

**RULES – INFORMATION**

APRIL 22, 2019

COMMERCIAL MULTIPLE LINE

LI-ML-2019-011

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**CONNECTICUT COMMERCIAL PACKAGE POLICY PACKAGE  
MODIFICATION FACTOR ANALYSIS FURNISHED FOR  
INFORMATION; EXCEL WORKBOOK NEWLY INCLUDED**

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**KEY MESSAGE**

This analysis is provided for your information. We are NOT revising the current package modification factors based on this analysis.

**BACKGROUND**

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

**ISO ACTION**

We are:

- NOT making a submission to the Insurance Department based on this analysis.
- NOT implementing any changes, at this time, to the current package modification factors for this jurisdiction.

**COMPANY ACTION**

You may wish to evaluate your package modification factor needs. The methods described in the attached analysis are based on the judgments of Insurance Services Office, Inc. You should evaluate and substitute your own judgments and procedures where appropriate, and consider your own loss experience when determining your package modification factor needs.

If you decide to independently file a package modification factor revision, you must comply with the applicable regulatory filing requirements.

**REFERENCE(S)**

[LI-ML-2019-004](#) (04/03/2019) Commercial Package Policy Experience Reviewed By Staff

**ATTACHMENT(S)**

- Informational Analysis
- 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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## 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 document 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).

CONNECTICUT  
ADVISORY PACKAGE MODIFICATION FACTOR REVIEW  
COMMERCIAL PACKAGE POLICY  
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. Total</u>
Motel/Hotel	0.0%	0.0%	0.0%
Apartment	+1.0%	+7.9%	+4.9%
Office	+2.0%	+1.3%	+1.4%
Mercantile	+2.0%	-1.0%	+0.1%
Institutional	+2.0%	-5.0%	-0.6%
Services	+2.0%	0.0%	+1.0%
Indust./Proc.	+1.1%	+1.1%	+1.1%
Contractors	<u>-2.0%</u>	<u>+9.9%</u>	<u>+8.6%</u>
Statewide	+1.6%	+1.1%	+1.3%

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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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ADVISORY PACKAGE MODIFICATION FACTOR REVIEW  
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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 03/31/18.
  - Basic Group II: ten fiscal accident years ending 03/31/18.
  - Special Causes of Loss: five fiscal accident years ending 03/31/18.
  - Crime: calendar year ending 06/30/16.
  - Inland Marine: five calendar accident years ending 12/31/16.
  - Fidelity: policy year ending 12/31/15.
  - Owners, Landlords, and Tenants: five fiscal accident years ending 03/31/18.
  - Manufacturers and Contractors: five fiscal accident years ending 03/31/18.
  - Products: three calendar accident years ending 12/31/17.
  - Local Products and Completed Operations: three calendar accident years ending 12/31/17.
- 

PRIOR ISO  
REVISIONS

The latest revisions in this state are:

<u>Filing</u>	ML-17-RLA1	ML-10-RLA1	ML-08-RLA1
<u>Dates</u>			
Implemented	02/01/18	01/01/11	03/01/09
<u>Changes</u>			
Indicated	+0.2%	+1.2%	-0.8%
Filed	+0.2%	+1.2%	-0.7%
Implemented	+0.2%	+1.2%	-0.7%

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ADVISORY PACKAGE MODIFICATION FACTOR REVIEW  
COMMERCIAL PACKAGE POLICY  
EXECUTIVE SUMMARY

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ADJUSTMENTS  
TO REPORTED  
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.

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TEN LARGEST  
GROUPS IN  
ISO DATA BASE

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.

COMMERCIAL MULTI PERIL (ASLOB 51 & 52)

1. Travelers Indemnity Company
  2. Liberty Mutual Insurance Company
  3. Tokio Marine Companies
  4. Hartford Accident & Indemnity Company
  5. NGM Insurance Company
  6. Hanover Insurance Company
  7. QBE Insurance Corporation
  8. Continental Casualty Company
  9. Nationwide Mutual Insurance Company
  10. Vermont Mutual Insurance Company
- 

SIZE OF ISO  
DATA BASE

The market share of ISO participating insurers as measured by Annual Statement Page 15 written premium for the year ending 12/31/17 is:

Commercial Multi Peril (ASLOB 51 & 52). 70.6%.

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ADDITIONAL  
SUPPORTING  
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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CONNECTICUT  
ADVISORY PACKAGE MODIFICATION FACTOR REVIEW  
COMMERCIAL PACKAGE POLICY  
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

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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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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. TOTAL
	CURRENT	CAPPED	% CHANGE	CURRENT	CAPPED	% CHANGE	% CHANGE
MOTEL/HOTEL (31)	1.00	1.00	0.0%	1.00	1.00	0.0%	0.0%
APARTMENT (32)	0.99	1.00	1.0%	0.76	0.82	7.9%	4.9%
OFFICE (33)	0.98	1.00	2.0%	0.76	0.77	1.3%	1.4%
MERCANTILE (34)	0.98	1.00	2.0%	0.97	0.96	-1.0%	0.1%
INSTITUTION (35)	0.98	1.00	2.0%	1.00	0.95	-5.0%	-0.6%
SERVICES (36)	0.98	1.00	2.0%	1.00	1.00	0.0%	1.0%
IND/PROC (37)	0.94	0.95	1.1%	0.91	0.92	1.1%	1.1%
CONTRACTORS (38)	1.00	0.98	-2.0%	0.91	1.00	9.9%	8.6%
STATEWIDE			1.6%			1.1%	1.3%

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

MOTEL/HOTEL (31) *****	(1) AGGREG- ATE LOSS COSTS	(2) CURRENT IMPLICIT PMF	(3) NET INDICATION	(4) INDIC. PMF	(5) CAPPED PMF
<u>COVERAGE</u>					
PROPERTY-					
BASIC GRP I	138,294	1.202	1.4%	1.219	1.146
BASIC GRP II	134,379	0.724	13.3	0.820	0.772
SP CAUSE/LOSS	255,394	1.144	3.7	1.186	1.116
*CRIME	1,847	0.910	0.0	0.910	0.910
*INL. MAR.	1,075	0.910	0.0	0.910	0.910
*FIDELITY	4,585	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>535,574</u>	<u>1.00</u>	<u>6.2%</u>	<u>1.062</u>	<u>1.00</u>
LIABILITY-					
OL&T	1,125,118	1.000	1.9%	1.019	1.000
<u>TOTAL</u>	<u>1,125,118</u>	<u>1.00</u>	<u>1.9%</u>	<u>1.019</u>	<u>1.00</u>
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PROP. & LIAB. TOTAL	1,660,692		3.3%		

  

APARTMENT (32) *****	(1) AGGREG- ATE LOSS COSTS	(2) CURRENT IMPLICIT PMF	(3) NET INDICATION	(4) INDIC. PMF	(5) CAPPED PMF
<u>COVERAGE</u>					
PROPERTY-					
BASIC GRP I	2,911,017	0.963	3.3%	0.995	0.981
BASIC GRP II	762,211	0.668	3.1	0.689	0.679
SP CAUSE/LOSS	1,789,850	1.378	-2.5	1.344	1.325
*CRIME	278	0.910	0.0	0.910	0.910
*INL. MAR.	21	0.910	0.0	0.910	0.910
*FIDELITY	11,492	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>5,474,869</u>	<u>0.99</u>	<u>2.4%</u>	<u>1.014</u>	<u>1.00</u>
LIABILITY-					
OL&T	7,247,703	0.763	6.6%	0.813	0.821
<u>TOTAL</u>	<u>7,247,703</u>	<u>0.76</u>	<u>7.0%</u>	<u>0.813</u>	<u>0.82</u>
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	12,722,572		5.0%		

