

Guidelines

for **insurance companies subject to the Swiss Solvency Test (SST)**
regarding **the treatment of natural catastrophe risks** in the SST

Version of 31 October 2017

Purpose

These guidelines provide guidance on the treatment of natural catastrophe risks in the SST with regard to determining the model to be used in the SST for natural catastrophe risks in accordance with FINMA Circular 2017/3 “SST”, providing proof of need for an internal model for natural catastrophe risks and submitting an application for approval to use an internal model. Further the guidelines determine the scope of a (partial) internal model for natural catastrophe risks and provide guidance on the SST reporting on natural catastrophe risks. These guidelines are not legally binding.

I. Terms used and definitions

The following terms are used in these guidelines:

- A **natural catastrophe risk (nat cat risk)** is the risk of financial losses to the insurance industry caused by a natural catastrophe event.
- A **natural catastrophe event (nat cat event)** is an event caused by a non-anthropogenic mechanism and which generally has an impact on a large contiguous area for an uninterrupted period of time lasting from a few seconds to several weeks.

Nat cat events typically affect a number of insurance policies or catastrophe securities (Insurance Linked Securities ILS, e.g. cat bonds) and can constitute risk concentrations, as set out in FINMA Circ. 17/3, Margin no. 75.

The impact of a nat cat event depends on the natural peril involved, the objects affected (e.g. buildings, referred to as the exposure), and the vulnerability of the exposure in the regions affected.

Nat cat events can occur singly or in clusters, and can be separate or interlinked in terms of both timing and geographical location.

- **Peril & region:** nat cat events can be classified by type of natural peril (e.g. hurricanes, floods, volcanic eruption) and geographic region affected. The "peril & region" combination is used in the SST reporting.

II. Main features of the risk profile of natural catastrophes

The scope of the modelling of nat cat risks and the scope of a potential internal model for nat cat risks (see Section IV.1) are determined by the insurance company's nat cat risk profile.

The nat cat risk profile is identified by the company in terms of nat cat events and their impact on the company's portfolio through the internal systems the insurance company has in place for risk identification and risk accumulation control.

II.1 Explicit identification of nat cat events

In accordance with Article 96 of the Insurance Supervision Ordinance (ISO; SR 961.011), insurance companies must have in place and use internal processes for risk identification and accumulation control as part of their overall risk management. With regard to nat cat risk, these processes are able to deliver the input required for applications such as pricing, quantifying reinsurance/retrocession needs and calculating risk capital.

In these internal processes, insurance companies use their own materiality thresholds in accordance with FINMA Circ. 17/3, Margin no. 15.

"Explicitly identified nat cat events" denotes those nat cat events explicitly identified and analysed by the internal processes referred to above as being relevant to the risk profile. These form the basis for the explicit modelling of the nat cat risks, potentially by an internal model.

"Not explicitly identified nat cat events" denotes the remaining nat cat events to which the insurance company may be exposed, but that are not explicitly identified and not explicitly modelled because of low materiality loss potential or negligible risk accumulation of the exposure.

The information below on nat cat risks and complete nat cats risks relates to explicitly identified nat cat events. Their full impact and all associated risks must be covered (see Section II.2).

II.2 Full impact of a nat cat event

The full impact of a nat cat event comprises all losses caused by this event on (re)insurance contracts or catastrophe securities (ILS) with regards to:

1. Exposure from the property insurance line of business (LoB);
2. Exposure from LoBs other than property insurance (e.g. marine, motor, engineering, personal accident, surety, life);
3. All coverages, including supplementary coverage and/or additional terms and conditions (e.g. business interruption);
4. Secondary perils (e.g. fire following earthquakes, storm surge following hurricanes), secondary effects (consequential damage such as post-loss amplification) and special features (e.g. clustering).

III. Models for natural catastrophe risks in the SST

In accordance with FINMA Circ. 17/3, Margin no. 78, the non-life standard model is accepted by FINMA as the SST model for modelling the impact of natural perils as defined by the Swiss Natural Peril Pool. The full impact of these events is covered by the model for the losses subject to the Swiss Natural Perils Pool and the model for the accumulation of losses ("*Kumulschäden*") from property, motor hull and accident insurance.

