BY JONATHAN WETERING

# Solvency II 2020 review: effects on catastrophe XL reinstatements for Dutch exposures

**Much has already been written about the new parameters for Dutch Natural Catastrophes (Nat-Cat) in the Solvency II 2020 Review.**

**Nevertheless, we see differences in how practitioners interpret peril dependency: some treat perils as fully dependent while others treat them as fully independent. These different approaches can produce materially different capital and reinstatement outcomes. For example, one cedent may conclude that their programme provides sufficient reinstatements, while another, using a different dependency assumption, may reach the opposite conclusion.**

**This article summarises the key Nat-Cat risk changes for the Netherlands as part of the Solvency II 2020 review, their impact on the required capital ($SCR_{natCAT}$), and practical implications for purchasing reinstatements.**

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## REVISION OF NAT-CAT PARAMETERS FROM 2027

With respect to the Netherlands, only the parameters for hail have been revised, flood has been added and the parameters for windstorm remain unchanged. The 1-in-200-year event (Occurrence Exceedance Probability, OEP) factor and the Aggregate Exceedance Probability (AEP) scenarios (pre-described events defined as a percentage of OEP) from 2027 are as follows[1]:

**Table 1** – Natural Catastrophe parameter updates and scenario prescriptions

| Portfolio | Windstorm | Hail* | Flood** |
|---|---|---|---|
| Property | 0.18% (unchanged) | 0.03% (was 0.02%) | 0.0350% (was n/a) |
| Motor Hull | n/a | 0.30% (was 0.10%) | 0.0525% (was n/a) |
| AEP (Scenario A) | 100% & 20% | 70% & 50% | 65% & 45% |
| AEP (Scenario B) | 80% & 40% | 100% & 20% | 100% & 10% |

* For Motor Hull, the TSI is multiplied by a factor of 10 (previously factor 5).

** For Motor Hull, the TSI is multiplied by a factor of 1.5.

As a result of these changes, hail and flood will have a larger impact on the $SCR_{natCAT}$ component within the Standard Formula. The windstorm peril was and remains the dominant driver, hail and flood will also contribute significantly from 2027 onward.

For illustration purposes in this article, we assume cedent XYZ with the following portfolio (for all CRESTA zones) and Total Sum Insured (TSI):
- TSI Fire: EUR 1m;
- TSI Motor Casco: EUR 200k;
- TSI Marine, Aviation, Transport: not applicable

**Table 2** – Illustrative impact of required capital for Natural Catastrophe risk

| Gross AEP SCR | Prior to 2027 | As from 2027 |
|---|---|---|
| Windstorm | 204,154 | 204,154 |
| Hail | 29,355 | 66,049 |
| Flood | N/A | 44,918 |
| Diversification | 27,256 | 95,898 |
| Total | 206,254 | 219,224 |

Due to the new parameters, the gross $SCR_{natCAT}$ will increase by approximately EUR 13k (+6.3%), since windstorm remains the main driver on a gross basis.

### AGGREGATION VS. DISAGGREGATION

EIOPA describes two methods for applying reinsurance where a layer covers multiple perils: aggregation and disaggregation. A key distinction is made between aggregation method and disaggregation method:

- Aggregation starts at the level of the individual Nat-Cat sub-modules (for NL: Windstorm, Hail, and Flood), calculates each peril charge and then combines them to obtain the overall $SCR_{natCAT}$ for the portfolio.

- Disaggregation works in the opposite direction: it starts from an overall gross loss (or gross capital impact) and allocates that amount back to individual components (e.g., by peril, country, or other segment). This is more important for taking into account layers with multiple Perils/Line of Business.

Most Dutch cedents use the aggregation method, so this article concentrates on that approach. Either method is acceptable, but once you choose one, it should be consistently applied.

### IMPACT ON REINSTATEMENTS AND CAPITAL REQUIREMENTS

Historically, two reinstatements were typically sufficient in the lower layers of catastrophe programs. With increased loss potential from secondary perils, the question arises whether additional cover should be purchased in advance – i.e., more reinstatements.

