

Filing Guidelines for Change in Rates & Rating Programs

ACTUARIAL SUPPORT (APPENDIX D)

This section is required for all actuarial **full filings**.

Actuarial Support Requirements

Provide adequate actuarial documentation and support for the rate levels including sufficient detail to enable the reviewer to trace the resulting rates from the raw data experience and other supporting data.

Data, and narrative description provided for all ratemaking steps for each specific rate change proposed by sub coverage¹. Endorsements should be supported separately, if not possible; indicate which coverage the endorsement is assigned to.

Submit all analysis to support the filing in Excel. The documentation will include the formula in the respective cells as opposed to the just the value or the formulae and location of source data used in those calculations will be footnoted on each page of calculations.

Reconcile all support provided to the Summary of Information (entered in CARS).

The support for an overall rate level change will include the following subsections, in the order set out below. Label each section or subsection according to the numbering scheme provided and contain all data, data definitions and sources, and any narrative necessary to explain or clarify the various ratemaking steps.

D.1) Overall Description of the Ratemaking Methodology and Summary

An insurer may use either a pure premium or a loss ratio ratemaking approach. Indicate the type of approach used, outline the process in a summary narrative, and include an overall description of the data. Include detailed information on the data in the appropriate subsections. For example, third party liability loss data states whether it is for all limits combined or if it is for a specific (basic) limit.

Base the actuarial analysis on the insurer's own Alberta data of the vehicle category in discussion to the extent possible. If necessary to rely on outside data or a different source of internal data (such as affiliated insurer data), identify the source of the data, explain its' applicability and why the use of other data is more appropriate.

Exhibited and label data, outline procedures, and disclose and support any change to the ratemaking methodology, the underlying data, assumption, or the selection method from the one used in the previous filing.

D.2) Development of Loss Experience

All losses considered together with Allocated Loss Adjustment Expenses (ALAE), and all references to "loss" should be referred to "loss and ALAE".

If considering ALAE separately from losses, provide the same detailed information as described for losses. Specifically:

- a) Provide the insurer's own current direct loss and claim count data. Explain where the data does not include the most recent half year.
- b) Use the insurer's own claims experience to the extent it is credible.

¹ bodily injury, property damage, direct compensation property damage, accident benefits, underinsured motorist, all perils, collision, comprehensive, specified perils and endorsements

- c) Use Alberta specific claims experience for the filed category of insurance at the coverage level. Valuation data for loss reserving purposes may not satisfy this requirement.
- d) Data at the major sub-coverage level is generally required for estimating ultimate costs. Aggregation will be required to estimate the required change in rates. Subdivide claims experience at the major sub-coverage level considering homogeneity and credibility of the data. The following are the major sub-coverage in the GISA Loss Development Exhibits of the GISA Automobile Statistical Plan (ASP). Finer breakdown of claims experience may be determined to be more appropriate.
- e) For each coverage and sub-coverage listed above, develop payment patterns for purposes of discounting claims. Show the interest rate selected by coverage for discounting purposes and the rationale for the selection.
- f) If the filing considers industry experience, use the most recent industry ratemaking data available. Accident full year and accident half-year loss and claim count development data on an industry-wide basis is generally available in April and early December, respectively.
- g) The AIRB considers insurer automobile experience collected by GISA under the Automobile Statistical Plan appropriate for ratemaking purposes. Insurers relying on alternative data sources should be able to reconcile closely with the Automobile Statistical Plan – Industry Exhibit (AIX) loss ratio and insurer loss development data reported under the ASP as of a common evaluation date. Provide a copy of the AIX data to demonstrate the ratemaking data is reasonably accurate and reconciles to the data used to support rate changes. Explain if the data does not reconcile closely to the AIX.

a) Loss Development²

Develop data to an ultimate level using an appropriate loss development procedure.

Provide the history of insurer incurred loss data valued at 12-month intervals (so-called "triangles" of loss valuations at various stages of development).

If loss development for a partial accident year is used, provide comparable experience at the same level of maturity to support the selected loss development factors.

If using credibility procedures in loss development, disclose the selection of the credibility criterion, present the filing of the credibility standard, and disclose and support the complement of credibility.

Outline the specific loss development approach used in the filing and disclose the details of the calculations and supporting worksheets. Provide details and support for all judgments associated with the process of loss development (e.g., the selection of loss development factors). Reference to the selections made in the Appointed Actuary Report (AAR) is not sufficient support. If the selections in the AAR are based on combined data with different vehicle categories, provide the experience of the specific vehicle category in discussion to validate the selections.

