



RULES – IMPLEMENTATION

MAY 30, 2019

COMMERCIAL MULTIPLE LINE

LI-ML-2019-018

## MISSOURI COMMERCIAL PACKAGE POLICY REVISED PACKAGE MODIFICATION FACTOR REVISION TO BE IMPLEMENTED

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### KEY MESSAGE

Revised Commercial Package Policy package modification factors for an overall statewide change of **-0.7%** to be implemented.

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### BACKGROUND

In circular [LI-ML-2019-004](#), we provided you with information about the Commercial Package Policy modification factor experience review.

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### ISO ACTION

We are implementing ML-2019-RLA1, which presents a review of Commercial Package Policy modification factors experience. Refer to the attachment(s) for complete details.

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### EFFECTIVE DATE

The ISO revision is subject to the following rule of application:

These changes are applicable to all policies written on or after November 1, 2019.

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### COMPANY ACTION

If you have authorized us to file on your behalf and decide:

- To use our revision and effective date, you are not required to file anything with the Insurance Department.
- To use our revision with a different effective date, to use our revision with modification, or to not use our revision, you must make an appropriate submission with the Insurance Department.

For guidance on submission requirements, consult the ISO State Filing Handbook.

WE WILL SUBMIT THIS REVISION TO THE INSURANCE DEPARTMENT ON OCTOBER 11, 2019. IF STATE FILING REQUIREMENTS DICTATE THAT YOU MAKE A SUBMISSION WITH THE INSURANCE DEPARTMENT, DO NOT SUBMIT IT PRIOR TO THIS DATE.

In all correspondence with the Insurance Department on this revision, you should refer to ISO Filing Designation Number ML-2019-RLA1, NOT this circular number. Communications with the regulator concerning a filing affecting multiple lines of business (i.e., CL, PL, AL filing designation) should specify the line(s) of business that you are addressing.

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### RATING SOFTWARE IMPACT

No new attributes are being introduced with this revision.

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## POLICYHOLDER NOTIFICATION

If you decide to implement this revision, you should check all applicable laws for the state(s) to which this revision applies, to determine whether or not a specific policyholder notice requirement may apply. Please note that circular [LI-CL-2018-044](#) contains the ISO Guide To Renewals With Changed Conditions For Commercial Lines, which is available only as a guide to assist participating companies in complying with various conditional renewal statutes or regulations, for the major commercial lines of insurance serviced by ISO. The information in the Guide does not necessarily reflect all requirements or exceptions that may apply, and it is not intended as a substitute for your review of all applicable statutes and regulations concerning policyholder notification.

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## REVISION DISTRIBUTION

We will issue a Notice to Manualholders with an edition date of 11-19 (or the earliest possible subsequent date), along with any new and/or revised manual pages.

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## REFERENCE(S)

- [LI-ML-2019-004](#) (04/03/2019) Commercial Package Policy Experience Reviewed By Staff
- [LI-CL-2018-044](#) (11/27/2018) Revised Lead Time Requirements Listing

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## ATTACHMENT(S)

- Filing [ML-2019-RLA1](#)
- Excel Workbook

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## FILES AVAILABLE FOR DOWNLOAD

To download all files associated with this circular, including attachments in the full circular PDF and/or any additional files not included in the PDF, search for the circular number on [ISOnet Circulars](#). Then click the Word/Excel link under the Full Circular column on the Search Results screen.

Please note that in some instances, not all files listed in the Attachment(s) block (if applicable) are included in the PDF.

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## DATA QUALITY

Statistical plan data reported to ISO is first processed through a system of rigorous automated data verification procedures so that only valid data would be used for ratemaking. Subsequent to this initial data submission review, additional analyses on the statistical plan data involving an even more customized data review for this line was performed by staff. During these processes, various data records were excluded from the review. The ISO staff responsible for this circular also reviewed the data for reasonableness.

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## ACKNOWLEDGMENT OF ACTUARIAL QUALIFICATIONS

The American Academy of Actuaries' "Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States" requires that an actuary issuing a Statement of Actuarial Opinion should include an acknowledgment with the opinion that he/she has met the qualification standards of the AAA. ISO considers this rule revision a Statement of Actuarial Opinion; therefore we are including the following acknowledgment:

I, Rimma Maasbach, am an Actuarial Consultant in Actuarial Operations for ISO, and I, Bei Zhou, am an Actuarial Product Director for Commercial Property for ISO. We are jointly responsible for the content of this Statement of Actuarial Opinion. We are both members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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## CONTACT INFORMATION

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Callers outside the United States, Canada, and the Caribbean may contact us using our global toll-free number (International Access Code + 800 48977489). For information on all ISO products, visit us at [www.verisk.com/iso](http://www.verisk.com/iso). To keep abreast of the latest Insurance Lines Services updates, view [www.verisk.com/ils](http://www.verisk.com/ils).

MISSOURI

ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

ML-2019-RLA1

EXECUTIVE SUMMARY

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PURPOSE

This document:

- presents a review of advisory Package Modification Factors (PMFs). PMFs are relativity factors used to adjust monoline loss costs as appropriate for multiline risks.
- provides the analyses used to derive these advisory PMFs.

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PMF CHANGES

The proposed Commercial Package Policy (CPP) Package Modification Factor changes are:

| <u>Type of Policy</u> | <u>Property</u> | <u>Liability</u> | <u>Prop. &amp; Liab.<br/>Total</u> |
|-----------------------|-----------------|------------------|------------------------------------|
| Motel/Hotel           | 0.0%            | 0.0%             | 0.0%                               |
| Apartment             | -3.5%           | 0.0%             | -2.9%                              |
| Office                | -5.1%           | -2.3%            | -3.4%                              |
| Mercantile            | -3.6%           | 0.0%             | -2.1%                              |
| Institutional         | -6.1%           | +1.1%            | -4.8%                              |
| Services              | -2.2%           | -2.1%            | -2.2%                              |
| Indust./Proc.         | +1.3%           | +5.5%            | +3.0%                              |
| Contractors           | <u>-5.2%</u>    | <u>+11.8%</u>    | <u>+8.6%</u>                       |
| Statewide             | -3.6%           | +3.3%            | -0.7%                              |

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INDICATED  
VS. CAPPED

Indicated PMF changes are based on standard ISO methodology. Differences between indicated and capped PMF changes are caused by rounding each indicated PMF to the nearest one percent and applying an upper cap of 1.00, where necessary.

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MISSOURI

ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

ML-2019-RLA1

EXECUTIVE SUMMARY

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HISTORICAL  
SOURCE DATA

The data used in this review is from ISO reporting companies for:

- Basic Group I: five fiscal accident years ending 12/31/17.
  - Basic Group II: ten fiscal accident years ending 12/31/17.
  - Special Causes of Loss: five fiscal accident years ending 12/31/17.
  - Crime: calendar year ending 06/30/17.
  - Inland Marine: five calendar accident years ending 12/31/17.
  - Fidelity: policy year ending 12/31/16.
  - Owners, Landlords, and Tenants: five fiscal accident years ending 12/31/17.
  - Manufacturers and Contractors: five fiscal accident years ending 12/31/17.
  - Products: three calendar accident years ending 12/31/18.
  - Local Products and Completed Operations: three calendar accident years ending 12/31/18.
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PRIOR ISO  
REVISIONS

The latest revisions in this state are:

| <u>Filing</u>  | ML-18-RLA1 | ML-14-RLA1 | ML-10-RLA1 |
|----------------|------------|------------|------------|
| <u>Dates</u>   |            |            |            |
| Implemented    | 10/01/18   | 11/01/14   | 10/01/10   |
| <u>Changes</u> |            |            |            |
| Indicated      | +3.2%      | +3.8%      | +0.1%      |
| Filed          | +3.2%      | +3.8%      | +0.1%      |
| Implemented    | +3.2%      | +3.8%      | +0.1%      |

MISSOURI

ADVISORY PACKAGE MODIFICATION FACTOR REVIEW

COMMERCIAL PACKAGE POLICY

ML-2019-RLA1

EXECUTIVE SUMMARY

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|   |   |
|---|---|
| ADJUSTMENTS<br>TO REPORTED<br>EXPERIENCE  | Standard actuarial procedures have been used in the reviews underlying the calculation of the PMFs, including adjusting the fire and liability losses to ultimate settlement level and, for all coverages, reflecting all loss adjustment expenses and trend. Specific procedures vary by subline.  |
| TEN LARGEST<br>GROUPS IN<br>ISO DATA BASE | <p>Insurers are listed in descending order based on the percent of statewide written premium volume from Annual Statement Page 15 for the year ending 12/31/17 for the Annual Statement Line of Business (ASLOB) indicated.</p> <p><u>COMMERCIAL MULTI PERIL</u> (ASLOB 51 &amp; 52)</p> <ol style="list-style-type: none"><li>1. Travelers Indemnity Company</li><li>2. Cincinnati Insurance Company</li><li>3. Tokio Marine Companies</li><li>4. Liberty Mutual Insurance Company</li><li>5. Hartford Accident and Indemnity Company</li><li>6. Columbia Insurance Group</li><li>7. Continental Casualty Company</li><li>8. Admiral Insurance Group</li><li>9. American International Group</li><li>10. Acuity A Mutual Insurance Company</li></ol> |
| SIZE OF ISO<br>DATA BASE                  | <p>The market share of ISO participating insurers as measured by Annual Statement Page 15 written premium for the year ending 12/31/17 is:</p> <p>Commercial Multi Peril (ASLOB 51 &amp; 52). 47.1%.</p>  |
| ADDITIONAL<br>SUPPORTING<br>MATERIAL      | Additional supporting material underlying the calculation of the experience review indications used in this PMF analysis may be found in the respective monoline experience review documents for each line.   |

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MISSOURI  
**ADVISORY PACKAGE MODIFICATION FACTOR REVIEW**

COMMERCIAL PACKAGE POLICY

ML-2019-RLA1

EXECUTIVE SUMMARY

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**COMPANY DECISION**

We encourage each insurer to decide independently whether the judgments made and the procedures or data used by ISO in developing the PMFs contained herein are appropriate for your use. We have included within this document the information upon which ISO relied in order to enable companies to make such independent judgments. The data underlying the enclosed material comes from companies reporting to Insurance Services Office, Inc. Therefore, the ISO experience permits the establishment of a much broader statistical ratemaking base than could be employed by using any individual company's data. A broader data base enhances the validity of ratemaking analysis derived therefrom.

At the same time, however, an individual company may benefit from a comparison of its own experience to the aggregate ISO experience, and may reach valid conclusions with respect to the manner in which its own costs can be expected to differ from ISO's projection based on the aggregate data.

Some calculations included in this document involve areas of ISO staff judgment. Each company should carefully review and evaluate whether the ISO selected PMFs are appropriate for its use.

The material has been developed exclusively by the staff of Insurance Services Office, Inc.

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## COMMERCIAL PACKAGE POLICY METHODOLOGY OVERVIEW

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### OBJECTIVE

A Commercial Package Policy (CPP) is essentially a combination of monoline coverages. CPP pricing employs monoline loss costs modified by Package Modification Factors (PMFs). These factors vary by the eight CPP types of policy and are reviewed annually. Monoline and multiline experience are combined and reviewed via a monoline/multiline relativity analysis. The resulting indicated PMFs represent the loss cost for a CPP relative to that for monoline policies providing the same coverages.

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### STEP 1: THE RELATIVITY ANALYSES

Each line of insurance develops indicated changes to monoline and multiline aggregate loss costs based on an experience ratio relativity analysis for that coverage. The monoline indication represents the needed change to monoline loss costs. The multiline indication represents the needed change to multiline aggregate loss costs, which is implemented through changes to the PMFs. For this PMF analysis, multiline indications are developed for each line of insurance and Type of Policy. Relativity analyses are explained in Section B.

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### STEP 2: CALCULATION OF THE PMFs

The procedure described above generates indicated Implicit PMFs (IPMFs) which vary by the various lines of insurance and by type of policy. IPMFs represent what the PMF would be for the CPP risk if only a single coverage were written. For each Type of Policy, IPMFs are weighted by CPP aggregate loss costs to determine the indicated property and liability PMFs. These PMFs may be capped, or rounded to the nearest one percent, and certain component IPMFs appropriately adjusted for this change. These calculations are explained in the remainder of Section A.

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MISSOURI

TABLE 1  
COMMERCIAL PACKAGE POLICY

SUMMARY OF THIS REVIEW

The display below summarizes the review and shows the capped Package Modification Factors for Property and Liability. For each type of risk, the PMFs are determined to be those factors which when applied to the monoline loss costs produce the appropriate CPP aggregate loss cost level as determined by an analysis of the CPP experience.

| TYPE OF POLICY   | PROPERTY PMFS |        |          | LIABILITY PMFS |        |          | PROP. & LIAB.<br>TOTAL |
|------------------|---------------|--------|----------|----------------|--------|----------|------------------------|
|                  | CURRENT       | CAPPED | % CHANGE | CURRENT        | CAPPED | % CHANGE | % CHANGE               |
| MOTEL/HOTEL (31) | 1.00          | 1.00   | 0.0%     | 0.96           | 0.96   | 0.0%     | 0.0%                   |
| APARTMENT (32)   | 0.86          | 0.83   | -3.5%    | 1.00           | 1.00   | 0.0%     | -2.9%                  |
| OFFICE (33)      | 0.79          | 0.75   | -5.1%    | 0.86           | 0.84   | -2.3%    | -3.4%                  |
| MERCANTILE (34)  | 0.83          | 0.80   | -3.6%    | 0.90           | 0.90   | 0.0%     | -2.1%                  |
| INSTITUTION (35) | 0.98          | 0.92   | -6.1%    | 0.94           | 0.95   | 1.1%     | -4.8%                  |
| SERVICES (36)    | 0.90          | 0.88   | -2.2%    | 0.97           | 0.95   | -2.1%    | -2.2%                  |
| IND/PROC (37)    | 0.79          | 0.80   | 1.3%     | 0.91           | 0.96   | 5.5%     | 3.0%                   |
| CONTRACTORS (38) | 0.96          | 0.91   | -5.2%    | 0.85           | 0.95   | 11.8%    | 8.6%                   |
| STATEWIDE        |               |        | -3.6%    |                |        | 3.3%     | -0.7%                  |

MISSOURI  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

| MOTEL/HOTEL (31)<br>***** | (1)<br>AGGREG-<br>ATE LOSS<br>COSTS | (2)<br>CURRENT<br>IMPLICIT<br>PMF | (3)<br>NET<br>INDICATION | (4)<br>INDIC.<br>PMF | (5)<br>CAPPED<br>PMF |
|---------------------------|-------------------------------------|-----------------------------------|--------------------------|----------------------|----------------------|
| <u>COVERAGE</u>           |                                     |                                   |                          |                      |                      |
| PROPERTY-                 |                                     |                                   |                          |                      |                      |
| BASIC GRP I               | 963,633                             | 0.873                             | 2.4%                     | 0.894                | 0.882                |
| BASIC GRP II              | 625,226                             | 1.392                             | 5.2                      | 1.464                | 1.445                |
| SP CAUSE/LOSS             | 251,025                             | 0.856                             | -9.5                     | 0.775                | 0.764                |
| *CRIME                    | 886                                 | 0.911                             | 0.0                      | 0.911                | 0.911                |
| *INL. MAR.                | 4,291                               | 0.910                             | 6.4                      | 0.968                | 0.968                |
| *FIDELITY                 | 3,843                               | 1.000                             | 0.0                      | 1.000                | 1.000                |
| <u>TOTAL</u>              | <u>1,848,904</u>                    | <u>1.00</u>                       | <u>1.4%</u>              | <u>1.014</u>         | <u>1.00</u>          |
| LIABILITY-                |                                     |                                   |                          |                      |                      |
| OL&T                      | 1,599,363                           | 0.959                             | -1.7%                    | 0.943                | 0.958                |
| <u>TOTAL</u>              | <u>1,599,363</u>                    | <u>0.96</u>                       | <u>-1.8%</u>             | <u>0.943</u>         | <u>0.96</u>          |
| -----                     | -----                               | -----                             | -----                    | -----                | -----                |
| PROP. & LIAB.<br>TOTAL    | 3,448,267                           |                                   | -0.1%                    |                      |                      |

  

| APARTMENT (32)<br>***** | (1)<br>AGGREG-<br>ATE LOSS<br>COSTS | (2)<br>CURRENT<br>IMPLICIT<br>PMF | (3)<br>NET<br>INDICATION | (4)<br>INDIC.<br>PMF | (5)<br>CAPPED<br>PMF |
|-------------------------|-------------------------------------|-----------------------------------|--------------------------|----------------------|----------------------|
| <u>COVERAGE</u>         |                                     |                                   |                          |                      |                      |
| PROPERTY-               |                                     |                                   |                          |                      |                      |
| BASIC GRP I             | 2,897,379                           | 0.633                             | 1.6%                     | 0.643                | 0.648                |
| BASIC GRP II            | 3,222,722                           | 1.271                             | -6.5                     | 1.188                | 1.197                |
| SP CAUSE/LOSS           | 1,280,868                           | 0.886                             | -14.4                    | 0.758                | 0.764                |
| *CRIME                  | 516                                 | 0.911                             | 0.0                      | 0.911                | 0.911                |
| *INL. MAR.              | 1,608                               | 0.910                             | 6.4                      | 0.968                | 0.968                |
| *FIDELITY               | 8,747                               | 1.000                             | 0.0                      | 1.000                | 1.000                |
| <u>TOTAL</u>            | <u>7,411,840</u>                    | <u>0.86</u>                       | <u>-4.1%</u>             | <u>0.824</u>         | <u>0.83</u>          |
| LIABILITY-              |                                     |                                   |                          |                      |                      |
| OL&T                    | 1,458,282                           | 1.000                             | 3.4%                     | 1.034                | 1.000                |
| <u>TOTAL</u>            | <u>1,458,282</u>                    | <u>1.00</u>                       | <u>3.4%</u>              | <u>1.034</u>         | <u>1.00</u>          |
| -----                   | -----                               | -----                             | -----                    | -----                | -----                |
| PROP. & LIAB.<br>TOTAL  | 8,870,122                           |                                   | -2.9%                    |                      |                      |

\* indicates coverage for which reviews are on a MULTISTATE basis.

