

# Property and Casualty Risk-Based Capital Committee—Release of Recent Report

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Chairperson  
Property and Casualty Risk-Based Capital Committee

Highlights of Recently Issued Report to the NAIC on P&C Underwriting Factors and Investment Income Adjustment (IIA) Factors

November 16, 2023

# About the Academy



AMERICAN ACADEMY  
*of* ACTUARIES

- The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues.
- The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

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Topics Covered Today - Key topics in the August 2023 Report except for payment patterns and the Present Value (PV) method, which were discussed in previous presentations.

- Summary of Results
- Interest Rates
- Adjustment for Catastrophe Risk Captured in  $R_{\text{Cat}}$
- Safety Level Calculations
- Minimum Risk Charges and Year-Over-Year Transition Rules
- Calculation of indicated Line 4 and IIA factors from PV indicated risk charges.

# Status of Final Report

- On August 30, 2023, the American Academy of Actuaries published on its website a report to the NAIC P&C RBC Working Group: [Update to P&C RBC Underwriting Factors and Investment Income Adjustment Factors](#)

Please refer to the final report for explanations of the methodology and implications of the analysis which produced the results presented here.

# Indicated Changes in Risk Charges by Line

(1)	Premium Risk			Reserve Risk		
	(2)	(3)	(4)= (3)/(2)-1	(5)	(6)	(7)= (6)/(5)-1
LOB	Risk Charge		Change in Risk Chg	Risk Charge		in Risk Chg
	Current	Indicated		Current	Indicated	
A-HO	0.182	0.188	3.0%	0.138	0.166	20.4%
B-PPA	0.125	0.137	10.1%	0.094	0.129	37.2%
C-CA	0.185	0.201	9.1%	0.162	0.259	59.7%
D-WC	0.138	0.126	-8.8%	0.116	0.082	-28.9%
E-CMP	0.148	0.160	8.7%	0.309	0.325	5.1%
F1-MPL-O	0.534	0.363	-32.0%	0.196	0.094	-51.9%
F2-MPL-C	0.189	0.244	28.8%	0.127	0.050	-60.5%
G-SL	0.166	0.164	-1.1%	0.161	0.238	48.5%
H-OL	0.130	0.135	3.5%	0.304	0.293	-3.9%
I-SP	0.120	0.062	-48.5%	0.204	0.213	4.8%
J-APD	0.044	0.050	13.0%	0.127	0.112	-12.0%
K-Fid/Sur	0.272	0.105	-61.2%	0.289	0.440	52.4%
L-Other	0.142	0.143	1.2%	0.180	0.147	-18.4%
M-Intl	0.556	0.804	44.7%	0.188	0.852	353.6%
N-Re-Prop	0.312	0.162	-48.3%	0.275	0.204	-25.7%
O-Re-Liab	0.295	0.227	-23.2%	0.388	0.266	-31.5%
R-PL	0.307	0.286	-6.9%	0.515	1.013	96.6%
S-FG/MG	0.754	1.534	103.5%	0.092	0.050	-45.8%
T-Wrnty	0.030	0.215	617.5%	0.289	0.302	4.6%
Total/Avg	0.135	0.133	-1.7%	0.195	0.202	3.5%

