DE NEDERLANDSCHE BANK N.V.

Guidance for Model Changes under Solvency II

The Solvency II legislation is not yet in force and it is therefore at the moment not possible to issue formal good practices based on these articles and requirements. However, the current pre-application process for internal models under Solvency II calls for guidance and it is the intention of De Nederlandsche Bank N.V. (DNB) to convert this guidance into a Good Practice in the future.

Disclaimer

This guidance is meant for undertakings under DNB's supervision, without restricting their room for interpretation of principle-based regulation but aiming for transparency of the supervisory practice. This guidance expresses DNB's views, making it possible for undertakings to make it part of their considerations while assessing their particular circumstances. This guidance is not mandatory but does give an insight into DNB's expected line of thinking, is indicative and does not exclude other possible interpretations by undertakings.

Relevant regulations

This guidance is based on the following regulations (which are not yet in force):

- EU Directive 2009/138/EC Article 44
- EU Directive 2009/138/EC Article 115
- Implementing Measures (level 2) Articles 204 IM2, 205 IM3, 232 TSIM 21 and 234 TSIM 23

EIOPA has also drafted preparatory guidelines (level 3) which are relevant to this guidance. We have included the principles underlying this level 3 where relevant.

Introduction

This guidance is relevant to undertakings that aim to use a full or partial internal model under Solvency II and that have been admitted to or want to enter the pre-application for the internal model approval process. This guidance sets out our intended good practices for model changes (MC), hereinafter referred to as good practices.

Several topics regarding MC are included in this guidance, divided into the following chapters:

- Chapter 1: Introduction
- Chapter 2: Governance of Model Changes
- Chapter 3: Sources, triggers, operational changes and input into the model
- Chapter 4: Distinction between Major and Minor Changes
- Chapter 5: Reporting Model Changes
- Chapter 6: Model change process in the pre-application
- Chapter 7: Other matters

Chapters 2 to 7 include multiple good practices that are numbered and shaded. These good practices are often accompanied by an introductory and/or an explanatory paragraph. In the three annexes some items are specified in more detail to assist undertakings in drafting their policies.

Background

Although Solvency II sets out several requirements for MC, effective execution of these requirements requires some interpretation in practice and some items are left to undertakings to elaborate. We reviewed the Model Change Policies (MCP) of several undertakings and found that some requirements were not clear to the undertakings and that they would welcome guidance. Based on these experiences and our understanding of the Solvency II requirements, we have established a number of good practices as guidance for undertakings in the Dutch insurance market wishing to apply for an IM.

These good practices reflect our current thinking. While undertakings might choose other options, the underlying principles and requirements should be kept in mind.

Chapter 1: Introduction

Many insurance undertakings have been developing Internal Models (IM) for years now, which in several cases have been assessed multiple times by supervisors and are sometimes already being used to manage the business. Although Solvency II is not yet in force and formal approval of IMs is not yet under discussion, with these maturing IMs the phase gradually emerges whereby in the pre-application (possibly different in each undertaking) the governance around model changes will operate in a way similar to the business-as-usual situation. In the business-as-usual situation it is expected that changes to the model will be needed to reflect changes to the business and the environment or to improve the model. It is the responsibility of the undertaking to ensure that the model continues to operate properly on a continuous basis, meaning that it should adequately reflect its risk profile and comply with the requirements. This will improve the accuracy of the results produced, enhance the uses of the model and improve the operability of the model, ultimately leading to better information, better risk management and a better basis for strategic decisions based on the model. It requires the undertakings involved to have an appropriate model change process that provides supervisors with sufficient comfort about the changes made to the internal model. Therefore, the model change policy is an essential component of the governance of the internal model.

Chapter 2: Governance of Model Changes

The Directive stipulates that Risk Management is responsible for the IM and for documenting any changes in the IM, making Risk Management the natural function for drafting the MCP. In practice we sometimes find that Model Validation is involved in the drafting of the MCP. However, in all cases the MCP is the responsibility of the model owner for design and execution.