FINMA provides no standardised approach for modelling risk arising from other natural catastrophe events in the SST. In accordance with Article 50c ISO, these risks must be modelled by a (partial) internal model (internal nat cat model).¹ Such an internal nat cat model needs prior approval by FINMA in accordance with FINMA Circ. 17/3, Margin no. 83. The scope of the internal nat cat model is defined in Section IV.1.

Alternatively, insurance companies which use a standard model for their other insurance risks (e.g. standard model for reinsurance or for non-life) can use it to model their nat cat risks if it covers them appropriately. When applying Article 50b para. 3 ISO, FINMA can require an internal model under Article 50c ISO to be used if the risk situation is not sufficiently reflected in the standard model.

¹ Normally insurance companies affected by this provision already have an internal model for implementing the specifications outlined in Section II.1 in accordance with Article 96 ISO.

The nat cat risks may then be modelled implicitly (e.g. together with other events in the categories "normal claims", "major claims" or "accumulated claims"), in which case it may not be possible to separate out the nat cat risks on a stand-alone basis.

IV. (Partial) internal models for natural catastrophe risks (internal nat cat models)

IV.1 Scope of an internal nat cat model

The scope of an internal model for nat cat risks must be clearly defined and demarcated from the scope of the other components of the insurance company's SST model, in particular to prevent gaps or overlaps.

In accordance with FINMA Circ. 17/3, Margin no. 6, all economically relevant risks to which the portfolio of an insurance company is exposed as a result of nat cat events must be covered by the company's SST model. The following procedure can be used and may help to prevent gaps and overlaps:

1. Determine the explicitly identified nat cat events and model explicitly nat cat risks caused by these events, classified by a combination of peril & region, in terms of their full impact.
2. Ensure that losses from nat cat events which are not explicitly identified are modelled in other components of the SST model, i.e. in components of the standard models or other parts of the company's internal model.
3. Ensure that:
 - the parts of the insurance company's SST model identified in (1) and (2) fully cover all risks to which the insurance company's portfolio is exposed as a result of nat cat events; and
 - the parts of the SST model identified in (1) and (2) do not overlap in terms of the events covered.

Decisions about the modelling of the relevant nat cat risks are made specifically with a view to the insurance company's risk profile. A plausible solution must be found if technical restrictions are encountered when modelling the explicitly identified nat cat events.

IV.2 Modelling nat cat risks

Insurance companies can follow the guidelines below for the explicit modelling of nat cat risks, specifically regarding the model design of the internal model under FINMA Circ. 17/3, Margin nos. 131 ff.:

1. When modelling the nat cat risks for the one-year period from the reference date, it is assumed that the insurance company will follow its own business plan. In accordance with Margin nos. 19 and 21 of FINMA Circ. 17/3, the modelling covers all relevant losses in the current year from in-force business, including new business.
2. All risks associated with the relevant nat cat event are modelled in full in the nat cat model. It may be necessary to adjust an existing model to cover risks that would not otherwise be covered (see Section IV.3). This includes model-specific effects such as secondary uncertainty.
3. Event losses are quantified as precisely as possible in the nat cat model with due regard to the contract terms and conditions of the relevant reinsurance/retrocession structures and catastrophe securities (ILS). Any simplifications are documented and justified.
4. In the internal model used for modelling nat cat risks, it is permitted to make use of models/software, typically stochastic event-set-based models (vendor models), provided that the choice of vendor model is justified and documented in terms of the insurance company's risk profile.
5. Vendor models can be operated directly by the insurance company. Alternatively, under FINMA Circ. 17/3, Margin no. 144, they can be outsourced within an insurance group or to an external service provider (e.g. broker), provided that the insurance company has complete transparency regarding the approach applied;
6. The results of the internal processes for identifying risk and controlling risk accumulation, particularly with regard to nat cat events not explicitly identified, and their coverage in other components of the SST model, are described and justified in the nat cat model documentation.