# Indicated Changes in ACL by Type of Company

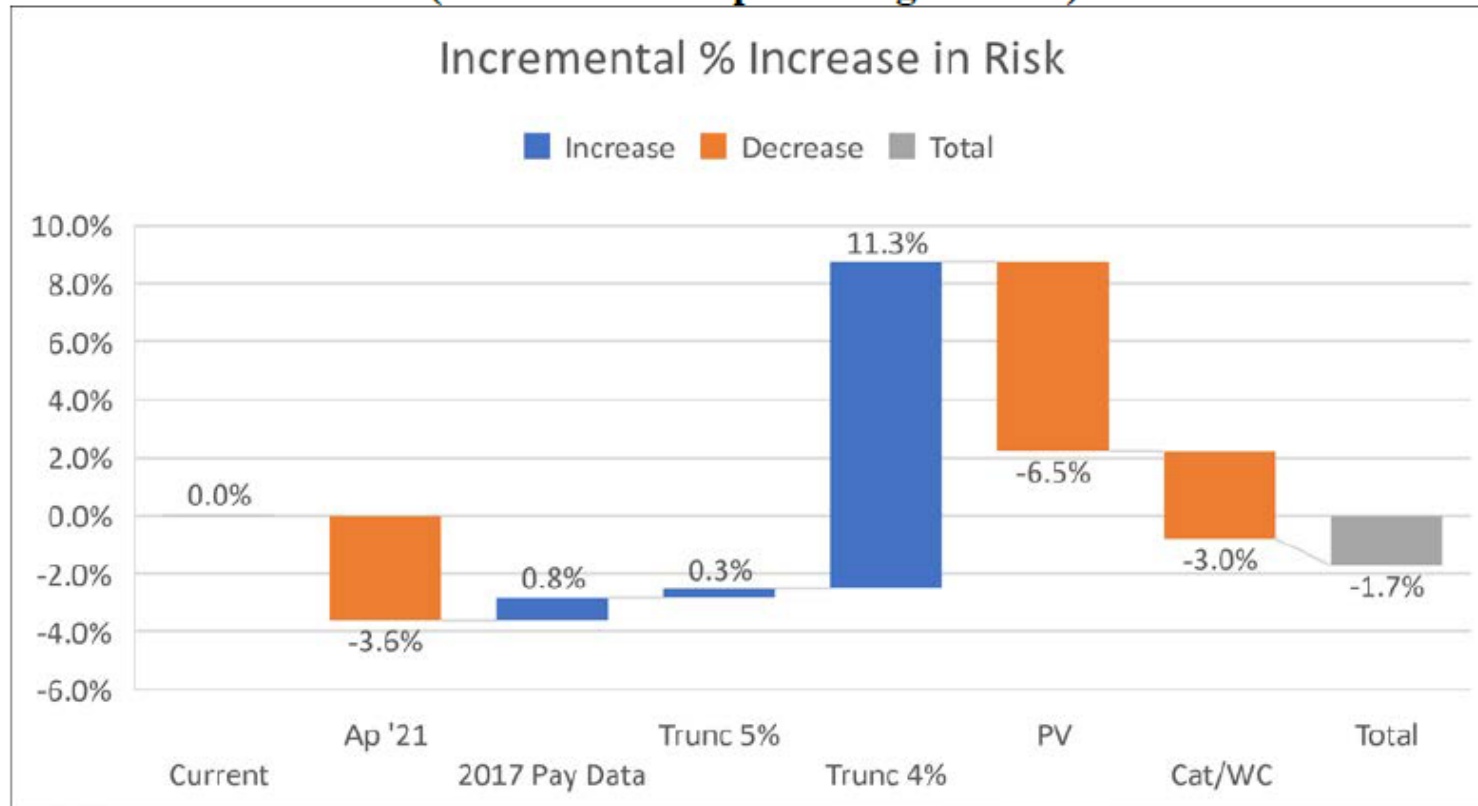
(1)	(2)	(3)	(4)	(5)	(6)
Row	Type of Company	ACL Value with 2019 Risk Charges (\$Billions)	% Change in:		
			Reserve Risk Charge	Premium Risk Charge	ACL
1	Commercial	64.9	4.8%	-4.5%	2.1%
2	Med Prof Liab	2.4	-52.2%	4.8%	-14.3%
3	NOC	0.9	21.3%	-17.6%	1.4%
4	Personal	84.3	12.4%	4.2%	1.6%
5	Reinsurance	8.2	-18.6%	-23.5%	-2.2%
6	Workers Comp	10.1	-9.7%	-2.9%	-4.8%
7	Total	170.6	3.4%	-0.8%	1.0%

# Distribution of Number of Companies by Indicated Change in ACL Values

(1)	(2)	(3)
% Changes in ACL RBC	# companies	% companies
Less Than -50%	9	0%
-50% to -25%	96	5%
-25% to -15%	117	6%
-15% to -5%	194	11%
-5% to 5%	951	52%
5% to 15%	298	16%
15% to 25%	95	5%
25% to 50%	71	4%
Over 50%	6	0%
<b>Total</b>	<b>1,837</b>	<b>100%</b>

# Summary of Movements in Indicated Risk Charges

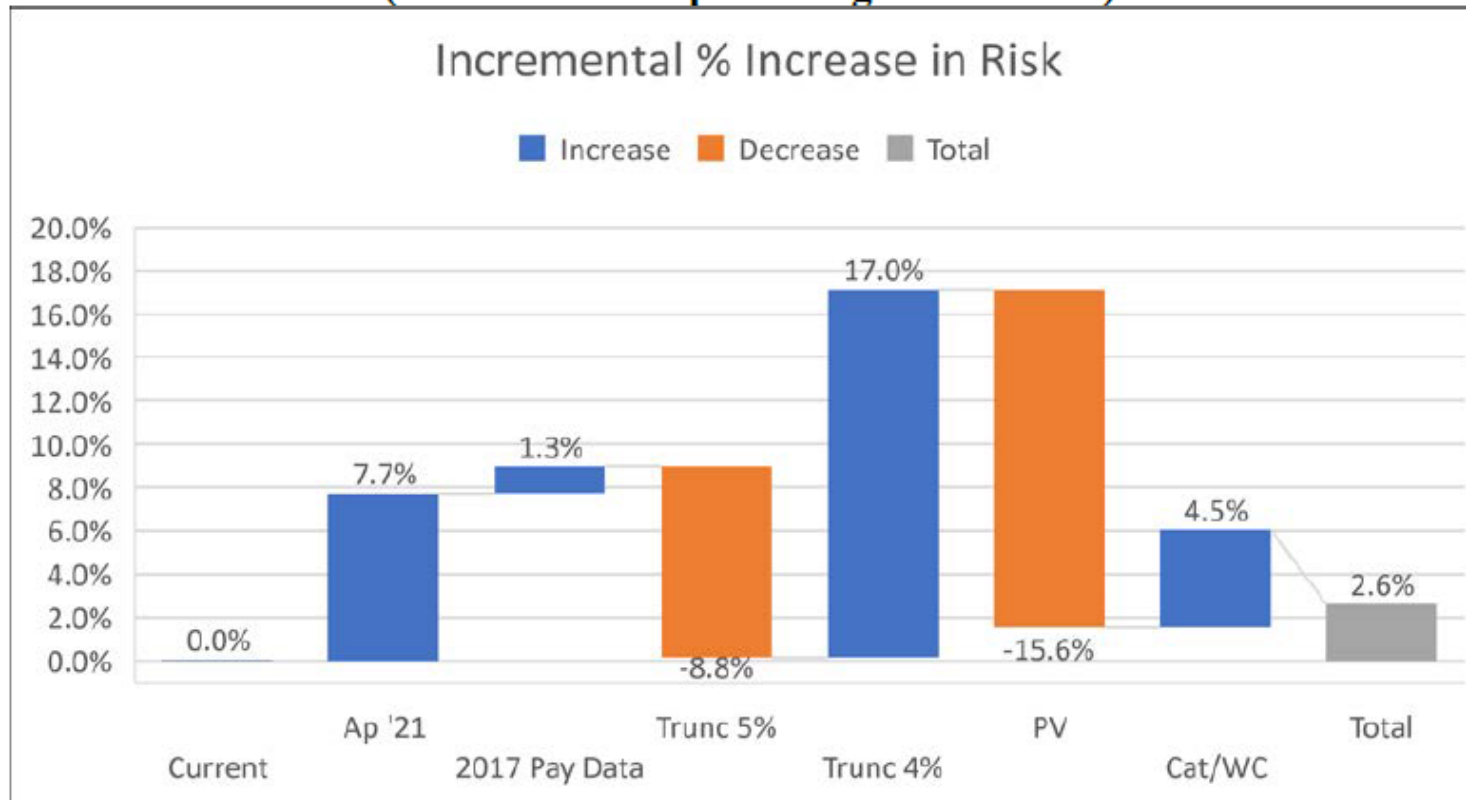
**Table 2.3A**  
**Premium Risk: Movement in Indicated Risk Charge with**  
**Assumption Changes Listed in Table 2.2**  
**(Movement as a percentage of risk)**