MISSOURI  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

| OFFICE (33)<br>*****     | (1)                            | (2)                               | (3)                      | (4)                  | (5)                  |
|--------------------------|--------------------------------|-----------------------------------|--------------------------|----------------------|----------------------|
|                          | AGGREGATE<br><u>LOSS COSTS</u> | CURRENT<br>IMPLICIT<br><u>PMF</u> | NET<br><u>INDICATION</u> | INDIC.<br><u>PMF</u> | CAPPED<br><u>PMF</u> |
| COVERAGE                 |                                |                                   |                          |                      |                      |
| PROPERTY-                |                                |                                   |                          |                      |                      |
| BASIC GRP I              | 1,331,479                      | 0.958                             | 2.6%                     | 0.983                | 0.983                |
| BASIC GRP II             | 1,190,762                      | 0.663                             | -4.0                     | 0.636                | 0.636                |
| SP CAUSE/LOSS            | 850,230                        | 0.732                             | -12.7                    | 0.639                | 0.639                |
| *CRIME                   | 2,836                          | 0.911                             | 0.0                      | 0.911                | 0.911                |
| *INL. MAR.               | 37,164                         | 0.910                             | 6.4                      | 0.968                | 0.968                |
| *FIDELITY                | 20,164                         | 1.000                             | 0.0                      | 1.000                | 1.000                |
| TOTAL                    | 3,432,635                      | 0.79                              | -4.9%                    | 0.751                | 0.75                 |
| LIABILITY-               |                                |                                   |                          |                      |                      |
| OL&T                     | 5,391,492                      | 0.866                             | -2.8%                    | 0.842                | 0.842                |
| M&C                      | 252,738                        | 0.816                             | 7.4                      | 0.876                | 0.876                |
| TOTAL                    | 5,644,230                      | 0.86                              | -1.9%                    | 0.843                | 0.84                 |
| -----                    | -----                          | -----                             | -----                    | -----                | -----                |
| PROP. & LIAB.<br>TOTAL   | 9,076,865                      |                                   | -3.1%                    |                      |                      |
| MERCANTILE (34)<br>***** | (1)                            | (2)                               | (3)                      | (4)                  | (5)                  |
|                          | AGGREGATE<br><u>LOSS COSTS</u> | CURRENT<br>IMPLICIT<br><u>PMF</u> | NET<br><u>INDICATION</u> | INDIC.<br><u>PMF</u> | CAPPED<br><u>PMF</u> |
| COVERAGE                 |                                |                                   |                          |                      |                      |
| PROPERTY-                |                                |                                   |                          |                      |                      |
| BASIC GRP I              | 4,202,485                      | 0.635                             | -2.1%                    | 0.622                | 0.622                |
| BASIC GRP II             | 6,644,806                      | 1.050                             | -4.1                     | 1.007                | 1.007                |
| SP CAUSE/LOSS            | 3,207,654                      | 0.793                             | -9.7                     | 0.716                | 0.716                |
| *CRIME                   | 26,696                         | 0.911                             | 0.0                      | 0.911                | 0.911                |
| *INL. MAR.               | 637,403                        | 0.910                             | 6.4                      | 0.968                | 0.968                |
| *FIDELITY                | 258,796                        | 1.000                             | 0.0                      | 1.000                | 1.000                |
| TOTAL                    | 14,977,840                     | 0.83                              | -3.9%                    | 0.798                | 0.80                 |
| LIABILITY-               |                                |                                   |                          |                      |                      |
| OL&T                     | 7,510,072                      | 0.914                             | -1.4%                    | 0.901                | 0.901                |
| M&C                      | 1,544,726                      | 0.945                             | 5.7                      | 0.999                | 0.999                |
| LOCAL PRODUCT            | 201,660                        | 0.607                             | 0.1                      | 0.608                | 0.608                |
| *MULTI PRODUCT           | 1,119,087                      | 0.862                             | -1.1                     | 0.853                | 0.853                |
| TOTAL                    | 10,375,545                     | 0.90                              | 0.1%                     | 0.901                | 0.90                 |
| -----                    | -----                          | -----                             | -----                    | -----                | -----                |
| PROP. & LIAB.<br>TOTAL   | 25,353,385                     |                                   | -2.2%                    |                      |                      |

\* indicates coverage for which reviews are on a MULTISTATE basis.

MISSOURI  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

| INSTITUTION (35)<br>***** | (1)               | (2)             | (3)               | (4)        | (5)        |
|---------------------------|-------------------|-----------------|-------------------|------------|------------|
|                           | AGGREGATE         | CURRENT         | NET               | INDIC.     | CAPPED     |
| COVERAGE                  | <u>LOSS COSTS</u> | <u>IMPLICIT</u> | <u>INDICATION</u> | <u>PMF</u> | <u>PMF</u> |
| PROPERTY-                 |                   |                 |                   |            |            |
| BASIC GRP I               | 4,476,352         | 0.954           | -4.9%             | 0.907      | 0.907      |
| BASIC GRP II              | 7,102,876         | 1.070           | -5.5              | 1.011      | 1.011      |
| SP CAUSE/LOSS             | 3,218,249         | 0.854           | -9.0              | 0.777      | 0.777      |
| *CRIME                    | 18,890            | 0.911           | 0.0               | 0.911      | 0.911      |
| *INL. MAR.                | 42,200            | 0.910           | 6.4               | 0.968      | 0.968      |
| *FIDELITY                 | 138,298           | 1.000           | 0.0               | 1.000      | 1.000      |
| TOTAL                     | 14,996,865        | 0.98            | -6.0%             | 0.921      | 0.92       |
| LIABILITY-                |                   |                 |                   |            |            |
| OL&T                      | 3,180,831         | 0.983           | -1.2%             | 0.971      | 0.971      |
| M&C                       | 268,193           | 0.655           | 23.1              | 0.806      | 0.806      |
| TOTAL                     | 3,449,024         | 0.94            | 1.3%              | 0.953      | 0.95       |
| -----                     | -----             | -----           | -----             | -----      | -----      |
| PROP. & LIAB.<br>TOTAL    | 18,445,889        |                 | -4.6%             |            |            |

  

| SERVICES (36)<br>***** | (1)               | (2)             | (3)               | (4)        | (5)        |
|------------------------|-------------------|-----------------|-------------------|------------|------------|
|                        | AGGREGATE         | CURRENT         | NET               | INDIC.     | CAPPED     |
| COVERAGE               | <u>LOSS COSTS</u> | <u>IMPLICIT</u> | <u>INDICATION</u> | <u>PMF</u> | <u>PMF</u> |
| PROPERTY-              |                   |                 |                   |            |            |
| BASIC GRP I            | 3,340,285         | 0.873           | 3.9%              | 0.907      | 0.907      |
| BASIC GRP II           | 3,773,310         | 1.021           | -4.2              | 0.978      | 0.978      |
| SP CAUSE/LOSS          | 1,755,696         | 0.760           | -10.6             | 0.679      | 0.679      |
| *CRIME                 | 12,118            | 0.911           | 0.0               | 0.911      | 0.911      |
| *INL. MAR.             | 72,610            | 0.910           | 6.4               | 0.968      | 0.968      |
| *FIDELITY              | 103,776           | 1.000           | 0.0               | 1.000      | 1.000      |
| TOTAL                  | 9,057,795         | 0.90            | -2.0%             | 0.882      | 0.88       |
| LIABILITY-             |                   |                 |                   |            |            |
| OL&T                   | 3,345,800         | 0.989           | -5.3%             | 0.937      | 0.937      |
| M&C                    | 2,865,928         | 0.971           | 2.3               | 0.993      | 0.993      |
| LOCAL PRODUCT          | 404,746           | 0.839           | 1.6               | 0.852      | 0.852      |
| *MULTI PRODUCT         | 62,688            | 0.914           | 0.2               | 0.916      | 0.916      |
| TOTAL                  | 6,679,162         | 0.97            | -1.6%             | 0.955      | 0.95       |
| -----                  | -----             | -----           | -----             | -----      | -----      |
| PROP. & LIAB.<br>TOTAL | 15,736,957        |                 | -1.8%             |            |            |

\* indicates coverage for which reviews are on a MULTISTATE basis.

MISSOURI  
TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

| IND/PROC (37)<br>*****    | (1)                            | (2)                               | (3)                      | (4)                  | (5)                  |
|---------------------------|--------------------------------|-----------------------------------|--------------------------|----------------------|----------------------|
|                           | AGGREGATE<br><u>LOSS COSTS</u> | CURRENT<br>IMPLICIT<br><u>PMF</u> | NET<br><u>INDICATION</u> | INDIC.<br><u>PMF</u> | CAPPED<br><u>PMF</u> |
| COVERAGE                  |                                |                                   |                          |                      |                      |
| PROPERTY-                 |                                |                                   |                          |                      |                      |
| BASIC GRP I               | 2,320,439                      | 0.818                             | 12.9%                    | 0.924                | 0.924                |
| BASIC GRP II              | 1,679,697                      | 0.724                             | -0.2                     | 0.723                | 0.723                |
| SP CAUSE/LOSS             | 1,324,559                      | 0.811                             | -17.3                    | 0.671                | 0.671                |
| *CRIME                    | 3,918                          | 0.911                             | 0.0                      | 0.911                | 0.911                |
| *INL. MAR.                | 4,118                          | 0.910                             | 6.4                      | 0.968                | 0.968                |
| *FIDELITY                 | 72,482                         | 1.000                             | 0.0                      | 1.000                | 1.000                |
| TOTAL                     | 5,405,213                      | 0.79                              | 0.8%                     | 0.796                | 0.80                 |
| LIABILITY-                |                                |                                   |                          |                      |                      |
| M&C                       | 2,312,372                      | 0.970                             | 7.1                      | 1.039                | 1.039                |
| LOCAL PRODUCT             | 44,581                         | 0.559                             | 2.1                      | 0.571                | 0.571                |
| *MULTI PRODUCT            | 1,303,266                      | 0.859                             | 0.5                      | 0.863                | 0.863                |
| TOTAL                     | 3,660,219                      | 0.91                              | 5.8%                     | 0.963                | 0.96                 |
| -----                     | -----                          | -----                             | -----                    | -----                | -----                |
| PROP. & LIAB.<br>TOTAL    | 9,065,432                      |                                   | 2.8%                     |                      |                      |
| CONTRACTORS (38)<br>***** | (1)                            | (2)                               | (3)                      | (4)                  | (5)                  |
|                           | AGGREGATE<br><u>LOSS COSTS</u> | CURRENT<br>IMPLICIT<br><u>PMF</u> | NET<br><u>INDICATION</u> | INDIC.<br><u>PMF</u> | CAPPED<br><u>PMF</u> |
| COVERAGE                  |                                |                                   |                          |                      |                      |
| PROPERTY-                 |                                |                                   |                          |                      |                      |
| BASIC GRP I               | 865,291                        | 0.919                             | 1.9%                     | 0.936                | 0.936                |
| BASIC GRP II              | 1,039,566                      | 1.004                             | -6.3                     | 0.941                | 0.941                |
| SP CAUSE/LOSS             | 754,942                        | 0.954                             | -13.2                    | 0.828                | 0.828                |
| *CRIME                    | 1,088                          | 0.911                             | 0.0                      | 0.911                | 0.911                |
| *INL. MAR.                | 5,311                          | 0.910                             | 6.4                      | 0.968                | 0.968                |
| *FIDELITY                 | 56,353                         | 1.000                             | 0.0                      | 1.000                | 1.000                |
| TOTAL                     | 2,722,551                      | 0.96                              | -5.3%                    | 0.909                | 0.91                 |
| LIABILITY-                |                                |                                   |                          |                      |                      |
| M&C                       | 8,158,808                      | 0.872                             | 13.9                     | 0.993                | 0.993                |
| LOCAL PRODUCT             | 3,573,863                      | 0.820                             | 4.8                      | 0.859                | 0.859                |
| TOTAL                     | 11,732,671                     | 0.85                              | 11.8%                    | 0.951                | 0.95                 |
| -----                     | -----                          | -----                             | -----                    | -----                | -----                |
| PROP. & LIAB.<br>TOTAL    | 14,455,222                     |                                   | 8.6%                     |                      |                      |

\* indicates coverage for which reviews are on a MULTISTATE basis.

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TABLE 2  
COMMERCIAL PACKAGE POLICY  
CALCULATION OF REVISED CPP PACKAGE MODIFICATION FACTORS (PMF)

| STATEWIDE<br>*****     | (1)               | (2)             | (3)               | (4)        | (5)        |
|------------------------|-------------------|-----------------|-------------------|------------|------------|
|                        | AGGREGATE         | CURRENT         | NET               | INDIC.     | CAPPED     |
| COVERAGE               | <u>LOSS COSTS</u> | <u>IMPLICIT</u> | <u>INDICATION</u> | <u>PMF</u> | <u>PMF</u> |
| PROPERTY-              |                   | PMF             |                   |            |            |
| BASIC GRP I            | 20,397,343        | 0.785           | 1.2%              | 0.794      | 0.795      |
| BASIC GRP II           | 25,278,965        | 1.019           | -4.4              | 0.974      | 0.975      |
| SP CAUSE/LOSS          | 12,643,223        | 0.818           | -11.3             | 0.726      | 0.726      |
| *CRIME                 | 66,948            | 0.911           | 0.0               | 0.911      | 0.911      |
| *INL. MAR.             | 804,705           | 0.910           | 6.4               | 0.968      | 0.968      |
| *FIDELITY              | 662,459           | 1.000           | 0.0               | 1.000      | 1.000      |
| TOTAL                  | 59,853,643        | 0.881           | -3.6%             | 0.849      | 0.849      |
| LIABILITY-             |                   |                 |                   |            |            |
| OL&T                   | 22,485,840        | 0.930           | -2.0%             | 0.911      | 0.910      |
| M&C                    | 15,402,765        | 0.904           | 10.0              | 0.994      | 0.994      |
| LOCAL PRODUCT          | 4,224,850         | 0.804           | 4.2               | 0.838      | 0.838      |
| *MULTI PRODUCT         | 2,485,041         | 0.862           | -0.2              | 0.860      | 0.860      |
| TOTAL                  | 44,598,496        | 0.899           | 3.3%              | 0.929      | 0.928      |
| -----                  | -----             | -----           | -----             | -----      | -----      |
| PROP. & LIAB.<br>TOTAL | 104,452,139       |                 | -0.7%             |            |            |

\* indicates coverage for which reviews are on a MULTISTATE basis.



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TABLE 2

COMMERCIAL PACKAGE POLICY

COMBINED PMFs

| <u>TYPE OF POLICY</u> | <u>CURRENT<br/>COMBINED</u> | <u>INDICATED<br/>COMBINED</u> | <u>CAPPED<br/>COMBINED</u> |
|-----------------------|-----------------------------|-------------------------------|----------------------------|
| MOTEL/HOTEL (31)      | 0.98                        | 0.980                         | 0.98                       |
| APARTMENT (32)        | 0.88                        | 0.855                         | 0.85                       |
| OFFICE (33)           | 0.84                        | 0.806                         | 0.81                       |
| MERCANTILE (34)       | 0.86                        | 0.838                         | 0.84                       |
| INSTITUTION (35)      | 0.97                        | 0.927                         | 0.93                       |
| SERVICES (36)         | 0.93                        | 0.912                         | 0.91                       |
| IND/PROC (37)         | 0.84                        | 0.857                         | 0.86                       |
| CONTRACTORS (38)      | 0.87                        | 0.944                         | 0.94                       |

NOTE: Combined PMFs are provided for informational purposes only.

## EXPLANATORY NOTES TO TABLE 2

### CALCULATION OF REVISED PACKAGE MODIFICATION FACTORS

|                          |  |
|--------------------------|--|
| OBJECTIVE                | <p>Commercial package policies were introduced in the 1960's as a convenient tool for both insurer and insured to have the many types of insurance needed by commercial risks packaged under one cover. Thus fire, extended coverage, crime, liability insurance, etc. could be written using a single policy instead of several. Today, virtually any type of monoline coverage can also be purchased as part of a package policy such as the CPP.</p> <p>The types of insured which can be written under a CPP are generally categorized into the following Types of Policy:</p> <ul style="list-style-type: none"><li>. Motels and Hotels (TOP 31)</li><li>. Apartments (TOP 32)</li><li>. Offices (TOP 33)</li><li>. Mercantile Operations (TOP 34)</li><li>. Institutions (TOP 35)</li><li>. Service Operations (TOP 36)</li><li>. Industrial and Processing Operations (TOP 37)</li><li>. Contractors (TOP 38)</li></ul> |
| PRICING OF POLICIES      | <p>Since a CPP is essentially a combination of monoline coverages, CPP pricing employs monoline loss costs modified by PMFs (Package Modification Factors). These factors vary by the categories shown above and are reviewed annually.</p>  |
| CPP PMF REVIEW PROCEDURE | <p>The CPP review of Package Modification Factors, which appears in Table 2 of this document, determines the appropriate PMF loss cost level for each of the eight CPP categories. This is done by combining the indications of the simultaneous reviews of monoline and multiline experience for the various lines (or coverages).</p> <p>A detailed explanation of the calculation of the revised PMFs follows.</p>  |

## EXPLANATORY NOTES TO TABLE 2 (Cont'd)

### LINES OF INSURANCE (COVERAGES) INCLUDED

The CPP review reflects the contribution from each significant coverage which can be written on a CPP. Included are:

#### Property Coverages

- . Basic Group I (BGI) - the predominant property coverage included.
- . Basic Group II (BGII) - both Basic Group I and Basic Group II must be purchased under a CPP contract.
- . Special Causes of Loss (SCL) - typically a type of insurance which is purchased in addition to Basic Group I and Basic Group II in order to provide "all risk" property coverage for the insured.
- . Crime (CRIME) - Crime insurance is a commonly purchased CPP coverage.
- . Inland Marine (INL. MAR.) - A highly specialized line of property insurance, Inland Marine coverages can be purchased as part of a package policy.
- . Fidelity (FIDELITY) - Certain forms of fidelity insurance can be part of the CPP package. Various forms of employee dishonesty coverage are available.

#### Liability Coverages

- . Owners, Landlords and Tenants (OL&T) Liability - this is the prevalent type of Premises/Operations liability for CPP insureds.
- . Manufacturers and Contractors Liability (M&C) - this is the type of Premises/Operations liability insurance for risks whose liability exposure is more heavily off-premises than on.
- . Products/Completed Operations Liability (PROD) - this type of insurance protects against claims for damages arising from products/completed operations in conjunction with an insured's business. For review purposes, this line of insurance is split into the following two categories:
  - Products: experience for this category is reviewed on a multistate basis.
  - Local Products/ Completed Operations: experience for this category reflects an exposure to loss which is local in nature; therefore, individual state experience is used.

## EXPLANATORY NOTES TO TABLE 2 (Cont'd)

### THE IMPLICIT PACKAGE MODIFICATION FACTOR

For each applicable coverage listed under each of the eight (8) CPP categories, a "current implicit PMF" is shown in column (2). The definition of this factor follows:

For a given CPP category (e.g., apartments) the published Package Modification Factor (PMF) represents the loss cost for a CPP relative to that for monoline policies providing the same coverages. Thus a property (liability) PMF of .80 represents a 20% lower aggregate loss cost for a CPP than for the comparable monoline policies. This PMF, however, represents the CPP "loss cost" for all property (liability) coverages combined. Based on CPP experience, it has been determined that this CPP "loss cost" can differ significantly if it is determined for each property (liability) coverage individually. The IPMF represents what the PMF would be for that CPP risk if only a single coverage were written. The use of the IPMF in monoline/multiline ratemaking and in the determination of revised CPP Package Modification Factors is significant in that it appropriately identifies how different the component parts of the multiline "loss cost" are.