Identify:

- how endorsements are reflected in their experience; and
- any changes made to their reserving practice, what affect they have on selections, if any.

b) Claim Count Development²

Develop the claims to an ultimate level using an appropriate claim count development procedure.

Outline the specific claim count development approach used in the filing and disclose details of the calculations and supporting worksheets. Disclose and support all judgments associated with the process of claims development (e.g., the selection of claims development factors).

² Refer to the approved [Industry Benchmarks Schedule](#).

Reference to the selections made in the AAR is not sufficient support. If the selections in the AAR are based on combined data with different vehicle categories, provide the experience of the specific vehicle category in discussion to validate the selections.

Base claim count development on the insurer's own Alberta data to the extent possible. In those few cases where the insurer relies upon industry experience to estimate its ultimate losses, explain why use of industry experience is more appropriate than basing ultimate loss estimates on its own data.

Provide the claim count triangles. If claim development for a partial accident year is used, provide comparable experience at the same level of maturity to support the selected claim development factors.

If using credibility procedures in claim count development, disclose the selection of the credibility criterion, present the filing of the credibility standard, and disclose and support the complement of credibility.

c) Loss Trends²

Outline the specific loss trend approach used and provide details of the calculations. Disclose and support all judgments associated with the process of loss trend.

To the extent credible, insurers will use loss trends based on their own experience, as they will reflect the dynamics of the insurer's business. Insurers experiencing major changes in their mix of business or practice will provide their own trending analysis for the coverages with credible data.

If using credibility procedures in estimating loss trend disclose and support the selection of the credibility criterion the application of the credibility standard, and the complement of credibility.

Support selected loss trends with an analysis of the indicated loss cost changes using an appropriate loss trend methodology. Rationalize and explain any loss trend selections, which do not follow the indicated loss trends. Include the date future trend is applied and the calculation of the average accident date.

The length of the trend period depends on the term of coverage offered by the insurer, the proposed effective date, and the valuation date of the loss data, disclose each of these items. If dividing trend into past trend and future trend components disclose and support each component in the detail described above including the date to distinguish between past and future trend. Frequency and severity trends are often reviewed and analysed separately in the selection of trend factors but consider correlations between frequency and severity.

Insurers without credible data may apply the most recent industry benchmark trends issued by the AIRB without providing additional support.

d) Treatment of Large Losses

Indicate how the insurer handled large losses in the experience period. If capping losses, demonstrate the number of such losses and the effects of the caps. Provide loss development data on a capped basis to support the estimation of ultimate losses on a capped basis.

Ensure large losses do not cause significant instability in the rates from one period to the next.

e) Catastrophe (or Excess Claim) Procedure

Comprehensive, specified perils and the comprehensive portion of all perils coverages are subject to losses arising from natural catastrophes. If using a procedure to estimate the impact of such losses, include the procedure, and calculation support details for the specific catastrophe procedure used, and all judgments associated with the process of calculating the catastrophe provision.

The catastrophe procedure will use of the insurer's own data to the extent possible, augmented where necessary by other relevant data, and include the insurer's definition of catastrophe.

f) Other Adjustments

Disclose, and support any other adjustments to the loss data. An example is an adjustment to historical loss experience to reflect product changes such as an upgrade or update to accident benefits coverage in developing indications for the period in which proposed rates will be in effect.

D.3) Unallocated Loss Adjustment Expenses (ULAE)²

Disclose and support the specific approach used to include a provision for ULAE, the calculations and all judgments associated with the estimation of ULAE.

The estimate of ULAE should use the insurer's own data for each category of insurance and coverage to the extent possible. If the actual ULAE costs vary over the experience period, the ULAE provision should vary over the experience period. Explain any departures from the Automobile Insurance Financial Information (AIFI) (PPV only) data submitted to General Insurance Statistical Agency (GISA).

D.4) Health Cost Recovery (Third Party Liability Coverage Only)²

The Government of Alberta assesses an annually adjusted amount to industry to cover the cost of health services provided to victims of auto accidents. The annual levy is set as a percentage of estimated total written third-party liability premiums for the upcoming year. Find the [Annual Levy](#) on the Treasury Board and Finance website. Use the current levy percentage (the new rate is effective January 1 each year).

Determine the amount included for Health Cost Recovery by multiplying the latest assessment factor by the on-levelled and trended earned premium for each year in the experience period. Then apply this amount to third party liability coverage as an additional fixed expense.

D.5) Premium

Describe the premium data, including the experience period and the source of the data.