# Summary of Movements in Indicated Risk Charges

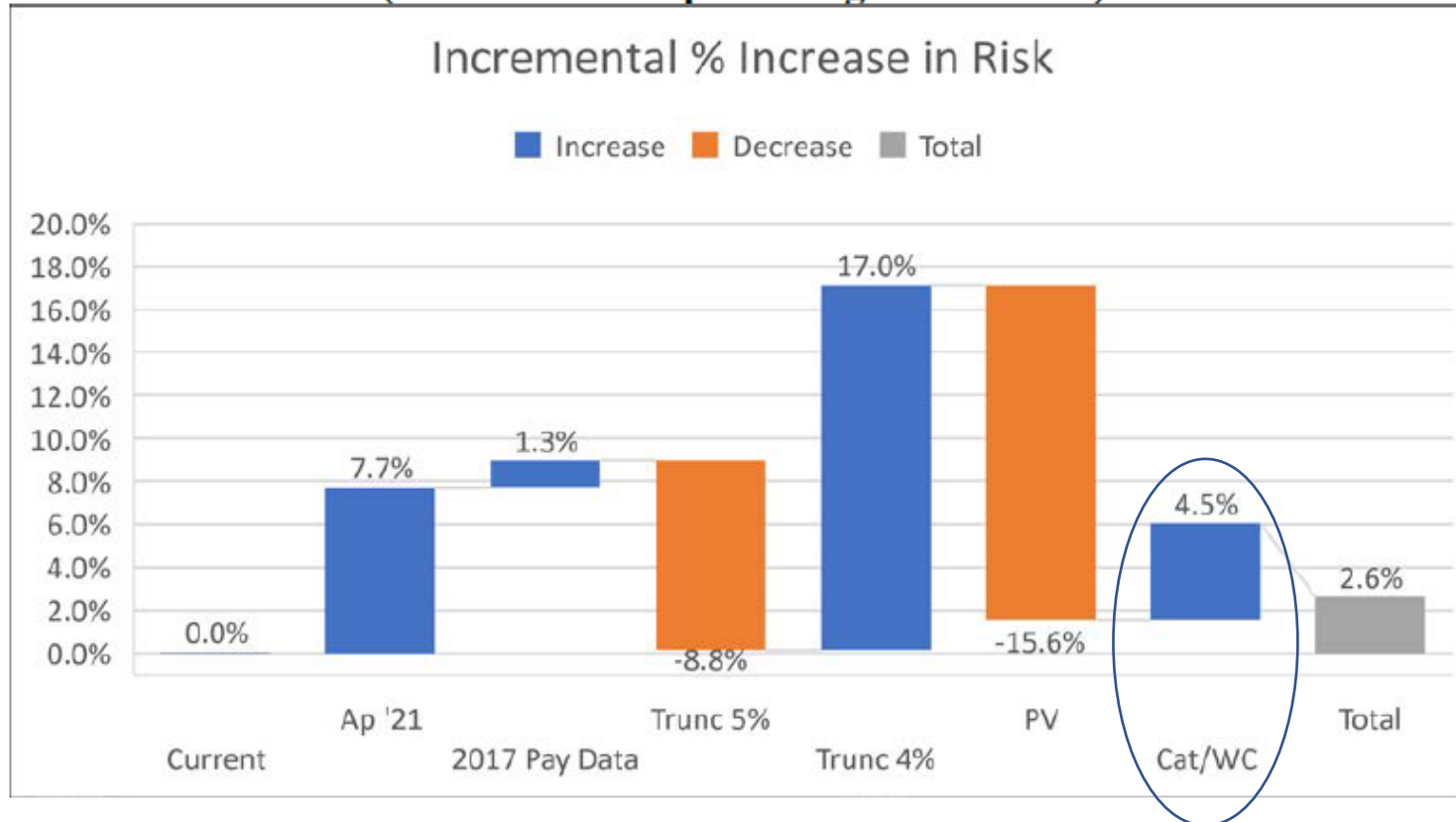
**Table 2.3B**  
**Reserve Risk: Movement in Indicated Risk Charge**  
**with Assumption Changes Listed in Table 2.2**  
**(Movement as a percentage of reserves)**