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

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

OFFICE (33) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
COVERAGE					
PROPERTY-					
BASIC GRP I	262,316	1.415	1.9%	1.442	1.447
BASIC GRP II	191,112	0.671	8.8	0.730	0.733
SP CAUSE/LOSS	379,202	1.001	-2.1	0.980	0.984
*CRIME	2,203	0.910	0.0	0.910	0.910
*INL. MAR.	2,739	0.910	0.0	0.910	0.910
*FIDELITY	16,438	1.000	0.0	1.000	1.000
TOTAL	854,010	0.98	1.7%	0.997	1.00
LIABILITY-					
OL&T	9,930,088	0.756	1.6%	0.768	0.768
M&C	272,378	0.995	1.3	1.008	1.008
TOTAL	10,202,466	0.76	1.7%	0.773	0.77
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	11,056,476		1.7%		
MERCANTILE (34) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
COVERAGE					
PROPERTY-					
BASIC GRP I	3,470,095	1.218	3.4%	1.259	1.250
BASIC GRP II	2,087,694	0.932	13.3	1.056	1.048
SP CAUSE/LOSS	2,255,821	0.774	-6.1	0.727	0.721
*CRIME	17,721	0.910	0.0	0.910	0.910
*INL. MAR.	59,766	0.910	0.0	0.910	0.910
*FIDELITY	159,466	1.000	0.0	1.000	1.000
TOTAL	8,050,563	0.98	2.8%	1.007	1.00
LIABILITY-					
OL&T	11,099,510	0.970	-2.5%	0.946	0.950
M&C	1,311,604	1.135	0.0	1.135	1.141
LOCAL PRODUCT	303,547	0.986	0.1	0.987	0.992
*MULTI PRODUCT	893,513	0.831	2.6	0.853	0.853
TOTAL	13,608,174	0.97	-1.5%	0.955	0.96
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	21,658,737		0.1%		

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

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

INSTITUTION (35) *****	(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	1,471,751	1.115	1.4%	1.131	1.164
BASIC GRP II	1,694,413	0.878	-6.3	0.823	0.847
SP CAUSE/LOSS	2,065,258	0.973	2.7	0.999	1.029
*CRIME	20,769	0.910	0.0	0.910	0.910
*INL. MAR.	6,878	0.910	0.0	0.910	0.910
*FIDELITY	160,105	1.000	0.0	1.000	1.000
TOTAL	5,419,174	0.98	-1.2%	0.969	1.00
LIABILITY-					
OL&T	2,967,872	1.008	-0.4%	1.004	1.004
M&C	372,843	0.672	0.7	0.677	0.677
TOTAL	3,340,715	1.00	-4.8%	0.952	0.95
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	8,759,889		-2.5%		

  

SERVICES (36) *****	(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	2,181,827	1.270	1.5%	1.289	1.226
BASIC GRP II	1,535,405	0.919	23.1	1.131	1.076
SP CAUSE/LOSS	1,520,218	0.787	-1.8	0.773	0.735
*CRIME	13,279	0.910	0.0	0.910	0.910
*INL. MAR.	30,619	0.910	0.0	0.910	0.910
*FIDELITY	122,398	1.000	0.0	1.000	1.000
TOTAL	5,403,746	0.98	7.1%	1.050	1.00
LIABILITY-					
OL&T	2,992,587	0.932	-4.7%	0.888	0.912
M&C	2,359,330	1.048	-0.1	1.047	1.075
LOCAL PRODUCT	539,600	1.217	1.6	1.236	1.269
*MULTI PRODUCT	36,704	0.899	1.8	0.915	0.915
TOTAL	5,928,221	1.00	-2.6%	0.974	1.00
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	11,331,967		2.1%		

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

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

IND/PROC (37) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
COVERAGE					
PROPERTY-					
BASIC GRP I	1,770,920	1.500	0.0%	1.500	1.500
BASIC GRP II	853,080	0.684	1.6	0.695	0.734
SP CAUSE/LOSS	1,306,730	0.776	-10.8	0.692	0.731
*CRIME	7,887	0.910	0.0	0.910	0.910
*INL. MAR.	2,279	0.910	0.0	0.910	0.910
*FIDELITY	72,325	1.000	0.0	1.000	1.000
TOTAL	4,013,221	0.94	-1.5%	0.926	0.95
LIABILITY-					
M&C	3,258,775	0.929	1.4	0.942	0.942
LOCAL PRODUCT	73,436	0.788	2.1	0.805	0.805
*MULTI PRODUCT	1,184,178	0.884	-2.3	0.864	0.864
TOTAL	4,516,389	0.91	0.9%	0.918	0.92
-----	-----	-----	-----	-----	-----
PROP. & LIAB. TOTAL	8,529,610		-0.2%		
CONTRACTORS (38) *****	(1)	(2)	(3)	(4)	(5)
	AGGREGATE <u>LOSS COSTS</u>	CURRENT IMPLICIT <u>PMF</u>	NET <u>INDICATION</u>	INDIC. <u>PMF</u>	CAPPED <u>PMF</u>
COVERAGE					
PROPERTY-					
BASIC GRP I	283,247	0.683	2.6%	0.701	0.722
BASIC GRP II	327,006	1.101	3.1	1.135	1.169
SP CAUSE/LOSS	574,690	1.216	-12.8	1.060	1.092
*CRIME	3,754	0.910	0.0	0.910	0.910
*INL. MAR.	1,090	0.910	0.0	0.910	0.910
*FIDELITY	45,146	1.000	0.0	1.000	1.000
TOTAL	1,234,933	1.00	-4.5%	0.955	0.98
LIABILITY-					
M&C	7,565,282	0.941	10.3	1.038	1.038
LOCAL PRODUCT	2,574,374	0.844	4.8	0.885	0.885
TOTAL	10,139,656	0.91	9.4%	0.996	1.00
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PROP. & LIAB. TOTAL	11,374,589		7.9%		

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

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

STATEWIDE *****	(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-		<u>PMF</u>			
BASIC GRP I	12,489,467	1.156	2.3%	1.182	1.170
BASIC GRP II	7,585,300	0.843	8.0	0.911	0.908
SP CAUSE/LOSS	10,147,163	0.920	-3.6	0.887	0.889
*CRIME	67,738	0.910	0.0	0.910	0.910
*INL. MAR.	104,467	0.910	0.0	0.910	0.910
*FIDELITY	591,955	1.000	0.0	1.000	1.000
<u>TOTAL</u>	<u>30,986,090</u>	<u>0.977</u>	<u>2.0%</u>	<u>0.997</u>	<u>0.993</u>
LIABILITY-					
OL&T	35,362,878	0.855	0.6%	0.861	0.865
M&C	15,140,212	0.959	5.5	1.012	1.016
LOCAL PRODUCT	3,490,957	0.896	3.8	0.931	0.935
*MULTI PRODUCT	2,114,395	0.861	-0.1	0.860	0.860
<u>TOTAL</u>	<u>56,108,442</u>	<u>0.897</u>	<u>0.6%</u>	<u>0.902</u>	<u>0.907</u>
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PROP. & LIAB. TOTAL	87,094,532		1.1%		

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



CONNECTICUT

TABLE 2

COMMERCIAL PACKAGE POLICY

COMBINED PMFs

<u>TYPE OF POLICY</u>	<u>CURRENT COMBINED</u>	<u>INDICATED COMBINED</u>	<u>CAPPED COMBINED</u>
MOTEL/HOTEL (31)	1.00	1.033	1.00
APARTMENT (32)	0.88	0.887	0.89
OFFICE (33)	0.78	0.787	0.79
MERCANTILE (34)	0.97	0.975	0.97
INSTITUTION (35)	0.98	0.962	0.98
SERVICES (36)	0.99	1.011	1.00
IND/PROC (37)	0.92	0.922	0.93
CONTRACTORS (38)	0.92	0.992	0.99

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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TABLE 3 - BASIC GROUP I RELATIVITY ANALYSIS

	(1)	(2)	(3)	(4)	(5)
TOP	\$ LST SQ FORMULA RELATIVITY	CREDIBILITY Z	Z-WTD. RELATIVITY	BALANCED RELATIVITY	INDICATED CHANGE **
10	0.845	0.118	0.980	0.979	
31	0.507	0.009	0.994	0.993	+1.4%
32	1.095	0.135	1.012	1.011	+3.3%
33	0.938	0.014	0.999	0.998	+1.9%
34	1.088	0.152	1.013	1.012	+3.4%
35	0.927	0.086	0.994	0.993	+1.4%
36	0.952	0.103	0.995	0.994	+1.5%
37 *	-----	-----	0.980	0.979	0.0%
38	1.331	0.016	1.005	1.004	+2.6%
RATING GROUP					
01	0.998	0.229	1.000	1.005	
02	0.980	0.101	0.998	1.004	
03	0.891	0.100	0.989	0.994	
04	0.896	0.277	0.970	0.975	
05	1.013	0.009	1.000	1.006	
06	1.058	0.115	1.007	1.012	
07	1.146	0.036	1.005	1.011	
08	0.877	0.101	0.987	0.992	
09	1.241	0.101	1.022	1.028	
10	1.734	0.022	1.012	1.018	
11	1.161	0.016	1.002	1.008	
13	1.120	0.100	1.011	1.017	
14	0.763	0.059	0.984	0.990	
15	0.723	0.048	0.985	0.990	
17	1.575	0.021	1.010	1.015	
18	0.863	0.032	0.995	1.001	
19	0.897	0.010	0.999	1.005	
21	1.236	0.084	1.018	1.024	
22	0.990	0.068	0.999	1.005	

\* - TOP 37 IMPLICIT PMF CAPPED AT 1.500.