- Direct premiums (prior to any reinsurance transactions or intra-company transfers) should be the basis for ratemaking and exclude the insurer's cessions to the Risk Sharing Pools.
- Direct premiums exclude premiums for the Facility Association Residual Market.
- If an insurer chooses to charge less than the approved rates with un-filed discounts, bring the premium to the undiscounted basis, and disclose details on the un-filed discount.
- For PPV only:
 - For risks rated on Grid premiums, report the direct premium for bodily injury, property damage tort and accident benefits coverage to reflect the actual Grid premium and not the insurer's manual premiums for these risks.
 - Base rate indications on the premium, reflecting the reduced premium level due to the Grid.

a) On-level Adjustments

Adjust all premiums by coverage and territory used in the filing for previous insurer rate changes and Grid changes.

For PPV, reflect the maximum premiums charged under the Grid for risks whose premium is limited by the Grid rating program for bodily injury, property damage tort and accident benefits (as opposed to the insurer's manual premiums for those risks).

If using a loss ratio approach to ratemaking, adjust earned premium to the level of the current rates using an appropriate on-level procedure. Display both the actual earned and the current rate level earned premiums.

Provide calculations if on-level adjustments use a factor approach (e.g., parallelogram). If on-level adjustments calculating premiums at current rates through computer re-rating of policies (e.g., extension of exposures), provide a description of the process with a comparison of the

results to the results obtained using the parallelogram method. Explain any significant difference.

Adjust on-level premium to an uncapped level and remove any un-filed discounts. (This is different from the presentation of the premiums for risks whose premiums are limited by the Grid rate. In this case, the premium should reflect the actual premium charged under the Grid rate level.)

Include the insurer's history of rate changes by coverage for the prior five years.

b) Premium Trend

Consider premium trend for coverage with inflation-sensitive exposure bases or for coverage where a changing mix of exposures may result in a corresponding change in premium income to the insurer. The changing mix of exposures with respect to the makes and models of vehicles for physical damage coverage is an example of a change in mix of exposures, which could produce premium trend. (CLEAR accounts for premium trend in the development of the rate groups.)

Outline the specific premium trend approach used in the filing. Disclose and support the details of the calculations and all judgments associated with the process of premium trend.

Use of the insurer's own data to the extent possible. To the extent the premium trend measures changes in the mix of business over time for the insurer's own portfolio, a commensurate adjustment to the loss experience for the changing mix of business must also be included in the analysis. Identify any shift in mix of business, which might affect premium trend.

The general approach to estimating premium trend can be expected to remain reasonably constant over the years for the insurer. Disclose, explain, and support any change in either the approach or the underlying data from the prior rate filing must be. Treatment of premium trend should consider:

- a) The gradual shift in the distribution of business to newer and more expensive vehicles results in increases in physical damage premiums and is reflected in deriving rate level indications. Otherwise, rate indications for certain coverages will be misstated.
- b) The Insurance Bureau of Canada determines and publishes annual industry average changes in rate group differentials. Insurers are required to provide their rate group distributions to support the selected rate group drifts.
- c) Take into consideration the rate group drift, liability limit drift and deductible drift in each filing.
- d) Identify finance fees or charges collected through premium instalment plans, and the associated costs, both as a dollar amount and as a percentage of premiums. Adjust premium payment patterns for policies with premium instalment plans. Document the delay in collection of premium and apply a factor. As noted in [D.6](#) below, consider the finance fee revenues in calculating the rate level change need - as either an additional percentage of premiums or a reduction to the expense provision. In either case, clearly present and support in the documentation.

c) Other Adjustments

Disclose, document, and support any other adjustments to premium data.

D.6) Other Expenses²

Divide other expenses (e.g., non-claims related expenses) between exposure variable (fixed) and premium variable (variable) expenses in a manner consistent with the way the insurer conducts its business, the way it incurred expenses, and the type of unit insured. Disclose and document the details of this segregation of expenses. If the insurer belongs to an insurer group, use the actual expense for the insurer, do not use the expense allocated from the insurer group.

Direct expenses (e.g., prior to any reinsurance transactions or intra-company transfers) should be the basis for ratemaking and must not include insurer's costs to the Risk Sharing Pools or Facility Association Residual Market.

Provide a copy of their submission to the GISA AIFI report for at least three years and GISA loss experience data for reconciliation with any internal data used in its analysis for **PPV only** to support its expense provision (and components thereof) included in the rate level indication calculations. Provide support for provisions for other expenses and explain an expense provision significantly higher than the industry average set out in the most recent GISA AIFI. If the support is not sufficient, the AIRB may use the 75th percentile of the industry expense provision to calculate the alternative indication. Explain any one-time expenses creating significant variances in one or more years.