# Summary of Movements in Indicated Risk Charges

**Table 2.3B**

**Reserve Risk: Movement in Indicated Risk Charge  
with Assumption Changes Listed in Table 2.2  
(Movement as a percentage of reserves)**



Notes on Workers' Compensation Tabular Reserve Adjustment

- Consider extending the scope of PR038, which includes certain medical tabular discount information, to all areas of discount.
- Review the variability of WC tabular discount among companies and the extent to which that affects the comparability of TAC among companies.
- We use this adjustment, but we note that it may not be correct for any company. For companies that do not discount, no adjustment is necessary, and the risk charge should be 4.6%, not 8.2%. For companies that do discount, the effect of the discount is likely to be more than 3.4%, so for them, the adjusted risk charge should be more than 8.2%.

# Summary of Movements in Indicated Risk Charges

**Table 2.4A**  
**Premium: Indicated Risk Charges by LOB**  
**According to Movement in Indicated Risk Charge by Analysis Element Shown in Table 2.2**  
**Listed in Order of Decreasing Total Indicated Change**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LOB	Assumption Set							Tot Chg (8)/(2)- 100%
	Current	Ap '21	2017 Pay Data	Trunc 5%	Trunc 4%	PV	Cat/WC	
T-Wrnty	3.0%	13.9%	20.2%	20.0%	20.6%	21.6%	21.6%	619.0%
S-FG/MG	75.4%	162.9%	169.5%	162.1%	167.7%	153.4%	153.4%	103.5%
M-Intl	55.6%	98.8%	99.1%	100.4%	103.1%	94.3%	80.4%	44.7%
F2-MPL-C	18.9%	20.5%	21.7%	21.9%	25.2%	24.4%	24.4%	29.0%
J-APD	4.4%	4.5%	4.5%	4.8%	5.2%	5.4%	4.9%	10.6%
B-PPA	12.5%	13.0%	13.0%	12.8%	14.2%	13.7%	13.7%	10.3%
C-CA	18.5%	19.5%	19.3%	18.7%	20.9%	20.1%	20.1%	9.1%
E-CMP	14.8%	14.4%	15.0%	15.3%	16.8%	15.9%	16.1%	9.0%
H-OL	13.0%	13.1%	14.0%	13.0%	16.2%	13.5%	13.5%	3.8%
A-HO	18.2%	17.8%	18.0%	18.2%	18.9%	18.6%	18.8%	3.2%
L-Other	14.2%	14.0%	13.8%	14.1%	15.0%	14.3%	14.3%	1.2%
G-SL	16.6%	17.9%	19.3%	19.2%	20.7%	18.9%	16.4%	-1.4%
R-PL	30.7%	31.3%	32.1%	32.2%	37.0%	28.6%	28.6%	-6.8%
D-WC	13.8%	12.6%	11.9%	12.3%	15.2%	12.0%	12.5%	-9.1%
O-Re-Liab	29.5%	24.0%	26.4%	27.9%	32.0%	23.0%	22.7%	-23.0%
F1-MPL-O	53.4%	39.0%	37.3%	39.1%	45.0%	36.3%	36.3%	-32.1%
N-Re-Prop	31.2%	31.3%	30.6%	32.6%	34.6%	33.5%	16.1%	-48.4%
I-SP	12.0%	7.5%	7.2%	7.3%	8.2%	7.9%	6.2%	-48.4%
K-Fid/Sur	27.2%	10.2%	11.2%	10.3%	11.5%	10.6%	10.6%	-61.0%
Total/Avg	13.5%	13.0%	13.1%	13.2%	14.7%	13.7%	13.3%	-1.7%

# Summary of Movements in Indicated Risk Charges

**Table 2.4B**  
**Reserves: Indicated Risk Charges by LOB**  
**According to Movement in Indicated Risk Charge by**  
**Analysis Element Shown in Table 2.2**  
**Listed in Order of Decreasing Total Indicated Change**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LOB	Assumption Set							Tot Chg (8)/(2)- 100%
	Current	Ap '21	2017 Pay Data	Trunc 5%	Trunc 4%	PV	Cat/WC	
M-Intl	18.8%	78.7%	90.6%	81.6%	85.7%	85.1%	85.1%	353.5%
R-PL	51.5%	107.9%	104.7%	105.9%	113.1%	101.3%	101.3%	96.6%
C-CA	16.2%	24.0%	24.4%	24.1%	26.3%	25.9%	25.9%	59.5%
K-Fid/Sur	28.9%	50.4%	52.9%	42.5%	45.6%	44.0%	44.0%	52.5%
G-SL	16.1%	25.9%	27.9%	24.5%	27.5%	23.9%	23.9%	48.8%
B-PPA	9.4%	11.5%	11.2%	11.0%	12.7%	12.9%	12.9%	37.6%
A-HO	13.8%	14.7%	15.3%	15.1%	16.4%	16.6%	16.6%	20.4%
E-CMP	30.9%	31.3%	34.2%	32.7%	35.7%	32.5%	32.5%	5.2%
I-SP	20.4%	23.4%	23.5%	20.6%	21.9%	21.3%	21.3%	4.6%
T-Wrnty	28.9%	23.4%	28.1%	24.9%	26.1%	30.2%	30.2%	4.6%
H-OL	30.4%	30.1%	31.3%	29.8%	33.9%	29.2%	29.2%	-4.0%
J-APD	12.7%	10.5%	10.4%	10.2%	10.8%	11.2%	11.2%	-12.1%
L-Other	18.0%	18.5%	18.0%	13.0%	14.7%	14.7%	14.7%	-18.5%
N-Re-Prop	27.5%	21.0%	21.4%	21.2%	23.5%	20.4%	20.4%	-25.7%
D-WC	11.6%	10.8%	10.5%	6.7%	11.3%	4.6%	8.2%	-29.2%
O-Re-Liab	38.8%	37.1%	37.2%	31.3%	36.9%	26.5%	26.5%	-31.6%
F1-MPL-O	19.6%	9.4%	7.6%	6.9%	10.4%	9.4%	9.4%	-52.1%
F2-MPL-C	12.7%	-3.4%	-3.0%	-3.6%	-1.3%	-0.9%	-0.9%	-106.9%
S-FG/MG	9.2%	-7.3%	-4.2%	-10.0%	-8.2%	-5.0%	-5.0%	-154.9%
<b>Total/Avg</b>	<b>19.5%</b>	<b>21.1%</b>	<b>21.3%</b>	<b>19.4%</b>	<b>22.7%</b>	<b>19.2%</b>	<b>20.1%</b>	<b>2.6%</b>