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

CONNECTICUT

TABLE 4 - SPECIAL CAUSES OF LOSS RELATIVITY ANALYSIS

	(1)	(2)	(3)	(4)	(5)
	\$ LST SQ FORMULA RELATIVITY	CREDIBILITY Z	Z-WTD. RELATIVITY	BALANCED RELATIVITY	INDICATED CHANGE *
TOP					
10	1.212	0.092	1.018	1.035	
31	4.623	0.035	1.055	1.073	+3.7%
32	0.962	0.194	0.993	1.009	-2.5%
33	0.919	0.050	0.996	1.013	-2.1%
34	0.825	0.233	0.956	0.972	-6.1%
35	1.200	0.242	1.045	1.063	+2.7%
36	0.997	0.173	0.999	1.016	-1.8%
37	0.568	0.171	0.908	0.923	-10.8%
38	0.238	0.083	0.888	0.903	-12.8%
CATEGORY					
01	1.030	0.714	1.021	1.020	
02	0.294	0.191	0.792	0.791	
03	0.564	0.057	0.968	0.967	
04	2.168	0.112	1.091	1.089	
05	0.954	0.128	0.994	0.993	
06	0.454	0.043	0.967	0.965	
07	0.176	0.028	0.953	0.951	
08	0.843	0.147	0.975	0.974	
09	0.862	0.210	0.969	0.968	
10	1.223	0.034	1.007	1.006	
11	0.887	0.176	0.979	0.978	
12	0.984	0.117	0.998	0.997	
13	0.660	0.057	0.977	0.975	
14	1.999	0.120	1.087	1.085	

\* INDICATED CHANGE =  
 (BALANCED RELATIVITY FOR TOP) / (BALANCED MONOLINE (TOP 10) RELATIVITY) - 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 loss cost level needs for Basic Group I;
- (2) determine monoline category loss cost level needs for Special Causes of Loss;
- (3) determine indicated changes to the eight property CPP Package Modification Factors (PMFs) 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 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 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:

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

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

SPECIAL CAUSES OF LOSS:

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

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

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

COLUMN (1)  
(Cont'd)

- .  $TOP_i$  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;
- .  $W_{ij}$  is the aggregate loss costs for the  $i$ th Type of Policy,  $j$ th Rating Group or Category;
- .  $R_{ij}$  is the experience ratio relativity for the  $i$ th Type of Policy,  $j$ th Rating Group or Category;
- .  $m$  is the number of Types of Policy in the analysis;
- .  $n$  is the number of Rating Groups or Categories 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 or Category 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 \$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.

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

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.

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:

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

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

MULTILINE  
CONSIDERATIONS  
(Cont'd)

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.

Entire State (Connecticut)  
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CONNECTICUT  
BASIC GROUP I RELATIVITY ANALYSIS  
TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 03/31/18 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) Z-WEIGHTED EXPERIENCE RATIO	(5) Z-WEIGHTED RELATIVITY
10 MONOLINE	01 APARTMENTS	40,189	427,202	0.511	0.529	0.698
	02 OTHER HABITATIONAL	46,683	213,350	1.382	0.684	0.902
	03 RESTAURANTS & BARS	69,573	322,268	0.498	0.527	0.695
	04 OTHER MERCANTILE RS	172,726	861,376	0.102	0.432	0.570
	05 PUBLIC BUILDINGS	2,892	23,516	0.867	0.587	0.774
	06 CHURCHES	8,134	45,209	0.634	0.550	0.726
	07 SCHOOLS	8,164	79,949	1.016	0.613	0.809
	08 OFFICES AND BANKS	61,447	382,951	1.292	0.680	0.897
	09 REC. FACILITIES	87,835	461,787	0.314	0.489	0.645
	10 HOTELS AND MOTELS	10,734	34,570	3.414	0.998	1.317
	11 HOSPITALS/NURS HOME	4,625	24,578	6.556	1.499	1.978
	13 MOTOR VEHICLE RISKS	26,919	149,314	0.587	0.543	0.716
	14 OTHER NON-MANUF.	47,981	251,357	0.043	0.444	0.586
	15 STORAGE	41,078	144,516	0.110	0.461	0.608
	17 FOOD MANUFACTURING	1,849	7,510	0.000	0.449	0.592
	18 WOOD MANUFACTURING	10,696	40,277	0.000	0.447	0.590
	19 WEARING APPAREL	1,068	4,970	0.000	0.449	0.592
	21 METAL MANUFACTURING	16,999	81,956	0.000	0.445	0.587
	22 OTHER MANUFACTURING	9,982	51,737	0.000	0.446	0.588
	TOTAL*	669,574	3,608,393	0.522	0.524	0.692
31 MULTILINE MOTEL/HOTEL	10 HOTELS AND MOTELS	138,294	866,374	0.335	0.674	0.889
	TOTAL*	138,294	866,374	0.335	0.674	0.889
32 MULTILINE APARTMENT	01 APARTMENTS	2,207,864	11,452,677	0.915	0.838	1.106
	02 OTHER HABITATIONAL	703,153	4,201,221	0.953	0.823	1.086
	TOTAL*	2,911,017	15,653,898	0.924	0.834	1.101
33 MULTILINE OFFICE	08 OFFICES AND BANKS	262,316	1,469,388	0.195	0.631	0.832
	TOTAL*	262,316	1,469,388	0.195	0.631	0.832
34 MULTILINE MERCANTILE	03 RESTAURANTS & BARS	742,961	3,523,156	0.708	0.743	0.980
	04 OTHER MERCANTILE RS	2,050,258	11,386,550	0.735	0.747	0.985
	08 OFFICES AND BANKS	107,848	445,329	0.201	0.658	0.868
	13 MOTOR VEHICLE RISKS	229,937	912,966	1.869	0.983	1.297
	14 OTHER NON-MANUF.	68,412	465,824	0.141	0.647	0.854
	15 STORAGE	270,679	1,198,006	0.004	0.596	0.786
	TOTAL*	3,470,095	17,931,831	0.719	0.745	0.983

Entire State (Connecticut)  
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CONNECTICUT  
 BASIC GROUP I RELATIVITY ANALYSIS  
 TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 03/31/18 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) Z-WEIGHTED EXPERIENCE RATIO	(5) Z-WEIGHTED RELATIVITY
<hr/>						
35 MULTILINE	02 OTHER HABITATIONAL	15,102	81,799	0.037	0.642	0.847
INSTITUTIONAL	05 PUBLIC BUILDINGS	62,306	320,413	0.535	0.720	0.950
	06 CHURCHES	754,096	5,146,823	0.739	0.752	0.992
	07 SCHOOLS	222,631	1,428,384	1.009	0.815	1.075
	08 OFFICES AND BANKS	160,060	1,007,235	0.396	0.684	0.902
	09 REC. FACILITIES	76,579	459,659	0.026	0.626	0.826
	11 HOSPITALS/NURS HOME	105,448	618,522	1.102	0.824	1.087
	13 MOTOR VEHICLE RISKS	4,305	41,364	0.000	0.637	0.840
	14 OTHER NON-MANUF.	71,224	333,952	0.378	0.692	0.913
	TOTAL*	1,471,751	9,438,151	0.696	0.747	0.986
36 MULTILINE	03 RESTAURANTS & BARS	69,945	608,015	0.058	0.635	0.838
SERVICES	04 OTHER MERCANTILE RS	229,118	1,180,581	0.630	0.727	0.959
	08 OFFICES AND BANKS	155,139	817,278	0.258	0.663	0.875
	09 REC. FACILITIES	716,166	3,574,816	1.116	0.855	1.128
	13 MOTOR VEHICLE RISKS	613,527	3,276,111	0.893	0.789	1.041
	14 OTHER NON-MANUF.	240,588	1,144,089	0.079	0.622	0.821
	15 STORAGE	105,456	655,673	0.113	0.643	0.848
	21 METAL MANUFACTURING	16,413	86,967	0.000	0.644	0.850
	22 OTHER MANUFACTURING	35,475	193,185	0.137	0.660	0.871
	TOTAL*	2,181,827	11,536,715	0.720	0.762	1.005
37 MULTILINE	04 OTHER MERCANTILE RS	110,532	582,227	0.045	0.634	0.836
INDUST/PROCESS	08 OFFICES AND BANKS	19,744	141,693	0.000	0.642	0.847
	13 MOTOR VEHICLE RISKS	0	71,303	0.000	0.645	0.851
	14 OTHER NON-MANUF.	56,794	254,525	0.050	0.646	0.852
	15 STORAGE	4,109	8,155	0.000	0.647	0.854
	17 FOOD MANUFACTURING	201,442	851,090	2.422	1.047	1.381
	18 WOOD MANUFACTURING	219,160	1,286,771	0.046	0.611	0.806
	19 WEARING APPAREL	30,083	403,316	0.046	0.640	0.844
	21 METAL MANUFACTURING	566,934	3,497,028	1.101	0.850	1.121
	22 OTHER MANUFACTURING	562,122	2,683,481	0.499	0.686	0.905
	TOTAL*	1,770,920	9,779,589	0.797	0.764	1.008