1. The model owner is responsible for design and execution of the MCP.

Model Changes can arise from quite different sources, as will be discussed below in Chapter 3. From this diversity of sources the potential changes or candidates for changes will be identified. To obtain an overview of all the changes from the different sources and to assess which ones need to be reported as major or minor, clear assignment of these tasks is necessary. It would be logical to assign these tasks to the model owner. The broader governance framework of the undertaking will cover the identification of candidates for potential changes, their assessment, their selection and the ultimate internal sign-off. The supervisory approval of major changes could be seen as an extension of the internal sign-off. One important process that should be harnessed to identify potential changes to the internal model is the validation of the model. Material weaknesses or shortcomings identified during the validation are obvious triggers for changes to the model. The teams that develop and run the model, e.g. capital modellers or actuaries, are likely to form views of changes that will improve the model. Users can also be considered as key contributors to the identification of potential changes. The next step in the governance will be to assess those potential changes with the aim of selecting those changes that bring the most value to the undertaking. The risk of non-compliance with the internal model requirements will form part of the assessment criteria.

When the undertaking identifies a breach of compliance with the requirements,[1] it should present a plan to restore compliance or demonstrate that the effect of the non-compliance is immaterial. Restoring compliance will include making changes to the model. An indication or evidence of non-compliance might arise from the application of some of the requirements, in particular the regular validation process, but might also arise from a source external to the model, such as the identification of a new emerging risk not captured by the model or any other risk management activities. It is the responsibility of the undertaking to ensure that the supervisor knows about changes that might have impacted its decision to approve the internal model.

[1] In particular in accordance with article 118 of Directive 2009/138/EC

It is a task of the model owner to have oversight over possible model changes, to take care of a proper follow up of these signals (i.e. taking a substantiated decision on whether it is a model change or not) and reporting to the supervisor. Weak governance of the changes to the model is likely to give rise to supervisory concerns of future downward drift of the capital requirement or other failure of compliance. Therefore, it is recommended to have the aforementioned tasks clearly assigned within the undertaking.

2. The responsibility for oversight over possible model changes, proper follow up of these signals and reporting to the supervisor is clearly assigned.

Involvement of senior management with model changes is needed, certainly for major changes. This involvement is expected in at least two stages of the model change process. The first is where decisions have to be taken which changes have to be developed and what the main requirements for these changes are. The second is where the actual model changes have to be approved. The validation of the changes covering the compliance with the internal model requirements will provide the relevant information for the management to verify that after implementation of the change the model continues to comply with the internal model requirements. This critical step in the process of changing the internal model is the opportunity for senior management to engage with the changes developed before they start to impact the risk management, the decisions made by the undertaking and in some cases the solvency capital requirement.

3. Senior management is involved in the governance of model changes, both in a preliminary phase and in the approval of model changes.

The implementation is the last step of the transition to business-as-usual. This will also be subject to validation to ensure that the changed model is correctly implemented. We also refer to our Model Validation Guidance v1.2 (Chapter 5, guidance 23).

4. Undertakings conduct an implementation validation for model changes.

A tool likely to be used is the Analysis of Change that links the changes observed in the outputs of the internal model to the different components of the change. Although not explicitly required, an AoC is strongly recommended and can be seen as proof of use. In this AoC, model changes are expected to be reported as a line item, identifying the effect of each major change separately. The effect of minor changes can be identified at an aggregate level.

5. The effects of model changes are identified in the Analysis of Change of the SCR.

Chapter 3: Sources, triggers, operational changes and input into the model

a) Sources

Sources of model changes refer to events that could cause an internal model to be less appropriate or no longer appropriate. These could be external events, such as a change in economic reality (for example low interest rates), a change in legislation or scientific developments. Sometimes a source might be less obvious. For example, a change in the market with the entry of a new competitor identified as likely to impact the whole market could be considered to trigger a change in the assumptions of profitability of the future business for the impacted line of business. A forward-looking approach is required. A model that will only be accurate for past periods will not be suitable to calculate the solvency capital requirement.

Sources of changes can also be internal, such as a change in risk profile (for example a new product or a different asset mix). Internal models are tailor-made for the entity-specific situation and material changes in the business can affect the appropriateness of the model. A particular example is the change to the technical provisions tools not included in the internal model, which, although not a direct change to the model, can be a source of a potential change of the internal model.

