



IAIS

INTERNATIONAL ASSOCIATION OF
INSURANCE SUPERVISORS

Public

ICS Consultation Document – Responses to Comments on Catastrophe Risk (Section 9.2.2.8)

9 March 2016



About this slide deck

1. This is the next tranche of resolutions of ICS Consultation Document (ICS CD) responses and comments received from IAIS Members and Stakeholders.
2. Member comments are grouped, noting that:
 - i. Members who provided confidential responses are not explicitly identified, but the total number of responses received is reported; and
 - ii. it is the policy of some Members to not comment on public consultations.
3. Stakeholder comments are presented on a thematic basis.

Glossary of Member Acronyms

AMF	Autorité des Marchés Financiers, Quebec, Canada
BaFin	Federal Financial Supervisory Authority, Germany
BMA	Bermuda Monetary Authority
CIRC	China Insurance Regulatory Commission
EIOPA	European Insurance and Occupational Pensions Authority
MAS	Monetary Authority of Singapore
NAIC	National Association of Insurance Commissioners, United States
OSFI	Office of the Superintendent of Financial Institutions, Canada
Russia	Central Bank of the Russian Federation

9.2.2.8 Catastrophe Risk

Question 100. Which of the two approaches described above would be most appropriate in the context of the ICS capital requirement?

259. *Such an interaction between sub-risks could be addressed in one of two potential ways:*
- a) *Explicitly by modelling the various sub risks together*
 - b) *Implicitly by modelling each sub-risk, but reflecting the interaction between the risks through a correlation parameter when the risk charges are aggregated.*

AMF, OSFI and two other Members support Option a).

BaFin, CIRC, EIOPA and four other Members support Option b).

MAS said that calibration is easier for the first approach while the second approach may be easier for a standard method but deriving credible calibration will be challenging.

9.2.2.8 Catastrophe Risk

Question 100. (cont'd)

A majority of stakeholders preferred (a) while a minority preferred (b). A couple of stakeholders said (a) is better for simplicity and practicality reasons. Other comments included:

- Life-related CAT Risk should be accounted for within Life Risk module
- Address life CAT Risk outside ICS by stress testing
- Show life-related CAT as a separate line to facilitate correlation with longevity risk
- Don't model sub-risks separately
- IAIS should not specify CAT scenarios; instead let IAIGs model their own scenarios
- Leave (a) vs (b) up to IAIGs

IAIS Response: The use of catastrophe models, as part of the field testing, allows main and sub-risks to be assessed together for natural catastrophe. For other catastrophe perils, the IAIS specified scenarios to be assessed.

9.2.2.8 Catastrophe Risk

Question 101. Is the approach above appropriate? If not, please explain what other approach should be adopted and why.

260. Furthermore, perils may have an impact on multiple high level risk categories (e.g. market risk and premium risk). For instance, catastrophes such as acts of terror or pandemics could impact the valuation of assets. Again, this interaction could be addressed by quantifying risk in respect of each risk independently and then applying a correlation factor or alternatively by holistically considering the overall impact of the peril.

261. It is proposed that there is no catastrophe stress applied for longevity risk. If there is a sudden event resulting in a decrease in mortality rates, it is likely that this would be a permanent decrease in mortality and would be best modelled through a stress of the level or trend of mortality rates.

AMF, BaFin, EIOPA, MAS, OSFI and five other Members expressed support for the outlined approaches.

9.2.2.8 Catastrophe Risk

Question 101. (cont'd)

Some stakeholders said the approach was appropriate. Two stakeholders said para 260 was too complex while two other stakeholders said that the CAT risk should consider the secondary impact as part of the modelled CAT risk. Two stakeholders said such complex secondary effects should be addressed via an ORSA and not the ICS Standard Method. Other comments included:

- Use internal model for CAT perils specific to insurer's business
- Bifurcation of perils is difficult to implement given internal model
- Longevity risk should reflect CAT longevity stress
- Not clear if sudden large temporary events (e.g. unexpected improvement in mortality due to mild winter) are accounted for

IAIS Response: The catastrophe scenario currently tested as part of the field testing for the standard method does not include a scenario for longevity risk. The IAIS considers the longevity risk to be appropriately captured by the longevity stress part of the life risk component .

9.2.2.8 Catastrophe Risk

Question 102. Which perils should be included in the ICS standard method? Is the list above appropriate? Should it include additional perils or exclude some of the listed perils? Please provide comments with reasons. Please provide comments about possible criteria for perils to be included in the list of perils.

BMA and one other Member support the perils listed in the consultation document.