# Interest Rates

US Treasury average per annum interest rates

A. Date Range	3 Year	5 Year
2018	2.6%	2.7%
2019	1.9%	2.0%
2020	0.4%	0.5%
2021	0.5%	0.9%
2022	3.0%	3.0%
Jan - June 2023	4.0%	3.7%
Jan-Oct 2023	4.3%	4.0%
B. Monthly 2023	3 Year	5 Year
Jan-23	3.9%	3.6%
Feb-23	4.2%	3.9%
Mar-23	4.1%	3.8%
Apr-23	3.8%	3.5%
May-23	3.8%	3.6%
Jun-23	4.3%	3.9%
Jul-23	4.5%	4.1%
Aug-23	4.6%	4.3%
Sep-23	4.7%	4.5%
Oct-23	4.9%	4.8%

- To choose the updated IIA interest rate for this analysis, we might follow what appears to be the method used in the 1990s. As such, we would make a conservative selection considering current interest rates and longer-term trends.
- Looking at 2023 through October 31 a rate of 4% might be appropriate. However, if we had followed the same method at years ended 2018 through 2022, we would have indicated interest rates ranging from 0.5% to 3%.
- An alternative calibration method we use in this Report recognizes that risk factors tend to increase when interest rates increase and vice versa and selects a combined indicated risk charge rather than selecting separate risk factors and IIAs. When we apply the alternative method, our indicated risk charges are largely independent of interest rate forecasts.
- To separate the indicated risk charges into its risk factor and IIA elements, for all lines of business (LOBs), we use a 4% interest rate. The risk charges are not sensitive to the 4% interest rate choice.



# Premium Risk—Catastrophe Adjustments

- Beginning with year-end 2017 reporting, the RBC Formula includes a new risk component,  $R_{CAT}$ , covering hurricane and earthquake components of the total premium risk.
- The Line 4 premium risk factors are based on data that includes hurricane and earthquake claims. Therefore, there is a potential duplication between the Line 4 risk factors and  $R_{CAT}$ . To remove that overlap, for the 2017 RBC Filings, the NAIC reduced the otherwise applicable Line 4 factor by an amount we call the catastrophe adjustment.
- The analysis documented in the August 2023 Report is the first Academy review of the catastrophe adjustment.
- Regulators provided us with summarized and blinded catastrophe and non-catastrophe data from confidential RBC Filings for this purpose.
- We evaluated the portion of risk charges related to catastrophes for the years where we have catastrophe data (AYs 2004-2017). We evaluated the extent to which those years are representative of the 1988-2017 experience period this Report uses to calibrate risk charges.
- We produced indicated catastrophe adjustments (see next slide).

# Premium Risk—Catastrophe Adjustments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LOB	Current Cat Adjustment	Data	Data	(3)-(4)	Selected Cat Adjustment	(3)+exp-100%	(6)/(7)
		87.5th Total LR	87.5th Non Cat LR	Indicated Cat Adjustment		87.5th Total Risk Charge	Cat Adj As % of Risk Charge
A-HO	2.8%	91.5%	88.9%	2.6%	2.6%	20.4%	12.7%
E-CMP	1.8%	83.3%	81.7%	1.6%	1.6%	18.9%	8.6%
G-SL	1.6%	96.0%	91.7%	4.3%	4.3%	29.8%	14.4%
I-SP	1.6%	82.8%	79.4%	3.4%	3.4%	12.9%	26.3%
J-APD	0.0%	84.8%	84.2%	0.6%	0.6%	8.0%	7.5%
M-Intl	0.0%	192.1%	159.3%	32.8%	15.0%	136.0%	11.0%
N-Re-Prop	6.9%	122.1%	96.2%	25.9%	25.9%	48.8%	53.0%
O-Re-Liab	0.0%	100.5%	100.2%	0.4%	0.4%	27.2%	1.3%
R-PL	0.0%	100.8%	100.6%	0.3%	0.0%	33.8%	0.0%