In the Netherlands, we observe that the net impact of these parameter changes (after reinsurance) increases the Nat-Cat capital charge for many cedents. However, diversification effects elsewhere in the Standard Formula (e.g., reserve risk or market risk) means the net Basic SCR increases by a smaller amount.

A practical implementation point is that the Nat-Cat framework reflects two events per peril. In the Netherlands specifically, with the inclusion of flood, this becomes six events across three perils (two windstorm, two hail and two flood) in the prescribed scenario structure. This raises the question of
a) whether two reinstatements in the lower layers remain sufficient or
b) whether including flood and the increased severity of hail justify purchasing additional reinstatements.

### FORMULA FOR CALCULATING THE NAT-CAT SCR

Generally, under Solvency II, each sub-module is calculated and then aggregated using a prescribed correlation matrix. However, for $SCR_{natCAT}$ there is no prescribed correlation matrix, which implies an identity matrix, meaning the correlation between different natural perils is zero. Therefore, the $SCR_{natCAT}$ formula can be expressed as:

$$SCR_{natCAT} = \sqrt{\sum_i SCR_i^2} = \sqrt{SCR^T \times I \times SCR}$$

Where $SCR_i$ are, specifically for the Netherlands, the individual risks for windstorm, hail, and flood and I is the identity matrix. This representation aligns with the absence of prescribed cross-peril correlations in the aggregation step.

### IMPLICATIONS FOR THE NUMBER OF SIMULATED EVENTS AND REINSTATEMENTS

Given the aggregation formula structure above, it is generally not consistent with the Standard Formula mechanics to treat the six peril events (two windstorm, two hail and two flood) as a single, fully dependent annual sequence solely for the purpose of exhausting a CAT XL programme. By doing so, it effectively introduces full cross peril dependence in the reinsurance application that is not reflected in the peril aggregation formula.

For event-based CAT XL programs, a consistent approach is therefore:

1. For each peril, calculate Scenario A and Scenario B (see Table 1) gross losses/capital impacts.

2. Apply the CAT XL contract within that peril sub-module (including reinstatement conditions if applicable).

3. Take the highest net result of Scenario A vs Scenario B for that peril.

4. Aggregate the peril net charges using the $SCR_{natCAT}$ formula.

In practice, we often see three covers (two reinstatements) in the lower layers of CAT XL programs and two covers (one reinstatement) in the upper layers. It is important that cedents purchase sufficient reinstatements, while also avoiding unnecessary reinstatements (and thus cost) driven by assumptions that are not aligned with the Standard Formula framework.

We will illustrate the above approach with the following example. The cedent XYZ has the following CAT XL contract covering the property and casco combined losses:

- Layer 1: 30,000 xs 15,000 with 2 free reinstatements
- Layer 2: 130,000 xs 45,000 with 1 free reinstatement

**Table 3** – a consistent approach for calculating the Natural Catastrophe risk, net of reinsurance

| Approach | Prior to 2027 | As from 2027 |
|---|---|---|
| 1. Calculate scenarios | See scenario A and B per peril in the graph | See scenario A and B per peril in the graph |
| 2. Apply CAT XL cover | Reinsurance cover applied per peril (light green bars) | Reinsurance cover applied per peril (light green bars) |
| 3. Take highest net result | Windstorm EUR 30,000, Hail EUR 27,231 | Windstorm EUR 30,000, Hail EUR 30,000, Flood EUR 30,000 |
| 4. Aggregate the net perils | Aggregation of net charges EUR 40,516 | Aggregation of net charges EUR 51,962 |

**Figure 1** – a graphical representation for calculating the Natural Catastrophe risk, net of reinsurance, Prior to 2027