Suggestions for additions of new perils included:

- Large scale cyber risk (AMF)
- Add Ice Storm to “Extra-tropical windstorm and hail” (AMF)
- Flood (AMF, OSFI, MAS and one other Member) – MAS suggested adding this to Tropical Cyclone
- Wildfire (OSFI and one other Member)
- Add Tsunami to Earthquake (MAS)
- Nuclear risk (OSFI)
- Financial Crisis (CIRC)
- EIOPA and four other Members proposed the following perils: *Natural catastrophe (which includes Windstorm, Earthquake, Flood, Hail, Subsidence), CAT risk of non-prop property reinsurance, Man-made CAT risk (which includes Motor vehicle liability, Marine, Aviation, Fire, Liability, Credit, and suretyship), and Other non-life CAT risk (which includes Transport insurance and reinsurance obligations [other than marine and aviation], Miscellaneous financial loss insurance and reinsurance obligations [other than extended warranty insurance and reinsurance obligations provided that the portfolio of these obligations is highly diversified and these obligation do not cover the costs of product recalls], Non-proportional casualty reinsurance obligations [motor vehicle liability, other motor insurance, marine aviation and transport insurance, fire and other damage to property insurance, general liability insurance]. Pandemic risk should be included in the disability/morbidity module.*

9.2.2.8 Catastrophe Risk

Question 102. (cont'd)

- BaFin proposed the following perils: *Natural CAT: (i) windstorm (ii) hail (iii) flood (iv) earthquake; Man-made CAT: (i) Motor vehicle liability (ii) Marine (iii) Aviation (iv) Fire (v) Liability (vi) Credit and suretyship. Other risks that should be covered: • Miscellaneous financial loss • Non-proportional casualty reinsurance*

Other suggestions:

- AMF said Marine Collision should not be CAT (unless it is multiple collisions). If it is, AMF and Russia said Airplane Collision should be added; Russia added rail disaster.
- Russia suggested use broader terminology e.g. 'Floods', 'Storms', 'Hails', 'Droughts' and 'Bush fires'
- Russia said city centre terrorist attack should be eliminated as it is not clear this is normally covered by IAIGs
- NAIC said that terrorist attack, marine collision and pandemic should not be included as perils since methods for quantifying these are not well developed. These should be implicitly included in other risk charges (e.g. pandemic in Mortality/Morbidity stresses; terrorism/marine in premium risk charge).
- Perils should be broken out by region (NAIC)

Suggestions for criteria: MAS said perils should be relevant to majority of IAIGs, while IAIGs should also report any significant perils not listed. NAIC said perils should be included if there exists established methods to quantify and report losses.

9.2.2.8 Catastrophe Risk

Question 102. (cont'd)

A few Stakeholders expressed general support of the list in the Consultation Document. Some suggestions for additional perils include wildfire, flood, casualty events, credit events, aviation, fire conflagration, and a split between natural vs non-natural perils. One stakeholder suggested making hail a distinct peril and renaming it 'convective storm'.

Several stakeholders believed the approach was inappropriate. Some suggestions specifying a PML level rather than a specific list of scenarios, leaving it to the company or supervisor to develop the list of scenarios, or assess CAT risk via the ORSA instead particularly for difficult-to-calculate perils. Two stakeholders were concerned that life risks were being double counted under this approach.

Some criteria suggested include:

- Perils that are solvency risks (one stakeholder said windstorm/hail losses are more likely to be an earnings rather than solvency event)
- Perils that can be modelled reliably (some stakeholders believe this would rule out terrorist attacks and marine/aviation collision)
- All perils with material impact on IAIG.

9.2.2.8 Catastrophe Risk

Question 102. (cont'd)

IAIS Response: As part of the field testing, the IAIS will continue to assess the appropriateness of the list of perils and will refine the catastrophe component of the standard method as appropriate.

9.2.2.8 Catastrophe Risk

Question 103. How should the IAIS define material in this context? Should materiality be defined in terms of likely impact on the ICS, or in relation to a more objective measure such as premium or other exposure threshold?

266. In the event that an IAIG has material exposure to a peril not included in the list of perils in paragraph 265, the IAIG will be required to define this peril and submit equivalent data in respect of this “bespoke peril” in addition to the compulsory perils.

AMF said materiality should be defined in terms of likely impact on (total) ICS.

BaFin said ‘material’ should mean that considering or not considering it could make a difference in decision making or judgement.

EIOPA and three other Members said that there is no need for additional ‘material’ peril if the proposed list of perils in Question 102 is used.

MAS said that premium is not a suitable proxy, while OSFI said that materiality should be defined relative to premiums, claims or available capital resources.