Entire State (Connecticut)  
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CONNECTICUT  
 BASIC GROUP I RELATIVITY ANALYSIS  
 TABLE 5 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 03/31/18 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) Z-WEIGHTED EXPERIENCE RATIO	(5) Z-WEIGHTED RELATIVITY
38 MULTILINE	04 OTHER MERCANTILE RS	237,718	1,335,937	1.263	0.852	1.124
CONTRACTORS	08 OFFICES AND BANKS	34,143	213,572	0.174	0.665	0.877
	14 OTHER NON-MANUF.	11,386	55,693	0.000	0.646	0.852
	TOTAL*	283,247	1,605,202	1.081	0.821	1.083
TOTAL ALL TOPS*	01 APARTMENTS	2,248,053	11,879,879	0.908	0.832	1.098
	02 OTHER HABITATIONAL	764,938	4,496,370	0.961	0.811	1.070
	03 RESTAURANTS & BARS	882,479	4,453,439	0.640	0.718	0.946
	04 OTHER MERCANTILE RS	2,800,352	15,346,671	0.705	0.730	0.964
	05 PUBLIC BUILDINGS	65,198	343,929	0.550	0.714	0.942
	06 CHURCHES	762,230	5,192,032	0.738	0.750	0.989
	07 SCHOOLS	230,795	1,508,333	1.009	0.808	1.066
	08 OFFICES AND BANKS	800,697	4,477,446	0.327	0.657	0.867
	09 REC. FACILITIES	880,580	4,496,262	0.941	0.799	1.054
	10 HOTELS AND MOTELS	149,028	900,944	0.557	0.697	0.920
	11 HOSPITALS/NURS HOME	110,073	643,100	1.331	0.852	1.124
	13 MOTOR VEHICLE RISKS	874,688	4,451,058	1.136	0.832	1.097
	14 OTHER NON-MANUF.	496,385	2,505,440	0.122	0.621	0.820
	15 STORAGE	421,322	2,006,350	0.042	0.595	0.785
	17 FOOD MANUFACTURING	203,291	858,600	2.400	1.041	1.374
	18 WOOD MANUFACTURING	229,856	1,327,048	0.044	0.603	0.796
	19 WEARING APPAREL	31,151	408,286	0.044	0.633	0.836
	21 METAL MANUFACTURING	600,346	3,665,951	1.040	0.833	1.099
	22 OTHER MANUFACTURING	607,579	2,928,403	0.470	0.681	0.898
	TOTAL*	13,159,041	71,889,541	0.756	0.758	1.000

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

## CONNECTICUT

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

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 03/31/18 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) RELATIVITY
<hr/>					
10 MONOLINE	01 BUILDINGS	490,255	2,563,872	1.483	1.438
	02 RES. APTS. AND COND	6,773	47,123	2.303	2.234
	03 OFFICES	49,101	272,079	0.312	0.303
	04 MERCANTILE - HIGH	67,739	326,287	0.233	0.226
	05 MERCANTILE - MEDIUM	20,247	133,075	0.162	0.157
	06 MERCANTILE - LOW	13,652	67,676	0.000	0.000
	07 MOTELS AND HOTELS	8,060	26,770	1.859	1.803
	08 INSTITUTIONAL - HIG	18,881	106,898	0.760	0.737
	09 INSTITUTIONAL - LOW	25,047	129,562	0.912	0.885
	10 INDUST-PROC - HIGH	4,212	19,536	0.385	0.373
	11 INDUST-PROC - LOW	16,937	119,718	0.054	0.052
	12 SERVICE - HIGH	17,765	94,561	0.087	0.084
	13 SERVICE - LOW	25,761	144,848	3.197	3.101
	14 CONTRACTORS	4,485	19,795	1.770	1.717
	TOTAL*	768,915	4,071,800	1.201	1.165
31 MULTILINE MOTEL/HOTEL	01 BUILDINGS	171,400	1,020,430	5.235	5.078
	07 MOTELS AND HOTELS	83,994	411,806	0.889	0.862
	TOTAL*	255,394	1,432,236	3.806	3.692
32 MULTILINE APARTMENT	01 BUILDINGS	1,170,210	6,135,179	1.089	1.056
	02 RES. APTS. AND COND	619,640	3,494,429	0.311	0.302
	TOTAL*	1,789,850	9,629,608	0.820	0.795
33 MULTILINE OFFICE	01 BUILDINGS	285,588	1,516,199	1.031	1.000
	03 OFFICES	88,178	564,321	0.753	0.730
	08 INSTITUTIONAL - HIG	3,964	33,257	0.494	0.479
	12 SERVICE - HIGH	1,327	3,216	0.000	0.000
	14 CONTRACTORS	145	724	0.000	0.000
	TOTAL*	379,202	2,117,717	0.957	0.928



## CONNECTICUT

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

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 03/31/18 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) RELATIVITY
34 MULTILINE MERCANTILE	01 BUILDINGS	1,556,345	7,879,414	0.918	0.890
	03 OFFICES	1,785	9,544	0.000	0.000
	04 MERCANTILE - HIGH	246,947	1,544,166	2.259	2.191
	05 MERCANTILE - MEDIUM	331,883	2,063,614	0.871	0.845
	06 MERCANTILE - LOW	105,185	574,253	0.427	0.414
	08 INSTITUTIONAL - HIG	166	663	0.000	0.000
	11 INDUST-PROC - LOW	187	622	0.000	0.000
	12 SERVICE - HIGH	5,732	33,023	1.617	1.568
	13 SERVICE - LOW	1,865	21,275	0.054	0.052
	14 CONTRACTORS	5,726	36,997	0.416	0.403
	TOTAL*	2,255,821	12,163,571	1.034	1.003
35 MULTILINE INSTITUTIONAL	01 BUILDINGS	1,164,226	6,632,361	1.358	1.317
	03 OFFICES	7,947	31,082	0.245	0.238
	04 MERCANTILE - HIGH	382	840	0.000	0.000
	08 INSTITUTIONAL - HIG	390,096	2,363,866	1.114	1.081
	09 INSTITUTIONAL - LOW	498,633	3,722,229	1.140	1.106
	12 SERVICE - HIGH	455	3,981	0.000	0.000
	13 SERVICE - LOW	2,559	12,482	0.000	0.000
	14 CONTRACTORS	960	3,436	0.000	0.000
	TOTAL*	2,065,258	12,770,277	1.252	1.214
36 MULTILINE SERVICES	01 BUILDINGS	1,023,298	5,478,351	1.131	1.097
	03 OFFICES	2,362	14,387	2.071	2.009
	04 MERCANTILE - HIGH	2,652	11,959	0.151	0.146
	05 MERCANTILE - MEDIUM	1,290	4,923	0.000	0.000
	06 MERCANTILE - LOW	1,964	8,757	0.000	0.000
	08 INSTITUTIONAL - HIG	17,422	79,637	0.000	0.000
	09 INSTITUTIONAL - LOW	25,069	135,906	0.000	0.000
	10 INDUST-PROC - HIGH	0	2,415	0.000	0.000
	11 INDUST-PROC - LOW	608	4,816	0.000	0.000
	12 SERVICE - HIGH	309,961	1,849,210	1.083	1.050
	13 SERVICE - LOW	127,087	732,877	0.608	0.590
	14 CONTRACTORS	8,505	39,738	0.031	0.030
	TOTAL*	1,520,218	8,362,976	1.037	1.006