### THE MULTILINE INDICATION

Under the CPP ratemaking procedures, monoline and multiline experience are combined for each coverage. The results of these coverage analyses are indicated changes to monoline loss costs and also indicated CPP aggregate loss cost level changes. The CPP indications by coverage are then incorporated in the CPP PMF review. These indications (shown in column (3)) represent the needed adjustments to the IPMFs (shown in column (2)) described above.

The development of these indications is detailed in Section B.

### THE INDICATED PMF

For each CPP category (and for property vs. liability), the indicated PMF is calculated as follows:

Each of the current IPMFs in column (2) is multiplied by the indicated percent change shown in column (3). A weighted average of the indicated IPMFs, using weights based on latest year aggregate loss costs at current ISO loss cost level (column (1) divided by column (2)), yields the indicated PMF at the bottom of column (4).

### THE CAPPED PMF

The indicated PMF for each category (and for property vs. liability) shown at the bottom of column (4) is limited to a maximum of 1.00 in arriving at the proposed PMF (bottom of column (5)). All indicated PMFs which are below 1.00 are rounded to the nearest .01 in determining the proposed PMF. To the extent that any indicated PMFs are capped at 1.00, indicated PMFs below this value are adjusted in order to minimize any revenue changes which would result from capping.

In addition to the adjustments just described, the IPMFs (for property and liability) shown in column (4) are subject to minimum and maximum values and adjusted in column (5) so that they average to the proposed PMF shown at the bottom of column (5).

## COMMERCIAL PACKAGE POLICY

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#### SECTION B - CALCULATION OF PROPOSED CHANGES

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TABLE 3 - BASIC GROUP I RELATIVITY ANALYSIS

|                  | (1)                                | (2)              | (3)                  | (4)                    | (5)                   |
|------------------|------------------------------------|------------------|----------------------|------------------------|-----------------------|
|                  | \$ LST SQ<br>FORMULA<br>RELATIVITY | CREDIBILITY<br>Z | Z-WTD.<br>RELATIVITY | BALANCED<br>RELATIVITY | INDICATED<br>CHANGE * |
| TOP              |                                    |                  |                      |                        |                       |
| 10               | 0.849                              | 0.146            | 0.976                | 0.990                  |                       |
| 31               | 0.985                              | 0.024            | 1.000                | 1.014                  | +2.4%                 |
| 32               | 0.943                              | 0.133            | 0.992                | 1.006                  | +1.6%                 |
| 33               | 1.025                              | 0.054            | 1.001                | 1.016                  | +2.6%                 |
| 34               | 0.764                              | 0.168            | 0.956                | 0.969                  | -2.1%                 |
| 35               | 0.678                              | 0.193            | 0.928                | 0.941                  | -4.9%                 |
| 36               | 1.105                              | 0.149            | 1.015                | 1.029                  | +3.9%                 |
| 37               | 2.201                              | 0.124            | 1.103                | 1.118                  | +12.9%                |
| 38               | 0.891                              | 0.047            | 0.995                | 1.009                  | +1.9%                 |
| RATING<br>GROUP  |                                    |                  |                      |                        |                       |
| 01               | 0.823                              | 0.178            | 0.966                | 0.968                  |                       |
| 02               | 1.039                              | 0.178            | 1.007                | 1.009                  |                       |
| 03               | 1.095                              | 0.078            | 1.007                | 1.010                  |                       |
| 04               | 1.210                              | 0.361            | 1.071                | 1.074                  |                       |
| 05               | 1.712                              | 0.032            | 1.017                | 1.020                  |                       |
| 06               | 1.115                              | 0.235            | 1.026                | 1.028                  |                       |
| 07               | 1.016                              | 0.097            | 1.002                | 1.004                  |                       |
| 08               | 0.736                              | 0.277            | 0.919                | 0.921                  |                       |
| 09               | 1.481                              | 0.152            | 1.062                | 1.064                  |                       |
| 10               | 1.010                              | 0.067            | 1.001                | 1.003                  |                       |
| 11               | 1.248                              | 0.063            | 1.014                | 1.017                  |                       |
| 13               | 1.381                              | 0.131            | 1.043                | 1.046                  |                       |
| 14               | 0.831                              | 0.157            | 0.971                | 0.974                  |                       |
| 15               | 0.963                              | 0.075            | 0.997                | 1.000                  |                       |
| 17               | 0.369                              | 0.031            | 0.970                | 0.972                  |                       |
| 18               | 0.522                              | 0.035            | 0.978                | 0.980                  |                       |
| 19               | 0.412                              | 0.017            | 0.985                | 0.987                  |                       |
| 20               | 0.393                              | 0.022            | 0.980                | 0.982                  |                       |
| 21               | 0.377                              | 0.153            | 0.861                | 0.863                  |                       |
| 22               | 0.490                              | 0.085            | 0.941                | 0.943                  |                       |
| TERRITORY        |                                    |                  |                      |                        |                       |
| Kansas City      | 1.013                              | 0.144            | 1.002                | 0.984                  |                       |
| Saint Louis City | 0.491                              | 0.173            | 0.884                | 0.869                  |                       |
| Balance of State | 1.053                              | 0.646            | 1.034                | 1.016                  |                       |

\* INDICATED CHANGE = (BALANCED RELATIVITY FOR TOP) / (MONOLINE RELATIVITY (TOP 10)) - 1

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TABLE 4 - SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS

|          | (1)                                | (2)              | (3)                  | (4)                    | (5)                   |
|----------|------------------------------------|------------------|----------------------|------------------------|-----------------------|
|          | \$ LST SQ<br>FORMULA<br>RELATIVITY | CREDIBILITY<br>Z | Z-WTD.<br>RELATIVITY | BALANCED<br>RELATIVITY | INDICATED<br>CHANGE * |
| TOP      |                                    |                  |                      |                        |                       |
| 10       | 1.706                              | 0.196            | 1.110                | 1.110                  |                       |
| 31       | 1.320                              | 0.020            | 1.006                | 1.005                  | -9.5%                 |
| 32       | 0.703                              | 0.144            | 0.951                | 0.950                  | -14.4%                |
| 33       | 0.693                              | 0.083            | 0.970                | 0.969                  | -12.7%                |
| 34       | 1.010                              | 0.263            | 1.003                | 1.002                  | -9.7%                 |
| 35       | 1.037                              | 0.303            | 1.011                | 1.010                  | -9.0%                 |
| 36       | 0.964                              | 0.191            | 0.993                | 0.992                  | -10.6%                |
| 37       | 0.570                              | 0.152            | 0.918                | 0.918                  | -17.3%                |
| 38       | 0.676                              | 0.094            | 0.964                | 0.963                  | -13.2%                |
| CATEGORY |                                    |                  |                      |                        |                       |
| 01       | 1.039                              | 0.771            | 1.030                | 1.023                  |                       |
| 02       | 0.758                              | 0.079            | 0.978                | 0.972                  |                       |
| 03       | 0.519                              | 0.090            | 0.943                | 0.936                  |                       |
| 04       | 0.912                              | 0.132            | 0.988                | 0.981                  |                       |
| 05       | 0.626                              | 0.082            | 0.962                | 0.956                  |                       |
| 06       | 1.353                              | 0.058            | 1.018                | 1.011                  |                       |
| 07       | 1.247                              | 0.018            | 1.004                | 0.997                  |                       |
| 08       | 0.555                              | 0.145            | 0.918                | 0.912                  |                       |
| 09       | 0.390                              | 0.145            | 0.872                | 0.867                  |                       |
| 10       | 9.414                              | 0.036            | 1.084                | 1.077                  |                       |
| 11       | 0.827                              | 0.170            | 0.968                | 0.962                  |                       |
| 12       | 0.406                              | 0.169            | 0.859                | 0.853                  |                       |
| 13       | 1.072                              | 0.073            | 1.005                | 0.998                  |                       |
| 14       | 1.041                              | 0.125            | 1.005                | 0.998                  |                       |

\* INDICATED CHANGE = (BALANCED RELATIVITY FOR TOP) / (MONOLINE RELATIVITY (TOP 10)) - 1

## EXPLANATORY NOTES TO TABLES 3 AND 4

### BASIC GROUP I AND SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS

#### OBJECTIVE

The explanations which follow clarify Tables 3 and 4, the Basic Group I Relativity Analysis and the Special Causes of Loss Relativity Analysis, respectively. The purpose of these analyses is to:

- (1) determine monoline classification and territorial loss cost level needs for Basic Group I;
- (2) determine monoline category loss cost level need for Special Causes of Loss;
- (3) determine indicated changes to the eight property CPP Package Modification Factors based on Basic Group I/Special Causes of Loss experience.

#### COLUMN (1)

#### LEAST SQUARES FORMULA RELATIVITIES

The Least Squares Formula Relativities are the marginal relativities which result from the application of the simultaneous review procedure to the raw experience (where marginal refers to the relativities for a given rating variable, e.g. type of policy, across all subsets of any other rating variables, i.e. rating group and territory for Basic Group I, and category for Special Causes of Loss).

The purpose of such a simultaneous review procedure is to arrive at a set of type of policy relativities (which will serve to price CPP policies relative to monoline policies via the PMF); a set of rating group/territory relativities for Basic Group I; and a set of category relativities for Special Causes of Loss that best represent the experience. This procedure is in contrast to a review of each rating variable's experience separately. Such one-way types of review do not take into account differing percentages of monoline and multiline experience in each rating variable, or differing percentages of a particular rating variable's experience in the monoline and multiline types of policy. The simultaneous relativity procedure accounts for these different distributions in generating relativities for the various rating variables.



EXPLANATORY NOTES TO TABLES 3 AND 4 (Cont'd)

COLUMN (1)  
(Cont'd)

The procedure uses an iterative technique to determine a set of marginal relativities by rating variable that is a best fit to the individual cell relativities, with each cell being defined as the cross-section of specific values of each rating variable. The process uses the relativity of the five year experience ratios by rating cell to the overall statewide experience ratio and the latest year aggregate loss costs for each rating cell. (This experience is shown in Table 5 for Basic Group I and Table 6 for Special Causes of Loss). Specifically, the iteration procedure uses the following formulas:

BASIC GROUP I:

$$TOP_i = \frac{\sum_{j=1}^n \sum_{k=1}^t W_{ijk}^2 R_{ijk} RG_j TER_k}{\sum_{j=1}^n \sum_{k=1}^t W_{ijk}^2 RG_j^2 TER_k^2}, \text{ where } 1 \leq i \leq m;$$

$$RG_j = \frac{\sum_{k=1}^t \sum_{i=1}^m W_{ijk}^2 R_{ijk} TOP_i TER_k}{\sum_{k=1}^t \sum_{i=1}^m W_{ijk}^2 TOP_i^2 TER_k^2}, \text{ where } 1 \leq j \leq n$$

$$TER_k = \frac{\sum_{j=1}^n \sum_{i=1}^m W_{ijk}^2 R_{ijk} TOP_i RG_j}{\sum_{j=1}^n \sum_{i=1}^m W_{ijk}^2 TOP_i^2 RG_j^2}, \text{ where } 1 \leq k \leq t$$

EXPLANATORY NOTES TO TABLES 3 AND 4 (Cont'd)

COLUMN (1)  
(Cont'd)

SPECIAL CAUSES OF LOSS:

$$TOP_i = \frac{\sum_{j=1}^n W_{ij}^2 R_{ij} CAT_j}{\sum_{j=1}^n W_{ij}^2 CAT_j^2}, \text{ where } 1 \leq i \leq m;$$

$$CAT_j = \frac{\sum_{i=1}^m W_{ij}^2 R_{ij} TOP_i}{\sum_{i=1}^m W_{ij}^2 TOP_i^2}, \text{ where } 1 \leq j \leq n$$

- $TOP_i$  is the relativity for the  $i$ th Type of Policy;
- $RG_j$  is the relativity for the  $j$ th Rating Group;
- $CAT_j$  is the relativity for the  $j$ th Category;
- $TER_k$  is the relativity for the  $k$ th Territory;
- $W_{ijk}$  is the loss cost volume at current level for the  $i$ th Type of Policy,  $j$ th Rating Group or Category and  $k$ th Territory;
- $R_{ijk}$  is the experience ratio relativity for the  $i$ th Type of Policy,  $j$ th Rating Group or Category and  $k$ th Territory;
- $R_{ij}$  is the experience ratio relativity for the  $i$ th Type of Policy,  $j$ th Rating Group or Category;

## EXPLANATORY NOTES TO TABLES 3 AND 4 (Cont'd)

### COLUMN (1) (Cont'd)

- m is the number of Types of Policy in the analysis;
- n is the number of Rating Groups or Categories in the analysis;
- t is the number of Territories in the analysis.

The procedure determines m Type of Policy relativities using the above formulas. Then, using those results, a set of n Rating Group and t Territory relativities are determined. These steps form an iterative process which continues until there is no appreciable difference in results from one iteration to the next.

### COLUMN (2)

#### CREDIBILITY

The credibility of the experience for each rating variable is determined from the formula:

$$Z = \frac{P}{P + K}$$

where P is the 5-year adjusted aggregate loss costs for a given rating variable, and K is a constant value. For Basic Group I, K equals an aggregate loss cost volume of \$55,000,000 for territory, \$40,000,000 for rating group, and \$100,000,000 for type of policy. For Special Causes of Loss, K equals an aggregate loss cost volume of \$15,000,000.

### COLUMN (3)

#### CREDIBILITY-WEIGHTED RELATIVITIES

Credibility-weighted relativities are calculated based on the formula

$$W = R^Z$$

where Z is the credibility, R is the least squares formula relativity and W is the credibility-weighted relativity for a given rating variable.

This formula implicitly assigns the complement of credibility to a relativity of unity.

EXPLANATORY NOTES TO TABLES 3 AND 4 (Cont'd)

COLUMN (4)

BALANCED RELATIVITIES

The credibility-weighted relativities are balanced to assure that the average relativity across all rating variables remains at unity.

MULTILINE  
CONSIDERATIONS

The type of policy (TOP) relativities are used to generate multiline indications which apply to the current Implicit Package Modification Factors (IPMFs). The indicated IPMFs are calculated as follows:

$$\text{TOP y indicated IPMF} = \frac{(\text{TOP y current IPMF}) \times (\text{TOP y relativity})}{\text{monoline relativity}}$$

For each CPP Type of Policy the indicated IPMF is subject to a minimum value of 0.50 and a maximum value of 1.50. If an indicated IPMF falls outside one of those limits, it is capped at that amount, the aggregate loss costs for that Type of Policy are adjusted to the capped IPMF level, and the entire relativity review as described above is re-performed to take this into account. If an IPMF has been capped it is so noted at the bottom of Table 3 and Table 4.

Loss cost changes for each TOP are calculated as described on Tables 3 and 4.

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MISSOURI  
BASIC GROUP I RELATIVITY ANALYSIS  
TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

| TYPE OF POLICY | CATEGORY               | (1)<br>ACCIDENT YEAR<br>ENDING 12/31/17<br>AGGREGATE LOSS<br>COSTS | (2)<br>5 - YEAR<br>AGGREGATE<br>LOSS COSTS | (3)<br>5 - YEAR<br>EXPERIENCE<br>RATIO | (4)<br>Z-WEIGHTED<br>EXPERIENCE<br>RATIO | (5)<br>Z-WEIGHTED<br>RELATIVITY |
|----------------|------------------------|--|--|--|--|---------------------------------|
| -----          |                        |  |  |  |  |                                 |
| 10 MONOLINE    | 01 APARTMENTS          | 81,353   | 657,765                                    | 1.262                                  | 1.126                                    | 1.184                           |
|                | 02 OTHER HABITATIONAL  | 183,816  | 1,153,787                                  | 0.694                                  | 0.914                                    | 0.961                           |
|                | 03 RESTAURANTS & BARS  | 52,533   | 259,039                                    | 0.029                                  | 0.734                                    | 0.772                           |
|                | 04 OTHER MERCANTILE RS | 601,307  | 3,350,586                                  | 1.121                                  | 1.049                                    | 1.102                           |
|                | 05 PUBLIC BUILDINGS    | 28,355   | 162,955                                    | 0.342                                  | 0.893                                    | 0.939                           |
|                | 06 CHURCHES            | 31,421   | 134,043                                    | 9.679                                  | 2.617                                    | 2.752                           |
|                | 07 SCHOOLS             | 36,061   | 327,632                                    | 0.076                                  | 0.848                                    | 0.891                           |
|                | 08 OFFICES AND BANKS   | 410,536  | 2,160,982                                  | 1.224                                  | 0.989                                    | 1.041                           |
|                | 09 REC. FACILITIES     | 212,360  | 1,100,248                                  | 0.270                                  | 0.784                                    | 0.824                           |
|                | 10 HOTELS AND MOTELS   | 92,954   | 444,305                                    | 0.753                                  | 0.925                                    | 0.972                           |
|                | 11 HOSPITALS/NURS HOME | 152,373  | 563,120                                    | 1.503                                  | 1.077                                    | 1.133                           |
|                | 13 MOTOR VEHICLE RISKS | 190,569  | 1,071,194                                  | 1.793                                  | 1.243                                    | 1.307                           |
|                | 14 OTHER NON-MANUF.    | 494,952  | 2,710,651                                  | 0.226                                  | 0.637                                    | 0.669                           |
|                | 15 STORAGE             | 150,627  | 750,161                                    | 0.037                                  | 0.674                                    | 0.709                           |
|                | 17 FOOD MANUFACTURING  | 16,355   | 103,268                                    | 0.000                                  | 0.828                                    | 0.871                           |
|                | 18 WOOD MANUFACTURING  | 39,275   | 284,645                                    | 5.133                                  | 1.763                                    | 1.853                           |
|                | 19 WEARING APPAREL     | 14,110   | 57,312                                     | 0.000                                  | 0.834                                    | 0.877                           |
|                | 20 CHEM. MANUFACTURING | 10,273   | 358,673                                    | 0.000                                  | 0.883                                    | 0.928                           |
|                | 21 METAL MANUFACTURING | 197,975  | 1,097,019                                  | 0.710                                  | 0.862                                    | 0.907                           |
|                | 22 OTHER MANUFACTURING | 63,102   | 337,889                                    | 0.000                                  | 0.811                                    | 0.853                           |
|                | TOTAL*                 | 3,060,307  | 17,085,274                                 | 0.942                                  | 0.937                                    | 0.986                           |
| 31 MULTILINE   | 10 HOTELS AND MOTELS   | 963,633  | 2,430,696                                  | 1.713                                  | 1.049                                    | 1.103                           |
| MOTEL/HOTEL    | TOTAL*                 | 963,633  | 2,430,696                                  | 1.713                                  | 1.049                                    | 1.103                           |
| 32 MULTILINE   | 01 APARTMENTS          | 1,578,964  | 8,030,094                                  | 0.699                                  | 0.814                                    | 0.856                           |
| APARTMENT      | 02 OTHER HABITATIONAL  | 1,318,415  | 7,371,264                                  | 1.382                                  | 0.970                                    | 1.020                           |
|                | TOTAL*                 | 2,897,379  | 15,401,358                                 | 1.010                                  | 0.885                                    | 0.931                           |
| 33 MULTILINE   | 08 OFFICES AND BANKS   | 1,331,479  | 5,758,231                                  | 0.520                                  | 0.793                                    | 0.834                           |
| OFFICE         | TOTAL*                 | 1,331,479  | 5,758,231                                  | 0.520                                  | 0.793                                    | 0.834                           |
| 34 MULTILINE   | 03 RESTAURANTS & BARS  | 631,883  | 2,552,063                                  | 0.939                                  | 0.873                                    | 0.918                           |
| MERCANTILE     | 04 OTHER MERCANTILE RS | 2,430,052  | 13,345,303                                 | 1.141                                  | 0.951                                    | 1.000                           |
|                | 08 OFFICES AND BANKS   | 197,112  | 812,279                                    | 0.313                                  | 0.788                                    | 0.829                           |
|                | 13 MOTOR VEHICLE RISKS | 466,698  | 1,341,560                                  | 2.201                                  | 1.108                                    | 1.165                           |
|                | 14 OTHER NON-MANUF.    | 117,851  | 584,358                                    | 0.649                                  | 0.851                                    | 0.895                           |
|                | 15 STORAGE             | 358,889  | 1,619,102                                  | 0.209                                  | 0.762                                    | 0.801                           |
|                | TOTAL*                 | 4,202,485  | 20,254,665                                 | 1.096                                  | 0.930                                    | 0.978                           |

