



# NATIONAL MEETING SPRING 2022

Date: 3/3/22

*Virtual Meeting*

*(in lieu of meeting at the 2022 Spring National Meeting)*

## **CATASTROPHE RISK (E) SUBGROUP**

Tuesday, March 22, 2022

11:00 a.m. – 12:00 p.m. ET / 10:00 – 11:00 a.m. CT / 9:00 – 10:00 a.m. MT / 8:00 – 9:00 a.m. PT

### **ROLL CALL**

Wanchin Chou, Co-Chair	Connecticut	Anna Krylova	New Mexico
Halina Smosna, Co-Chair	New York	Tom Botsko	Ohio
Robert Ridenour, Vice Chair	Florida	Andrew Schallhorn	Oklahoma
Laura Clements	California	Will Davis	South Carolina
Judy Mottar	Illinois	Miriam Fisk	Texas
Gordon Hay	Nebraska		

NAIC Support Staff: Eva Yeung

### **AGENDA**

1. Consider Adoption of its Feb. 22, 2022; Jan. 25, 2022; and Dec. 16, 2021, Minutes —*Wanchin Chou (CT)* Attachment A
2. Discuss its Working Agenda—*Halina Smosna (NY)* Attachment B
3. Discuss the Insured Loss Threshold for Wildfire Peril—*Halina Smosna (NY)*
4. Consider Exposure of Proposal 2021-17-CR (MOD) (Wildfire Information-Only Reporting Exemption)—*Scott Williamson (Reinsurance Association of America—RAA)* Attachment C
5. Discuss the Independent Model Review Instruction in the Rcat Component —*Wanchin Chou (CT)* Attachment D
6. Discuss the Issue of Double Counting in the R5 Component—*Halina Smosna (NY)*
7. Discuss Any Other Matters Brought Before the Subgroup—*Wanchin Chou (CT)* Attachment E
8. Adjournment

SharePoint/NAIC Support Staff Hub/Member Meetings/Spring 2022 National Meeting/Task Forces/CapAdequacy/Cat Risk SG/CatRiskSG.docx

Draft: 3/4/22

Catastrophe Risk (E) Subgroup  
Virtual Meeting  
February 22, 2022

The Catastrophe Risk (E) Subgroup of the Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Feb. 22, 2022. The following Subgroup members participated: Wanchin Chou, Co-Chair, and Qing He (CT); Halina Smosna, Co-Chair, Gloria Huberman, and HauMichael Ying (NY); Robert Ridenour, Vice Chair, and Jane Nelson (FL); Laura Clements, Lynne Wehmueller, and Giovanni Muzzarelli (CA); Judy Mottar (IL); Anna Krylova (NM); Tom Botsko (OH); Andrew Schallhorn (OK); and Miriam Fisk and Rebecca Armon (TX). Also participating was: Julie Lederer (MO).

1. Consider Adoption of Proposal 2021-17-CR (Adding Wildfire Peril for Informational Purposes Only)

Mr. Chou said the Subgroup identified wildfire as one of the major drivers of U.S. insured losses during the previous meeting. He also stated that a referral letter from the Climate and Resiliency (EX) Task Force was received on March 15, 2021, to recommend that the Subgroup consider: 1) expanding the current catastrophe framework to include other perils such as wildfire, flood, and/or convective storms that may experience a greater tail risk under projected climate-related trends; and 2) implementing two perils in the risk-based capital (RBC) framework by year-end 2022 if possible. He said a response was sent by the Subgroup on April 26, 2021, indicating that the catastrophe models are complicated; the Subgroup will need time to review and gain a better understanding so the costs and benefits for using the models are justified. He also said a proposal to include wildfire peril in the Rcat component for informational purposes only was developed and exposed for a 60-day public comment period ending Feb. 13. He stated that the Subgroup received three comment letters during the exposure period; some minor editorial changes in the proposal were made based on the received comment letters to clarify that this proposal is for informational purposes only and no timeline has been set for the RBC implementation until the needed enhancements and statistical impacts are implemented. In addition, the exemption interrogatory clearly indicated that the exemption rules to address the minimal wildfire exposure are consistent with the earthquake and hurricane perils.

Matthew Wulf (Swiss Re) recommended that the Subgroup consider extending the informational purposes only period to allow companies the time to responsibly incorporate either a vendor or internal model fully into pricing, risk selection, and capital management processes. Matthew Vece (American Property Casualty Insurance Association—APCIA) also supported an extended, multi-year period for informational-only filings until all the concerns are addressed before incorporated into RBC for solvency purposes, as wildfire models are still in the new stage of development, and the models are more prone to yielding inconsistent results, especially in the tail of the distribution. Jonathan Rodgers (National Association of Mutual Insurance Companies—NAMIC) and Scott Williamson (Reinsurance Association of America—RAA) said they submitted a comment letter on Feb. 13. Mr. Rodgers suggested that the filing only be required for companies that currently employ the approved models. He also stated that the comment letter clearly indicates that both NAMIC and the RAA do not think wildfire models are ready to be relied upon for solvency purposes; exploring other opportunities to address this peril during the for informational purposes only period is worth consideration. Mr. Botsko recommended that the Subgroup move the proposal forward, as the Subgroup agreed to take time to evaluate the impact and allow more time for the modelers to enhance their modeling approach with this new peril. Mr. Williamson asked the Subgroup to consider adopting the proposal with a carve out for companies that do not currently employ the model. Ms. Smosna asked for clarity around the term “employ” and whether Mr. Williamson means “license” models or “use” models, because many companies use models through their broker relationships and do not actually license the models. Mr. Williamson stated that he intended the term “employ” to refer to companies that license the models. Ms.