9.2.2.8 Catastrophe Risk

Question 103. (cont'd)

A few stakeholders said materiality should be defined in terms of total ICS requirement. Other suggestions for bases for materiality included premiums, claims, maximum loss exposure, aggregate limit of liabilities or payments at a specific confidence level. One stakeholder said defining materiality using more objective measures is impossible for life insurers. Another said it is not necessary to define materiality as only perils that can be reasonably modelled and are solvency risks should be included.

A few other suggestions provided were:

- Place the onus on the IAIG to justify why a peril is or is not material.
- IAIS should provide individual criteria and thresholds for perils in advance to aid comparability.
- Include measures to ensure transparent disclosure e.g. confirmation of coverage of all material risks; potential impact of modeling simplifications etc.

IAIS Response: As part of the field testing, the IAIS will continue to assess the materiality of catastrophe perils and will refine the catastrophe component of the standard method as appropriate.

9.2.2.8 Catastrophe Risk

Question 104. For the purpose of field testing, the IAIS is considering collecting data for various confidence levels from full empirical distributions, in order to consider the shape of the distribution and the most appropriate aggregation method. Is that likely to be a challenge for IAIGs? Please explain.

EIOPA and four other Members said that full empirical distributions are unlikely to be available for all perils and for all IAIGs, as not all IAIGs may have sophisticated methodologies to model CAT risk.

BaFin said that the vast data required for deriving distributions is probably not available from most IAIGs.

9.2.2.8 Catastrophe Risk

Question 104. (cont'd)

Most stakeholders responded that this would be difficult. Only two stakeholders said it should be straightforward, but caveating that regional definitions may differ and Man-Made CAT may be harder. Several stakeholders said it would not be possible for life companies, and that not all IAIGs model such risks and hence would not have data to provide. Several stakeholders said that a full or credible empirical distribution is unlikely to be available for tail risks.

One stakeholder pointed out that for IAIGs who do use CAT models, outputs of those models would be readily available but not the aggregations. Two stakeholders said that this would be difficult for Pandemic risk, either because they do not possess data points or the required data points would be prohibitively voluminous.

IAIS Response: For the purpose of the field testing, the IAIS is collecting data at various confidence levels for natural catastrophe for which the use of catastrophe models is allowed.

9.2.2.8 Catastrophe Risk

Question 105. Are the defined scenario method and the use of partial models appropriate for the purpose of the ICS standard method? If yes, please explain why. If not, please provide alternative methods and explain why they would be more appropriate.

EIOPA and four other Members said that this is appropriate for field testing given the inherent complexity of modelling CAT risk. AMF, BMA, MAS, OSFI and one other Member also agreed with the approach. MAS said that the defined scenario method may be better for comparability than allowing full flexibility to use own partial models, and that scenarios should be defined broadly, while BaFin believed that scenarios needed to be defined very specifically to be comparable. BaFin also said that a simpler method should be available for IAIGs who do not use models.

OSFI highlighted the need for the IAIS to have an efficient way of updating the scenarios.

9.2.2.8 Catastrophe Risk

Question 105. (cont'd)

There was general support amongst stakeholders for the use of partial models, with a couple saying partial models are the most practical way to approach CAT risk in the standard method. Three stakeholders said the use of internal models is the ideal approach, with one adding that the use of partial models should be made optional for IAIGs that have internal models. Two stakeholders said that a process for supervisory review needs to accompany the use of partial models.

A small number of stakeholders supported using the defined scenario method as a simplified option, in conjunction with partial models. A few said that the method is appropriate for specific types of CAT risks, such as mortality risk / Pandemic, common CAT risks such as US Hurricane, and an Economic scenario. Three stakeholders said Defined Scenarios will not feasibly work as the CAT risks faced by each IAIG are too varied/unique and the results will be inconsistent.

Two other suggestions provided by stakeholders were to use an 'X per Mile' specification for Pandemic risk scenario, and to consider a simplified factor-based approach as a simpler alternative.

IAIS Response: For the purpose of field testing, the IAIS allows the use of catastrophe models for the assessment of natural catastrophe and defined scenario for other perils and will consider whether there is a need to modify the approach based on field testing data and feedback received.

9.2.2.8 Catastrophe Risk

Question 106. In case of a defined scenario by the IAIS:

- a) What elements should be part of the description of the scenario defined by the IAIS? Please provide an example.
- b) Which calculation method by the IAIG of the impact of a defined scenario should be allowed by the IAIS for the ICS standard method? Please explain why this is appropriate.

BaFin, EIOPA and four other Members said to use a risk factor multiplied by exposure measure. CIRC said that region-specific factors or methods should be used and geographic diversification needs to be reflected.