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MISSOURI  
BASIC GROUP I RELATIVITY ANALYSIS  
TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

| TYPE OF POLICY | CATEGORY               | (1)<br>ACCIDENT YEAR<br>ENDING 12/31/17<br>AGGREGATE LOSS<br>COSTS | (2)<br>5 - YEAR<br>AGGREGATE<br>LOSS COSTS | (3)<br>5 - YEAR<br>EXPERIENCE<br>RATIO | (4)<br>Z-WEIGHTED<br>EXPERIENCE<br>RATIO | (5)<br>Z-WEIGHTED<br>RELATIVITY |
|----------------|------------------------|--|--|--|--|---------------------------------|
| <hr/>          |                        |  |  |  |  |                                 |
| 35 MULTILINE   | 02 OTHER HABITATIONAL  | 35,406   | 164,434                                    | 0.994                                  | 0.877                                    | 0.921                           |
| INSTITUTIONAL  | 05 PUBLIC BUILDINGS    | 238,009  | 1,139,461                                  | 2.837                                  | 1.219                                    | 1.282                           |
|                | 06 CHURCHES            | 2,069,079  | 12,123,370                                 | 0.548                                  | 0.791                                    | 0.832                           |
|                | 07 SCHOOLS             | 839,640  | 3,971,069                                  | 0.074                                  | 0.718                                    | 0.755                           |
|                | 08 OFFICES AND BANKS   | 412,556  | 2,180,100                                  | 0.488                                  | 0.786                                    | 0.827                           |
|                | 09 REC. FACILITIES     | 232,117  | 1,214,171                                  | 0.091                                  | 0.752                                    | 0.791                           |
|                | 11 HOSPITALS/NURS HOME | 442,816  | 2,121,808                                  | 0.943                                  | 0.883                                    | 0.929                           |
|                | 13 MOTOR VEHICLE RISKS | 3,912  | 24,605                                     | 0.000                                  | 0.733                                    | 0.771                           |
|                | 14 OTHER NON-MANUF.    | 202,817  | 942,746                                    | 0.125                                  | 0.763                                    | 0.802                           |
|                | TOTAL*                 | 4,476,352  | 23,881,764                                 | 0.575                                  | 0.806                                    | 0.848                           |
| 36 MULTILINE   | 03 RESTAURANTS & BARS  | 102,113  | 557,810                                    | 0.063                                  | 0.892                                    | 0.938                           |
| SERVICES       | 04 OTHER MERCANTILE RS | 249,325  | 1,439,933                                  | 1.191                                  | 1.154                                    | 1.213                           |
|                | 08 OFFICES AND BANKS   | 516,078  | 2,999,798                                  | 0.117                                  | 0.586                                    | 0.616                           |
|                | 09 REC. FACILITIES     | 957,348  | 4,875,666                                  | 1.785                                  | 1.542                                    | 1.621                           |
|                | 13 MOTOR VEHICLE RISKS | 748,365  | 3,551,860                                  | 1.689                                  | 1.423                                    | 1.497                           |
|                | 14 OTHER NON-MANUF.    | 514,488  | 2,524,287                                  | 0.855                                  | 0.967                                    | 1.017                           |
|                | 15 STORAGE             | 161,255  | 869,544                                    | 1.035                                  | 1.057                                    | 1.111                           |
|                | 21 METAL MANUFACTURING | 15,710   | 127,625                                    | 0.088                                  | 1.004                                    | 1.056                           |
|                | 22 OTHER MANUFACTURING | 75,603   | 529,921                                    | 0.147                                  | 0.830                                    | 0.873                           |
|                | TOTAL*                 | 3,340,285  | 17,476,444                                 | 1.184                                  | 1.188                                    | 1.249                           |
| 37 MULTILINE   | 04 OTHER MERCANTILE RS | 192,157  | 1,096,819                                  | 5.786                                  | 2.762                                    | 2.904                           |
| INDUST/PROCESS | 08 OFFICES AND BANKS   | 41,642   | 217,273                                    | 0.538                                  | 0.972                                    | 1.021                           |
|                | 13 MOTOR VEHICLE RISKS | 3,324  | 14,641                                     | 0.000                                  | 0.472                                    | 0.496                           |
|                | 14 OTHER NON-MANUF.    | 74,303   | 436,131                                    | 0.419                                  | 0.954                                    | 1.003                           |
|                | 15 STORAGE             | 501  | 21,938                                     | 0.000                                  | 1.052                                    | 1.106                           |
|                | 17 FOOD MANUFACTURING  | 219,885  | 1,191,398                                  | 0.037                                  | 0.667                                    | 0.702                           |
|                | 18 WOOD MANUFACTURING  | 187,125  | 1,164,383                                  | 0.994                                  | 1.073                                    | 1.129                           |
|                | 19 WEARING APPAREL     | 99,974   | 614,306                                    | 1.992                                  | 1.433                                    | 1.507                           |
|                | 20 CHEM. MANUFACTURING | 51,712   | 540,483                                    | 0.045                                  | 0.824                                    | 0.867                           |
|                | 21 METAL MANUFACTURING | 968,824  | 5,988,760                                  | 0.675                                  | 0.820                                    | 0.862                           |
|                | 22 OTHER MANUFACTURING | 480,992  | 2,829,616                                  | 1.035                                  | 1.081                                    | 1.136                           |
|                | TOTAL*                 | 2,320,439  | 14,115,748                                 | 1.169                                  | 1.074                                    | 1.129                           |

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MISSOURI  
BASIC GROUP I RELATIVITY ANALYSIS  
TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

| TYPE OF POLICY              | CATEGORY               | (1)<br>ACCIDENT YEAR<br>ENDING 12/31/17<br>AGGREGATE LOSS<br>COSTS | (2)<br>5 - YEAR<br>AGGREGATE<br>LOSS COSTS | (3)<br>5 - YEAR<br>EXPERIENCE<br>RATIO | (4)<br>Z-WEIGHTED<br>EXPERIENCE<br>RATIO | (5)<br>Z-WEIGHTED<br>RELATIVITY |
|-----------------------------|------------------------|--|--|--|--|---------------------------------|
| 38 MULTILINE<br>CONTRACTORS | 04 OTHER MERCANTILE RS | 594,765  | 3,406,855                                  | 0.950                                  | 1.032                                    | 1.085                           |
|                             | 08 OFFICES AND BANKS   | 215,689  | 1,221,070                                  | 0.224                                  | 0.803                                    | 0.844                           |
|                             | 14 OTHER NON-MANUF.    | 54,837   | 252,136                                    | 0.367                                  | 0.958                                    | 1.008                           |
|                             | TOTAL*                 | 865,291  | 4,880,061                                  | 0.732                                  | 0.970                                    | 1.020                           |
| TOTAL ALL TOPS*             | 01 APARTMENTS          | 1,660,317  | 8,687,859                                  | 0.727                                  | 0.830                                    | 0.872                           |
|                             | 02 OTHER HABITATIONAL  | 1,537,637  | 8,689,485                                  | 1.291                                  | 0.961                                    | 1.010                           |
|                             | 03 RESTAURANTS & BARS  | 786,529  | 3,368,912                                  | 0.765                                  | 0.866                                    | 0.911                           |
|                             | 04 OTHER MERCANTILE RS | 4,067,606  | 22,639,496                                 | 1.333                                  | 1.075                                    | 1.131                           |
|                             | 05 PUBLIC BUILDINGS    | 266,364  | 1,302,416                                  | 2.571                                  | 1.184                                    | 1.245                           |
|                             | 06 CHURCHES            | 2,100,500  | 12,257,413                                 | 0.685                                  | 0.819                                    | 0.861                           |
|                             | 07 SCHOOLS             | 875,701  | 4,298,701                                  | 0.074                                  | 0.723                                    | 0.760                           |
|                             | 08 OFFICES AND BANKS   | 3,125,092  | 15,349,733                                 | 0.508                                  | 0.786                                    | 0.827                           |
|                             | 09 REC. FACILITIES     | 1,401,825  | 7,190,085                                  | 1.275                                  | 1.296                                    | 1.363                           |
|                             | 10 HOTELS AND MOTELS   | 1,056,587  | 2,875,001                                  | 1.629                                  | 1.038                                    | 1.091                           |
|                             | 11 HOSPITALS/NURS HOME | 595,189  | 2,684,928                                  | 1.087                                  | 0.933                                    | 0.981                           |
|                             | 13 MOTOR VEHICLE RISKS | 1,412,868  | 6,003,860                                  | 1.863                                  | 1.291                                    | 1.357                           |
|                             | 14 OTHER NON-MANUF.    | 1,459,248  | 7,450,309                                  | 0.483                                  | 0.816                                    | 0.858                           |
|                             | 15 STORAGE             | 671,272  | 3,260,745                                  | 0.369                                  | 0.813                                    | 0.855                           |
|                             | 17 FOOD MANUFACTURING  | 236,240  | 1,294,666                                  | 0.034                                  | 0.679                                    | 0.714                           |
|                             | 18 WOOD MANUFACTURING  | 226,400  | 1,449,028                                  | 1.712                                  | 1.193                                    | 1.254                           |
|                             | 19 WEARING APPAREL     | 114,084  | 671,618                                    | 1.746                                  | 1.359                                    | 1.429                           |
|                             | 20 CHEM. MANUFACTURING | 61,985   | 899,156                                    | 0.038                                  | 0.834                                    | 0.877                           |
|                             | 21 METAL MANUFACTURING | 1,182,509  | 7,213,404                                  | 0.673                                  | 0.830                                    | 0.872                           |
|                             | 22 OTHER MANUFACTURING | 619,697  | 3,697,426                                  | 0.821                                  | 1.023                                    | 1.075                           |
|                             | TOTAL*                 | 23,457,650   | 121,284,241                                | 0.965                                  | 0.951                                    | 1.000                           |

\* TOTALS IN COLUMNS (3), (4) & (5) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

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SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS  
TABLE 6 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

| TYPE OF POLICY | CATEGORY               | (1)<br>ACCIDENT YEAR<br>ENDING 12/31/17<br>AGGREGATE LOSS<br>COSTS | (2)<br>5 - YEAR<br>AGGREGATE<br>LOSS COSTS | (3)<br>5 - YEAR<br>EXPERIENCE<br>RATIO | (4)<br>RELATIVITY |
|----------------|------------------------|--|--|--|-------------------|
| 10 MONOLINE    | 01 BUILDINGS           | 1,209,759  | 6,257,492                                  | 1.650                                  | 1.848             |
|                | 02 RES. APTS. AND COND | 21,362   | 168,750                                    | 0.077                                  | 0.086             |
|                | 03 OFFICES             | 118,493  | 648,425                                    | 0.411                                  | 0.460             |
|                | 04 MERCANTILE - HIGH   | 140,610  | 739,932                                    | 0.352                                  | 0.394             |
|                | 05 MERCANTILE - MEDIUM | 21,811   | 118,157                                    | 0.277                                  | 0.310             |
|                | 06 MERCANTILE - LOW    | 19,117   | 129,921                                    | 0.109                                  | 0.122             |
|                | 07 MOTELS AND HOTELS   | 18,631   | 94,148                                     | 8.772                                  | 9.823             |
|                | 08 INSTITUTIONAL - HIG | 27,695   | 163,860                                    | 1.040                                  | 1.165             |
|                | 09 INSTITUTIONAL - LOW | 51,192   | 208,583                                    | 0.299                                  | 0.335             |
|                | 10 INDUST-PROC - HIGH  | 7,576  | 63,609                                     | 0.599                                  | 0.671             |
|                | 11 INDUST-PROC - LOW   | 66,561   | 409,718                                    | 0.425                                  | 0.476             |
|                | 12 SERVICE - HIGH      | 53,782   | 330,334                                    | 0.286                                  | 0.320             |
|                | 13 SERVICE - LOW       | 49,511   | 321,983                                    | 2.867                                  | 3.211             |
|                | 14 CONTRACTORS         | 17,107   | 92,538                                     | 0.842                                  | 0.943             |
|                | TOTAL*                 | 1,823,207  | 9,747,450                                  | 1.380                                  | 1.545             |
| 31 MULTILINE   | 01 BUILDINGS           | 195,482  | 636,536                                    | 1.358                                  | 1.521             |
| MOTEL/HOTEL    | 07 MOTELS AND HOTELS   | 55,543   | 173,348                                    | 0.525                                  | 0.588             |
|                | TOTAL*                 | 251,025  | 809,884                                    | 1.174                                  | 1.315             |
| 32 MULTILINE   | 01 BUILDINGS           | 1,067,281  | 5,576,160                                  | 0.671                                  | 0.751             |
| APARTMENT      | 02 RES. APTS. AND COND | 213,587  | 1,126,157                                  | 0.517                                  | 0.579             |
|                | TOTAL*                 | 1,280,868  | 6,702,317                                  | 0.645                                  | 0.722             |
| 33 MULTILINE   | 01 BUILDINGS           | 671,475  | 2,846,880                                  | 0.647                                  | 0.725             |
| OFFICE         | 03 OFFICES             | 176,967  | 785,108                                    | 0.777                                  | 0.870             |
|                | 04 MERCANTILE - HIGH   | 265  | 1,210                                      | 0.000                                  | 0.000             |
|                | 08 INSTITUTIONAL - HIG | 1,469  | 7,286                                      | 0.000                                  | 0.000             |
|                | 11 INDUST-PROC - LOW   | 48   | 204  | 0.000                                  | 0.000             |
|                | 12 SERVICE - HIGH      | 6  | 1,143                                      | 10.269                                 | 11.499            |
|                | 14 CONTRACTORS         | 0  | 62   | 0.000                                  | 0.000             |
|                | TOTAL*                 | 850,230  | 3,641,893                                  | 0.673                                  | 0.754             |



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SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS  
TABLE 6 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

| TYPE OF POLICY                | CATEGORY               | (1)<br>ACCIDENT YEAR<br>ENDING 12/31/17<br>AGGREGATE LOSS<br>COSTS | (2)<br>5 - YEAR<br>AGGREGATE<br>LOSS COSTS | (3)<br>5 - YEAR<br>EXPERIENCE<br>RATIO | (4)<br>RELATIVITY |
|-------------------------------|------------------------|--|--|--|-------------------|
| 34 MULTILINE<br>MERCANTILE    | 01 BUILDINGS           | 2,520,353  | 10,666,228                                 | 0.960                                  | 1.075             |
|                               | 03 OFFICES             | 4,247  | 6,125                                      | 0.000                                  | 0.000             |
|                               | 04 MERCANTILE - HIGH   | 263,177  | 1,519,350                                  | 1.368                                  | 1.532             |
|                               | 05 MERCANTILE - MEDIUM | 212,665  | 1,201,366                                  | 0.592                                  | 0.663             |
|                               | 06 MERCANTILE - LOW    | 185,266  | 799,649                                    | 1.294                                  | 1.449             |
|                               | 08 INSTITUTIONAL - HIG | 279  | 1,524                                      | 0.000                                  | 0.000             |
|                               | 11 INDUST-PROC - LOW   | 2,244  | 3,913                                      | 0.000                                  | 0.000             |
|                               | 12 SERVICE - HIGH      | 4,832  | 19,454                                     | 0.000                                  | 0.000             |
|                               | 13 SERVICE - LOW       | 3,659  | 17,979                                     | 0.000                                  | 0.000             |
|                               | 14 CONTRACTORS         | 10,932   | 48,954                                     | 0.000                                  | 0.000             |
|                               | TOTAL*                 | 3,207,654  | 14,284,542                                 | 0.981                                  | 1.099             |
| 35 MULTILINE<br>INSTITUTIONAL | 01 BUILDINGS           | 2,340,144  | 12,810,089                                 | 0.991                                  | 1.110             |
|                               | 03 OFFICES             | 355  | 737  | 0.000                                  | 0.000             |
|                               | 08 INSTITUTIONAL - HIG | 436,978  | 2,290,266                                  | 0.529                                  | 0.592             |
|                               | 09 INSTITUTIONAL - LOW | 438,550  | 2,282,484                                  | 0.379                                  | 0.424             |
|                               | 11 INDUST-PROC - LOW   | 0  | 17   | 0.000                                  | 0.000             |
|                               | 12 SERVICE - HIGH      | 228  | 739  | 0.000                                  | 0.000             |
|                               | 14 CONTRACTORS         | 1,994  | 9,293                                      | 0.000                                  | 0.000             |
|                               | TOTAL*                 | 3,218,249  | 17,393,625                                 | 0.844                                  | 0.945             |
| 36 MULTILINE<br>SERVICES      | 01 BUILDINGS           | 1,135,357  | 5,659,324                                  | 0.925                                  | 1.036             |
|                               | 03 OFFICES             | 2,951  | 11,817                                     | 0.000                                  | 0.000             |
|                               | 04 MERCANTILE - HIGH   | 3,661  | 16,267                                     | 0.000                                  | 0.000             |
|                               | 05 MERCANTILE - MEDIUM | 4,847  | 21,041                                     | 4.895                                  | 5.482             |
|                               | 06 MERCANTILE - LOW    | 353  | 1,271                                      | 0.000                                  | 0.000             |
|                               | 08 INSTITUTIONAL - HIG | 13,658   | 74,325                                     | 0.000                                  | 0.000             |
|                               | 09 INSTITUTIONAL - LOW | 12,779   | 57,702                                     | 0.000                                  | 0.000             |
|                               | 10 INDUST-PROC - HIGH  | 98   | 155  | 0.000                                  | 0.000             |
|                               | 11 INDUST-PROC - LOW   | 218  | 854  | 0.000                                  | 0.000             |
|                               | 12 SERVICE - HIGH      | 412,358  | 2,699,222                                  | 0.371                                  | 0.415             |
|                               | 13 SERVICE - LOW       | 156,825  | 833,469                                    | 0.743                                  | 0.832             |
|                               | 14 CONTRACTORS         | 12,591   | 56,840                                     | 0.000                                  | 0.000             |
|                               | TOTAL*                 | 1,755,696  | 9,432,287                                  | 0.765                                  | 0.857             |