Smosna expressed concern that that might leave out too large a universe of companies from the informational-only process. Mr. Chou said the Subgroup will continue working with the RAA to resolve the exemption issues in the near future. He also encouraged all the interested parties to keep reviewing the comments and continue discussing the outstanding issues in the upcoming meetings.

Having no further comments, Mr. Botsko made a motion, seconded by Mr. Ridenour, to adopt proposal 2021-17-CR (Attachment XX). The motion passed unanimously.

## 2. Discussed the Independent Model Review Instructions in Rcat

Mr. Chou said during the previous discussion, the Subgroup identified three different kinds of catastrophe models that deviate from the vendor models: 1) internal catastrophe models; 2) vendor catastrophe models with adjustments or different weight; and 3) derivative models based on the vendor models. He stated that the Subgroup will focus on discussing the vendor catastrophe models with adjustments or different weight first. He said he believes the PR002 Attestation and PR027 Catastrophe Risk pages will require further modification to better accommodate this type of model. Ms. Lederer said the Missouri Department of Commerce and Insurance (DCI) has used the RBC instructions to review an internal catastrophe model. She said she would like to offer some comments to the Rcat instructions in the upcoming meeting. Mr. Chou also asked the industry to review the instructions and provide comments at the Spring National Meeting.

## 3. Discussed the Issue of Double Counting in the R5 Component

Ms. Smosna said the wildfire peril will follow the same process as the other perils to adjust the R5 component based on the PR100s data collection. She said any received comments regarding this item will be discussed in the upcoming meeting.

## 4. Heard a Presentation Regarding the Private Flood Market

Nancy Watkins (Milliman) provided a presentation on: 1) flood market background; 2) the need for flood catastrophe models; 3) flood and catastrophe model regulation; and 4) flood model evaluation (Attachment Six-xx). Mr. Chou said currently, the Subgroup just started the discussion on: 1) the materiality of the flood peril; and 2) the RBC financial solvency regulations. He stated that Ms. Watkins will be invited back for another presentation if the Subgroup decides to further study this peril.

Lastly, Mr. Chou said the Subgroup will continue discussing all the outstanding issues at the Spring National Meeting.

Having no further business, the Catastrophe Risk (E) Subgroup adjourned.

SharePoint/NAIC Support Staff Hub/Member Meetings/Spring 2022 National Meeting/Task Forces/CapAdequacy/Cat Risk SG/02-22propertycatsg.docx

Draft: 2/2/22

Catastrophe Risk (E) Subgroup  
Virtual Meeting  
January 25, 2022

The Catastrophe Risk (E) Subgroup of the Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Jan. 25, 2022. The following Subgroup members participated: Wanchin Chou, Chair, and Qing He (CT); Robert Ridenour, Vice Chair, and Jane Nelson (FL); Laura Clements and Giovanni Muzzarelli (CA); Judy Mottar (IL); Gordon Hay (NE); Anna Krylova and Leatrice Geckler (NM); Halina Smosna and Gloria Huberman (NY); Tom Botsko and Dale Bruggeman (OH); Andrew Schallhorn (OK); Will Davis (SC); and Miriam Fisk, Rebecca Armon, and Monica Avila (TX).

1. Discussed the Possibility of Adding Flood Peril in the Rcat Component

Mr. Chou said the Subgroup received a referral letter from the Climate and Resiliency (EX) Task Force in March 2021, which recommended that the Subgroup consider expanding the current catastrophe framework to include other perils such as wildfire, flood, and/or convection storms that may experience a greater risk under projected climate-related trends. He also said a response from the Subgroup stated that it was focusing on developing the risk charge for the wildfire perils at that time due to limited resources. He said last year, the Subgroup completed: 1) reviewing three different wildfire vendor models; and 2) adopting the Karen Clark & Company (KCC) earthquake and hurricane models. As the wildfire instructions and risk-based capital (RBC) structure is currently exposed for comments, he believes now is a good time to start reviewing the next peril; i.e., flood. He stated that the flood model review ad hoc group will be established next month to start the review process. He said he anticipates that the process will be similar to the wildfire model review process, which will include six different phases: 1) introduction to flood models; 2) in-depth technical reviews; 3) impact studies (model comparison); 4) developing RBC risk charge; 5) exposing the flood peril RBC structure and instructions for information purposes only; and 6) modifying the structure and instructions based on the comments and feedback. He urged all the interested parties to contact NAIC staff if they are interested in joining the ad hoc group. Scott Williamson (Reinsurance Association of America—RAA) encouraged the Subgroup to consider the materiality issue with respect to whether the flood peril is warranted, given the exposure of the industry. He also asked NAIC staff to perform a materiality analysis to determine if it makes sense to proceed further. Mr. Botsko recommended that the Subgroup consider conducting a company survey to determine if the exposure of not only the flood but also the convective storms are significant enough to study further. Ralph Blanchard (Travelers) said he is concerned that adding flood peril may have issues on removing the double counting in the R5 component, as flood can be caused by multiple perils. Nancy Watkins (Milliman) recommended that the Subgroup consider reviewing the Alabama Department of Insurance (DOI) Private Flood Insurance Survey as a good starting point.