Undertakings should be aware that the IM does not consist only of the calculation kernel but also includes other aspects, such as the governance around it, the IT facilitating it and the data used in the IM. Elaborating on governance, two types of change in governance will be considered as a source of model changes. Firstly, changes to the governance of the undertaking, such as a change in legal structure, might require amending the ability of the model to produce outputs at the relevant level of granularity. Secondly, changes to the governance of the internal model. Examples are changes in the seniority level of those involved in the decision-taking or changes in the model validation process, model validation policy, etc. All these will clearly be model changes.

Therefore, in considering potential sources for model changes, undertakings should take a broad view. This is laid down in the Explanatory Text to the Preparatory Guidelines that EIOPA issued in September 2013. For the sake of convenience, the particular section of the Explanatory Text with examples is included in Annex 1 of this Guidance. It clearly shows the line of thinking an undertaking should follow in considering possible model changes.

6. Undertakings take a broad view in considering potential sources of model changes, including all items that can potentially influence the outcome, the uses and/or operation of the IM.

7. Undertakings are aware that the MCP should be adjusted if they identify new sources of model changes.

b) Triggers

Triggers are signals that a relevant event has happened that might be a source for a change of the internal model. The event itself, such as a material change in risk profile, might already trigger the question of whether the model should be revised. However, it will not always be possible to answer this question based on the mere occurrence of the event itself. Changes to the risk profile must also be considered in relation to the knowledge and information available to assess the risks that the undertaking is facing. In particular, as more information becomes available either through the internal collection of data such as claims or through an improvement in the understanding of the risk such as academic research or broad data gathering, this should be considered as a potential trigger for a change to the model. Moreover, some sources of change might be more subtle and could escape attention. Therefore, the use of certain tools is necessary to identify such sources and/or to determine the effect of those sources on the internal model. Already mentioned in Chapter 2 are the outcomes of Model Validation and the feedback from model users and/or model developers. Other triggers could be the ORSA, where the undertaking specifically considers its risk profile, and the outcome of stress and scenario testing. Also, reverse stress testing can be a trigger to show that certain shocks or diversification assumptions are too mild or too aggressive.

Another interesting tool is the P&L attribution that might trigger a model change. For example, when the loss on equity is close to the calculated SCR for equity and the specific period is not regarded as very stressful, it should be a trigger to reassess the model. Another example is of course a material effect that cannot be explained by the risk factors and will be attributed as non-explained.

Although triggers are not model changes, they can sometimes be clear indicators that a model change is needed. Undertakings should therefore be aware of these triggers and carefully consider whether or not a model change is required. These considerations should be clearly substantiated and documented to allow supervisors to establish afterwards that all relevant triggers have been considered and appropriately addressed.

8. Undertakings consider all relevant triggers to assess whether a model change is needed. The choices made are substantiated and documented.

c) Operational changes

Given the sources of model changes as discussed above, there are many triggers to consider a potential model change. However, the presence of a trigger will not always result in a model change. For instance, not all changes are considered to be relevant. Changes that arise from the normal day-to-day operations (e.g. the replacement of a single member of an important committee by his/her successor in the undertaking) are not seen as model changes but as operational changes. However, there is a thin line between operational changes and model changes. Continuing the previous example, changing the whole committee could very well be regarded as a model change.

9. Undertakings clearly define in the MCP what changes will be considered operational changes instead of model changes.

d) Regular updates

As part of the day-to-day operations, the data used in the internal model will also be updated. Three types of data can be distinguished:

- Exposure data: data related to the insurance policies and data related to the composition of the asset portfolio.
- External parameters: examples are mortality tables and market data when they are not used for calibration of the model.
- Calibration data: data used in the calibration of the internal model, such as market data, lapse data and claims data.

Regular updates of the exposure data and external parameters are in general not considered model changes. However, in some cases these updates might reflect a change in the risk profile or a change in the external environment that should be reflected in the internal model. For example, in the event of a change of the mortality table, the life risk model might have to be updated to ensure consistency between the technical provisions and the internal model. In these cases a trigger should indicate that a model change is needed. Undertakings develop their own criteria when such updates will qualify as a model change and include that in the model documentation.

10. Updates of exposure data are not considered model changes, unless they reflect a change in the risk profile. Undertakings develop their own criteria when updates will qualify as a model change. Updates of external parameters are not considered model changes unless they reflect a change in the external environment.