MISSOURI

SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS  
TABLE 6 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

| TYPE OF POLICY              | CATEGORY               | (1)<br>ACCIDENT YEAR<br>ENDING 12/31/17<br>AGGREGATE LOSS<br>COSTS | (2)<br>5 - YEAR<br>AGGREGATE<br>LOSS COSTS | (3)<br>5 - YEAR<br>EXPERIENCE<br>RATIO | (4)<br>RELATIVITY |
|-----------------------------|------------------------|--|--|--|-------------------|
| 37 MULTILINE<br>INDUST/PROC | 01 BUILDINGS           | 768,021  | 4,004,493                                  | 0.492                                  | 0.551             |
|                             | 03 OFFICES             | 942  | 5,924                                      | 4.165                                  | 4.664             |
|                             | 04 MERCANTILE - HIGH   | 979  | 1,810                                      | 0.000                                  | 0.000             |
|                             | 05 MERCANTILE - MEDIUM | 25   | 416  | 0.000                                  | 0.000             |
|                             | 06 MERCANTILE - LOW    | 131  | 471  | 0.000                                  | 0.000             |
|                             | 10 INDUST-PROC - HIGH  | 76,490   | 500,475                                    | 5.356                                  | 5.998             |
|                             | 11 INDUST-PROC - LOW   | 475,031  | 2,658,728                                  | 0.485                                  | 0.543             |
|                             | 12 SERVICE - HIGH      | 843  | 2,163                                      | 0.000                                  | 0.000             |
|                             | 13 SERVICE - LOW       | 360  | 633  | 0.000                                  | 0.000             |
|                             | 14 CONTRACTORS         | 1,737  | 3,906                                      | 0.000                                  | 0.000             |
|                             | TOTAL*                 | 1,324,559  | 7,179,019                                  | 0.771                                  | 0.863             |
| 38 MULTILINE<br>CONTRACTORS | 01 BUILDINGS           | 413,018  | 2,174,235                                  | 0.640                                  | 0.717             |
|                             | 03 OFFICES             | 5,675  | 26,611                                     | 0.719                                  | 0.805             |
|                             | 04 MERCANTILE - HIGH   | 853  | 5,607                                      | 0.251                                  | 0.281             |
|                             | 08 INSTITUTIONAL - HIG | 659  | 1,871                                      | 0.000                                  | 0.000             |
|                             | 11 INDUST-PROC - LOW   | 1,069  | 2,907                                      | 0.000                                  | 0.000             |
|                             | 12 SERVICE - HIGH      | 1,758  | 4,591                                      | 0.000                                  | 0.000             |
|                             | 13 SERVICE - LOW       | 287  | 965  | 0.000                                  | 0.000             |
|                             | 14 CONTRACTORS         | 331,623  | 1,940,552                                  | 0.656                                  | 0.735             |
|                             | TOTAL*                 | 754,942  | 4,157,339                                  | 0.644                                  | 0.721             |
| TOTAL ALL TOPS*             | 01 BUILDINGS           | 10,320,890   | 50,631,437                                 | 0.954                                  | 1.068             |
|                             | 02 RES. APTS. AND COND | 234,949  | 1,294,907                                  | 0.477                                  | 0.534             |
|                             | 03 OFFICES             | 309,630  | 1,484,747                                  | 0.627                                  | 0.702             |
|                             | 04 MERCANTILE - HIGH   | 409,545  | 2,284,176                                  | 1.000                                  | 1.120             |
|                             | 05 MERCANTILE - MEDIUM | 239,348  | 1,340,980                                  | 0.650                                  | 0.728             |
|                             | 06 MERCANTILE - LOW    | 204,867  | 931,312                                    | 1.180                                  | 1.321             |
|                             | 07 MOTELS AND HOTELS   | 74,174   | 267,496                                    | 2.597                                  | 2.908             |
|                             | 08 INSTITUTIONAL - HIG | 480,738  | 2,539,132                                  | 0.541                                  | 0.606             |
|                             | 09 INSTITUTIONAL - LOW | 502,521  | 2,548,769                                  | 0.361                                  | 0.404             |
|                             | 10 INDUST-PROC - HIGH  | 84,164   | 564,239                                    | 4.922                                  | 5.512             |
|                             | 11 INDUST-PROC - LOW   | 545,171  | 3,076,341                                  | 0.474                                  | 0.531             |
|                             | 12 SERVICE - HIGH      | 473,807  | 3,057,646                                  | 0.355                                  | 0.398             |
|                             | 13 SERVICE - LOW       | 210,642  | 1,175,029                                  | 1.227                                  | 1.374             |
|                             | 14 CONTRACTORS         | 375,984  | 2,152,145                                  | 0.617                                  | 0.691             |
|                             | TOTAL*                 | 14,466,430   | 73,348,356                                 | 0.893                                  | 1.000             |

\* TOTALS IN COLUMNS (3) & (4) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

## EXPLANATORY NOTES TO TABLES 5 AND 6

### BASIC GROUP I/SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

**INTRODUCTION**      The experience used in the relativity analysis and displayed in Tables 5 and 6 is the latest five years of accident year data as reported under the Commercial Statistical Plan. As in the overall review, loss costs have been adjusted to current ISO loss cost and prospective amount of insurance levels (with multiline aggregate loss costs adjusted additionally by the current implicit package modification factors). Incurred losses are adjusted to prospective cost levels, and are further adjusted by the Basic Group I large loss procedure and the Special Causes of Loss excess procedure. Losses have also been developed to their ultimate settlement value by application of loss development factors.

**COLUMN (1)**      AGGREGATE LOSS COSTS

The latest year adjusted aggregate loss costs (adjusted as described above) are used as weights both in the calculation of any totals shown in this table and in the iterative formulae used in the simultaneous review procedure.

**COLUMN (2)**      5 - YEAR AGGREGATE LOSS COSTS

The combined five-year adjusted aggregate loss costs (adjusted as described above) are used to calculate the experience ratios in column (3).

**COLUMN (3)**      FIVE-YEAR EXPERIENCE RATIOS

These are the ratio of the combined five-year adjusted incurred losses (adjusted as described above) to the combined five-year adjusted aggregate loss costs as shown in Column (2). Any totals which are shown are weighted averages using the adjusted aggregate loss costs in Column (1).

**COLUMN (4)**      CREDIBILITY (Z) WEIGHTED EXPERIENCE RATIO

A credibility procedure is applied to the initial experience ratios in column (3) on a cell-by-cell basis prior to the simultaneous review procedure. The credibility values are calculated using an empirical Bayesian credibility procedure. In the following discussion, cell refers to an individual combination of TOP, rating group or category, and territory (where applicable).

## EXPLANATORY NOTES TO TABLES 5 AND 6 (Cont'd)

### COLUMN (4) (Cont'd)

The important concept underlying empirical Bayesian credibility is that the credibility should depend both on the overall variation of the group of which the cell is a member, in addition to the variation of the yearly experience ratios for each cell. Therefore, if a cell's data is itself very stable then we would assign a relatively high credibility value, and vice versa.

The empirical Bayesian credibility formula for individual cell credibility is  $Z = ((C-3)/C) (P/(P+K)) + (3/C)$ . P equals the cell's five-year adjusted aggregate loss costs and C equals the number of unique combinations of rating variables (Territory, TOP and Rating Group/Category) within a class group. The K value is estimated from the underlying data using the empirical Bayes method and varies by TOP group and by territory where applicable. The three TOP groups used in this analysis are: Monoline (TOP 10), Premises (TOP's 31-35), and Operations (TOP's 36-38). The 3/C term corrects for the statistical bias associated with the credibility process. The minimum credibility that is possible is 3/C.

The calculated credibility (Z) is then applied to the five-year experience ratio with the complement of credibility applied to the credibility-weighted average of the individual experience ratios of the group, where group refers to the specified TOP/territory group. In a non-territory state, K values would be determined for the three TOP groups on an entire state basis.

### COLUMN (5)

#### WEIGHTED RELATIVITIES

The relativities are the ratios of the five-year credibility-weighted experience ratios shown in column (4) to the average five-year credibility-weighted experience ratio for all TOP's, rating groups and territories (where applicable) combined. These relativities represent how much better or worse than average the experience for a given cell is. They are used along with the aggregate loss costs in column (1) as input for the simultaneous review procedure.

MISSOURI

TABLE 7 - BASIC GROUP II RELATIVITY ANALYSIS

|                   | (1)<br>ACCIDENT YEAR<br>ENDING 12/31/17<br>AGGR. LOSS COSTS<br>AT CURRENT<br>IMPLICIT PMF | (2)<br>ACCIDENT YEARS<br>2008-2017<br>EXPER. RATIO<br>AT CURRENT<br>PMF A | (3)<br>FORMULA<br>RELATIVITY<br>(2)/ 1.199 | (4)<br>CREDI-<br>BILITY Z<br>C | (5)<br>Z<br>WEIGHTED<br>RELA-<br>TIVITY D | (6)<br>BALANCED<br>FORMULA<br>RELA-<br>TIVITY E | (7)<br>NORMALIZED<br>FORMULA<br>RELA-<br>TIVITY F | (8)<br>INDICATED<br>CHANGE G |
|-------------------|---|---|--|--------------------------------|---|---|---|------------------------------|
| MONOLINE          | 2,890,176   | 1.303   | 1.087                                      | 0.428                          | 1.037                                     | 1.037   | 1.0415  |                              |
| MULTILINE         | 25,278,965  | 1.187   | 0.990                                      | 0.856                          | 0.991                                     | 0.991   | 0.9954  |                              |
| COVERAGE          | 28,169,141  | 1.199   | 1.000                                      |                                |   | 0.9957 B  | 1.0001  |                              |
| MULTILINE TOP     |   |   |  |                                |   |   |   |                              |
| 31 MOTEL/HOTEL    | 625,226   | 2.332   | 1.945                                      | 0.089                          | 1.084                                     | 1.091   | 1.0957  | +5.2%                        |
| 32 APARTMENT      | 3,222,722   | 1.100   | 0.917                                      | 0.430                          | 0.964                                     | 0.970   | 0.9742  | -6.5%                        |
| 33 OFFICE         | 1,190,762   | 1.133   | 0.945                                      | 0.182                          | 0.990                                     | 0.996   | 1.0003  | -4.0%                        |
| 34 MERCANTILE     | 6,644,806   | 1.174   | 0.979                                      | 0.568                          | 0.988                                     | 0.994   | 0.9983  | -4.1%                        |
| 35 INSTITUTIONAL  | 7,102,876   | 1.152   | 0.961                                      | 0.663                          | 0.974                                     | 0.980   | 0.9842  | -5.5%                        |
| 36 SERVICES       | 3,773,310   | 1.166   | 0.972                                      | 0.472                          | 0.987                                     | 0.993   | 0.9973  | -4.2%                        |
| 37 INDUST/PROCESS | 1,679,697   | 1.315   | 1.097                                      | 0.299                          | 1.029                                     | 1.035   | 1.0395  | -0.2%                        |
| 38 CONTRACTORS    | 1,039,566   | 1.011   | 0.843                                      | 0.215                          | 0.966                                     | 0.972   | 0.9762  | -6.3%                        |
|                   | 25,278,965  | 1.187 B   | 0.990                                      |                                | 0.985 B                                   | 0.991 B   | 0.9954  |                              |

B - AVERAGE WEIGHTED BY COLUMN (1)

C - CREDIBILITY =  $P/(P+K)$  WHERE P REPRESENTS THE TOTAL 10 YEAR ADJUSTED LOSS COSTS AND K = 45,000,000

D - (5) = (3) \* (4) + (1.000 - (4))

E - (6) = (5) \* (0.991/0.985)

F - (7) = (6) / 0.9957

G - (8) = (NORMALIZED RELATIVITY FOR TOP)/(NORMALIZED MONOLINE RELATIVITY (TOP 10)) - 1

## EXPLANATORY NOTES TO TABLE 7

### BASIC GROUP II RELATIVITY ANALYSIS

#### OBJECTIVE

The explanations which follow clarify Table 7, the Basic Group II (BG II) relativity analysis. The purpose of this analysis is to:

- (1) determine the monoline loss cost level need;
- (2) determine indicated changes to the eight property Commercial Package Policy (CPP) Package Modification Factors (PMFs) based on Basic Group II experience.

#### COLUMN (1)

##### AGGREGATE LOSS COSTS

The latest accident year adjusted aggregate loss costs (adjusted in the same manner as in the overall review, i.e. to current manual loss cost and prospective amount of insurance levels, with multiline aggregate loss costs further adjusted to current IPMF level) are used as weights in the calculation of any totals shown in this table.

#### COLUMN (2)

##### 10 - YEAR EXPERIENCE RATIO

These experience ratios are the ratio of the combined ten year CSP adjusted incurred losses (adjusted to current deductible and prospective cost levels including loss development, and also adjusted to reflect the BGII excess loss procedure) to the combined ten year CSP adjusted aggregate loss costs. Any totals which are shown are weighted averages using the aggregate loss costs in Column (1). When a dash is displayed in the column, it indicates that the indicated IPMF which resulted from this procedure was capped. The procedure which follows when capping occurs is described below.

#### COLUMN (3)

##### FORMULA RELATIVITY

The formula relativities are the ratios of the ten year experience ratios for the type of policy (either monoline vs. multiline or individual multiline programs) to the average ten year experience ratio for monoline and multiline combined. These relativities represent how much better or worse than average the experience for a given type of policy is. Again, any totals which are shown are weighted averages and the display of a dash indicates that the resulting IPMF was capped.

EXPLANATORY NOTES TO TABLE 7 (Cont'd)

COLUMN (3)  
(Cont'd)

Unlike the BGI and SCL relativity analyses, the BGII analysis does not employ a simultaneous review procedure since a one way review is involved. That is, the overall loss cost change is only distributed across type of policy; no other rating variables are considered.

COLUMN (4)

CREDIBILITY

The credibility of the experience for each type of policy is determined from the formula:

$$Z = \frac{P}{P + K}$$

where P is the ten year adjusted aggregate loss costs for a given type of policy, and K is a constant loss cost volume of \$45,000,000.

COLUMN (5)

Z - WEIGHTED RELATIVITY

The weighted relativity is a weighted average of the individual TOP formula relativity and the overall (coverage) formula relativity using credibility and its complement as the respective weights. Therefore, to the extent that the indication for a type of policy is not fully credible, the complement of credibility is assigned to the statewide coverage level change.

COLUMN (6)

BALANCED FORMULA RELATIVITY

The individual multiline weighted relativities are balanced to the multiline weighted relativity level by applying a factor equal to the overall multiline relativity (i.e. the weighted relativity for all multiline combined which is shown on the top of the exhibit directly under the corresponding monoline relativity) divided by the average multiline relativity (i.e. the weighted average of the individual multiline weighted relativities which is shown on the bottom of the exhibit). When the indicated IPMF for a type of policy is capped, the balanced relativity is set equal to the product of the capped IPMF and the monoline balanced formula relativity, divided by the current IPMF.

EXPLANATORY NOTES TO TABLE 7 (Cont'd)

COLUMN (7)

NORMALIZED FORMULA RELATIVITY

The normalized relativity is equal to the balanced formula relativity divided by the average monoline/multiline combined relativity. This balances the average monoline/multiline relativity to unity.

COLUMN (8)

INDICATED LOSS COST CHANGES

The indicated multiline (by TOP) changes are calculated by taking the ratio of the TOP relativity (Column 7) to the monoline relativity.

For each type of policy the indicated IPMF is subject to a minimum value of 0.50 and a maximum value of 1.50. If an indicated IPMF falls outside one of those limits, it is capped at that amount, the aggregate loss costs for that type of policy are adjusted to the capped IPMF level, and the entire relativity review as described above is redone to take this into account. If an IPMF has been capped it is so noted in footnote A.



## CRIME AND FIDELITY

The reviews for Burglary and Theft and for Fidelity are done on a multistate basis, combining both multiline and monoline experience. However, unlike other coverages included in a Commercial Package Policy, there is no simultaneous review procedure for either Burglary and Theft or for Fidelity in which separate loss cost level changes can be determined for multiline and monoline experience. In the absence of a simultaneous review procedure, we are unable to determine Type of Policy relativities with which to price CPP policies relative to monoline policies and therefore have assumed a multiline change of 0.0% and thus no change to the historic Crime or Fidelity IPMFs.

TABLES 8 AND 9

Tables 8 and 9 are not applicable this year. Commercial Inland Marine relativities are not being reviewed in 2019.