2. Discussed the Independent Model Review Instructions in Rcat

Mr. Chou said last year, the Subgroup discussed three different kinds of catastrophe models that deviate from the vendor models: 1) internal catastrophe models; 2) vendor catastrophe models with adjustments or different weight; and 3) derivative models based on the vendor models. He stated that the industry provided some valuable information during the discussion, such as recommending that Subgroup: 1) consider developing a basic approval process if the Subgroup decides to rely on models in order to ensure the use of models are consistent and comparable across companies; and 2) review the RBC instructions, as it clearly indicated that a company should use the same data, modeling, and assumptions that the insurer uses in its own internal catastrophe risk management process. He said he believes adding this charge of reviewing the PR002 and PR027 instructions and blanks to the ad hoc group is worth considering, as both items are related to the model review process. He also

stated that this is just a continued improvement of the RBC instructions and blanks; this is a high priority for the Subgroup, and it will be reflected in the Subgroup's working agenda soon. Matthew T. Wulf (Swiss Re) said Swiss Re and its domiciliary state will continue working with the Subgroup on this item in the future. Mr. Blanchard said Travelers will continue supporting the idea of treating adjustments to the vendor models differently from the totally separate models.

### 3. Discussed the Issue of Double Counting in the R5 Component

Mr. Chou said the current RBC formula PR100 through PR122 require insurers to provide actual catastrophe losses incurred separately by Annual Statement Line of Business for each of the last 10 accident years. The purpose of requiring the reporting of actual catastrophe losses is to avoid double counting catastrophe losses in the formula. Mr. Chou stated that the catastrophe risk element of the RBC formula is based on the results of catastrophe models run by the insurer. The existing R5 industry factors are derived from industry total loss data, which includes actual catastrophe losses, so it is necessary to study these actual catastrophe losses to avoid the double counting that would otherwise take place. Mr. Chou asked the industry to review the current methodology and provide comments in the next meeting.

### 4. Discussed Other Matters

Mr. Chou said proposal 2021-17-CR (Adding Wildfire Peril for Informational Purposes Only) was exposed for a 60-day public comment period ending Feb. 13. He encouraged all the interested parties to review the materials and submit comments for discussion in the upcoming meeting.

Lastly, Mr. Chou said he is pleased to announce the appointment of Ms. Smosna as co-chair of the Subgroup. He said he will work closely with Ms. Smosna to ensure the Subgroup completes all its charges successfully in the future.

Mr. Chou said the Subgroup will continue discussing all the outstanding issues in the meeting next month.

Having no further business, the Catastrophe Risk (E) Subgroup adjourned.

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Draft: 1/24/21

Catastrophe Risk (E) Subgroup  
Virtual Meeting  
December 16, 2021

The Catastrophe Risk (E) Subgroup of the Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Dec. 16, 2021. The following Subgroup members participated: Wanchin Chou, Chair, and Amy Waldhauer (CT); Laura Clements and Giovanni Muzzarelli (CA); Judy Mottar (IL); Gordon Hay (NE); Halina Smosna (NY); Tom Botsko and Dale Bruggeman (OH); Andrew Schallhorn (OK); Will Davis (SC); and Miriam Fisk and Monica Avila (TX).

1. Adopted Proposal 2021-15-CR (Adding KCC Models)

Mr. Chou said the Florida Commission on Hurricane Loss Projection Methodology (FCHLPM) reviewed and verified the Karen Clark & Company (KCC) hurricane model on June 19, 2019, and June 4, 2021. The Subgroup believed the KCC models seem to qualify under the same standards as the other modeling firms have for earthquakes and hurricanes. Mr. Chou said a proposal was created to include the KCC earthquake and hurricane models as one of the NAIC approved third-party commercial vendor models to calculate the catastrophe risk charge, which was exposed for a 30-day public comment period. He also stated that the Subgroup received one comment letter during the exposure period. Glen Daraskevich (KCC) said the KCC supports the proposed update to the list of NAIC-approved catastrophe models and appreciates the Subgroup's goal of keeping the list current with market usage.

Mr. Botsko made a motion, seconded by Ms. Mottar, to adopt proposal 2021-15-CR (Attachment XX). The motion passed unanimously.

2. Heard an Update from its Catastrophe Model Technical Review Ad Hoc Group

Mr. Chou said the ad hoc group met Dec. 6 to discuss the survey questions created by the members within the group, which was based on *Actuarial Standard of Practice (ASOP) No. 38—Catastrophe Modeling (for All Practice Areas)*. He said the survey results indicated that the ad hoc group gained a better understanding on different aspects of different models during a series of question and answer sections.

Ms. Smosna stated that the ad hoc group reviewed the technical documentation provided by three vendors: Risk Management Solutions (RMS), AIR, and KCC. Also, the ad hoc group posed questions to each noted vendor and had several follow up discussions with them separately. Ms. Smosna said the ad hoc group also acknowledged that although these are the best tools available to assess wildfire risk, limitations exist. A notable limitation across all three vendors includes the data vintage. In addition, Ms. Smosna indicated that the ad hoc group noted that although the key vendors are subject matter experts (SMEs), this does not negate the fact that wildfire models are in their infancy. Moreover, she said the ad hoc group comfortably stated that the vendors are experts and have dedicated huge resources to wildfire modeling; but going further and being able to state that the level of capital required for wildfire exposure is adequate based upon the modeling is a conclusion that cannot be validated by the ad hoc group. She concluded that at this point, the ad hoc group members only have a basic understanding of each vendor model and are reasonably familiar with the major model components and how those components interrelate.

Mr. Chou said the issue of the wildfire-prone areas was also discussed during the meeting. He stated that identifying the potential wildfire-prone areas will provide better determination of exemption from the wildfire charge. In addition, he provided a brief overview on the wildfire structure to the ad hoc group. He said the

structure will be included in the 2022 risk-based capital (RBC) formula just for informational purposes only. He also stated that the structure will not go live until all the outstanding issues are resolved. Lastly, he said the ad hoc group will not meet until the Subgroup starts reviewing the next peril.