# Premium Risk—Catastrophe Adjustments

- For J-APD, the Lines 1 to 3 calculations of PR018 (which compare the company historical loss ratio to the industry historical loss ratio) use total losses, including catastrophe losses. For other LOBs with catastrophe adjustments, the calculations in Lines 1 to 3 use losses excluding the company catastrophe losses. As the data shows catastrophe losses for J-APD, it might be appropriate to make the J-APD calculations for Lines 1 to 3 of PR018 the same as for the other LOBs with catastrophe exposure.
- A key assumption in our analysis is that the hurricane and earthquake modeling includes reasonable provisions for all losses of the types that are reported in the catastrophe experience. The NAIC should consider the extent to which the modeling is sufficiently comprehensive.
- We observed unexpected differences in indicated undiscounted risk charges between Annual Statement data and RBC data. That may be an issue related to the early-year use of the RBC forms PR101, etc., for reporting historical hurricane and earthquake loss experience. The NAIC should consider whether differences can be investigated.



# Statistical Safety Level in RBC

- Setting the safety level for the P&C RBC formula is a policy decision for regulators.
- The indicated company action level risk charges in the August 2023 Report are based on the 87.5th percentile safety level.
- The August 2023 Report shows the impact of using various safety levels in RBC.
- Preliminary impacts of higher safety levels on indicated risk charges (compared to 87.5 percentile)
  - 90th percentile safety level increases premium risk charges about 25%, reserve risk charges about 40%.
  - 95th percentile safety level increases premium risk charges about 120% and reserve risk charges about 180%.
- Considerations for not changing the safety level:
  - Capital required for a loss development runoff time horizon of nine years is more than that required by some regulatory solvency formulas which utilize a one-year development horizon.
  - Past analysis has shown that larger companies, who cover most policyholders, have lower indicated risk charges than smaller and mid-sized companies, implying a higher safety level for most policyholders.
- Considerations for increasing the safety level
  - 87.5% is lower than the safety level in any other component of the RBC Formula or, to our knowledge, in regulatory capital formulas in other countries (e.g., Rcat=99%, Bond Factors=96%).
  - Risk charges have declined over time, concurrent with interest rates. But there is no reason to expect a continuation of the downward trend in risk.
  - Years prior to 1988, with poor experience, have been excluded from the analysis and deserve some consideration.
  - Captives and runoff companies may now rely on regulatory capital requirements more, making the setting of regulatory capital more important.

# Indicated Risk Charges at Various Safety Levels

Table 9.1A  
Premiums: Indicated Risk Charges at Various Safety Levels

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LOB	Current Risk Charge	PV Indicated risk Charges			(4)/(2)-1	(4)/(3)-1	(5)/(3)-1
		Premium			90 v current	90 v 87.5	95 v 87.5
		87.5th	90th	95th			
A-HO	18.2%	18.8%	21.9%	34.0%	20%	17%	81%
B-PPA	12.5%	13.7%	16.2%	24.6%	30%	18%	79%
C-CA	18.5%	20.1%	24.2%	38.3%	31%	20%	90%
D-WC	13.8%	12.5%	16.1%	27.2%	17%	29%	117%
E-CMP	14.8%	16.1%	19.1%	29.5%	29%	19%	84%
F1-MPL-O	<b>53.4%</b>	36.3%	42.9%	69.3%	-20%	18%	91%
F2-MPL-C	18.9%	24.4%	30.0%	46.4%	58%	23%	90%
G-SL	16.6%	16.4%	22.4%	30.1%	35%	37%	84%
H-OL	13.0%	13.5%	19.1%	39.0%	47%	41%	188%
I-SP	<b>12.0%</b>	6.2%	9.5%	23.3%	-21%	54%	275%
J-APD	4.4%	4.9%	7.3%	15.4%	66%	51%	217%
K-Fid/Sur	<b>27.2%</b>	10.6%	16.0%	35.8%	-41%	51%	238%
L-Other	14.2%	14.3%	18.8%	35.8%	33%	31%	150%
M-Intl	55.6%	80.4%	117.5%	184.4%	111%	46%	129%
N-Re-Prop	<b>31.2%</b>	16.1%	24.0%	57.0%	-23%	49%	254%
O-Re-Liab	<b>29.5%</b>	22.7%	31.0%	54.5%	5%	36%	140%
R-PL	30.7%	28.6%	40.4%	91.8%	31%	41%	221%
S-FG/MG	75.4%	153.4%	177.7%	374.0%	136%	16%	144%
T-Wrnty	3.0%	21.6%	28.9%	37.4%	862%	34%	73%
Avg	13.5%	13.3%	16.7%	28.8%	24%	26%	117%

- We can use Table 9.1 to assess how adequate/inadequate current risk charges are from an implied safety level perspective. In column 2, we mark LOBs where the current risk charges are above the 90th indicated percentile level (yellow and bold) or within 10% of the 90th percentile level (yellow but not bold). These are the LOBs where current risk charges are particularly high relative to an 87.5th percentile safety level.