TABLE 10  
MISSOURI  
OWNERS, LANDLORDS AND TENANTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
-----

|                | (1)<br>BAILEY<br>FORMULA<br>RELATIV. | (2)<br>CREDIBILITY<br>Z | (3)<br>Z-WTD<br>RELATIV. | (4)<br>BALANCED<br>RELATIV. | (5)<br>INDICATED<br>CHANGE |
|----------------|--------------------------------------|-------------------------|--------------------------|-----------------------------|----------------------------|
| TOP            |                                      |                         |                          |                             |                            |
| 10             | 1.052                                | 0.290                   | 1.015                    | 1.016                       |                            |
| 31             | 0.984                                | 0.114                   | 0.998                    | 0.999                       | -1.7%                      |
| 32             | 1.482                                | 0.125                   | 1.050                    | 1.051                       | +3.4%                      |
| 33             | 0.934                                | 0.192                   | 0.987                    | 0.988                       | -2.8%                      |
| 34             | 1.003                                | 0.255                   | 1.001                    | 1.002                       | -1.4%                      |
| 35             | 1.017                                | 0.194                   | 1.003                    | 1.004                       | -1.2%                      |
| 36             | 0.767                                | 0.148                   | 0.962                    | 0.962                       | -5.3%                      |
| CLASS<br>GROUP |                                      |                         |                          |                             |                            |
| 01             | 0.929                                | 0.125                   | 0.991                    | 0.993                       |                            |
| 02             | 0.808                                | 0.180                   | 0.962                    | 0.964                       |                            |
| 03             | 0.991                                | 0.128                   | 0.999                    | 1.001                       |                            |
| 04             | 1.178                                | 0.026                   | 1.004                    | 1.006                       |                            |
| 05             | 1.407                                | 0.043                   | 1.015                    | 1.017                       |                            |
| 06             | 1.011                                | 0.067                   | 1.001                    | 1.003                       |                            |
| 07             | 1.095                                | 0.131                   | 1.012                    | 1.014                       |                            |
| 08             | 1.464                                | 0.054                   | 1.021                    | 1.023                       |                            |
| 09             | 0.753                                | 0.170                   | 0.953                    | 0.955                       |                            |
| 10             | 0.927                                | 0.176                   | 0.987                    | 0.989                       |                            |
| 11             | 0.918                                | 0.130                   | 0.989                    | 0.991                       |                            |
| 12             | 1.067                                | 0.298                   | 1.020                    | 1.022                       |                            |
| 13             | 1.814                                | 0.104                   | 1.064                    | 1.066                       |                            |
| 16             | 1.043                                | 0.073                   | 1.003                    | 1.005                       |                            |
| TERRITORY      |                                      |                         |                          |                             |                            |
| 1              | 1.326                                | 0.205                   | 1.060                    | 1.066                       |                            |
| 2              | 0.974                                | 0.298                   | 0.992                    | 0.998                       |                            |
| 3              | 0.931                                | 0.379                   | 0.973                    | 0.979                       |                            |

\* INDICATED CHANGE = (BALANCED RELATIVITY FOR TOP) / (MONOLINE RELATIVITY (TOP 10)) - 1

TABLE 11  
MISSOURI  
MANUFACTURERS AND CONTRACTORS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
-----

| TOP         | (1)<br>BAILEY<br>FORMULA<br>RELATIV. | (2)<br>CREDIBILITY<br>Z | (3)<br>Z-WTD<br>RELATIV. | (4)<br>BALANCED<br>RELATIV. | (5)<br>INDICATED<br>CHANGE |
|-------------|--------------------------------------|-------------------------|--------------------------|-----------------------------|----------------------------|
| 10          | 0.782                                | 0.243                   | 0.942                    | 0.948                       |                            |
| 33          | 1.429                                | 0.031                   | 1.011                    | 1.018                       | +7.4%                      |
| 34          | 0.944                                | 0.080                   | 0.995                    | 1.002                       | +5.7%                      |
| 35          | 4.308                                | 0.101                   | 1.159                    | 1.167                       | +23.1%                     |
| 36          | 0.741                                | 0.126                   | 0.963                    | 0.970                       | +2.3%                      |
| 37          | 1.099                                | 0.081                   | 1.008                    | 1.015                       | +7.1%                      |
| 38          | 1.298                                | 0.267                   | 1.072                    | 1.080                       | +13.9%                     |
| CLASS GROUP |                                      |                         |                          |                             |                            |
| 30          | 0.868                                | 0.118                   | 0.983                    | 0.982                       |                            |
| 31          | 1.079                                | 0.169                   | 1.013                    | 1.012                       |                            |
| 32          | 1.033                                | 0.277                   | 1.009                    | 1.008                       |                            |
| 33          | 1.046                                | 0.121                   | 1.005                    | 1.004                       |                            |
| 34          | 0.885                                | 0.129                   | 0.984                    | 0.983                       |                            |
| 35          | 2.334                                | 0.024                   | 1.021                    | 1.019                       |                            |
| 36          | 0.728                                | 0.075                   | 0.976                    | 0.975                       |                            |
| 37          | 0.566                                | 0.041                   | 0.977                    | 0.976                       |                            |
| 38          | 1.312                                | 0.107                   | 1.030                    | 1.028                       |                            |

\* INDICATED CHANGE = (BALANCED RELATIVITY FOR TOP) / (MONOLINE RELATIVITY (TOP 10)) - 1

TABLE 12  
MISSOURI  
OWNERS, LANDLORDS AND TENANTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
-----

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

| TERRITORY           | ALL                   | (1)   | (2)  | (3)                              | (4)      | (5)                      | (6)                  |
|---------------------|-----------------------|---|--|----------------------------------|----------|--------------------------|----------------------|
|                     |                       | CALENDAR A.Y.E.<br>12/31/2017 AGGREGATE<br>LOSS COSTS AT<br>CURRENT LEVEL | CALENDAR A.Y.E.<br>2013 - 2017<br>AGG LOSS COST<br>CURRENT LEVEL | FIVE YEAR<br>EXPERIENCE<br>RATIO | RELATIV. | NUMBER OF<br>OCCURRENCES | BAL CELL<br>RELATIV. |
| TYPE OF POLICY      | CLASS GROUP           |   |  |                                  |          |                          |                      |
| 10 MONOLINE         | 01 FOOD&BEV. (RETAIL) | \$417,519   | \$1,294,498  | 1.027                            |          | 65                       |                      |
|                     | 02 RESTAURANTS        | 429,315   | 3,531,772  | 0.848                            |          | 164                      |                      |
|                     | 03 STORES             | 182,111   | 767,033  | 1.320                            |          | 43                       |                      |
|                     | 04 VENDING & RENTAL   | 14,872  | 86,661   | 0.000                            |          | 0                        |                      |
|                     | 05 FOOD & BEV. DIST.  | 28,607  | 158,931  | 1.770                            |          | 8                        |                      |
|                     | 06 NON-FOOD&BEV.DIST  | 137,831   | 726,955  | 1.264                            |          | 23                       |                      |
|                     | 07 CLUBS,AMSMT&SPRTS  | 545,527   | 2,186,211  | 1.472                            |          | 147                      |                      |
|                     | 08 HEALTH CARE FACIL  | 12,172  | 107,346  | 2.113                            |          | 7                        |                      |
|                     | 09 HOTELS AND MOTELS  | 1,096,549   | 5,671,955  | 0.760                            |          | 279                      |                      |
|                     | 10 SCHLS & CHURCHES   | 324,062   | 1,484,781  | 0.997                            |          | 80                       |                      |
|                     | 11 APARTMENTS         | 714,267   | 2,855,930  | 1.228                            |          | 89                       |                      |
|                     | 12 BUILDINGS&OFFICES  | 2,506,625   | 12,058,952   | 0.926                            |          | 538                      |                      |
|                     | 13 MISC. PREMISES     | 182,534   | 925,102  | 1.196                            |          | 68                       |                      |
|                     | 16 GOVT SUBDIVISIONS  | 10,756  | 49,852   | 2.443                            |          | 8                        |                      |
|                     | TOTAL *               | \$6,602,747   | \$31,905,979   | 1.012                            |          | 1,519                    |                      |
| 31 MULT MOTEL/HOTEL | 09 HOTELS AND MOTELS  | \$986,044   | \$3,761,411  | 0.737                            |          | 234                      |                      |
|                     | TOTAL *               | \$986,044   | \$3,761,411  | 0.737                            |          | 234                      |                      |
| 32 MULT APARTMENT   | 11 APARTMENTS         | \$747,119   | \$4,222,231  | 1.034                            |          | 219                      |                      |
|                     | 12 BUILDINGS&OFFICES  | 151,945   | 665,404  | 2.882                            |          | 63                       |                      |
|                     | TOTAL *               | \$899,064   | \$4,887,635  | 1.347                            |          | 282                      |                      |
| 33 MULT OFFICE      | 12 BUILDINGS&OFFICES  | \$3,282,931   | \$15,629,684   | 0.953                            |          | 655                      |                      |
|                     | 13 MISC. PREMISES     | 41,047  | 210,264  | 4.035                            |          | 11                       |                      |
|                     | TOTAL *               | \$3,323,978   | \$15,839,948   | 0.992                            |          | 666                      |                      |
| 34 MULT MERCANTILE  | 01 FOOD&BEV. (RETAIL) | \$883,011   | \$4,473,223  | 0.800                            |          | 219                      |                      |
|                     | 02 RESTAURANTS        | 1,715,908   | 7,509,553  | 0.784                            |          | 424                      |                      |
|                     | 03 STORES             | 706,047   | 3,062,242  | 0.865                            |          | 233                      |                      |
|                     | 04 VENDING & RENTAL   | 5,704   | 41,274   | 1.241                            |          | 3                        |                      |
|                     | 05 FOOD & BEV. DIST.  | 137,387   | 621,645  | 1.290                            |          | 26                       |                      |
|                     | 06 NON-FOOD&BEV.DIST  | 342,218   | 1,690,415  | 0.850                            |          | 59                       |                      |
|                     | 12 BUILDINGS&OFFICES  | 839,856   | 4,424,806  | 1.241                            |          | 210                      |                      |
|                     | TOTAL *               | \$4,630,131   | \$21,823,158   | 0.903                            |          | 1,174                    |                      |

TABLE 12  
MISSOURI  
OWNERS, LANDLORDS AND TENANTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
-----

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

| TERRITORY         | ALL                   | (1)<br>CALENDAR A.Y.E.<br>12/31/2017 AGGREGATE<br>LOSS COSTS AT<br>CURRENT LEVEL | (2)<br>CALENDAR A.Y.E.<br>2013 - 2017<br>AGG LOSS COST<br>CURRENT LEVEL | (3)<br>FIVE YEAR<br>EXPERIENCE<br>RATIO | (4)<br>RELATIV. | (5)<br>NUMBER OF<br>OCCURRENCES | (6)<br>BAL CELL<br>RELATIV. |
|-------------------|-----------------------|--|---|---|-----------------|---------------------------------|-----------------------------|
| TYPE OF POLICY    | CLASS GROUP           |  |   |   |                 |                                 |                             |
| 35 MULT INSTITUT. | 07 CLUBS,AMSMT&SPRTS  | \$81,283   | \$298,829   | 0.831                                   |                 | 11                              |                             |
|                   | 08 HEALTH CARE FACIL  | 222,759  | 1,247,735   | 1.450                                   |                 | 47                              |                             |
|                   | 10 SCHLS & CHURCHES   | 1,281,332  | 6,921,569   | 0.916                                   |                 | 477                             |                             |
|                   | 12 BUILDINGS&OFFICES  | 49,693   | 268,141   | 1.406                                   |                 | 49                              |                             |
|                   | 13 MISC. PREMISES     | 34,929   | 187,654   | 1.586                                   |                 | 6                               |                             |
|                   | 16 GOVT SUBDIVISIONS  | 291,059  | 1,466,004   | 0.904                                   |                 | 90                              |                             |
|                   | TOTAL *               | \$1,961,055  | \$10,389,932  | 0.996                                   |                 | 680                             |                             |
| 36 MULT SERVICES  | 03 STORES             | \$115,409  | \$494,845   | 0.638                                   |                 | 21                              |                             |
|                   | 04 VENDING & RENTAL   | 39,579   | 200,310   | 1.320                                   |                 | 10                              |                             |
|                   | 07 CLUBS,AMSMT&SPRTS  | 1,174,829  | 5,392,053   | 0.628                                   |                 | 152                             |                             |
|                   | 08 HEALTH CARE FACIL  | 10,575   | 38,059  | 0.000                                   |                 | 0                               |                             |
|                   | 09 HOTELS AND MOTELS  | 74,433   | 394,915   | 0.573                                   |                 | 8                               |                             |
|                   | 10 SCHLS & CHURCHES   | 2,596  | 14,756  | 0.603                                   |                 | 1                               |                             |
|                   | 12 BUILDINGS&OFFICES  | 377,858  | 1,849,916   | 1.278                                   |                 | 93                              |                             |
|                   | 13 MISC. PREMISES     | 267,483  | 1,467,962   | 1.495                                   |                 | 110                             |                             |
|                   | TOTAL *               | \$2,062,762  | \$9,852,816   | 0.868                                   |                 | 395                             |                             |
| TOTAL ALL         | TOP                   |  |   |   |                 |                                 |                             |
|                   | 01 FOOD&BEV. (RETAIL) | \$1,300,530  | \$5,767,721   | 0.873                                   |                 | 284                             |                             |
|                   | 02 RESTAURANTS        | 2,145,223  | 11,041,325  | 0.797                                   |                 | 588                             |                             |
|                   | 03 STORES             | 1,003,567  | 4,324,120   | 0.921                                   |                 | 297                             |                             |
|                   | 04 VENDING & RENTAL   | 60,155   | 328,245   | 0.986                                   |                 | 13                              |                             |
|                   | 05 FOOD & BEV. DIST.  | 165,994  | 780,576   | 1.373                                   |                 | 34                              |                             |
|                   | 06 NON-FOOD&BEV.DIST  | 480,049  | 2,417,370   | 0.969                                   |                 | 82                              |                             |
|                   | 07 CLUBS,AMSMT&SPRTS  | 1,801,639  | 7,877,093   | 0.893                                   |                 | 310                             |                             |
|                   | 08 HEALTH CARE FACIL  | 245,506  | 1,393,140   | 1.420                                   |                 | 54                              |                             |
|                   | 09 HOTELS AND MOTELS  | 2,157,026  | 9,828,281   | 0.743                                   |                 | 521                             |                             |
|                   | 10 SCHLS & CHURCHES   | 1,607,990  | 8,421,106   | 0.932                                   |                 | 558                             |                             |
|                   | 11 APARTMENTS         | 1,461,386  | 7,078,161   | 1.129                                   |                 | 308                             |                             |
|                   | 12 BUILDINGS&OFFICES  | 7,208,908  | 34,896,903  | 1.038                                   |                 | 1,608                           |                             |
|                   | 13 MISC. PREMISES     | 525,993  | 2,790,982   | 1.595                                   |                 | 195                             |                             |
|                   | 16 GOVT SUBDIVISIONS  | 301,815  | 1,515,856   | 0.959                                   |                 | 98                              |                             |
|                   | TOTAL *               | \$20,465,781   | \$98,460,879  | 0.970                                   |                 | 4,950                           |                             |

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

TABLE 13  
MISSOURI  
MANUFACTURERS AND CONTRACTORS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
-----

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

| TYPE OF POLICY     | CLASS GROUP          | (1)<br>CALENDAR A.Y.E.<br>12/31/2017 AGGREGATE<br>LOSS COSTS AT<br>CURRENT LEVEL | (2)<br>CALENDAR A.Y.E.<br>2013 - 2017<br>AGG LOSS COST<br>CURRENT LEVEL | (3)<br>FIVE YEAR<br>EXPERIENCE<br>RATIO | (4)<br>RELATIV. | (5)<br>NUMBER OF<br>OCCURRENCES | (6)<br>BAL CELL<br>RELATIV. |
|--------------------|----------------------|--|---|---|-----------------|---------------------------------|-----------------------------|
| 10 MONOLINE        | 30 SERVICE           | \$897,380  | \$2,545,800   | 0.621                                   | 0.632           | 64                              | 0.932                       |
|                    | 31 LIGHT CONTRACTING | 641,000  | 2,812,764   | 1.028                                   | 1.046           | 147                             | 0.960                       |
|                    | 32 MEDIUM CONTRCTING | 3,285,390  | 15,387,711  | 0.845                                   | 0.860           | 550                             | 0.956                       |
|                    | 33 HEAVY CONTRACTING | 1,195,386  | 5,878,428   | 0.546                                   | 0.556           | 75                              | 0.953                       |
|                    | 34 DEALER OR DISTRIB | 667,612  | 3,015,660   | 0.650                                   | 0.661           | 82                              | 0.933                       |
|                    | 35 LGT. MANUFACTURER | 79,276   | 489,362   | 2.197                                   | 2.236           | 5                               | 0.967                       |
|                    | 36 MED. MANUFACTURER | 374,105  | 1,683,741   | 0.604                                   | 0.615           | 45                              | 0.925                       |
|                    | 37 HVY. MANUFACTURER | 200,718  | 974,310   | 0.500                                   | 0.509           | 7                               | 0.926                       |
|                    | 38 MISC. OPERATION   | 445,856  | 2,010,255   | 1.029                                   | 1.047           | 90                              | 0.975                       |
|                    | TOTAL *              | \$7,786,723  | \$34,798,031  | 0.775                                   |                 | 1,065                           |                             |
| 33 MULT OFFICE     | 31 LIGHT CONTRACTING | \$799  | \$11,997  | 0.000                                   | 0.000           | 0                               | 1.030                       |
|                    | 32 MEDIUM CONTRCTING | 6,142  | 23,743  | 0.000                                   | 0.000           | 0                               | 1.026                       |
|                    | 33 HEAVY CONTRACTING | 61,693   | 296,354   | 1.828                                   | 1.860           | 4                               | 1.023                       |
|                    | 38 MISC. OPERATION   | 87,185   | 422,842   | 1.706                                   | 1.736           | 14                              | 1.047                       |
|                    | TOTAL *              | \$155,819  | \$754,936   | 1.678                                   |                 | 18                              |                             |
| 34 MULT MERCANTILE | 30 SERVICE           | \$20,756   | \$95,960  | 0.001                                   | 0.001           | 0                               | 0.985                       |
|                    | 32 MEDIUM CONTRCTING | 105,124  | 345,076   | 0.112                                   | 0.114           | 10                              | 1.010                       |
|                    | 34 DEALER OR DISTRIB | 774,375  | 3,811,080   | 0.722                                   | 0.734           | 89                              | 0.986                       |
|                    | 36 MED. MANUFACTURER | 233  | 16,258  | 0.000                                   | 0.000           | 0                               | 0.978                       |
|                    | 38 MISC. OPERATION   | 51,871   | 182,728   | 4.737                                   | 4.821           | 19                              | 1.031                       |
|                    | TOTAL *              | \$952,359  | \$4,451,102   | 0.857                                   |                 | 118                             |                             |
| 35 MULT INSTITUT.  | 31 LIGHT CONTRACTING | \$6,347  | \$32,503  | 1.130                                   | 1.150           | 3                               | 1.181                       |
|                    | 32 MEDIUM CONTRCTING | 159,000  | 767,703   | 4.508                                   | 4.587           | 181                             | 1.176                       |
|                    | TOTAL *              | \$165,347  | \$800,206   | 4.378                                   |                 | 184                             |                             |
| 36 MULT SERVICES   | 30 SERVICE           | \$56,445   | \$268,549   | 0.654                                   | 0.666           | 20                              | 0.952                       |
|                    | 31 LIGHT CONTRACTING | 95,394   | 558,774   | 0.277                                   | 0.282           | 24                              | 0.981                       |
|                    | 32 MEDIUM CONTRCTING | 98,571   | 497,289   | 1.043                                   | 1.061           | 19                              | 0.977                       |
|                    | 33 HEAVY CONTRACTING | 48,469   | 258,824   | 1.121                                   | 1.141           | 15                              | 0.974                       |
|                    | 34 DEALER OR DISTRIB | 1,013,847  | 3,887,903   | 0.758                                   | 0.771           | 130                             | 0.953                       |
|                    | 36 MED. MANUFACTURER | 8,897  | 48,392  | 4.416                                   | 4.494           | 2                               | 0.946                       |
|                    | 38 MISC. OPERATION   | 445,287  | 1,904,244   | 0.622                                   | 0.633           | 76                              | 0.997                       |
|                    | TOTAL *              | \$1,766,910  | \$7,423,975   | 0.739                                   |                 | 286                             |                             |