### 3. Exposed Proposal 2021-17-CR (Adding Wildfire Peril for Informational Purposes Only)

Mr. Chou said while the Subgroup reviewed the possibility of expanding the current catastrophe framework to include other perils that may experience a greater tail risk under projected climate-related trends, the wildfire has been identified as one of the major drivers of the U.S. insured losses. He suggested that setting up a proposal to include wildfire peril in the Rcat component for informational purposes only to address this risk is necessary. He also indicated that the wildfire peril will not be included in the RBC calculation until all the outstanding issues are resolved. Lastly, he urged all the interested parties to review the proposal and provide comments during the exposure period.

Mr. Botsko expressed the Subgroup's appreciation to the ad hoc group for its efforts in reviewing the wildfire models. Ralph Blanchard (Travelers) proposed to include Florida in the wildfire-prone areas. Steve Broadie (American Property Casualty Insurance Association—APCIA), Scott Williamson (Reinsurance Association of America—RAA), and Matthew Wulf (Swiss Re) requested to extend the 30-day exposure to 60 days due to the holiday season and the need for more time to review.

The Subgroup agreed to expose proposal 2021-17-CR for a 60-day public comment period ending Feb. 13.

Mr. Chou said the Subgroup will continue discussing all the outstanding issues in the meeting next month.

Having no further business, the Catastrophe Risk (E) Subgroup adjourned.

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2022 #	Owner	2022 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
<b>Carry-Over Items Currently being Addressed – P&amp;C RBC</b>							
1	Cat Risk SG	1		Continue development of RBC formula revisions to include a risk charge based on catastrophe model output:			
			Year-end 2022 or later	a) Evaluate other catastrophe risks for possible inclusion in the charge - determine whether to recommend developing charges for any additional perils, and which peril or perils those should be.	Referral from the Climate and Resiliency Task Force. March 2021	4/26/21 - The SG exposed the referral for a 30-day period. 6/1/21 - The SG forwarded the response to the Climate and Resiliency Task Force. 2/22/22 - The SG adopted proposal 2021-17-CR (adding the wildfire peril for informational purposes only). The SG continues reviewing other perils for possible inclusion in the Rcat.	4/26/2021
2	Cat Risk SG	1	Year-end 2022 or later	Evaluate the possibility of allowing additional third party models or adjustments to the vendor models to calculate the cat model losses		7/15/21 - The SG is continue evaluating this item. 10/27/21 - The SG exposed the proposal 2021-15-CR (adding KCC model ). 12/16/21 - The SG adopted the proposal 2021-15-CR.	12/6/2019
3	Cat Risk SG	1	2021 Spring Meeting	Modify instructions to PR027 Interrogatories that clarify how insurers with no gross exposure to earthquake or hurricane should complete the interrogatories		<del>10/27/20 – expose the proposal for 30-day comment period 3/8/21 – The SG adopted the proposal 2020-08-CR at the Spring National Meeting. 3/15/21 – The WG adopted this proposal. 3/23/21 – The CADTF adopted this proposal.</del>	10/19/2020
3	Cat Risk SG	1	2022 Spring Meeting or later	Implement Wildfire Peril in the Rcat component (For Informational Purpose Only)		7/15/21 - The SG is continue studying this item. 2/22/22 - The SG adopted the proposal 2021-17-CR.	3/8/2021
<b>New Items – P&amp;C RBC</b>							
4	Cat Risk SG	1	Jun-22	Evaluate the possibility of modifying exemption criteria for different cat perils in the PR027 Interrogatories.			3/23/2022
5	Cat Risk SG	2	2023 Spring Meeting or later	Evaluate the possibility of enhancing the Independent Model Instructions.			3/23/2022



## Capital Adequacy (E) Task Force

### RBC Proposal Form

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Capital Adequacy (E) Task Force  | <input type="checkbox"/> Health RBC (E) Working Group     | <input type="checkbox"/> Life RBC (E) Working Group    |
| <input type="checkbox"/> Catastrophe Risk (E) Subgroup    | <input type="checkbox"/> Investment RBC (E) Working Group | <input type="checkbox"/> Longevity Risk (A/E) Subgroup |
| <input type="checkbox"/> C3 Phase II/ AG43 (E/A) Subgroup | <input type="checkbox"/> P/C RBC (E) Working Group        |  |

<b>DATE:</b> <u>3/22/22</u>	<b><u>FOR NAIC USE ONLY</u></b>
<b>CONTACT PERSON:</b> <u>Eva Yeung</u>	Agenda Item # <u>2021-17-CR</u>
<b>TELEPHONE:</b> <u>816-783-8407</u>	Year <u>2022</u>
<b>EMAIL ADDRESS:</b> <u>eyeung@naic.org</u>	<b><u>DISPOSITION</u></b>
<b>ON BEHALF OF:</b> <u>NAMIC and RAA</u>	<input type="checkbox"/> ADOPTED _____
<b>NAME:</b> <u>Jonathan Rodgers and Scott Williamson</u>	<input type="checkbox"/> REJECTED _____
<b>TITLE:</b> _____	<input type="checkbox"/> DEFERRED TO _____
<b>AFFILIATION:</b> _____	<input type="checkbox"/> REFERRED TO OTHER NAIC GROUP _____
<b>ADDRESS:</b> _____	<input type="checkbox"/> EXPOSED _____
	<input checked="" type="checkbox"/> OTHER (SPECIFY) MOD <u>2021-17-CR</u>

#### IDENTIFICATION OF SOURCE AND FORM(S)/INSTRUCTIONS TO BE CHANGED

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Health RBC Blanks       | <input checked="" type="checkbox"/> Property/Casualty RBC Blanks | <input type="checkbox"/> Life and Fraternal RBC Instructions |
| <input type="checkbox"/> Health RBC Instructions | <input type="checkbox"/> Property/Casualty RBC Instructions      | <input type="checkbox"/> Life and Fraternal RBC Blanks       |
| <input type="checkbox"/> OTHER _____             |  |  |

#### DESCRIPTION OF CHANGE(S)

- 1) PR027INT: Add C (10) to the PR027INT Interrogatory allowing an exemption for companies that meet the specific requirements.
- 2) PR027C: Modify PR027C to include disclosure of estimated wildfire risk exposure on a gross and net of reinsurance basis in-lieu of modeled results for companies exempted under C (10).