MAS and one other Member said that scenarios should be devised at a fairly high level to reduce inconsistency. MAS suggested that IAIS can set, at a minimum, the return period or exceedence probability, the types of perils that must be covered, and the lines of business that should be considered.

9.2.2.8 Catastrophe Risk

Question 106. (cont'd)

Stakeholders provided the following suggestions for elements in the defined scenario:

- Region/location of the event (one said it should be defined as the city/region where the scenario would cause the greatest loss)
- Impact / damage rate: Additional deaths/1000 persons (One suggestion was to vary this based on distance from impacted area for terrorist attacks), or absolute number of deaths
- Nature, magnitude, & Timing of event
- Contingent / secondary effects
- Type of insurance exposure or coverage (e.g. building, content, business interruption; occupancy)
- Hazard copula between regions
- reflection of financial conditions in policies (e.g. high deductibles or layered policies for industrial business)
- Population density
- Total economic and insured losses
- Line of business
- Number of events (to allow reinsurance programmes to be applied)
- Define impact on factors directly affecting the calculation (e.g. change to mortality rate by country)

One stakeholder emphasised that parameters needs to leave minimal room for interpretation. One stakeholder said that a range of calculation approaches should be maintained as it will differ depending on peril and region.

IAIS Response: As part of the field testing, the IAIS will continue to refine the definition of the relevant catastrophe scenarios.

9.2.2.8 Catastrophe Risk

Question 107. In the case of a bespoke defined scenario by the IAIG, should the scenario be approved by the IAIS before its application by the IAIG?

OSFI said that the scenario should be approved by the IAIS.

EIOPA and four other Members suggested to consider framing the use of modified scenarios as part of a partial internal model approach subject to supervisory review/approval, rather than as part of the standard method. BaFin suggested considering whether the use of partial internal models is already sufficient.

MAS and one other Member said the scenario should not be approved by the IAIS but rather the group-wide supervisor, with MAS noting that it would be a very resource-intensive exercise for the IAIS. MAS said that the supervisor's approval should be after consultation with IAIS. MAS also suggested that IAIS should define principles for defining bespoke scenarios to ensure some level of comparability.

CIRC said IAIS should seek opinions of different regions, define scenarios and then establish strict approval system to prevent abuse.

9.2.2.8 Catastrophe Risk

Question 107. (cont'd)

Half of the stakeholders that responded said that approval should be given by the Group-wide Supervisor and not the IAIS, with two suggesting that the IAIS should still be consulted to ensure consistency globally. A smaller number of stakeholders said the IAIS should or could consider approving for consistency and fairness, with one stakeholder stressing that an IAIG should not be penalised for identifying an event that another IAIG is exposed to but has not identified. One stakeholder maintained that partial models should be used for non-life CAT risk.

IAIS Response: As part of field testing the IAIS will continue to monitor the need and the appropriate qualitative framework around bespoke scenarios.

9.2.2.8 Catastrophe Risk

Question 108. Should the use of partial models be allowed for the calculation of catastrophe risk for the ICS standard method? Why or why not.

AMF, BaFin, BMA, EIOPA, MAS, OSFI and six other Members agreed with the use of partial models. The main reason cited was that doing so captures the risks faced by the IAIGs more accurately due to diversity in IAIG risk profiles.

Nearly all stakeholders that responded agreed that partial models should be allowed for CAT risk calculations. The most common reason given was that it allows for the most accurate reflection of the risks. Some stakeholders said it is meaningful in allowing the IAIG to understand the risk and is already a common industry practice, and a number of stakeholders believed there was no other practical approach. One stakeholder said that partial models should *not* be permitted for life CAT risks and that an ‘x per mile’ approach would suffice. Other comments by some stakeholders were that care is needed to account for different IAIGs using different CAT model vendors for the same risks, and that the use of partial models needs to be subject to supervisory review.

IAIS Response: For the purpose of field testing, the IAIS allows the use of catastrophe models for the assessment of natural catastrophe and defined scenario for other perils.

9.2.2.8 Catastrophe Risk

Question 109. In the case where the use of partial models is allowed by the IAIS:

- a) Should IAIGs be required to seek prior approval of the partial models?
- b) What criteria should be applied by the IAIS (either as generic conditions, or as part of the prior approval) to allow the use of internal models?
- c) What information about the partial model and its use by the IAIG should be provided to the supervisor with each ICS calculation?

****** Note this question partially overlaps with Questions 162 and 164, which are not summarized here

a) MAS, OSFI and two other Members agreed that approval of the models should be needed. EIOPA and three other Members said that the model itself should not be approved, but supervisory approval should be required before an IAIG can use a model. AMF said it should be to supervisor's discretion whether to require approval. BMA said that prior approval should not be required, but specific disclosures should be provided.