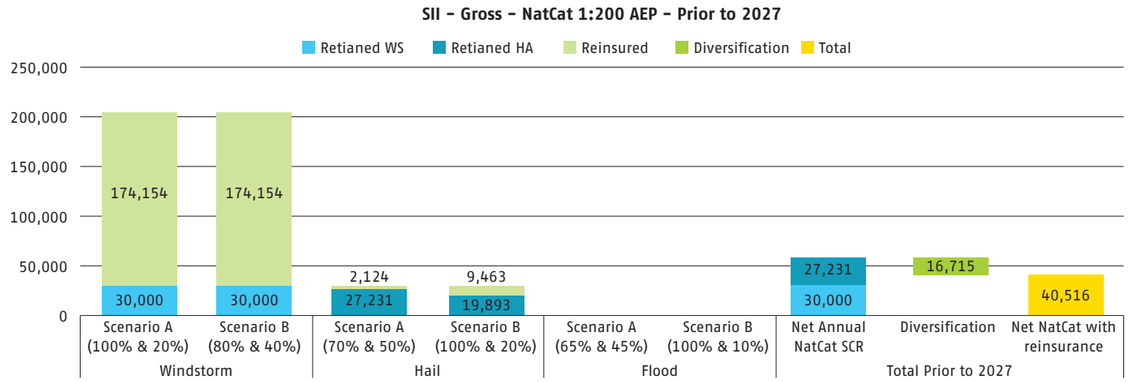
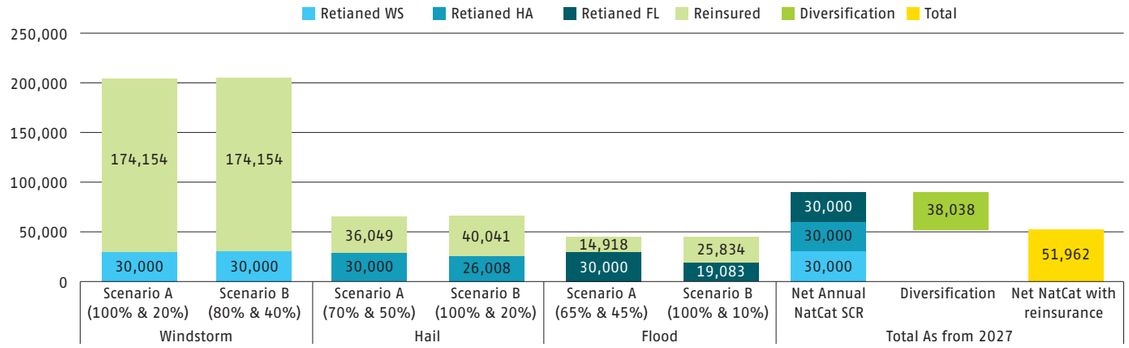



**Figure 2** – a graphical representation for calculating the Natural Catastrophe risk, net of reinsurance, As from 2027




For this specific portfolio and CAT XL structure, the highest net result "Prior to 2027" is EUR 30,000 (twice the retention) only for windstorm. The highest hail net result (EUR 27,231) reached the retention for 1 event only (EUR 15k + 2nd event below retention).
From 2027 onward, all three perils reach the retention level twice, producing three net results of EUR 30,000. Consequently, the net Nat-Cat capital requirement rises by approximately EUR 11,5k (+28.3%), substantially larger than the 6.3% increase observed on a gross basis.
Due to the long stretch of Layer 2, the losses are fully absorbed in the second layer and therefore 1 reinstatement is sufficient.

### CLOSING REMARKS

DNB's interpretation of these changes is critical. If DNB adopts a different supervisory view – for example, expecting a reinsurance exhaustion approach that effectively assumes stronger cross peril dependence – then additional reinstatements may still be required, depending on the cedent's specific reinsurance program structure.

### CONCLUSION

The Solvency II 2020 review increases the impact of Hail and adds Flood on the Nat-Cat capital requirement from 2027 onwards. Under the Standard Formula, the aggregation for $SCR_{natCAT}$ does not prescribe cross-peril correlations, which makes it difficult to justify treating all peril events as a single, fully dependent annual sequence.
Consequently, there is no immediate need to increase the number of reinstatements, given DNB's interpretation supports an approach consistent with peril-level calculation and aggregation. Cedents should select their preferred methodology (aggregation or disaggregation) and apply it consistently. Understanding these mechanics is key in order to avoid surprises and determining the appropriate number of reinstatements for multi-peril CAT XL covering Dutch based insurance policies. ■