#### REASON OR JUSTIFICATION FOR CHANGE \*\*

For those smaller companies, where the modeling requirements would impose a cost and compliance burden that represent an outsized cost relative to the incremental benefit of providing the modeled data for information-only purposes. The exemption option is only intended to apply to the information-only reporting for wildfire, while the Subgroup continues to evaluate materiality and model maturity.

When wildfire is added to RBC as a capital requirement, this exemption option would no longer be available, and all companies would be required to provide modeled exposure data unless they qualify under the existing exemptions listed in PR027 Interrogatory items C (7), (8), or (9).

**Additional Staff Comments:**

The original proposal was adopted by the Subgroup on 2/22/2022.

This proposal would modify the originally adopted proposal to add a small company in-lieu-of-modeling reporting option.

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**\*\* This section must be completed on all forms.**

**Revised 2-2019**

**CALCULATION OF CATASTROPHE RISK CHARGE FOR WILDFIRE PR027C FOR INFORMATIONAL PURPOSES ONLY**

Wildfire	Reference	Modeled Losses			
		(1) Direct and Assumed	(2) Net	3† Ceded Amounts Recoverable	(4)†† Ceded Amounts Recoverable with zero Credit Risk Charge
(1) Worst Year in 50	Company Records				
(2) Worst Year in 100	Company Records				
(3) Worst Year in 250	Company Records				
(4) Worst Year in 500	Company Records				
				(5) Y/N	
(5)	Has the company reported above, its modeled wildfire losses using an occurrence exceedance probability (OEP) basis?				
		(6) Amount	(7) Factor	(7) RBC Requirement (C(6) * Factor)	
(6)	Net Wildfire Risk	L(2) C(2)	0 1.000	0	
(7)	Contingent Credit Risk for Wildfire Risk	L(2) C(3) - C(4)	0 0.018	0	
(8)	Total Wildfire Catastrophe Risk (AEP Basis)	If L(5) C(5) = "N", L(8) C(6) = L(6) C(7)+ L(7) C(7), otherwise "0"	0 1.000	0	
(9)	Total Wildfire Catastrophe Risk (OEP Basis)	If L(5) C(5) = "Y", L(9) C(6) = L(6) C(7)+ L(7) C(7), otherwise "0"	0 1.000	0	
(10)	Total Wildfire Catastrophe Risk	L(8) C(7) + L(9) C(7)		0	
<b>Disclosure in-lieu-of model-based reporting:</b>		(8) Direct and Assumed	(9) Net		
(11)	For a company qualifying for the exemption under PR027INT C (10), complete 11a through 11c below:				
	a. Provide the company's gross and net wildfire 1-in-100-year equivalent exposure on a best estimate basis in-lieu-of model-based reporting.				
	b. Provide details on how the company estimated its wildfire risk.				
	c. Provide a narrative disclosure about how the company manages it's wildfire risk.				

Lines (1)-(4): Modeled losses to be entered on these lines are to be calculated using one of the following NAIC approved third party commercial vendor catastrophe models - AIR, RMS, or KCC; or a catastrophe model that is internally developed by the insurer and has received permission of use by the lead or domestic state. The insurance company's own insured property exposure information should be used as inputs to the model(s). The insurance company may elect to use the modeled results from any one of the models, or any combination of the results of two or more of the models. Each insurer will not be required to utilize any prescribed set of modeling assumptions, but will be expected to use the same data, modeling, and assumptions that the insurer uses in its own internal catastrophe risk management process. An attestation to this effect and an explanation of the company's key assumptions and model selection may be required, and the company's catastrophe data, assumptions, model and results may be subject to examination.

† Column (3) is modeled catastrophe losses that would be ceded under reinsurance contracts. This should be associated with the Net Modeled Losses shown in Column (2).  
 †† Column (4) is modeled catastrophe losses that would be ceded to the categories of reinsurers that are not subject to the RBC credit risk charge (i.e., U.S. affiliates and mandatory pools, whether authorized, unauthorized, or certified).

Denotes items that must be manually entered on the filing software.

INTERROGATORY TO SUPPORT EXEMPTION FROM COMPLETING PR027 (To be completed by companies reporting no RBC charge in either Lines 1 through 3 ) PR027INT

Place an "X" in the appropriate cell for the criteria under which the company is claiming an exemption

A Earthquake Exemption (To be completed by companies reporting no RBC charge in PR027 Line 1) -

- (1) The company has not entered into a reinsurance agreement covering earthquake exposure with a non-affiliate or a non-US affiliate and, either
  - (1a) the company participates in an inter-company pooling arrangement with 0% participation, leaving no net exposure for earthquake risks; Or
  - (1b) the company cedes 100% of its earthquake exposures to its US affiliate(s), leaving no net exposure for earthquake risks
- (2) The Company's Ratio of Insured Value - Property to surplus as regards policyholders is less than 50%
- (3) The company has written Insured Value - Property that includes earthquake coverage in the Earthquake-Prone areas representing less than 10% of its surplus as regards policyholders


For any company qualifying for the exemption under 3 provide details about how the "geographic areas in the New Madrid Seismic Zone" were determined.