# Indicated Risk Charges at Various Safety Levels

Table 9.1B  
Reserves: Indicated Risk Charges at Various Safety Levels

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LOB	Current Risk Charge	PV Indicated risk Charges			(4)/(2)-1	(4)/(3)-1	(5)/(3)-1
		Reserve			90 v current	90 v 87.5	95 v 87.5
		87.5th	90th	95th			
A-HO	13.8%	16.6%	22.6%	47.0%	64%	36%	184%
B-PPA	9.4%	12.9%	17.8%	35.7%	89%	37%	176%
C-CA	16.2%	25.9%	32.4%	60.0%	99%	25%	132%
D-WC	11.6%	8.2%	12.8%	28.4%	10%	56%	247%
E-CMP	30.9%	32.5%	39.9%	72.1%	29%	23%	122%
F1-MPL-O	19.6%	9.4%	16.2%	40.4%	-17%	72%	330%
F2-MPL-C	12.7%	-0.9%	4.6%	24.7%	-64%	NM	NM
G-SL	16.1%	23.9%	30.7%	60.3%	91%	29%	152%
H-OL	30.4%	29.2%	39.1%	73.1%	28%	34%	150%
I-SP	20.4%	21.3%	31.6%	66.9%	55%	48%	214%
J-APD	12.7%	11.2%	20.5%	59.3%	61%	84%	430%
K-Fid/Sur	28.9%	44.0%	69.8%	144.1%	142%	58%	227%
L-Other	18.0%	14.7%	22.5%	54.8%	25%	54%	274%
M-Intl	18.8%	85.1%	113.8%	423.1%	506%	34%	397%
N-Re-Prop	27.5%	20.4%	28.9%	59.8%	5%	42%	193%
O-Re-Liab	38.8%	26.5%	39.1%	88.2%	1%	47%	232%
R-PL	51.5%	101.3%	128.0%	231.3%	148%	26%	128%
S-FG/MG	9.2%	-5.0%	-1.5%	36.3%	-116%	NM	NM
T-Wrnty	28.9%	30.2%	46.2%	262.0%	60%	53%	768%
Avg	19.5%	20.1%	27.5%	55.2%	41%	37%	175%

- For F2-MPL-C and S-FG/MG, for reserve risk, comparisons of 90th and 95th percentile safety levels to the 87.5th percentile safety level are not meaningful (NM) because the 87.5th percentile indicated risk charge is negative.
- Negative indicated risk charges arise when the investment income projected by the IIA is larger than the undiscounted risk charge.
- In those cases, the risk charge would be increased to a minimum selected by the NAIC.

# Minimum Risk Charges and Year-Over-Year Capping Approaches

- Imposing transition rules and a minimum risk charge are decisions for regulators. Calculations shown in the August 2023 Report related to transition rules and minimum risk charges are only illustrative.
- We have considered a minimum risk charge of 5%, consistent with the current lowest risk charge.
- We looked at various capping approaches to limit changes in risk charge over one year to +/- 10%, 20%, or 35%, values which the committee has reviewed in the past.
- These risk charge limits are calculated line by line assuming a company with LOB expense ratio equal to the industry expense ratios and assuming no company loss experience adjustment.
- The next three slides illustrate transition rules and minimum risk charges, while showing the calculation of indicated Line 4 and IIA factors from PV indicated risk charges.

# Calculation of Line 4 and IIA Factors – Part A

Table 10.1

Sample Calculation of Line 4 and Line 7/8 Factors

Row	Step	LOB			
		Premium Risk		Reserve Risk	
		A-HO	F2-MPL-C	A-HO	F2-MPL-C
<b>A. Indicated Line 4 and IIA Factors</b>					
1	Indicated Risk Charge-PV Approach; Gross of Cat; Including risk development horizon and WC tabular adjustments (Appendix 5 Exhibit A5-1A, 1B, col 7).	21.3%	24.4%	16.6%	-0.9%
2	Expense Ratio (Table 1.1A, column 2)	28.9%	25.5%	NA	NA
3	IAs- 40-year runoff payment pattern; 4% interest; (Exhibit A2-5A and 5B; Also Table 1.1)	0.966	0.863	0.951	0.896
4	Indicated Line 4 Factor Gross of Cat Prem: (4) = (1.0+(1)-(2))/(3) Reserve: (4)=(1.0+(1))/(3)-1.0	0.956	1.146	22.6%	10.6%
5	Indicated Catastrophe Adjustment (Table 7.1, column 6)	2.6%	NA	NA	NA
6	Indicated Line 4 Factor Net of Cat (6)=(4)-(5)	0.930	1.146	0.226	0.106

- The calibration method (PV method) used in the 2023 Report recognizes that risk factors tend to increase when interest rates increase and vice versa and selects a combined indicated risk charge rather than selecting separate risk factors and IIAs. The purpose of Table 10.1 is to show the calculation of indicated Line 4 and IIA factors from PV indicated risk charges. This is necessary so that Line 4 and IIA factors will be available for the RBC formula template.
- Row 3: IAs based on the 40-year runoff payment pattern by LOB and a 4% interest rate. We use the 40-year runoff payment pattern rather than the 40-year truncated payment pattern. We use the 40-year truncated payment pattern to put the RDHA into the overall risk charge (see page 47 of Report). However, the runoff payment pattern better presents the actual investment income potential. Using the runoff payment pattern for IAs makes the risk factors higher than they would be with the truncated payment pattern. That is correct because the RDHA is an increase in the risk factor.
- The indicated risk charges in row 1 do not include any transition limitations. In the past, the NAIC limited the maximum change in any LOB risk factor in any year to a set amount. We believe that is a good practice. The maximum change per year is a policy matter for the NAIC. The August 2023 Report does not show the effect of limits, other than the 10% example in Table 10.1, Part C.
- Row 6 is the value to be used in the RBC Formula, absent the application of minimums and transition rules.