The AIRB considers it reasonable to treat commissions and premium taxes as premium variable expenses and treat portion or all other expenses as fixed expenses. Treating all general expenses as a variable of premiums is generally inappropriate. Provide the commission structure including the standard commission rate.

Allocate exposure variable expenses across all coverages.

The AIRB permits the inclusion of contingent commission; provided it is supported and does not exceed 3.00% of premiums. State the standard commission and contingent commission provisions separately.

List marketing expenses separately. Normal marketing expenses may be included in the expense provision. Exclude extraordinary expenses due to expansions, mergers, acquisitions etc. Indicate if there has been any major investment or marketing expenses and if so, how reflected in expense provision.

As noted in [D.5b](#), state and clearly identify finance fee revenues. Treat finance fee revenues as either additional premiums or a negative expense (in either case as a percentage of premiums) in calculating the rate level change indication.

Exclude the expense provision established in respect of the Facility Association Residual Market. Treat Risk Sharing Pools as direct business and reflect in the direct loss and premium data.

a) Exposure Variable Expenses (Fixed)

Some expenses can be expected to vary in relationship to the number of units insured (exposures) rather than in relationship to the premium volume.

Outline the specific approach to estimating exposure variable expenses used in the filing and disclose details of the calculations. Disclose details and support for all judgments associated with the process of estimating exposure variable expenses.

Exposure variable expenses should make use of the insurer's own data. If it necessary to rely on outside data or a different source of internal data, identify the source of the data and provide an explanation of its applicability.

Exposure variable expenses may be subject to trend. The elements of trend discussed in subsection [D.2c](#).

Explain any significant departure from insurer information submitted in its financial reporting to prudential regulators.

b) Premium Variable Expenses (Variable)

Some expenses vary in relationship to the premium volume rather than in relationship to the number of units insured. Disclose and support the specific approach to estimating premium variable expenses used in the filing, details of the calculations, and all judgments associated with the process of estimating premium variable expenses.

Explain any significant departure from insurer information submitted in its financial reporting to prudential regulators.

D.7) Profit Provision²

The AIRB has established target pre-tax profit provision by coverage (including Facility Association). Submit the rate indications based on target profit provision as a return on premium.

Provide the basis of the selected investment return assumption for discounting claim costs. The selected expected investment return considers the actual investment returns earned in the recent past as reported in the annual financial reporting to prudential regulators, and the expected investment returns reflecting the mix of all investment assets expected to be held by the insurer.

The selected claims payment pattern must be internally consistent with the estimate of the ultimate loss amount to be paid.

If the proposed rates are different from those which are actuarially indicated based on the target profit level (stated as a pre-tax return on premium), provide an estimate of the target profit level (stated as a pre-tax return on premium) underlying the proposed rates.

D.8) Credibility

The Alberta experience of the insurer may not be of sufficient volume to produce stable overall province-wide rate level indications, which are actuarially credible. In such cases, use credibility procedures as a means of augmenting the insurer's Alberta data.

Disclose and support the standard for 100% credibility and the formula for calculating partial credibility. The AIRB considers a commonly used standard of 1,082 claims for short tail, low severity/low volatility coverage, such as property damage and physical damage, reasonable. The AIRB considers the use of a higher standard in long tail, high severity/high volatility coverage in the form of a multiplier of the base standard, reasonable. Assess the credibility of third-party liability loss experience separately for bodily injury and property damage.

The standard for full credibility is expected to be higher for loss trends than for the insurer loss experience period (usually 3 to 5 years) used to determine the rate indications.

If using prior filing indications in the credibility complement and the AIRB has communicated significant differences to the insurer regarding its indications versus the AIRB's, consider adjusting the prior indication for these differences before utilizing it in the current credibility complement. The trend period from the target effective date of the prior rate indication is no more than 2 years, to ensure the indication is based on current and relevant data.

If using an alternative body of data experience as a credibility complement, include exhibits to show the adjustments made to this data for risk distribution differences. Consider and adjust differences in loss costs or loss ratios due to differences in risk characteristics (other than distributional differences) between the data groups where appropriate.

D.9) Other Adjustments

Quantify any other adjustments made to the data, which affect expected premium, or losses, disclose, and support their effect on the rates in this section.

D.10) Summary Rate Level Indications

Provide summary sheets showing how the data combines with the adjustments and provisions outlined in subsections (D.2 – D.9).