(3a) What resource was used to define the New Madrid Seismic Zone?

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(3b) Was exposure determined based on zip codes or counties in the zone, was it based on all of the earthquake exposure in the identified states or was another methodology used? Describe any other methodology used.


Note: "Earthquake-Prone areas" include any of the following states or commonwealths: Alaska, Hawaii, Washington, Oregon, California, Idaho, Nevada, Utah, Arizona, Montana, Wyoming, Colorado, New Mexico, Puerto Rico, and geographic areas in the following states that are in the New Madrid Seismic Zone - Missouri, Arkansas, Mississippi, Tennessee, Illinois and Kentucky.

B Hurricane Exemption (To be completed by companies reporting no RBC charge in PR027 Line 2) -

- (4) The company has not entered into a reinsurance agreement covering hurricane exposure with a non-affiliate or a non-US affiliate and, either
  - (4a) the company participates in an inter-company pooling arrangement with 0% participation, leaving no net exposure for hurricane risks; Or
  - (4b) the company cedes 100% of its hurricane exposures to its US affiliate(s), leaving no net exposure for hurricane risks
- (5) The Company's Ratio of Insured Value - Property to surplus as regards policyholders is less than 50%
- (6) The company has written Insured Value - Property that includes hurricane coverage in the Hurricane-Prone areas representing less than 10% of its surplus as regards policyholders


Note: "Hurricane-Prone areas" include Hawaii, District of Columbia and states and commonwealths bordering on the Atlantic Ocean, and/or Gulf of Mexico including Puerto Rico.

C Wildfire Exemption (To be completed by companies reporting no RBC charge in PR027 Line 3) -

- (7) The company has not entered into a reinsurance agreement covering wildfire exposure with a non-affiliate or a non-US affiliate and, either
  - (7a) the company participates in an inter-company pooling arrangement with 0% participation, leaving no net exposure for wildfire risks; Or
  - (7b) the company cedes 100% of its wildfire exposures to its US affiliate(s), leaving no net exposure for wildfire risks
- (8) The Company's Ratio of Insured Value - Property to surplus as regards policyholders is less than 50%
- (9) The company has written Insured Value - Property that includes wildfire coverage in the wildfire-Prone areas representing less than 10% of its surplus as regards policyholders
- (10) The company writes less than \$50 million in direct and assumed premium (gross premium written) in the following Annual Statement lines – Fire, Allied Lines, Earthquake, Farmowners, Homeowners, and Commercial Multi-Peril in wildfire-prone areas; and the company does not currently utilize NAIC approved third party commercial vendor wildfire catastrophe models.


Note: "Wildfire-Prone areas" include any of the following states: California, Idaho, Montana, Oregon, Nevada, Wyoming, Colorado, New Mexico, Washington, Arizona, and Utah.

Denotes items that must be manually entered on the filing software.  
\* Item C is for informational purposes only.

Hi Wanchin and Eva,

We note that agenda item 2 of Tuesday's call is on the RCAT independent model review instructions. Since the Missouri Department of Commerce and Insurance (DCI) has used these instructions to review an internal catastrophe model, we would like to offer the subgroup our comments.

### **Background on the DCI's review**

On April 7, 2017, the Catastrophe Risk Subgroup granted permission for Swiss Re to use its internal model for year-end 2017 RCAT reporting. For subsequent year-ends, this permission came from the Missouri DCI.

In order to grant Swiss Re initial permission for year-end 2018 reporting, the DCI performed an in-depth review of the company's model, centered around the seven requirements in the RCAT instructions. We relied on written information from the company, phone calls with the company, and in-person meetings with the company and the group-wide supervisor. Our review was informative and valuable. It was also extremely time-consuming for the DCI (and, I assume, for the company as well). Performing a thorough review based on the requirements in the RCAT instructions could be difficult for small insurance departments with limited technical staff.

As mentioned above, the DCI performed an in-depth review in 2018. For subsequent year-ends, our review has been much more high-level and has focused on any follow-up items from the previous year. While the RCAT instructions indicate that ongoing review should happen through the exam process, this may be too infrequent in some cases, especially since the company could be asked to re-file prior RBC reports if the regulator identifies a concern. Companies large enough to use their own model are probably only examined every five years. The DCI would prefer to perform an annual review and remain updated on any changes to the model. This seems particularly important as more perils are added to the RCAT charge.

### **Our comments on the seven items in the RCAT instructions**

Taken as a whole, the seven requested items in the RCAT instructions seem reasonable. Gathering information on these items allowed for a thorough review and made the DCI comfortable granting permission for Swiss Re to use its model.

We offer the following comments on several of the items:

1. Regarding item 3:
  - a. We do not know what it means to validate a peril or for perils to include both U.S. and global exposures. We raised these concerns in 2017 before the instructions were finalized. In order to attempt to comply with this item, we interpreted it as we saw reasonable. Namely, we checked that:
    - i. If the insurer has exposure to the perils covered by the RBC catastrophe risk charge (earthquake and hurricane), those perils are contemplated in the RBC charge, and
    - ii. The insurer is including both U.S. and non-U.S. exposures in the RBC charge.
  - b. Whether or not our interpretation is correct, we recommend rewording this item to make the subgroup's intention clear.
  