Entities update the calibration of their models with the most recent calibration data on a regular basis to keep it aligned with developments that have occurred. These updates are in principle considered to be model changes. However, this proposition comes with some practical challenges, as an internal model contains a high number of parameters which are calibrated on a regular basis. Qualifying each change in such a parameter as a model change could place quite a burden on companies, considering that a sound and well-controlled process is of greater interest than the value of the data or to some extent the resulting parameters. The object of the change could then become the process for updating the internal model parameter itself, provided that the process is robust, objective and transparent and forms part of the methodology of the internal model approved by the supervisor. As part of this process the frequency, methods, the model's limits and governance of a regular calibration or recalibration are described. Changes in the calibration of the internal model due to regular calibration data updates in accordance with this process and approved by the supervisor are then not considered as model changes. However, any change in this process will be a model change.

It will not be good practice to apply the update process blindly, as an unexpected change in the observational data might make the estimation method inappropriate, so some safeguards and boundaries will have to be in place.

11. Changes in the calibration of the internal model due to regular calibration data updates are considered model changes, unless these recalibrations are performed in accordance with a predefined process that has been approved by the supervisor as part of the internal model.

Chapter 4: Criteria for assigning Major and Minor Changes

a) General

The classification of changes in minor and major is a requirement that involves consequences for the interaction with the supervisor. In considering whether a change is major or minor, undertakings often tend to base their decision solely on quantitative criteria, such as the effect on the total SCR. However, the impact on the SCR is a crude indicator and it will be very difficult to set a threshold that will satisfy both the undertaking and the supervisor if the change of the SCR is the main or sole criterion to classify a major change. For example, a fundamental change in methodology that does not (immediately) lead to a significant change in the calculated SCR will not be captured by a quantitative criterion. Also, some sources of change (such as governance or IT) will not trigger a quantitative criterion. Therefore, it is essential that undertakings use quantitative and qualitative criteria.

12. It is essential that undertakings use quantitative and qualitative criteria to determine whether changes are major or minor.

b) Quantitative criteria

In the assessment of MCPs we have seen a wide variety of thresholds used as a quantitative criterion. A common feature was that none of these figures were substantiated and based only on a change in the total SCR. DNB is certainly not aiming for a very low hurdle that would result in as many changes as possible being reported as major. On the other hand, DNB also wants to avoid situations where the hurdle is so high that no or almost no major changes are reported. Therefore, undertakings should strive for a quantitative criterion which gives DNB the comfort that all eligible changes will be presented as a major change for approval. A possible approach is that undertakings could use the pre-application to see what the effect is of a certain quantitative criterion (dry run) and discuss with DNB whether this would provide enough comfort. This would naturally result in the desired substantiation of the quantitative criterion. Where the modelling techniques are more established, a higher threshold might be more acceptable, whereas if the modelling techniques or the data available make the outcome of the modelling more uncertain or dependent on key assumptions, a lower threshold is more appropriate.

13. Undertakings substantiate the quantitative criteria used, providing comfort to the supervisor that an appropriate hurdle is applied.

Very simple measures, such as the number and type of material expert judgments included in the change and the number and type of uses that will be impacted by the change, can be used as indicators to set criteria to classify changes as major.

14. Quantitative criteria do not necessarily have to be linked to the SCR.

Certainly over time it can happen that subsequent minor changes result in an IM that deviates significantly from the IM the supervisor approved before. Undertakings should be aware that this could happen and consider whether this should qualify as a major change, certainly if no other major change was reported during this period.

15. The possibility that (over time) an accumulation of minor changes can result in a major change is to be considered and included in the MCP.

c) Qualitative criteria

We found that only a few undertakings had some qualitative criteria for a major change and this is effectively an area undertakings have to work on. Some changes will not necessarily fail to meet the requirements but will make a material aspect of the previous assessment by the supervisor irrelevant due to their nature. It is then necessary to submit the change to the supervisor for approval as a major change. This is the case, for instance, of material changes in the use of the model. Other examples are the inclusion in the model of new types of mitigation techniques, new management actions or the introduction of new elements to support the loss absorbency of deferred taxes.

Qualitative changes that are considered to be material, such as the outsourcing or insourcing of relevant components for risk measurement, would qualify as a major change. A fundamental change of external data sources could be a major change. However, if it would be only replacing one supplier with another (e.g. Bloomberg or Reuters for market data) and there would be no impact on the outcome, this would be a minor change. Other qualitative examples of a minor change are the use of a new software version without significant functional changes or a small correction in a formula in the model without material impact on the outcome.