# Calculation of Line 4 and IIA Factors – Part B

**Table 10.1**  
**Sample Calculation of Line 4 and Line 7/8 Factors**

Row	Step	LOB			
		Premium Risk		Reserve Risk	
		A-HO	F2-MPL-C	A-HO	F2-MPL-C
<b>A. Indicated Line 4 and IIA Factors</b>					
1	Indicated Risk Charge-PV Approach; Gross of Cat; Including risk development horizon and WC tabular adjustments (Appendix 5 Exhibit A5-1A, 1B, col 7).	21.3%	24.4%	16.6%	-0.9%
2	Expense Ratio (Table 1.1A, column 2)	28.9%	25.5%	NA	NA
3	IIAs- 40-year runoff payment pattern; 4% interest; (Exhibit A2-5A and 5B; Also Table 1.1)	0.966	0.863	0.951	0.896
4	Indicated Line 4 Factor Gross of Cat Prem: (4) = $(1.0+(1)-(2))/(3)$ Reserve: (4)= $(1.0+(1))/(3)-1.0$	0.956	1.146	22.6%	10.6%
5	Indicated Catastrophe Adjustment (Table 7.1, column 6)	2.6%	NA	NA	NA
6	Indicated Line 4 Factor Net of Cat (6)=(4)-(5)	0.930	1.146	0.226	0.106
<b>B. Illustration of Minimum Risk Charges</b>					
7	Indicated Risk Charge Net of Cat Prem: (6)*(3)+(2)-1.0 Reserve: $(1.0+(6))*(3)-1.0$	18.8%	24.4%	16.6%	-0.9%
8	Max of 5.0% and row (7)	18.8%	24.4%	16.6%	5.0%
9	Indicated Line 4 Factor Net of Cat, after minimum Prem: (9) = $(1.0+(8)-(2))/(3)$ Reserve: (9)= $(1.0+(8))/(3)-1.0$	0.930	1.146	22.6%	17.2%

- Rows 7-9 illustrate how we calculate the Line 4 factor when applying a 5% minimum risk charge. This is only illustrative - imposing a minimum risk charge is a decision for regulators.
- Row 7: Risk charge net of catastrophes. We calculate this by applying the risk charge formula to row 6, the indicated Line 4 risk factor net of the indicated catastrophe adjustment.
- Row 8: Indicated risk charge equals the maximum of the indicated risk charge from row 7, or the selected minimum, 5% in this example. The minimum applies to the risk charge after catastrophe adjustment.
- Row 9: Converts the risk charge in row 8 to the Line 4 risk factor. For any LOB with a risk charge already 5.0% or greater, row 9 = row 6.

# Calculation of Line 4 and IIA Factors – Part C

Row	Step	LOB			
		Premium Risk		Reserve Risk	
		A-HO	F2-MPL-C	A-HO	F2-MPL-C
<b>B. Illustration of Minimum Risk Charges</b>					
7	Indicated Risk Charge Net of Cat Prem: $(6) \cdot (3) + (2) - 1.0$ Reserve: $(1.0 + (6)) \cdot (3) - 1.0$	18.8%	24.4%	16.6%	-0.9%
8	Max of 5.0% and row (7)	18.8%	24.4%	16.6%	5.0%
9	Indicated Line 4 Factor Net of Cat, after minimum Prem: $(9) = (1.0 + (8) - (2)) / (3)$ Reserve: $(9) = (1.0 + (8)) / (3) - 1.0$	0.930	1.146	22.6%	17.2%
<b>C. Illustration of application of transition rules with maximum changes</b>					
10	2022 Risk Factor, net of cats (Table 1.1 column 2)	0.936	1.130	0.213	0.276
11	2022 IIA (Table 1.1)	0.954	0.827	0.938	0.883
12	2022 Risk Charge (Net of Cats) Prem: $(10) \cdot (11) + (2) - 1.0$ Reserve: $(1.0 + (10)) \cdot (11) - 1.0$	18.2%	18.9%	13.8%	12.7%
13	Indicated change in risk charge (net of cats) $(12) / (7) - 100\%$	3.2%	29.0%	20.4%	-106.9%
14	Line 13 subject to Maximum increase 10.0% Maximum decrease -10.0%	3.2%	10.0%	10.0%	-10.0%
15	Indicated risk charge after transition limitations; subject to 5% minimum $\text{Max}((1.0 + (14)) \cdot (12), 5\%)$	18.8%	20.8%	15.2%	11.4%
16	Indicated Line 4 Factor Net of Cat After Transition Caps and Minimum Prem: $(1.0 + (15) - (2)) / (3)$ Reserve: $(1.0 + (15)) / (3) - 1.0$	0.930	1.105	0.211	0.243

- Rows 10-16 illustrate how we calculate the Line 4 factor when applying a maximum increase/decrease of 10% in risk charge. This is only illustrative - imposing transition rules is a decision for regulators.
- Rows 10, 11: Show the current (2022) RBC Formula Line 4 and IIA factors, respectively.
- Row 12: We calculate the risk charge implied by the 2022 Line 4 and IIA factors.
- Row 13: The change in risk charge from the 2022 risk charge to the indicated risk charge =  $(\text{row 7}) / (\text{row 12}) - 1.0$ .
- Row 14 = Row 13 but limited to reflect the selected transition maximum increase and decrease (+/-10% in this illustration).
- Row 15: Indicated risk charge after transition caps and minimum risk charge.
- Row 16: Line 4 factor after transition caps and minimum risk charge.

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