2. Regarding item 6:
  - a. It appears that complying with this item is challenging for several reasons:

- i. If an insurer has been relying on its internal model for many years, it may not maintain a license for a vendor model.
    - ii. If an insurer aggregates losses, instead of exposures, across accounts, it may not be able to produce a portfolio of exposures for input into a vendor model.
    - iii. It can be difficult, if not impossible, to identify drivers of differences between an internal model and a vendor model. First, the models are extremely complex, relying on numerous modules and impacted by various assumptions within those modules. Second, vendor model licenses often prohibit “back engineering” of the model’s parameterizations, so the company may not have full insight into the model’s assumptions.
  - b. Given these difficulties, would it be possible to add alternative methods of comparison to the RCAT instructions? We have found it helpful to review a comparison of internal model estimates to actual results for historical events.
3. Regarding item 7: We experienced difficulty in receiving written documentation from the group-wide supervisor.

Thank you for allowing us to share our experiences with the RCAT instructions.

Sincerely,

Julie

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## CALCULATION OF CATASTROPHE RISK CHARGE RCAT PR027A, PR027B, PR027C, PR027, AND PR027INT

The catastrophe risk charge for earthquake (PR027A), hurricane (PR027B), and wildfire for Informational purposes only (PR027C) risks is calculated by multiplying the RBC factors by the corresponding modeled losses and reinsurance recoverables. The risk applies on a net basis with a corresponding contingent credit risk charge for certain categories of reinsurers. Data must be provided for the worst year in 50, 100, 250, and 500; however, only the worst year in 100 will be used in the calculation of the catastrophe risk charge. While projected losses modeled on an Aggregate Exceedance Probability basis is preferred, companies are permitted to report on an Occurrence Exceedance Probability basis if that is consistent with the company's internal risk management process.

The projected losses can be modeled using the following NAIC approved third party commercial vendor catastrophe models: AIR, [CorelogicCorelogic for Earthquake and Hurricane only](#), RMS, KCC, the ARA HurLoss Model ([hurricane only](#)), or the Florida Public Model for hurricane, as well as catastrophe models that are internally developed by the insurer or that are the result of adjustments made by the insurer to vendor models to represent the own view of catastrophe risk (hereinafter "own models").

However, an insurer seeking to use an own model must first obtain written permission to do so by the domestic or lead state insurance regulator. In the situation where the model output is used to determine the catastrophe risk capital requirement for a single entity, the regulator granting permission to use the own model is the domestic state. In the situation where the model output is used to determine the catastrophe risk capital requirement for a group, the grantor is the lead state regulator. In the situation where the insurer seeking permission is a non-U.S. insurer, the grantor shall be the lead state regulator. Under all scenarios, the regulator that is granting permission should inform other domestic states that have a catastrophe risk exposure and share the results of the review.

To obtain permission to use the own model, the insurer must provide the domestic or lead state insurance regulator with written evidence of each of the following:

1. The use of the own model is reasonable considering the nature, scale, and complexity of the insurer's catastrophe risk;
2. The own model is used for catastrophe risk management, capital assessment, and the capital allocation process and the model has been used for at least the last 3 years;
3. The perils included in the RBC Catastrophe Risk Charge have been validated by the insurer and that these perils include both US and global exposures, where applicable;
4. The own model has been developed using reasonable data and assumptions and that model results used in determining the RBC Catastrophe Risk Charge reflect exposure data that is no older than six months;
5. The insurer has individuals with experience in developing, testing and validating internal models or engages third parties with such experience. The insurer must provide supporting model documentation and a copy of the latest validation report and the insurer is solely responsible for the relevant cost. For each peril included in the RBC Catastrophe Risk Charge, the validation report should attest that the projected losses are a reasonable quantification of the exposure of the reporting entity. The validation report must provide a description of the scope, content, results and limitations of the validation, the individual qualifications of validation team and the date of the validation. Both the model documentation and the model validation report must be provided at a minimum once every five years, or whenever the lead or domestic state calls an examination; whenever there is a material change in the model; or whenever there is a material change in the insurer's exposure to catastrophe exposure.
6. The results of the own model should be compared with the results produced by at least one of the following models: AIR, [CorelogicCorelogic for Earthquake and Hurricane only](#), RMS, KCC, ARA HurLoss ([hurricane only](#)), or the Florida Public Model [for hurricane](#). The insurer must provide the comparison and an explanation of the drivers of differences between the results produced by the internal model vs. results produced by the selected prescribed model.
7. If the own model has been approved or accepted by the non-U.S. group-wide supervisor for use in the determination of regulatory capital, the insurer must submit evidence, if available, from the non-US group-wide supervisor of the most recent approval/acceptance including the description of scope, content, results and limitations of the approval/acceptance process and dates of any planned future approval/acceptance, if known. The name and the contact information of a contact person at the non-US group-wide supervisor should also be provided for questions on the approval/acceptance process.

If the lead or domestic state determines that permission to use the own model cannot be granted, the insurer shall be required to determine the RBC Catastrophe Risk Charge through the use of one of the third-party commercial vendor models (AIR, [CorelogicCorelogic for Earthquake and Hurricane only](#), RMS, KCC, ARA HurLoss (hurricane only)), or the Florida Public Model for hurricane, as advised by the lead state or domestic state.

If the lead or domestic state determines that permission to use the own model can be granted to determine the RBC Catastrophe Risk Charge, the model will be subject to additional review through the ongoing examination process. If, as a result of the examination, the lead or domestic state determines that permission to use the own model should be revoked, the insurer may be required to resubmit the risk-based capital filing and any past filings so impacted where own model was used, as directed by the lead state or domestic state.

If the insurer obtains permission to use the own model, it cannot revert back to using third party commercial vendor models to determine the RBC Catastrophe Risk Charge in subsequent reporting periods, unless this is agreed with the lead or domestic state that granted permission.

The contingent credit risk charge should be calculated in a manner consistent with the way the company internally evaluates and manages its modeled net catastrophe risk.