## CONNECTICUT

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

TYPE OF POLICY	CATEGORY	(1) ACCIDENT YEAR ENDING 03/31/18 AGGREGATE LOSS COSTS	(2) 5 - YEAR AGGREGATE LOSS COSTS	(3) 5 - YEAR EXPERIENCE RATIO	(4) RELATIVITY
37 MULTILINE INDUST/PROC	01 BUILDINGS	766,535	4,630,076	0.642	0.623
	03 OFFICES	229	1,610	0.000	0.000
	04 MERCANTILE - HIGH	43	1,211	0.000	0.000
	10 INDUST-PROC - HIGH	73,718	509,024	0.772	0.749
	11 INDUST-PROC - LOW	465,413	3,088,922	0.557	0.540
	12 SERVICE - HIGH	0	445	0.000	0.000
	13 SERVICE - LOW	534	1,164	0.000	0.000
	14 CONTRACTORS	258	1,203	5.620	5.451
	TOTAL*	1,306,730	8,233,655	0.620	0.601
38 MULTILINE CONTRACTORS	01 BUILDINGS	259,315	1,621,825	0.243	0.236
	03 OFFICES	2,152	15,116	0.751	0.728
	04 MERCANTILE - HIGH	5,935	16,164	0.000	0.000
	05 MERCANTILE - MEDIUM	158	158	0.000	0.000
	06 MERCANTILE - LOW	1,337	15,910	0.614	0.596
	08 INSTITUTIONAL - HIG	618	1,518	0.000	0.000
	11 INDUST-PROC - LOW	49	540	0.000	0.000
	12 SERVICE - HIGH	3,990	8,918	0.000	0.000
	13 SERVICE - LOW	247	329	0.000	0.000
	14 CONTRACTORS	300,889	1,947,783	0.532	0.516
	TOTAL*	574,690	3,628,261	0.392	0.380
TOTAL ALL TOPS*	01 BUILDINGS	6,887,172	37,477,707	1.149	1.114
	02 RES. APTS. AND COND	626,413	3,541,552	0.333	0.323
	03 OFFICES	151,754	908,139	0.594	0.576
	04 MERCANTILE - HIGH	323,698	1,900,627	1.773	1.720
	05 MERCANTILE - MEDIUM	353,578	2,201,770	0.827	0.802
	06 MERCANTILE - LOW	122,138	666,596	0.374	0.363
	07 MOTELS AND HOTELS	92,054	438,576	0.974	0.945
	08 INSTITUTIONAL - HIG	431,147	2,585,839	1.046	1.015
	09 INSTITUTIONAL - LOW	548,749	3,987,697	1.078	1.046
	10 INDUST-PROC - HIGH	77,930	530,975	0.751	0.728
	11 INDUST-PROC - LOW	483,194	3,214,618	0.538	0.522
	12 SERVICE - HIGH	339,230	1,993,354	1.021	0.990
	13 SERVICE - LOW	158,053	912,975	1.011	0.981
	14 CONTRACTORS	320,968	2,049,676	0.536	0.520
	TOTAL*	10,916,078	62,410,101	1.031	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.

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TABLE 7 - BASIC GROUP II RELATIVITY ANALYSIS

	(1) ACCIDENT YR ENDING 03/31/18	(2) ACCIDENT YRS 2009-2018 NON-HURR. EXPER. RATIO AT CURRENT PMF A	(3) FORMULA RELATIVITY (2) / 0.648	(4) CREDI- BILITY Z C	(5) Z WEIGHTED RELA- TIVITY D	(6) BALANCED FORMULA RELA- TIVITY E	(7) NORMALIZED FORMULA RELA- TIVITY F	(8) INDICATED CHANGE G
MONOLINE	749,345	0.406	0.627	0.138	0.949	0.949	0.9320	
MULTILINE	7,585,300	0.672	1.037	0.667	1.025	1.025	1.0065	
COVERAGE	8,334,645	0.648	1.000			1.0182 B	0.9998	
MULTILINE TOP								
31 MOTEL/HOTEL	134,379	1.785	2.755	0.032	1.056	1.075	1.0558	+13.3%
32 APARTMENT	762,211	0.473	0.730	0.146	0.961	0.978	0.9605	+3.1%
33 OFFICE	191,112	0.837	1.292	0.049	1.014	1.032	1.0136	+8.8%
34 MERCANTILE	2,087,694	0.755	1.165	0.337	1.056	1.075	1.0558	+13.3%
35 INSTITUTIONAL	1,694,413	0.406	0.627	0.341	0.873	0.889	0.8731	-6.3%
36 SERVICES	1,535,405	1.004	1.549	0.268	1.147	1.168	1.1471	+23.1%
37 INDUST/PROCESS	853,080	0.480	0.741	0.203	0.947	0.964	0.9468	+1.6%
38 CONTRACTORS	327,006	0.376	0.580	0.094	0.961	0.978	0.9605	+3.1%
	7,585,300	0.672 B	1.037		1.007 B	1.025 B	1.0065 B	

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) \* (1.025/1.007)

F - (7) = (6) / 1.0182

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.

The BG II relativity analysis is based on non-hurricane loss experience only, as it is assumed that type of policy relativities are the same for both non-hurricane and hurricane perils. The resulting relativities apply to the total (hurricane plus non-hurricane) BG II loss costs.

COLUMN (1)

AGGREGATE LOSS COSTS

The latest fiscal 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 NON-HURRICANE EXPERIENCE RATIO

These experience ratios are the ratio of the combined ten year CSP adjusted incurred non-hurricane losses (adjusted to current deductible and prospective cost levels 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.

## EXPLANATORY NOTES TO TABLE 7 (Cont'd)

### COLUMN (3)

#### FORMULA RELATIVITY

The formula relativities are the ratios of the ten year non-hurricane experience ratios for the type of policy (either monoline vs. multiline or individual multiline programs) to the average ten year non-hurricane 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. 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 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.

EXPLANATORY NOTES TO TABLE 7 (Cont'd)

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.

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.

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TABLE 8COMMERCIAL I.M. RELATIVITY ANALYSIS

(1)	(2)	(3)	(4)	(5)
TOP	BALANCED	CURRENT	INDICATED	SELECTED
10	RELATIVITY	IPMF	IPMF*	IPMF
	1.000	0.910	0.910	0.910
3X & 7X	1.000			

## CLASSIFICATION

150	0.923
191	1.100
192	0.785
220	0.789
221	0.755
234	1.202
235	1.088
240	0.789
241	0.715
327	0.757
328	0.932
340	0.646
341	0.757
342	0.751
343	0.767
403	0.640
451	0.946
452	0.778
453	0.811
454	0.713
460	0.479
482	0.889
510	0.662
514	0.631
530	0.628
534	0.757

\*COLUMN (4) = COLUMN (3) \* (TOP 3X & 7X COLUMN (2) / TOP 10 COLUMN (2) )

CONNECTICUT

COMMERCIAL INLAND MARINE RELATIVITY ANALYSIS  
TABLE 9 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

<u>TYPE OF POLICY</u>	<u>RATING</u>	(1) 2016 AGGREGATE <u>LOSS COSTS</u>	(2) 2012 - 2016 <u>AGGREGATE LOSS COSTS</u>	(3) FIVE-YEAR <u>EXP RATIO</u>	(4) <u>RELATIVITY</u>
<u>MONOLINE 10</u>	<u>GROUP</u>				
	150	311,633	1,898,096	1.151	1.353
	191	5,446,492	15,816,054	1.032	1.213
	192	862,002	2,760,886	0.627	0.737
	220	5,112	87,903	5.716	6.717
	221	1,491	2,853	1.199	1.409
	234	5,224,155	20,144,072	0.600	0.705
	235	8,439,000	24,407,283	0.761	0.894
	240	928,183	3,685,254	0.656	0.771
	241	15,553	114,739	0.053	0.062
	327	18,917	91,546	0.000	0.000
	328	2,319,887	11,908,665	0.792	0.931
	340	40,688	87,993	0.000	0.000
	341	0	0	0.000	0.000
	342	19,188	65,375	0.555	0.652
	343	589	3,417	343.665	578.925
	403	1,600,852	5,771,545	0.345	0.405
	451	3,309,677	12,953,836	0.855	1.005
	452	34,702	137,467	1.628	1.913
	453	45,575	212,456	3.203	3.764
	454	164,836	745,300	0.734	0.863
	460	790,198	3,687,530	0.415	0.488
	482	839,364	2,841,134	0.986	1.159
	510	3,252	39,977	0.020	0.024
	514	446,469	1,612,361	0.339	0.398
	530	504,434	2,697,004	0.489	0.575
	534	0	0	0.000	0.000
	TOTAL#	31,372,249	111,772,746	0.785	0.922

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COMMERCIAL INLAND MARINE RELATIVITY ANALYSIS  
TABLE 9 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