Base indicated rate change on at least three consecutive years of the most recent actual experience. Apply an appropriate weight to each year, generally assigning more weight to the most recent years. If these weights are different from the insurer's prior filing, disclose, explain, and support the change.

Proposed rate changes should be in the same direction and same relative magnitude as the indicated rate change direction at the coverage level. For example, if the indicated rate change for third party liability is positive and the indicated rate change for accident benefits is negative, the AIRB expects a proposed increase in the rates for third party liability and a proposed decrease in the rates for accident benefits, even though both third party liability and accident benefits are required basic coverage. Provide explanations if a discrepancy is present. **The proposed rate change cannot exceed the indicated rate change at an individual coverage level.**

Explain significant differences at the coverage level between the indicated and proposed rate changes.

The data included in the experience period must be readily reconcilable with information provided in CARS for the insurer's filing.

Provide rationale and other considerations in support of the proposed rate changes.

D.11) Segmentation Analysis

Provide both indicated and proposed differentials for all rating variables (including discounts and surcharges) for which there are proposed changes. Provide an explanation where the proposed differentials are not moving in the direction indicated. Outline the classification analysis in detail.

The analysis should make use of the insurer's own data. If the insurer finds it necessary to rely on outside data or a different source of insurer data, identify the source of the data and provide an explanation of its applicability in the analysis.

Provide a comparison of the current, indicated, and proposed differentials by coverage for which rate differentials are changing. Include the written premium distribution and the exposure distribution by classification.

If credibility procedures are used, disclose in the same detail as outlined in subsection [D.8](#).

Test for and avoid reversals in its proposed differentials.

a) Predictive Models

For filings with rating variables and associated differentials based on predictive models including GLMs, the following information will assist in expediting the review.

- Description of the data underlying the model. Include jurisdiction; time period; evaluation date; number of records; what each record represents (e.g., vehicle, policy, etc.); discussion of any data adjustments (e.g., trend/ development/ capping/ catastrophe); full description of any non-company data; discussion of data validation procedures; discussion of missing or excluded data and treatment thereof.
- Model Type and description of model hyper parameters (e.g., "GLM with Tweedie error function and log link function"; "Boosted Regression Tree with learning rate of 0.01; final model has 1,000 trees"; etc.).
- Separately for each model, describe the target variable (e.g., frequency, severity, loss cost, etc.), and list all explanatory variables. For each explanatory variable, state if the variable is a control, fixed offset, or if the model indication is used for rating differential selection.
- Disclose any variables, which are either (a) in the rating plan but not included in the model; or (b) in the model but not part of the rating plan. Discuss rationale and explain how any relationships between variables inside and outside the model are considered and reflected in the rating plan.
- Validation of Model – describe data segmentation between training/holdout; provide lift chart on holdout data (minimum 10 deciles). Provide a description of how each "actual" and "expected" value is calculated.
- Model Insights – discuss the process for determining the inclusion or exclusion of variables within the models (provide measures of statistical significance and correlation between

variables). For machine learning models, it is beneficial to provide measures including but not limited to permutation importance, Shapley Additive explanations (SHAP) values and plots, and partial dependence plots. Furthermore, explain how your model(s) guard against overfitting, and how credibility/confidence levels are considered.

- Side by side comparison in Excel format, displaying (a) model indication; (b) current differential; (c) proposed differential; and (d) percentage differences. Include rationale for any selection not moving in the direction of the model indication.
- Validation of Selected Rating Plan – double lift chart (minimum 10 deciles) demonstrating improvement in segmentation vs. current rating plan.

Given a set of policyholder and vehicle attributes, provide sufficient details so the AIRB can determine the premium for an individual policyholder based on the details included in the filing. To expedite the review:

- Avoid use of obscure acronyms or system abbreviations to describe variable names.
- Provide any large tables of numbers (such as indicated vs. current vs. proposed) in Excel.
- Clearly label all graph axis and titles.
- If there are different models for each coverage, provide relevant information for each model.

Additional supporting information may be provided at the filer's discretion or may be requested by AIRB staff or consulting actuary during the filing review.

b) Changes to Rating Territory Definitions

Refer to Rating Territories in [Technical Guidance - Changes in Rates and Rating Programs](#) for further information. Depending on the approach used for determining rating territories and corresponding differentials, actuarial support may be required.

c) Introduction of New Rating Variables

Refer to Rating Variables in [Technical Guidance - Changes in Rates and Rating Programs](#) for further information if the insurer is seeking to introduce a new rating variable. The insurer should review all proposed rating variables with AIRB staff prior to inclusion in a filing.