Note that no tax effect offsets or reinstatement premiums should be included in the modeled losses. Further note that the catastrophe risk charge is for earthquake and hurricane risks only.

As per the footnote on this page, modeled losses to be entered PR027A, PR027B and PR027C in Lines (1) through (4) are to be calculated using one of the third party commercial vendor models – AIR, ~~Corelogic~~ [Corelogic for Earthquake and Hurricane only](#), RMS, KCC, ARA HurLoss (hurricane only); or the Florida Public Model (hurricane only) or the insurer’s own catastrophe model; and using the insurance company’s own insured property exposure information as inputs to the model. The insurance company may elect to use the modeled results from any one of the models, or any combination of results of two or more of the models. Each insurer will not be required to utilize any prescribed set of modeling assumptions but will be expected to use the same exposure data, modeling, and assumptions that the insurer uses in its own internal catastrophe risk management process. Any exceptions must be explained in the required *Attestation Re: Catastrophe Modeling Used in RBC Catastrophe Risk Charges* within this RBC Report.

The Interrogatory on page (PR027INT) supports an exemption from filing the catastrophe risk charge.

Any company qualifying for exemption from the earthquake risk charge must identify the particular criteria from among (1a), (1b), (2) and (3) that provides its qualification for exemption and may leave the other three items from this group of four possible qualifications for exemption blank; except identification of criteria (3) as the basis for the exemption requires a further answer to (3a) and (3b). If an insurer does not write or assume earthquake risks leaving no gross exposure, enter an “X” in PR027INT interrogatory 3, with no need to fill in (3a) and (3b). If the company qualifies for exemption from the earthquake risk charge, page PR027A and line (1) on PR027 may be left blank.

Any company qualifying for exemption from the hurricane risk charge must identify the particular criteria from among (4a), (4b), (5) and (6) that provides its qualification for exemption and may leave the other three items from this second group of four possible qualifications for exemption blank. If an insurer does not write or assume hurricane risks leaving no gross exposure, enter an “X” in PR027INT interrogatory 6. If the company qualifies for exemption from the hurricane risk charge, page PR027B and line (2) on PR027 may be left blank.

Any company qualifying for exemption from the wildfire risk charge must identify the particular criteria from among (7a), (7b), (8) and (9) that provides its qualification for exemption and may leave the other three items from this third group of four possible qualifications for exemption blank. If an insurer does not write or assume hurricane risks leaving no gross exposure, enter an “X” in PR027INT interrogatory 9. If the company qualifies for exemption from the wildfire risk charge, page PR027C and line (3) on PR027 may be left blank.

In general, the following conditions will qualify a company for exemption: if it uses an intercompany pooling arrangement or quota share arrangement with U.S. affiliates covering 100% of its earthquake, hurricane and wildfire risks such that there is no exposure for these risks; if it has a ratio of Insured Value – Property to surplus as regards policyholders of less than 50%; or if it writes Insured Value – Property that includes hurricane earthquake and/or wildfire coverage in catastrophe-prone areas representing less than 10% of its surplus as regards policyholders.

“Insured Value – Property” includes aggregate policy limits for structures and contents for policies written and assumed in the following annual statement lines – Fire, Allied Lines, Earthquake, Farmowners, Homeowners, and Commercial Multi-Peril.

“Catastrophe-Prone Areas in the U.S.” include:



- i. For hurricane risks, Hawaii, District of Columbia and states and commonwealths bordering on the Atlantic Ocean and/or the Gulf of Mexico including Puerto Rico.
- ii. For earthquake risk or for fire following earthquake, any of the following commonwealth or states: Alaska, Hawaii, Washington, Oregon, California, Idaho, Nevada, Utah, Arizona, Montana, Wyoming, Colorado, New Mexico, Puerto Rico, and geographic areas in the following states that are in the New Madrid Seismic Zone - Missouri, Arkansas, Mississippi, Tennessee, Illinois and Kentucky.
- iii. For wildfire risk, California, Idaho, Montana, Oregon, Nevada, Wyoming, Colorado, New Mexico, Washington, Arizona, and Utah.

*Specific Instructions for Application of the Formula*

Column (1) – Direct and Assumed Modeled Losses

These are the direct and assumed modeled losses per the first footnote. Include losses only; no loss adjustment expenses. For companies that are part of an inter-company pooling arrangement, the losses in this column should be consistent with those reported in Schedule P, i.e. losses reported in this column should be the gross losses for the pool multiplied by the company's share of the pool.

Column (2) – Net Modeled Losses

These are the net modeled losses per the footnote. Include losses only; no loss adjustment expenses.

Column (3) - Ceded Amounts Recoverable

These are the modeled losses ceded under any reinsurance contract. Include losses only, no loss adjustment expenses, and should be associated with the Net Modeled Losses.

Column (4) - Ceded Amounts with Zero Credit Risk Charge

Per the footnote, modeled catastrophe losses that would be ceded to the categories of reinsurers that are not subject to the RBC credit risk charge (i.e., U.S. affiliates and mandatory pools, whether authorized, unauthorized, or certified).

Column (6) – Amount

These are automatically calculated based on the previous columns.

Column (7) - RBC Requirement

A factor of 1.000 is applied to the reported modeled catastrophe losses calculated on both AEP and OEP basis, and a factor of 0.018 is applied to the reinsurance recoverables. The RBC Requirement is based on either AEP reported results or OEP reported results (not both), consistent with the way the company internally evaluates and manages its modeled net catastrophe risk.

Column (5) – Y/N

Please indicate “Y” for OEP basis and “N” for AEP basis. This column should not be blank.