TYPE OF POLICY	RATING GROUP	(1) 2016 AGGREGATE LOSS COSTS	(2) 2012 - 2016 AGGREGATE LOSS COSTS	(3) FIVE-YEAR EXP RATIO	(4) RELATIVITY
MULTILINE ## 3X & 7X	150	720,095	3,333,227	0.795	0.934
	191	603,595	2,704,067	0.774	0.910
	192	202,803	783,492	0.826	0.971
	220	6,439	28,512	1.526	1.793
	221	5,606	27,010	0.258	0.303
	234	12,669,443	52,530,286	1.162	1.365
	235	478,171	2,380,353	2.879	3.383
	240	11,651	60,061	1.983	2.330
	241	5,028	15,371	0.019	0.022
	327	2,942	18,862	0.000	0.000
	328	396	2,751	168.726	198.268
	340	32,828	132,609	0.016	0.019
	341	0	0	0.000	0.000
	342	6,082	30,546	0.000	0.000
	343	2,369	7,996	0.000	0.000
	403	479,869	2,417,275	0.739	0.868
	451	95,342	438,635	0.360	0.423
	452	38,096	206,651	0.535	0.629
	453	34,375	104,958	0.147	0.173
	454	228,162	984,183	0.274	0.322
	460	3,613,811	15,118,089	0.318	0.374
	482	127,496	760,961	0.693	0.814
	510	23,290	121,842	0.000	0.000
	514	63,169	300,866	0.073	0.086
	530	1,129,574	4,779,992	0.414	0.486
	534	0	0	0.000	0.000
	TOTAL#	20,580,632	87,288,595	0.952	1.119

## REFLECTS CURRENT IPMF OF 0.910.

CONNECTICUT

COMMERCIAL INLAND MARINE RELATIVITY ANALYSIS  
TABLE 9 - SUMMARY OF EXPERIENCE USED IN SIMULTANEOUS REVIEW

<u>TYPE OF POLICY</u>	<u>RATING</u>	(1)	(2)	(3)	(4)
<u>TOTAL ALL TOPS#</u>	<u>GROUP</u>	<u>2016 AGGREGATE LOSS COSTS</u>	<u>2012 - 2016 AGGREGATE LOSS COSTS</u>	<u>FIVE-YEAR EXP RATIO</u>	<u>RELATIVITY</u>
	150	1,031,728	5,231,323	0.903	1.061
	191	6,050,087	18,520,121	1.006	1.182
	192	1,064,805	3,544,378	0.665	0.781
	220	11,551	116,415	3.380	3.972
	221	7,097	29,863	0.456	0.536
	234	17,893,598	72,674,358	0.998	1.173
	235	8,917,171	26,787,636	0.875	1.028
	240	939,834	3,745,315	0.672	0.790
	241	20,581	130,110	0.045	0.053
	327	21,859	110,408	0.000	0.000
	328	2,320,283	11,911,416	0.821	0.965
	340	73,516	220,602	0.007	0.008
	341	0	0	0.000	0.000
	342	25,270	95,921	0.421	0.495
	343	2,958	11,413	267.552	314.397
	403	2,080,721	8,188,820	0.436	0.512
	451	3,405,019	13,392,471	0.841	0.988
	452	72,798	344,118	1.056	1.241
	453	79,950	317,414	1.889	2.220
	454	392,998	1,729,483	0.467	0.549
	460	4,404,009	18,805,619	0.335	0.394
	482	966,860	3,602,095	0.947	1.113
	510	26,542	161,819	0.002	0.002
	514	509,638	1,913,227	0.306	0.360
	530	1,634,008	7,476,996	0.437	0.514
	534	0	0	0.000	0.000
	TOTAL#	51,952,881	199,061,341	0.851	1.000

# TOTAL IN COLUMN (3) IS AN AVERAGE USING COLUMN (1) AS WEIGHTS.

## EXPLANATORY NOTES TO TABLES 8 AND 9

### COMMERCIAL INLAND MARINE RELATIVITY ANALYSIS

#### EXPERIENCE BASE

The Commercial Inland Marine IPMF review presented in the attached exhibits is based on a review of the latest available five years of monoline and multiline experience through accident year 2016 for all companies reporting data to Insurance Services Office under the Inland Marine Module of the Commercial Statistical Plan (CSP) and the Intermediate Level of the Commercial Minimum Statistical Plan (CMSP).

#### ADJUSTMENT OF DATA

Aggregate loss costs for each year in the review period have been adjusted to the levels which would have been earned had the current loss costs applied throughout the experience period. Reported premiums are adjusted to current level on an individual policy basis by applying a factor equal to all loss cost level changes that have been implemented subsequent to the policy being written. These adjusted premiums are then converted to a loss cost at current level. In order to eliminate the impact of company deviations from the manual level and individual risk modifications which were in effect at the time the policy was written, aggregate loss costs are further adjusted based on reported Rate Modification and Rate Departure Factors/Loss Cost Multipliers. Multiline aggregate loss costs are further adjusted to the level of the current Implicit Package Modification Factor (IPMF). Incurred losses are loaded for all loss adjustment expenses by applying a factor of 1.105.

#### RELATIVITY ANALYSIS

For Inland Marine coverage, a multistate IPMF level is determined via a two-way relativity analysis similar to the analysis used in Basic Group I. The experience for all reviewed classes is used to form class group relativities. These relativities for monoline and multiline (all programs combined) are determined through an iterative procedure. The ratio of the multiline relativity to the monoline relativity is multiplied by the current IPMF to yield the indicated IPMF. The indicated IPMF is subject to a minimum value of 0.500 and a maximum value of 1.500. If an indicated IPMF falls outside one of those limits, it is capped at that amount, the premiums for that Type of Policy (i.e., TOP 10 versus TOP 3X) are adjusted to the capped IPMF level, and the entire relativity review is performed again to take this into account.

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

	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE *
TOP					
10	0.984	0.293	0.995	0.995	
31	1.148	0.097	1.013	1.014	+1.9%
32	1.361	0.191	1.061	1.061	+6.6%
33	1.047	0.239	1.011	1.011	+1.6%
34	0.876	0.228	0.970	0.970	-2.5%
35	0.934	0.142	0.990	0.991	-0.4%
36	0.682	0.140	0.948	0.948	-4.7%
CLASS GROUP					
01	0.735	0.108	0.967	0.969	
02	0.623	0.150	0.931	0.933	
03	1.081	0.099	1.008	1.009	
04	0.667	0.023	0.991	0.992	
05	0.926	0.041	0.997	0.998	
06	0.883	0.060	0.993	0.994	
07	1.489	0.138	1.056	1.058	
08	1.127	0.063	1.008	1.009	
09	1.124	0.124	1.015	1.016	
10	1.027	0.145	1.004	1.005	
11	1.008	0.190	1.002	1.003	
12	1.010	0.359	1.004	1.005	
13	2.012	0.070	1.050	1.052	
16	0.298	0.030	0.964	0.966	
TERRITORY					
1	0.545	0.116	0.932	0.930	
3	0.926	0.124	0.990	0.989	
4	1.120	0.207	1.024	1.022	
5	1.204	0.105	1.020	1.018	
6	1.265	0.143	1.034	1.033	
7	1.021	0.398	1.008	1.007	
8	0.873	0.122	0.984	0.982	
9	0.977	0.062	0.999	0.997	

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

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

TOP	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE *
10	0.903	0.214	0.978	0.968	
33	0.744	0.029	0.991	0.981	+1.3%
34	0.755	0.078	0.978	0.968	0.0%
35	0.286	0.012	0.985	0.975	+0.7%
36	0.815	0.112	0.977	0.967	-0.1%
37	0.907	0.080	0.992	0.982	+1.4%
38	1.379	0.239	1.080	1.068	+10.3%
CLASS GROUP					
30	0.740	0.114	0.966	0.965	
31	1.031	0.170	1.005	1.004	
32	1.017	0.216	1.004	1.002	
33	0.978	0.106	0.998	0.996	
34	1.676	0.119	1.063	1.062	
35	0.273	0.023	0.971	0.969	
36	0.621	0.058	0.973	0.972	
37	0.740	0.045	0.987	0.985	
38	0.991	0.091	0.999	0.998	