IV.3 Adjustments to ensure the completeness of the nat cat model

A given nat cat model approach may initially not cover the full impact of the nat cat events in scope as defined in Section II.2; risks not initially covered are often referred to as "non-modelled risks". In that case, it must be demonstrated that all material risks are covered or adjustments be applied to the nat cat model.

These adjustments may concern:

1. Adjustments for property insurance exposure: in case the full exposure from property insurance business is not available at the required level of detail. Such adjustments are typically relevant for event-set-based models (e.g. vendor models).

2. Adjustments for exposures from other LoBs: in case LoBs other than property insurance are covered by (re)insurance contracts but not modelled in the given modelling approach.
3. Adjustments for types of cover and secondary effects: in case not all types of cover (e.g. contingent business interruption) or secondary effects can be explicitly modelled by the given nat cat model.
4. Adjustments for the current year: in case not all (re-)insurance contracts for the current year are known at the date of the SST modelling.

V. Approval process for internal nat cat models

V.1 Proof of need for an internal model

For proof of need for an internal nat cat model as set out in FINMA Circ. 17/3, Margin no. 91, the insurance company informs FINMA that it intends to use an internal model for nat cat risks for the SST, and provides a written explanation of its scope as described in Section IV.1 along with the rationale for using this model as set out in Section III.

In addition, insurance companies using a standard model to model their other non-life insurance risks (e.g. the standard model for reinsurance or for non-life) are also to explain the demarcation of the internal nat cat model from the standard model as described in Section IV.1 and how the internal nat cat model is integrated into the standard model.

V.2 Application for approval and summary review

Application for approval of an internal nat cat model is to be submitted for the full scope of nat cat risks in accordance with FINMA Circ. 17/3.

As part of the application for approval, insurance companies are required to submit the model documentation (FINMA Circ. 17/3, Margin nos. 95-98), and in addition, the completed standardised Excel questionnaire on internal nat cat models (the "Natural catastrophe risk model questionnaire"²). The information provided in the questionnaire must be as complete, accurate and transparent as possible to be used by FINMA for the summary review.

If a vendor model is used to model the nat cat risks, the model documentation is generally limited to detailed comments on the above-mentioned questionnaire, particularly the "Options & Settings" tab. FINMA

² Download from www.finma.ch > Monitoring > Insurers > Cross-sectoral tools > Swiss Solvency Test (SST) > Internal risk models.

can require insurance companies to provide complete documentation for the chosen vendor model if deemed necessary for reviewing the model.

The guidelines (dated 17 February 2017) on the validation report required as part of the application for approval to use an internal model in the SST apply by analogy.³

For a first application for approval, FINMA will waive the requirement for an impact analysis under FINMA Circ. 17/3, Margin no. 98. If the requested internal nat cat model is intended to replace parts of a SST model currently accepted by FINMA, the impact analysis must be provided as a quantitative comparison of the two models in terms of the fundamental data (Fundamental Data Sheet [FDS]).

VI. SST reporting

VI.1 Using an internal nat cat model

The modelled nat cat risks are reported using the Excel-based standardised data collection file "Standardised natural catastrophe risk data requirements"⁴ available on the FINMA website as part of the annual SST reporting.

VI.2 Using a standard model

Insurance companies that use a standard model for nat cat risks in the SST (see Section IV.1) must provide information on their current exposure to nat cat events as part of their annual SST reporting. For this purpose, FINMA makes available a compulsory template entitled "exposure declaration" in the data collection file "Standardised natural catastrophe risk data requirements"⁴.

³ Download from www.finma.ch > Monitoring > Insurers > Cross-sectoral tools > Swiss Solvency Test (SST) > Internal risk models.

⁴ Download from www.finma.ch > Monitoring > Insurers > Cross-sectoral tools > Swiss Solvency Test (SST) > Tools > Mandatory data submissions for internal risk models.