9.2.2.8 Catastrophe Risk

Question 109. (cont'd)

b) Members made the following suggestions for criteria:

- Demonstrate appropriate governance around the models (AMF, EIOPA, and five other Members)
- Demonstrate understanding of limitations of model and take these into account (EIOPA, and four other Members)
- Demonstrate good underlying data quality (EIOPA, MAS and four other Members)
- A use-test condition (AMF, MAS and one other Member)
- Disclosure of information to allow supervisor to understand key assumptions and judgements, and to allow benchmarking where appropriate. (BMA)
- Calibration and stress testing of model parameters. (AMF)
- Use of a common model approval framework across and within jurisdictions; key model design elements (e.g. confidence level, time horizon, diversification, calibration of tails etc.) in advance; model results are subject to periodic cross-jurisdiction stress/scenario testing etc. (OSFI)
- Criteria on documentation of model (MAS)

9.2.2.8 Catastrophe Risk

Question 109. (cont'd)

c) Members made the following suggestions for information to be provided to the supervisor:

- Description of model(s) used (BMA, EIOPA and four other Members)
- Description of governance around model(s) (EIOPA and four other Members)
- Disclosure of model assumptions/parameters/results (AMF, OSFI)
- Differences from standard method or previous version of model (AMF, MAS)
- Analysis of differences from standard model/previous versions and why these are more appropriate (MAS)
- Model outputs (AMF, OSFI)
- Description of adjustments applied to the model and rationale (BMA and one other Member)
- Description of how data used in model has been collected/processed/applied (EIOPA and four other Members)
- Detailed model parameters (OSFI)
- Additional model statistics/information (BMA) (The BMA gave the following examples: CAT capital charge by total and per peril, plus additional statistics to help supervisor assess validity of results such as: -Gross and net losses for a variety of return periods / by peril. - Annual average aggregate gross loss. - Standard deviation of annual aggregate gross loss. - Exposure limits. - Modelled exposure and perils. - Data quality. - Reinsurance information.)

9.2.2.8 Catastrophe Risk

Question 109. (cont'd)

a) A majority of stakeholders said that prior approval should be sought, with most of those saying the approval should be by the relevant supervisor. One said that approval should be sought for non-life only and that life-related partial models should not require approval. One said that if it is a commonly used external vendor model, approval should not be necessary. A couple of stakeholders said that supervisory review would be beneficial while one said the supervisor should not approve or review the models but should at least gain an understanding of them. Two stakeholder said it is not at all worth the increased compliance costs and reduced flexibility to firms, and the increased resource costs by supervisors, to require prior approval.

b) Some suggested criteria were as follows:

- Conformity with accepted practices
- Demonstrate material risks have been captured
- Demonstrate interactions at all relevant levels in model have been captured
- Demonstrate adequate internal governance and external review
- Adequate documentation
- Data quality
- Evidence of use

9.2.2.8 Catastrophe Risk

Question 109. (cont'd)

c) Stakeholders made the following suggestions for information to be provided to the supervisor:

- Detailed input parameters
- Detailed output
- List of models used for each region and peril
- Data sources
- Details of validation performed
- Limits of models
- Technical documentation

IAIS Response: As part of the development of ICS version 1.0, the IAIS will consider if partial models should continue to be allowed and the appropriate qualitative framework to be defined.

9.2.2.8 Catastrophe Risk

Question 110. If GAAP with adjustments were used as an alternative valuation approach for the ICS, detail those adjustments, if any that would be required to produce a comparable catastrophe risk charge to those produced using the market-adjusted valuation approach under the catastrophe risk charge described in this section.

EIOPA and four other Members said that the calculation of capital requirements should not be tied to a particular valuation methodology. Valuation method should bring assets and liabilities to a sufficiently comparable position to allow one methodology of capital requirements to be applied.

One stakeholder said that if GAAP with Adjustments is essentially cost accounting, then stresses can be applied on discounted future cash flows, or a factor approach can be used. If it is unlocked book value gross premium valuation or a current value/market value approach, then stresses can be applied on balance sheet or discounted cash flows.

Two stakeholders said they do not see a way to make GAAP with Adjustments comparable, while another two said they do not support pursuing the GAAP with Adjustments approach. One stakeholder said that there would be no such equivalent method under GAAP with Adjustments as GAAPs do not include a specific CAT risk charge; rather, CAT Risk would be implicitly included in unearned premium.

IAIS Response: As the GAAP with Adjustments approach is further developed, interactions with and implications for Catastrophe Risk will be considered.