 | 2.4853 | 4.5000 | 4.5000 | 8.0000 | 4.3189 | 3.0830 |

Absent this revision by L&I, Entities with a disproportionate share of PPD claims would have seen their losses estimated at a significantly higher level than indicated by the split data, while losses for Entities with a disproportionate share of timeloss claims would have been understated. The revision instituted by L&I has allowed for a more accurate projection of losses and thus, a more accurate and fairer estimate of refunds.

Additional Reviews of Retro Experience

As we have noted in the past, further work should be done to determine whether the equity of the program would benefit from adding a fourth or fifth review to the three reviews that are currently done.

The additional reviews would introduce additional fairness into the program as retrospective adjustments that more accurately reflect the ultimate losses for each Entity would be calculated.

This would improve equity both among retro Entities and between retro Entities and those Entities that do not participate in retro.

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Distribution and Use

- Usage and Responsibility of Client - This report was prepared for the sole use of Washington State Department of Labor & Industries (L&I) for the purpose of assisting in their review of the Retro Program. All decisions in connection with the implementation or use of advice or recommendations contained in this report are the sole responsibility of L&I.
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Considerations and Limitations

- **Data Verification (Claim and Exposure)** – For our analysis, we relied on data and information provided by L&I without independent audit. Though we have reviewed the data for reasonableness and consistency, we have not audited or otherwise verified this data. It should also be noted that our review of data may not always reveal imperfections. We have assumed that the data provided is both accurate and complete. The results of our analysis are dependent on this assumption. If this data or information is inaccurate or incomplete, our findings and conclusions may need to be revised.
- **Exclusion of Other Program Costs** – The scope of the project does not include the estimation of any costs other than those described herein. Such ancillary costs may include unallocated loss adjustment expenses (ULAE); excess insurance premiums; the costs of trustee, legal, administrative, risk management and actuarial services; fees and assessments; and costs for surety bonds or letters of credit pertaining to claim liabilities.
- **Supporting Assets** – We have not examined, nor do we express any opinion regarding, the assets, if any, that are used to provide for the payment obligations associated with the estimates of unpaid costs presented in this report.
- **Rounding and Accuracy** – Our models may retain more digits than those displayed. In addition, the results of certain calculations may be presented in the exhibits with more or less digits than would be considered significant. As a result, it should be recognized that (i) there may be rounding differences between the results of calculations presented in the exhibits and replications of those calculations based on displayed underlying amounts, and (ii) calculation results may not have been adjusted to reflect the precision of the calculation.
- **Unanticipated Changes** – Our conclusions are based on an analysis of the L&I data and on the estimation of the outcome of many contingent events. Future costs were developed from the historical claim experience and covered exposure, with adjustments for anticipated changes. Our estimates make no provision for extraordinary future emergence of new classes of losses or types of losses not sufficiently represented in historical databases or which are not yet quantifiable.
- **Internal / External Changes** – The sources of uncertainty affecting our estimates are numerous and include factors internal and external to L&I. Internal factors include items such as changes in claim reserving or settlement practices. The most significant external influences include, but are not limited to, changes in the legal, social, or regulatory environment surrounding the claims process. Uncontrollable factors such as general economic conditions also contribute to the variability.

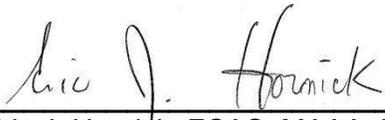
- **Uncertainty Inherent in Projections** – While this analysis complies with applicable Actuarial Standards of Practice and Statements of Principles, users of this analysis should recognize that our projections involve estimates of future events, and are subject to economic and statistical variations from expected values. We have not anticipated any extraordinary changes to the legal, social, or economic environment that might affect the frequency or severity of claims. For these reasons, no assurance can be given that the emergence of actual losses will correspond to the projections in this analysis.

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Acknowledgements

I, Eric J. Hornick, am a Principal for Oliver Wyman Actuarial Consulting Inc. I am a member of the American Academy of Actuaries, a Fellow of the Casualty Actuarial Society, and a Fellow of the Conference of Consulting Actuaries. I meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.


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