MISSOURI  
MANUFACTURERS AND CONTRACTORS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
-----  
SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

| TYPE OF POLICY       | CLASS GROUP          | (1)<br>CALENDAR A.Y.E.<br>12/31/2017 AGGREGATE<br>LOSS COSTS AT<br>CURRENT LEVEL | (2)<br>CALENDAR A.Y.E.<br>2013 - 2017<br>AGG LOSS COST<br>CURRENT LEVEL | (3)<br>FIVE YEAR<br>EXPERIENCE<br>RATIO | (4)<br>RELATIV. | (5)<br>NUMBER OF<br>OCCURRENCES | (6)<br>BAL CELL<br>RELATIV. |
|----------------------|----------------------|--|---|---|-----------------|---------------------------------|-----------------------------|
|                      |                      |  |   |   |                 |                                 |                             |
| 37 MULT INDUST/PROC. | 31 LIGHT CONTRACTING | \$557  | \$2,902   | 0.000                                   | 0.000           | 0                               | 1.027                       |
|                      | 32 MEDIUM CONTRCTING | 172,574  | 887,448   | 2.025                                   | 2.061           | 24                              | 1.023                       |
|                      | 33 HEAVY CONTRACTING | 40,642   | 212,383   | 0.089                                   | 0.090           | 4                               | 1.019                       |
|                      | 34 DEALER OR DISTRIB | 23,165   | 60,685  | 0.165                                   | 0.168           | 2                               | 0.998                       |
|                      | 35 LGT. MANUFACTURER | 88,807   | 421,240   | 2.160                                   | 2.198           | 6                               | 1.034                       |
|                      | 36 MED. MANUFACTURER | 623,324  | 3,087,237   | 0.705                                   | 0.717           | 55                              | 0.990                       |
|                      | 37 HVY. MANUFACTURER | 454,533  | 2,182,038   | 0.582                                   | 0.592           | 24                              | 0.990                       |
|                      | 38 MISC. OPERATION   | 22,028   | 98,552  | 1.456                                   | 1.482           | 6                               | 1.044                       |
|                      | TOTAL *              | \$1,425,630  | \$6,952,485   | 0.901                                   |                 | 121                             |                             |
| 38 MULT CONTRACTORS  | 30 SERVICE           | \$743,441  | \$3,645,036   | 1.182                                   | 1.203           | 169                             | 1.060                       |
|                      | 31 LIGHT CONTRACTING | 1,027,960  | 4,801,359   | 1.322                                   | 1.346           | 342                             | 1.092                       |
|                      | 32 MEDIUM CONTRCTING | 2,326,091  | 11,149,570  | 1.197                                   | 1.218           | 607                             | 1.088                       |
|                      | 33 HEAVY CONTRACTING | 909,038  | 4,415,343   | 1.677                                   | 1.706           | 169                             | 1.084                       |
|                      | 38 MISC. OPERATION   | 23,561   | 149,746   | 0.310                                   | 0.315           | 2                               | 1.110                       |
|                      | TOTAL *              | \$5,030,091  | \$24,161,054  | 1.303                                   |                 | 1,289                           |                             |
| TOTAL ALL TOP        | 30 SERVICE           | \$1,718,022  | \$6,555,345   | 0.858                                   |                 | 253                             |                             |
|                      | 31 LIGHT CONTRACTING | 1,772,057  | 8,220,299   | 1.158                                   |                 | 516                             |                             |
|                      | 32 MEDIUM CONTRCTING | 6,152,892  | 29,058,540  | 1.096                                   |                 | 1,391                           |                             |
|                      | 33 HEAVY CONTRACTING | 2,255,228  | 11,061,332  | 1.041                                   |                 | 267                             |                             |
|                      | 34 DEALER OR DISTRIB | 2,478,999  | 10,775,328  | 0.712                                   |                 | 303                             |                             |
|                      | 35 LGT. MANUFACTURER | 168,083  | 910,602   | 2.178                                   |                 | 11                              |                             |
|                      | 36 MED. MANUFACTURER | 1,006,559  | 4,835,628   | 0.700                                   |                 | 102                             |                             |
|                      | 37 HVY. MANUFACTURER | 655,251  | 3,156,348   | 0.557                                   |                 | 31                              |                             |
|                      | 38 MISC. OPERATION   | 1,075,788  | 4,768,367   | 1.087                                   |                 | 207                             |                             |
|                      | TOTAL *              | \$17,282,879   | \$79,341,789  | 0.983                                   |                 | 3,081                           |                             |

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.



TABLE 14  
STATE MISSOURI  
PRODUCTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
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|       | (1)<br>BAILEY<br>FORMULA<br>RELATIV. | (2)<br>CREDIBILITY<br>Z | (3)<br>Z-WTD<br>RELATIV. | (4)<br>BALANCED<br>RELATIV. | (5)<br>INDICATED<br>CHANGE * |
|-------|--------------------------------------|-------------------------|--------------------------|-----------------------------|------------------------------|
| TOP   |                                      |                         |                          |                             |                              |
| 10    | 0.988                                | 0.372                   | 0.995                    | 0.996                       |                              |
| 34    | 1.036                                | 0.371                   | 1.013                    | 1.014                       | + 1.8%                       |
| 36    | 1.005                                | 0.187                   | 1.001                    | 1.002                       | + 0.6%                       |
| 37    | 0.988                                | 0.507                   | 0.994                    | 0.994                       | - 0.2%                       |
| CLASS |                                      |                         |                          |                             |                              |
| GROUP |                                      |                         |                          |                             |                              |
| 3     | 0.924                                | 0.500                   | 0.961                    | 0.965                       |                              |
| 4     | 1.048                                | 0.406                   | 1.019                    | 1.024                       |                              |
| 5     | 1.107                                | 0.132                   | 1.014                    | 1.018                       |                              |
| 6     | 1.007                                | 0.320                   | 1.002                    | 1.006                       |                              |
| 7     | 1.006                                | 0.182                   | 1.001                    | 1.005                       |                              |

\* INDICATED CHANGE =  
(BALANCED RELATIVITY FOR TOP) / (BALANCED MONOLINE (TOP 10) RELATIVITY) - 1

NOTE: THE INDICATED CHANGES BY TOP WERE FURTHER ADJUSTED BY THE FOLLOWING  
DIFFERENTIALS:  
TOP 34: 0.972  
TOP 36: 0.996  
TOP 37: 1.007

TABLE 15  
MULTISTATE  
PRODUCTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
-----  
SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

| TYPE OF POLICY       | CLASS GROUP           | (1)<br>CALENDAR A.Y.E.<br>12/31/2017 AGGREGATE<br>LOSS COSTS AT<br>CURRENT LEVEL | (2)<br>CALENDAR A.Y.E.<br>2013 - 2017<br>AGG LOSS COST<br>CURRENT LEVEL | (3)<br>FIVE YEAR<br>EXPERIENCE<br>RATIO | (4)<br>RELATIV. | (5)<br>NUMBER OF<br>OCCURRENCES | (6)<br>BAL CELL<br>RELATIV. |
|----------------------|-----------------------|--|---|---|-----------------|---------------------------------|-----------------------------|
|                      |                       |  |   |   |                 |                                 |                             |
| 10 MONOLINE          | 03 MAN,DLR,DSTFD/DRG  | \$18,227,491   | \$79,500,211  | 0.856                                   | 0.869           | 1,461                           | 0.961                       |
|                      | 04 DLR,DST-NOTFD/DRG  | 9,616,743  | 42,155,667  | 1.119                                   | 1.136           | 640                             | 1.019                       |
|                      | 05 MAN.NTFD/DRG (LOW) | 1,605,615  | 6,748,634   | 1.039                                   | 1.055           | 84                              | 1.014                       |
|                      | 06 MAN.NTFD/DRG (MED) | 9,640,686  | 42,498,903  | 0.958                                   | 0.972           | 466                             | 1.002                       |
|                      | 07 MAN.NTFD/DRG (HGH) | 2,568,561  | 11,286,663  | 1.018                                   | 1.033           | 129                             | 1.001                       |
|                      | TOTAL *               | \$41,659,096   | \$182,190,078   | 0.957                                   |                 | 2,780                           |                             |
| 34 MULT MERCANTILE   | 03 MAN,DLR,DSTFD/DRG  | \$5,166,155  | \$25,851,441  | 1.131                                   | 1.148           | 791                             | 0.979                       |
|                      | 04 DLR,DST-NOTFD/DRG  | 29,011,611   | 140,165,685   | 1.037                                   | 1.052           | 1,972                           | 1.038                       |
|                      | 06 MAN.NTFD/DRG (MED) | 7,625  | 57,567  | 0.000                                   | 0.000           | 0                               | 1.020                       |
|                      | TOTAL *               | \$34,185,391   | \$166,074,693   | 1.051                                   |                 | 2,763                           |                             |
| 36 MULT SERVICES     | 04 DLR,DST-NOTFD/DRG  | \$3,197,904  | \$14,609,890  | 1.041                                   | 1.057           | 699                             | 1.025                       |
|                      | 06 MAN.NTFD/DRG (MED) | 54,898   | 258,512   | 0.781                                   | 0.793           | 1                               | 1.008                       |
|                      | TOTAL *               | \$3,252,802  | \$14,868,402  | 1.037                                   |                 | 700                             |                             |
| 37 MULT INDUST/PROC. | 03 MAN,DLR,DSTFD/DRG  | \$16,474,514   | \$81,117,947  | 0.888                                   | 0.901           | 2,761                           | 0.960                       |
|                      | 05 MAN.NTFD/DRG (LOW) | 4,070,679  | 20,897,437  | 1.092                                   | 1.108           | 269                             | 1.012                       |
|                      | 06 MAN.NTFD/DRG (MED) | 28,248,516   | 131,744,418   | 0.987                                   | 1.002           | 1,582                           | 1.001                       |
|                      | 07 MAN.NTFD/DRG (HGH) | 7,346,721  | 36,933,393  | 0.965                                   | 0.980           | 537                             | 1.000                       |
|                      | TOTAL *               | \$56,140,430   | \$270,693,195   | 0.963                                   |                 | 5,149                           |                             |
| TOTAL ALL TOP        | 03 MAN,DLR,DSTFD/DRG  | \$39,868,160   | \$186,469,599   | 0.905                                   |                 | 5,013                           |                             |
|                      | 04 DLR,DST-NOTFD/DRG  | 41,826,258   | 196,931,242   | 1.056                                   |                 | 3,311                           |                             |
|                      | 05 MAN.NTFD/DRG (LOW) | 5,676,294  | 27,646,071  | 1.077                                   |                 | 353                             |                             |
|                      | 06 MAN.NTFD/DRG (MED) | 37,951,725   | 174,559,400   | 0.979                                   |                 | 2,049                           |                             |
|                      | 07 MAN.NTFD/DRG (HGH) | 9,915,282  | 48,220,056  | 0.979                                   |                 | 666                             |                             |
|                      | TOTAL *               | \$135,237,719  | \$633,826,368   | 0.985                                   |                 | 11,392                          |                             |

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

TABLE 16  
STATE MISSOURI  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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|                | (1)<br>BAILEY<br>FORMULA<br>RELATIV. | (2)<br>CREDIBILITY<br>Z | (3)<br>Z-WTD<br>RELATIV. | (4)<br>BALANCED<br>RELATIV. | (5)<br>INDICATED<br>CHANGE * |
|----------------|--------------------------------------|-------------------------|--------------------------|-----------------------------|------------------------------|
| TOP            |                                      |                         |                          |                             |                              |
| 10             | 0.969                                | 0.752                   | 0.977                    | 0.973                       |                              |
| 34             | 0.959                                | 0.541                   | 0.978                    | 0.974                       | + 0.1%                       |
| 36             | 0.986                                | 0.516                   | 0.993                    | 0.989                       | + 1.6%                       |
| 37             | 0.972                                | 0.138                   | 0.996                    | 0.993                       | + 2.1%                       |
| 38             | 1.025                                | 0.962                   | 1.024                    | 1.020                       | + 4.8%                       |
| CLASS<br>GROUP |                                      |                         |                          |                             |                              |
| 1              | 0.918                                | 0.550                   | 0.954                    | 0.948                       |                              |
| 2              | 1.037                                | 0.495                   | 1.018                    | 1.012                       |                              |
| 11             | 1.095                                | 0.352                   | 1.032                    | 1.026                       |                              |
| 12             | 1.016                                | 1.000                   | 1.016                    | 1.010                       |                              |
| 13             | 0.785                                | 0.266                   | 0.938                    | 0.932                       |                              |

\* INDICATED CHANGE =  
(BALANCED RELATIVITY FOR TOP) / (BALANCED MONOLINE (TOP 10) RELATIVITY) - 1

TABLE 16  
MULTISTATE

LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS \*

| STATE    | (1)<br>BAILEY<br>FORMULA<br>RELATIV | (2)<br>CREDIBILITY<br>Z | (3)<br>Z-WTD<br>RELATIV | (4)<br>BALANCED<br>RELATIV. |
|----------|-------------------------------------|-------------------------|-------------------------|-----------------------------|
|          | 1.418                               | 0.386                   | 1.144                   | 1.144                       |
|          | 1.202                               | 0.623                   | 1.122                   | 1.121                       |
|          | 1.425                               | 0.229                   | 1.085                   | 1.084                       |
|          | 1.144                               | 0.427                   | 1.059                   | 1.059                       |
|          | 1.413                               | 0.160                   | 1.057                   | 1.057                       |
|          | 1.437                               | 0.153                   | 1.057                   | 1.057                       |
|          | 1.197                               | 0.263                   | 1.049                   | 1.048                       |
|          | 1.096                               | 0.505                   | 1.048                   | 1.047                       |
|          | 1.135                               | 0.345                   | 1.045                   | 1.044                       |
|          | 1.122                               | 0.368                   | 1.043                   | 1.043                       |
|          | 1.191                               | 0.231                   | 1.041                   | 1.041                       |
|          | 1.128                               | 0.326                   | 1.040                   | 1.040                       |
|          | 1.173                               | 0.239                   | 1.039                   | 1.039                       |
|          | 1.148                               | 0.224                   | 1.031                   | 1.031                       |
|          | 1.059                               | 0.435                   | 1.025                   | 1.025                       |
|          | 1.052                               | 0.453                   | 1.023                   | 1.023                       |
|          | 1.257                               | 0.100                   | 1.023                   | 1.023                       |
|          | 1.083                               | 0.227                   | 1.018                   | 1.018                       |
|          | 1.101                               | 0.187                   | 1.018                   | 1.018                       |
|          | 1.090                               | 0.192                   | 1.017                   | 1.016                       |
|          | 1.045                               | 0.369                   | 1.016                   | 1.016                       |
| Missouri | 1.037                               | 0.307                   | 1.011                   | 1.011                       |
|          | 1.019                               | 0.449                   | 1.008                   | 1.008                       |
|          | 1.027                               | 0.143                   | 1.004                   | 1.003                       |
|          | 1.002                               | 0.494                   | 1.001                   | 1.000                       |
|          | 1.002                               | 0.131                   | 1.000                   | 1.000                       |
|          | 0.994                               | 0.097                   | 0.999                   | 0.999                       |
|          | 0.992                               | 0.402                   | 0.997                   | 0.997                       |
|          | 0.989                               | 0.377                   | 0.996                   | 0.995                       |
|          | 0.975                               | 0.190                   | 0.995                   | 0.995                       |
|          | 0.965                               | 0.458                   | 0.984                   | 0.983                       |
|          | 0.924                               | 0.241                   | 0.981                   | 0.981                       |
|          | 0.933                               | 0.349                   | 0.976                   | 0.976                       |
|          | 0.895                               | 0.260                   | 0.972                   | 0.971                       |
|          | 0.892                               | 0.285                   | 0.968                   | 0.968                       |
|          | 0.788                               | 0.160                   | 0.963                   | 0.962                       |
|          | 0.693                               | 0.104                   | 0.963                   | 0.962                       |
|          | 0.889                               | 0.364                   | 0.958                   | 0.958                       |
|          | 0.759                               | 0.154                   | 0.958                   | 0.958                       |
|          | 0.843                               | 0.288                   | 0.952                   | 0.952                       |
|          | 0.720                               | 0.158                   | 0.949                   | 0.949                       |
|          | 0.765                               | 0.195                   | 0.949                   | 0.949                       |
|          | 0.906                               | 0.547                   | 0.948                   | 0.947                       |
|          | 0.793                               | 0.238                   | 0.946                   | 0.946                       |
|          | 0.512                               | 0.084                   | 0.945                   | 0.945                       |
|          | 0.639                               | 0.136                   | 0.941                   | 0.941                       |
|          | 0.813                               | 0.308                   | 0.938                   | 0.938                       |
|          | 0.889                               | 0.581                   | 0.934                   | 0.933                       |
|          | 0.846                               | 0.470                   | 0.924                   | 0.924                       |
|          | 0.756                               | 0.321                   | 0.914                   | 0.914                       |
|          | 0.602                               | 0.179                   | 0.913                   | 0.913                       |
|          | 0.804                               | 0.575                   | 0.882                   | 0.882                       |

\* Sorted by balanced relative change.