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



TABLE 12  
CONNECTICUT  
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)
		FISCAL A.Y.E. 03/31/2018 AGGREGATE	FISCAL A.Y.E. 2014 - 2018	FIVE YEAR EXPERIENCE	RELATIV.	NUMBER OF OCCURRENCES	BAL CELL RELATIV.
TYPE OF POLICY	CLASS GROUP	LOSS COSTS AT CURRENT LEVEL	AGG LOSS COST CURRENT LEVEL	RATIO			
10 MONOLINE	01 FOOD&BEV. (RETAIL)	\$240,644	\$1,014,540	0.426		33	
	02 RESTAURANTS	266,837	1,515,914	0.741		48	
	03 STORES	106,343	743,743	2.296		61	
	04 VENDING & RENTAL	5,695	48,467	0.000		0	
	05 FOOD & BEV. DIST.	119,829	539,847	0.225		7	
	06 NON-FOOD&BEV.DIST	102,240	837,618	0.749		23	
	07 CLUBS, AMSMT&SPRTS	853,974	3,352,781	1.953		176	
	08 HEALTH CARE FACIL	75,256	308,806	1.021		19	
	09 HOTELS AND MOTELS	388,033	1,780,489	1.307		110	
	10 SCHLS & CHURCHES	385,086	2,331,865	1.075		87	
	11 APARTMENTS	1,996,949	7,435,423	1.237		249	
	12 BUILDINGS&OFFICES	5,171,540	23,450,125	0.972		686	
	13 MISC. PREMISES	71,625	451,846	2.070		41	
	16 GOVT SUBDIVISIONS	44,889	129,349	0.847		12	
	TOTAL *	\$9,828,940	\$43,940,813	1.119		1,552	
31 MULT MOTEL/HOTEL	09 HOTELS AND MOTELS	\$693,661	\$3,240,786	1.480		170	
	TOTAL *	\$693,661	\$3,240,786	1.480		170	
32 MULT APARTMENT	11 APARTMENTS	\$2,800,096	\$13,139,323	1.387		407	
	12 BUILDINGS&OFFICES	1,668,278	6,010,427	1.875		250	
	TOTAL *	\$4,468,374	\$19,149,750	1.569		657	
33 MULT OFFICE	12 BUILDINGS&OFFICES	\$6,110,984	\$29,007,504	1.198		1,025	
	13 MISC. PREMISES	11,142	50,582	7.635		4	
	TOTAL *	\$6,122,126	\$29,058,086	1.210		1,029	
34 MULT MERCANTILE	01 FOOD&BEV. (RETAIL)	\$839,690	\$5,014,300	0.838		178	
	02 RESTAURANTS	3,387,230	13,685,121	0.634		358	
	03 STORES	657,337	3,078,492	0.870		98	
	04 VENDING & RENTAL	6,975	56,301	0.000		0	
	05 FOOD & BEV. DIST.	138,134	727,161	1.675		24	
	06 NON-FOOD&BEV.DIST	392,819	2,177,238	0.976		43	
	12 BUILDINGS&OFFICES	1,420,703	6,707,261	0.987		237	
	13 MISC. PREMISES	213	1,061	0.000		0	
	TOTAL *	\$6,843,101	\$31,446,935	0.795		938	

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

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TERRITORY	ALL	(1) FISCAL A.Y.E. 03/31/2018 AGGREGATE LOSS COSTS AT CURRENT LEVEL	(2) FISCAL A.Y.E. 2014 - 2018 AGG LOSS COST CURRENT LEVEL	(3) FIVE YEAR EXPERIENCE RATIO	(4) RELATIV.	(5) NUMBER OF OCCURRENCES	(6) BAL CELL RELATIV.
TYPE OF POLICY	CLASS GROUP						
35 MULT INSTITUT.	07 CLUBS, AMSMT&SPRTS	\$55,761	\$148,902	0.650		4	
	08 HEALTH CARE FACIL	381,410	1,806,009	1.272		53	
	10 SCHLS & CHURCHES	1,102,490	6,069,352	1.137		292	
	12 BUILDINGS&OFFICES	60,676	229,305	1.332		12	
	13 MISC. PREMISES	1,438	6,336	0.000		0	
	16 GOVT SUBDIVISIONS	227,986	703,760	0.199		5	
	TOTAL *	\$1,829,761	\$8,963,664	1.039		366	
36 MULT SERVICES	03 STORES	\$83,397	\$466,395	1.060		18	
	04 VENDING & RENTAL	67,684	286,527	0.662		10	
	07 CLUBS, AMSMT&SPRTS	981,361	4,895,044	0.888		166	
	08 HEALTH CARE FACIL	2,344	18,354	0.000		0	
	09 HOTELS AND MOTELS	17,500	76,702	0.144		1	
	10 SCHLS & CHURCHES	15,854	34,786	0.000		0	
	12 BUILDINGS&OFFICES	476,525	2,111,277	1.401		115	
	13 MISC. PREMISES	200,333	961,463	1.367		45	
	TOTAL *	\$1,844,998	\$8,850,548	1.056		355	
TOTAL ALL	TOP						
	01 FOOD&BEV. (RETAIL)	\$1,080,334	\$6,028,840	0.746		211	
	02 RESTAURANTS	3,654,067	15,201,035	0.641		406	
	03 STORES	847,077	4,288,630	1.068		177	
	04 VENDING & RENTAL	80,354	391,295	0.557		10	
	05 FOOD & BEV. DIST.	257,963	1,267,008	1.002		31	
	06 NON-FOOD&BEV.DIST	495,059	3,014,856	0.929		66	
	07 CLUBS, AMSMT&SPRTS	1,891,096	8,396,727	1.362		346	
	08 HEALTH CARE FACIL	459,010	2,133,169	1.224		72	
	09 HOTELS AND MOTELS	1,099,194	5,097,977	1.398		281	
	10 SCHLS & CHURCHES	1,503,430	8,436,003	1.109		379	
	11 APARTMENTS	4,797,045	20,574,746	1.325		656	
	12 BUILDINGS&OFFICES	14,908,706	67,515,899	1.182		2,325	
	13 MISC. PREMISES	284,751	1,471,288	1.781		90	
	16 GOVT SUBDIVISIONS	272,875	833,109	0.306		17	
	TOTAL *	\$31,630,961	\$144,650,582	1.130		5,067	

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

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

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1) FISCAL A.Y.E. 03/31/2018 AGGREGATE LOSS COSTS AT CURRENT LEVEL	(2) FISCAL A.Y.E. 2014 - 2018 AGG LOSS COST CURRENT LEVEL	(3) FIVE YEAR EXPERIENCE RATIO	(4) RELATIV.	(5) NUMBER OF OCCURRENCES	(6) BAL CELL RELATIV.
10 MONOLINE	30 SERVICE	\$585,891	\$2,348,629	0.798	0.704	51	0.934
	31 LIGHT CONTRACTING	591,268	2,954,928	1.082	0.954	137	0.972
	32 MEDIUM CONTRCTING	3,388,352	15,947,943	1.027	0.906	474	0.970
	33 HEAVY CONTRACTING	775,739	4,310,740	0.861	0.759	53	0.965
	34 DEALER OR DISTRIB	121,903	635,151	1.667	1.469	32	1.028
	35 LGT. MANUFACTURER	104,352	243,154	0.059	0.052	1	0.938
	36 MED. MANUFACTURER	177,694	1,231,013	0.444	0.392	9	0.941
	37 HVY. MANUFACTURER	92,226	592,678	1.245	1.097	11	0.954
	38 MISC. OPERATION	298,235	1,441,498	1.473	1.298	57	0.966
	TOTAL *	\$6,135,660	\$29,705,734	0.994		825	
33 MULT OFFICE	31 LIGHT CONTRACTING	\$5,402	\$93,084	0.000	0.000	0	0.985
	32 MEDIUM CONTRCTING	8,977	46,297	0.000	0.000	0	0.983
	33 HEAVY CONTRACTING	64,261	340,525	0.202	0.178	1	0.977
	38 MISC. OPERATION	89,287	469,223	1.423	1.255	15	0.979
	TOTAL *	\$167,927	\$949,129	0.834		16	
34 MULT MERCANTILE	30 SERVICE	\$47,467	\$183,674	0.040	0.035	0	0.934
	32 MEDIUM CONTRCTING	98,454	336,728	2.278	2.008	8	0.970
	34 DEALER OR DISTRIB	606,719	3,052,584	1.158	1.021	93	1.028
	38 MISC. OPERATION	55,994	230,480	1.886	1.663	9	0.966
	TOTAL *	\$808,634	\$3,803,466	1.279		110	
35 MULT INSTITUT.	31 LIGHT CONTRACTING	\$24,394	\$122,861	0.000	0.000	0	0.978
	32 MEDIUM CONTRCTING	205,472	319,489	0.370	0.326	3	0.977
	TOTAL *	\$229,866	\$442,350	0.330		3	
36 MULT SERVICES	30 SERVICE	\$67,037	\$425,000	0.857	0.756	20	0.933
	31 LIGHT CONTRACTING	137,811	1,090,939	0.159	0.140	9	0.971
	32 MEDIUM CONTRCTING	65,248	310,627	0.000	0.000	0	0.969
	33 HEAVY CONTRACTING	44,648	232,368	2.110	1.861	4	0.964
	34 DEALER OR DISTRIB	785,487	3,403,554	1.799	1.586	130	1.027
	36 MED. MANUFACTURER	5,173	23,424	0.984	0.868	2	0.940
	38 MISC. OPERATION	349,177	1,801,018	0.653	0.576	62	0.965
	TOTAL *	\$1,454,581	\$7,286,930	1.251		227	