TABLE 17  
MISSOURI  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

-----  
SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

| TYPE OF POLICY       | CLASS GROUP           | (1)<br>CALENDAR A.Y.E.<br>12/31/2017 AGGREGATE<br>LOSS COSTS AT<br>CURRENT LEVEL | (2)<br>CALENDAR A.Y.E.<br>2013 - 2017<br>AGG LOSS COST<br>CURRENT LEVEL | (3)<br>FIVE YEAR<br>EXPERIENCE<br>RATIO | (4)<br>RELATIV. | (5)<br>NUMBER OF<br>OCCURRENCES | (6)<br>BAL CELL<br>RELATIV. |
|----------------------|-----------------------|--|---|---|-----------------|---------------------------------|-----------------------------|
|                      |                       |  |   |   |                 |                                 |                             |
| 10 MONOLINE          | 01 RET. STRS-FOOD/DRG | \$21,978   | \$135,295   | 1.089                                   | 1.005           | 15                              | 0.933                       |
|                      | 02 RET. STRS-NTFD/DRG | 26,718   | 88,603  | 0.528                                   | 0.487           | 2                               | 0.996                       |
|                      | 11 COMP. OPS. (LOW)   | 51,870   | 220,186   | 0.063                                   | 0.058           | 3                               | 1.010                       |
|                      | 12 COMP. OPS. (MED)   | 1,329,569  | 6,548,276   | 0.551                                   | 0.509           | 81                              | 0.994                       |
|                      | 13 COMP. OPS. (HGH)   | 188,229  | 844,584   | 0.357                                   | 0.329           | 8                               | 0.917                       |
|                      | TOTAL *               | \$1,618,364  | \$7,836,944   | 0.520                                   |                 | 109                             |                             |
| 34 MULT MERCANTILE   | 01 RET. STRS-FOOD/DRG | \$71,391   | \$311,866   | 1.591                                   | 1.467           | 64                              | 0.934                       |
|                      | 02 RET. STRS-NTFD/DRG | 37,486   | 159,313   | 1.469                                   | 1.355           | 16                              | 0.997                       |
|                      | 12 COMP. OPS. (MED)   | 9,122  | 36,250  | 0.579                                   | 0.534           | 1                               | 0.995                       |
|                      | TOTAL *               | \$117,999  | \$507,429   | 1.474                                   |                 | 81                              |                             |
| 36 MULT SERVICES     | 01 RET. STRS-FOOD/DRG | \$9,904  | \$42,087  | 1.584                                   | 1.461           | 3                               | 0.948                       |
|                      | 02 RET. STRS-NTFD/DRG | 122,927  | 488,122   | 2.757                                   | 2.543           | 55                              | 1.012                       |
|                      | 11 COMP. OPS. (LOW)   | 9,174  | 56,096  | 4.180                                   | 3.856           | 9                               | 1.026                       |
|                      | 12 COMP. OPS. (MED)   | 85,005   | 322,150   | 2.944                                   | 2.716           | 14                              | 1.010                       |
|                      | 13 COMP. OPS. (HGH)   | 9,822  | 45,911  | 0.000                                   | 0.000           | 0                               | 0.932                       |
|                      | TOTAL *               | \$236,832  | \$954,366   | 2.716                                   |                 | 81                              |                             |
| 37 MULT INDUST/PROC. | 01 RET. STRS-FOOD/DRG | \$637  | \$2,610   | 0.000                                   | 0.000           | 0                               | 0.952                       |
|                      | 11 COMP. OPS. (LOW)   | 226  | 1,750   | 4.459                                   | 4.113           | 1                               | 1.030                       |
|                      | 12 COMP. OPS. (MED)   | 25,223   | 154,806   | 7.713                                   | 7.116           | 5                               | 1.014                       |
|                      | 13 COMP. OPS. (HGH)   | 0  | 4   | 0.000                                   | 0.000           | 0                               | 0.935                       |
|                      | TOTAL *               | \$26,086   | \$159,170   | 7.497                                   |                 | 6                               |                             |
| 38 MULT CONTRACTORS  | 11 COMP. OPS. (LOW)   | \$134,862  | \$553,745   | 0.989                                   | 0.913           | 11                              | 1.059                       |
|                      | 12 COMP. OPS. (MED)   | 1,739,871  | 8,150,468   | 1.324                                   | 1.222           | 215                             | 1.042                       |
|                      | 13 COMP. OPS. (HGH)   | 216,468  | 929,450   | 1.273                                   | 1.174           | 18                              | 0.961                       |
|                      | TOTAL *               | \$2,091,201  | \$9,633,663   | 1.297                                   |                 | 244                             |                             |
| TOTAL ALL TOP        | 01 RET. STRS-FOOD/DRG | \$103,910  | \$491,858   | 1.474                                   |                 | 82                              |                             |
|                      | 02 RET. STRS-NTFD/DRG | 187,131  | 736,038   | 2.181                                   |                 | 73                              |                             |
|                      | 11 COMP. OPS. (LOW)   | 196,132  | 831,777   | 0.897                                   |                 | 24                              |                             |
|                      | 12 COMP. OPS. (MED)   | 3,188,790  | 15,211,950  | 1.094                                   |                 | 316                             |                             |
|                      | 13 COMP. OPS. (HGH)   | 414,519  | 1,819,949   | 0.827                                   |                 | 26                              |                             |
|                      | TOTAL *               | \$4,090,482  | \$19,091,572  | 1.117                                   |                 | 521                             |                             |

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

TABLE 18  
MULTISTATE  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

-----  
SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

| TYPE OF POLICY       | CLASS GROUP          | (1)   | (2)  | (3)                              | (4)      | (5)                      | (6)                  |
|----------------------|----------------------|---|--|----------------------------------|----------|--------------------------|----------------------|
|                      |                      | CALENDAR A.Y.E.<br>12/31/2017 AGGREGATE<br>LOSS COSTS AT<br>CURRENT LEVEL | CALENDAR A.Y.E.<br>2013 - 2017<br>AGG LOSS COST<br>CURRENT LEVEL | FIVE YEAR<br>EXPERIENCE<br>RATIO | RELATIV. | NUMBER OF<br>OCCURRENCES | BAL CELL<br>RELATIV. |
| 10 MONOLINE          | 01 RET.STRS-FOOD/DRG | \$2,570,942   | \$11,000,189   | 0.978                            |          | 762                      |                      |
|                      | 02 RET.STRS-NTFD/DRG | 2,629,603   | 11,663,817   | 1.219                            |          | 494                      |                      |
|                      | 11 COMP. OPS. (LOW)  | 4,024,036   | 18,069,271   | 1.329                            |          | 705                      |                      |
|                      | 12 COMP. OPS. (MED)  | 82,107,926  | 364,826,722  | 1.080                            |          | 6,242                    |                      |
|                      | 13 COMP. OPS. (HGH)  | 7,801,373   | 39,341,081   | 0.703                            |          | 282                      |                      |
|                      | TOTAL *              | \$99,133,880  | \$444,901,080  | 1.062                            |          | 8,485                    |                      |
| 34 MULT MERCANTILE   | 01 RET.STRS-FOOD/DRG | \$8,002,266   | \$37,342,335   | 0.940                            |          | 3,591                    |                      |
|                      | 02 RET.STRS-NTFD/DRG | 5,186,195   | 23,434,483   | 1.012                            |          | 665                      |                      |
|                      | 12 COMP. OPS. (MED)  | 2,043,786   | 10,139,349   | 1.186                            |          | 140                      |                      |
|                      | TOTAL *              | \$15,232,247  | \$70,916,167   | 0.997                            |          | 4,396                    |                      |
| 36 MULT SERVICES     | 01 RET.STRS-FOOD/DRG | \$729,961   | \$3,439,653  | 1.065                            |          | 197                      |                      |
|                      | 02 RET.STRS-NTFD/DRG | 12,256,900  | 48,452,562   | 1.088                            |          | 2,518                    |                      |
|                      | 11 COMP. OPS. (LOW)  | 3,094,937   | 14,012,389   | 1.111                            |          | 510                      |                      |
|                      | 12 COMP. OPS. (MED)  | 4,447,208   | 21,021,492   | 0.941                            |          | 694                      |                      |
|                      | 13 COMP. OPS. (HGH)  | 989,332   | 5,061,195  | 1.199                            |          | 87                       |                      |
|                      | TOTAL *              | \$21,518,338  | \$91,987,291   | 1.065                            |          | 4,006                    |                      |
| 37 MULT INDUST/PROC. | 01 RET.STRS-FOOD/DRG | \$26,867  | \$90,627   | 2.388                            |          | 1                        |                      |
|                      | 11 COMP. OPS. (LOW)  | 114,535   | 530,208  | 1.229                            |          | 19                       |                      |
|                      | 12 COMP. OPS. (MED)  | 3,550,014   | 17,334,430   | 1.039                            |          | 268                      |                      |
|                      | 13 COMP. OPS. (HGH)  | 40,532  | 307,938  | 0.580                            |          | 0                        |                      |
|                      | TOTAL *              | \$3,731,948   | \$18,263,203   | 1.050                            |          | 288                      |                      |
| 38 MULT CONTRACTORS  | 11 COMP. OPS. (LOW)  | \$8,122,432   | \$37,446,153   | 1.157                            |          | 634                      |                      |
|                      | 12 COMP. OPS. (MED)  | 143,209,202   | 677,397,379  | 1.125                            |          | 12,565                   |                      |
|                      | 13 COMP. OPS. (HGH)  | 14,631,915  | 67,788,410   | 0.919                            |          | 693                      |                      |
|                      | TOTAL *              | \$165,963,549   | \$782,631,942  | 1.108                            |          | 13,892                   |                      |
| TOTAL ALL TOP        | 01 RET.STRS-FOOD/DRG | \$11,330,036  | \$51,872,804   | 0.960                            |          | 4,551                    |                      |
|                      | 02 RET.STRS-NTFD/DRG | 20,072,698  | 83,550,862   | 1.086                            |          | 3,677                    |                      |
|                      | 11 COMP. OPS. (LOW)  | 15,355,940  | 70,058,021   | 1.193                            |          | 1,868                    |                      |
|                      | 12 COMP. OPS. (MED)  | 235,358,136   | 1,090,719,372  | 1.105                            |          | 19,909                   |                      |
|                      | 13 COMP. OPS. (HGH)  | 23,463,152  | 112,498,624  | 0.858                            |          | 1,062                    |                      |
|                      | TOTAL *              | \$305,579,962   | \$1,408,699,683  | 1.084                            |          | 31,067                   |                      |

\* TOTALS IN COLUMN (3) ARE AVERAGES USING COLUMN (1) AS WEIGHTS.

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

OBJECTIVES

The objectives of this procedure are to:

- 1) determine monoline loss cost level needs for the appropriate rating variables;
- 2) determine indicated changes to the eight liability Commercial Package Policy (CPP) Package Modification Factors (PMFs) based on Premises/Operations and Products/Completed Operations data.

EXPERIENCE  
BASE

The experience used in this relativity analysis is the latest five (5) years of accident year data, as reported under the Commercial Statistical Plan with aggregate loss costs adjusted to current loss cost level (multiline aggregate loss costs adjusted additionally by the current Implicit Package Modification Factors). Losses have been trended and developed in the Relativity Analysis. ALCCCL have been trended.

SIMULTANEOUS  
DETERMINATION  
OF RATING  
VARIABLE  
RELATIVITIES

Once the aggregate loss costs at current level and incurred losses used in the analysis have been appropriately adjusted, the 5-year experience ratios are calculated for each combination of the appropriate rating variables. From these ratios, relativities to the statewide 5-year experience ratio are calculated. These relativities are then used in a minimum bias iterative review procedure, which simultaneously determines the relativities for each rating variable.

The purpose of a simultaneous review procedure is to arrive at a set of relativities for each rating variable that best represent the experience. For example, the type of policy relativities will serve to derive the relationship of CPP policies relative to monoline policies, via the PMF, while the class group and territory (if applicable) relativities will serve to derive the relationship of the various classification and territories relative to one another. An iterative technique is used to derive relativities for each rating variable. This procedure is in contrast to a one-way type of review, wherein relativities for each rating variable would each be reviewed separately.

Such one-way types of review do not take into account differing percentages of experience of each rating variable within the other rating variables. The simultaneous review procedure accounts for these different distributions in generating relativities for each rating variable.

RATING  
VARIABLES  
USED

For Premises/Operations and Products/Completed Operations, the rating variables used in the relativity analysis are as follows:

|                                      |   |
|--------------------------------------|---|
| Manufacturers and Contractors -      | type of policy and class group            |
| Owners, Landlords and Tenants -      | type of policy, territory and class group |
| Products -                           | type of policy and class group            |
| Local Products/Completed Operations- | type of policy, state and class group     |

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

ITERATIVE  
PROCEDURE

The iterative technique referred to in the previous paragraph solves for a set of relativities for each rating variable based on the experience for the cells; that is, based on the experience ratio and latest year adjusted aggregate loss cost volume for each combination of rating variables relative to the experience ratio and adjusted aggregate loss cost volume for all combinations of rating variables combined. Specifically, the iterative procedure uses the following formulas:

For Owners, Landlords and Tenants:

$$TOP_i = \frac{\sum_j \sum_k W_{ijk} r_{ijk}}{\sum_j \sum_k W_{ijk} CG_j TER_k} \quad \text{where } 1 \leq i \leq m$$

$$CG_j = \frac{\sum_i \sum_k W_{ijk} r_{ijk}}{\sum_i \sum_k W_{ijk} TOP_i TER_k} \quad \text{where } 1 \leq j \leq n$$

$$TER_k = \frac{\sum_i \sum_j W_{ijk} r_{ijk}}{\sum_i \sum_j W_{ijk} TOP_i CG_j} \quad \text{where } 1 \leq k \leq p$$

$TOP_i$  is the relative change for the  $i^{th}$  type of policy;

$CG_j$  is the relative change for the  $j^{th}$  class group;

$TER_k$  is the relative change for the  $k^{th}$  territory;

$W_{ijk}$  is the aggregate loss costs at current level for the  $i^{th}$

type of policy,  $j^{th}$  class group and  $k^{th}$  territory;

$r_{ijk}$  is the relative change for the  $i^{th}$  type of policy,

$j^{th}$  class group and  $k^{th}$  territory;

$m$  is the number of types of policy in the analysis;

$n$  is the number of class groups in the analysis;

$p$  is the number of territories in the analysis;



EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

For Manufacturers and Contractors, and Products:

$$TOP_i = \frac{\sum_j W_{ij} r_{ij}}{\sum_j W_{ij} CG_j} \quad \text{where } 1 \leq i \leq m$$
$$CG_j = \frac{\sum_i W_{ij} r_{ij}}{\sum_i W_{ij} TOP_i} \quad \text{where } 1 \leq j \leq n$$

$TOP_i$  is the relative change for the  $i^{\text{th}}$  type of policy;

$CG_j$  is the relative change for the  $j^{\text{th}}$  class group;

$W_{ij}$  is the aggregate loss costs at current level for the  $i^{\text{th}}$

type of policy and  $j^{\text{th}}$  class group;

$r_{ij}$  is the relative change for the  $i^{\text{th}}$  type of policy

and  $j^{\text{th}}$  class group;

$m$  is the number of types of policy in the analysis;

$n$  is the number of class groups in the analysis;

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

For Local Products/Completed Operations:

$$TOP_i = \frac{\sum_j \sum_k W_{ijk} r_{ijk}}{\sum_j \sum_k W_{ijk} CG_j ST_k} \quad \text{where } 1 \leq i \leq m$$

$$CG_j = \frac{\sum_i \sum_k W_{ijk} r_{ijk}}{\sum_i \sum_k W_{ijk} TOP_i ST_k} \quad \text{where } 1 \leq j \leq n$$

$$ST_k = \frac{\sum_i \sum_j W_{ijk} r_{ijk}}{\sum_i \sum_j W_{ijk} TOP_i CG_j} \quad \text{where } 1 \leq k \leq p$$

$TOP_i$  is the relative change for the  $i^{\text{th}}$  type of policy;

$CG_j$  is the relative change for the  $j^{\text{th}}$  class group;

$ST_k$  is the relative change for the  $k^{\text{th}}$  state;

$W_{ijk}$  is the aggregate loss costs at current level for the  $i^{\text{th}}$

type of policy,  $j^{\text{th}}$  class group and  $k^{\text{th}}$  state;

$r_{ijk}$  is the relative change for the  $i^{\text{th}}$  type of policy,

$j^{\text{th}}$  class group and  $k^{\text{th}}$  state;

$m$  is the number of types of policy in the analysis;

$n$  is the number of class groups in the analysis;

$p$  is the number of states in the analysis;

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

ITERATIVE  
PROCEDURE  
(Cont'd)

For example, for Owners, Landlords and Tenants, the procedure starts by inserting the actual relativities for type of policy and class group into the third formula to get a territory relativity. This result is then used with the class group relativity in the first formula to get a new type of policy relativity, which in turn is substituted along with the territory relativity into the second formula to get a new class group relativity. The process continues on in that fashion until there is no appreciable difference from one iteration to the next.

APPLICATION OF  
CREDIBILITY

Consideration is then given to the credibility of the experience for each rating variable. The credibility of each of these categories is based on the formula  $Z = \sqrt{P/18,000}$  for Owners, Landlords and Tenants,  $Z = \sqrt{P/18,000}$  for Manufacturers and Contractors and  $Z = \sqrt{P/20,000}$  for Products, where P is the 5 year occurrence total for a given class group, territory or type of policy. For Local Products/Completed Operations, separate formulas are used to calculate the credibility of the experience for each type of policy and class group versus the credibility of the experience for each state, namely  $Z = \sqrt{P/15,000}$  for type of policy and class group, and  $Z = \sqrt{P/5,500}$  for state (in this case, P is the 5 year occurrence total for a given state). Credibility-weighted relativities are then calculated as follows:

$$W = R^Z \quad \text{where:}$$

Z is the class group, territory, state or type of policy credibility;

R is the class group, territory, state or type of policy relativity;

W is the credibility-weighted relativity.

The resulting credibility-weighted relativities are then balanced to assure that the average relativity remains at unity.

EXPLANATORY NOTES TO GENERAL LIABILITY  
RELATIVITY ANALYSIS - TABLES 10 THROUGH 18.

MULTILINE  
CONSIDERATIONS

The monoline relativities and the class group, territory (if applicable) and state relativities which result from the aforementioned procedures are then used to generate indicated monoline classification loss cost changes. The multiline relativities are used to generate multiline indications that apply to the current Implicit Package Modification Factors. The indicated IPMFs are calculated as follows:

$$\text{TOP y indicated IPMF} = \frac{(\text{TOP y current IPMF}) \times (\text{TOP y relativity})}{(\text{monoline relativity})}$$

For each CPP Type of Policy the indicated IPMF is subject to a minimum value of 0.50 and a maximum value of 1.50. If an indicated IPMF falls outside one of those limits, it is capped at that amount, the aggregate loss costs for that Type of Policy are adjusted to the capped IPMF level, and the entire relativity review as described above is re-performed to take this into account.

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COMMERCIAL PACKAGE POLICY

TABLE OF CONTENTS

SECTION C - REVISED CLM DIVISION NINE

Commercial Package Policy Package Modification Factors (Revised MLCP-PMF-1) ..... C-2

COMMERCIAL LINES MANUAL  
DIVISION NINE – MULTIPLE LINE  
COMMERCIAL PACKAGE POLICY  
PACKAGE MODIFICATION FACTORS

MISSOURI (24)

**PACKAGE MODIFICATION FACTORS**

| Package<br>Modification<br>Assignment<br>(PMA) | Premium From CLM Division |   |                           |                           |
|--|---------------------------|---|---------------------------|---------------------------|
|  | Two                       | Three,<br>Four,<br>Five,<br>Eight<br>Property | Four,<br>Six<br>Liability | All<br>Other<br>Divisions |
| Apartment House                                | .90                       | .83   | 1.00                      | 1.00                      |
| Contractors                                    | .90                       | .91   | .95                       | 1.00                      |
| Industrial & Processing                        | .90                       | .80   | .96                       | 1.00                      |
| Institutional                                  | .90                       | .92   | .95                       | 1.00                      |
| Mercantile                                     | .90                       | .80   | .90                       | 1.00                      |
| Motel/Hotel                                    | .90                       | 1.00  | .96                       | 1.00                      |
| Office   | .90                       | .75   | .84                       | 1.00                      |
| Service  | .90                       | .88   | .95                       | 1.00                      |

**Table 1. Package Modification Factors**