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

SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1) FISCAL A.Y.E. 03/31/2018 AGGREGATE LOSS COSTS AT CURRENT LEVEL	(2) FISCAL A.Y.E. 2014 - 2018 AGG LOSS COST CURRENT LEVEL	(3) FIVE YEAR EXPERIENCE RATIO	(4) RELATIV.	(5) NUMBER OF OCCURRENCES	(6) BAL CELL RELATIV.
37 MULT INDUST/PROC.	31 LIGHT CONTRACTING	\$703	\$3,446	0.000	0.000	0	0.986
	32 MEDIUM CONTRCTING	74,688	376,054	2.334	2.058	15	0.984
	33 HEAVY CONTRACTING	84,368	413,986	0.389	0.343	5	0.978
	34 DEALER OR DISTRIB	13,633	61,483	0.207	0.182	4	1.043
	35 LGT. MANUFACTURER	260,817	964,521	0.369	0.325	9	0.952
	36 MED. MANUFACTURER	997,408	5,134,101	0.672	0.592	50	0.954
	37 HVY. MANUFACTURER	530,366	2,582,344	0.677	0.597	27	0.967
	38 MISC. OPERATION	47,126	269,380	0.324	0.285	6	0.980
	TOTAL *	\$2,009,109	\$9,805,315	0.672		116	
38 MULT CONTRACTORS	30 SERVICE	\$855,887	\$4,520,718	1.149	1.013	163	1.031
	31 LIGHT CONTRACTING	1,289,218	6,572,499	1.695	1.494	375	1.073
	32 MEDIUM CONTRCTING	1,743,554	9,225,178	1.518	1.338	347	1.071
	33 HEAVY CONTRACTING	690,508	3,788,825	1.742	1.536	143	1.064
	38 MISC. OPERATION	85,002	257,938	0.116	0.103	2	1.066
	TOTAL *	\$4,664,169	\$24,365,158	1.507		1,030	
TOTAL ALL TOP	30 SERVICE	\$1,556,282	\$7,478,021	0.970		234	
	31 LIGHT CONTRACTING	2,048,796	10,837,757	1.389		521	
	32 MEDIUM CONTRCTING	5,584,745	26,562,316	1.182		847	
	33 HEAVY CONTRACTING	1,659,524	9,086,444	1.212		206	
	34 DEALER OR DISTRIB	1,527,742	7,152,772	1.520		259	
	35 LGT. MANUFACTURER	365,169	1,207,675	0.280		10	
	36 MED. MANUFACTURER	1,180,275	6,388,538	0.639		61	
	37 HVY. MANUFACTURER	622,592	3,175,022	0.761		38	
	38 MISC. OPERATION	924,821	4,469,537	1.000		151	
	TOTAL *	\$15,469,946	\$76,358,082	1.134		2,327	

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

TABLE 14  
CONNECTICUT  
PRODUCTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS  
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TOP	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED CHANGE *
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: 1.008  
                                  TOP 36: 1.012  
                                  TOP 37: 0.979

TABLE 15  
MULTISTATE  
PRODUCTS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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

TYPE OF POLICY	CLASS GROUP	(1) CALENDAR A.Y.E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	(2) CALENDAR A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	(3) FIVE YEAR EXPERIENCE RATIO	(4) RELATIV.	(5) NUMBER OF OCCURRENCES	(6) BAL CELL 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  
CONNECTICUT  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

	(1) BAILEY FORMULA RELATIV.	(2) CREDIBILITY Z	(3) Z-WTD RELATIV.	(4) BALANCED RELATIV.	(5) INDICATED 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 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 16C  
MULTISTATE  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS \*

STATE	(1) BAILEY FORMULA	(2) CREDIBILITY	(3) Z-WTD	(4) BALANCED
	RELATIV	Z	RELATIV	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
	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
Connecticut	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  
CONNECTICUT  
LOCAL PRODUCTS/COMPLETED OPERATIONS  
BASIC LIMIT RELATIVE CHANGE ANALYSIS

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SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1) CALENDAR A.Y.E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	(2) CALENDAR A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	(3) FIVE YEAR EXPERIENCE RATIO	(4) RELATIV.	(5) NUMBER OF OCCURRENCES	(6) BAL CELL RELATIV.
10 MONOLINE	01 RET.STRS-FOOD/DRG	\$15,950	\$48,224	2.472	2.280	2	0.897
	02 RET.STRS-NTFD/DRG	8,682	46,652	1.595	1.472	6	0.957
	11 COMP. OPS. (LOW)	38,712	189,427	0.950	0.876	3	0.970
	12 COMP. OPS. (MED)	1,136,001	5,126,557	0.434	0.400	56	0.955
	13 COMP. OPS. (HGH)	72,088	533,723	0.256	0.236	4	0.881
	TOTAL *	\$1,271,433	\$5,944,583	0.473		71	
34 MULT MERCANTILE	01 RET.STRS-FOOD/DRG	\$101,263	\$403,316	1.771	1.634	52	0.898
	02 RET.STRS-NTFD/DRG	55,971	270,617	1.000	0.922	11	0.958
	12 COMP. OPS. (MED)	20,383	80,681	1.870	1.725	3	0.956
	TOTAL *	\$177,617	\$754,614	1.539		66	
36 MULT SERVICES	01 RET.STRS-FOOD/DRG	\$8,597	\$34,746	2.589	2.388	2	0.911
	02 RET.STRS-NTFD/DRG	211,628	855,827	1.009	0.931	34	0.972
	11 COMP. OPS. (LOW)	37,523	188,313	0.954	0.880	9	0.986
	12 COMP. OPS. (MED)	51,020	295,631	0.588	0.542	10	0.970
	13 COMP. OPS. (HGH)	6,972	62,557	0.000	0.000	0	0.895
	TOTAL *	\$315,740	\$1,437,074	0.955		55	
37 MULT INDUST/PROC.	11 COMP. OPS. (LOW)	\$421	\$2,242	0.000	0.000	0	0.990
	12 COMP. OPS. (MED)	42,549	210,791	1.191	1.098	3	0.974
	TOTAL *	\$42,970	\$213,033	1.179		3	
38 MULT CONTRACTORS	11 COMP. OPS. (LOW)	\$59,433	\$268,280	0.312	0.288	4	1.017
	12 COMP. OPS. (MED)	1,359,013	7,038,005	1.367	1.261	170	1.001
	13 COMP. OPS. (HGH)	87,917	450,744	1.315	1.213	5	0.924
	TOTAL *	\$1,506,363	\$7,757,029	1.323		179	
TOTAL ALL TOP	01 RET.STRS-FOOD/DRG	\$125,810	\$486,286	1.916		56	
	02 RET.STRS-NTFD/DRG	276,281	1,173,096	1.026		51	
	11 COMP. OPS. (LOW)	136,089	648,262	0.670		16	
	12 COMP. OPS. (MED)	2,608,966	12,751,665	0.947		242	
	13 COMP. OPS. (HGH)	166,977	1,047,024	0.803		9	
	TOTAL *	\$3,314,123	\$16,106,333	0.971		374	

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

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

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SUMMARY OF EXPERIENCE USED IN RELATIVE CHANGE ANALYSIS

TYPE OF POLICY	CLASS GROUP	(1) CALENDAR A.Y.E. 12/31/2017 AGGREGATE LOSS COSTS AT CURRENT LEVEL	(2) CALENDAR A.Y.E. 2013 - 2017 AGG LOSS COST CURRENT LEVEL	(3) FIVE YEAR EXPERIENCE RATIO	(4) RELATIV.	(5) NUMBER OF OCCURRENCES	(6) BAL CELL 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  $i^{th}$  type of policy;

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

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

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

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

and  $j^{th}$  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  $i^{th}$  type of policy;

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

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

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

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

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

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