As mentioned, these are just a few examples and undertakings are encouraged to develop their own set of qualitative criteria that sufficiently covers all possible sources of change.

16. Undertakings develop their own set of qualitative criteria that covers all possible sources of model change.

Some changes are methodological with a minor effect on the SCR given the specific circumstances. However, when circumstances change, their impact could be major. Also, a change in the methods applied in the internal model can encompass a change in the view of risk or a change in the way of assessing risks in the internal model. Both are of interest to the supervisor and presumably to senior individuals or committees within the undertaking. This interest is legitimate, irrespective of the immediate quantitative impact of the change on the outputs of the model. Moreover, the tests and standards on internal models in Solvency II include many requirements with respect to conceptual soundness and adequate techniques. Therefore, methodological changes could qualify as major changes, even when the impact on the SCR is minor. However, it is possible that the greater part of methodological changes will not be major. Therefore undertakings identify upfront in the model documentation which possible changes in methodology are major in all cases.

17. Undertakings identify upfront which methodological changes are considered to be major changes in all cases.

For the other methodological changes the criteria for major/minor include not only the effect on the SCR, but also other (qualitative) criteria such as the effect on the SCR in other (adverse) circumstances or the consequences for the use of the internal model.

18. Other methodological changes are assessed not only on the basis of their (immediate) effect on the SCR but also on the basis of other criteria.

More or less the same logic as for methodological changes holds true for changes in key assumptions and/or key expert judgments. Starting from the technical specification of its model, an undertaking identifies the key assumptions or key expert judgments that, if changed, will qualify as major.

19. Undertakings identify upfront which assumptions and expert judgements are considered to be key and where a change will therefore be major.

In the technical specification undertakings can also identify in advance indicators that can be seen as a signal for a major change.

20. Indicators for major change or changes qualifying as major are already identified in the model documentation.

The distinction between major and minor changes may not always be straightforward. As this distinction is important for the supervisor, we may want to assess whether an undertaking has made this choice in an appropriate manner. Therefore, undertakings may want to document their substantiation for qualifying changes as major and minor.

21. Undertakings document their substantiation for qualifying changes as major or minor.

Chapter 5: Reporting Model Changes

Clear requirements for reporting changes to the supervisor are useful for consistency in reporting. The Solvency II provisions do not explicitly require such description to be included in the policy. Nevertheless, its inclusion will provide the supervisor with some comfort that relevant information on minor changes will be reported. Moreover, if it is not clear what will be reported, this will hamper the collection of information needed for reporting. In particular, the undertaking might include in its policy some indications and specifications about how the minor changes will be reported quarterly to the supervisors. To assist undertakings we have included in Annex 2 items that we deem useful in a report to the supervisor.

22. The MCP includes reporting requirements, facilitating consistency and assisting collection of information.

In principal model changes should be validated independently before being reported to the supervisor. This certainly applies to major changes. Where minor changes are concerned, however, it could be that, because of their number, they would put too much strain on model validation capacity. It is envisaged that in these cases model validation will take a risk-based approach, considering factors such as the nature and the extent of the particular change, the number of minor changes for a risk module in a certain period, the time until the next regular validation, etc.

23. Undertakings validate the model changes before they are reported to the supervisor, in principle, but a risk-based approach for minor changes is permitted.

There is a period between the time at which the need for a major model change is identified and the time at which the change is approved and implemented. When the old model ceases to be appropriate, the undertaking might consider a prudent capital approach (e.g. a self-imposed capital add-on). Until the new model is approved by the supervisor, the undertaking might already use the new model for managing its business but should still take the outcome of the old model into account. Of course, the supervisory reports should be based on the latest version of the model approved by the supervisor with the outcomes of the new model included in the explanatory notes.

24. From the time at which the model is considered to be inappropriate until the time at which the model change is approved and implemented, the undertaking considers the consequences for the use of the old model.

Making the supervisor aware that an application for major change will be submitted, and when, could be important for the allocation of supervisory resources in a timely manner. Engaging early with the supervisor on the scope and nature of the change might also help in reducing the time necessary for the application to be assessed.

25. It is deemed a prudent approach to advise the supervisor that a major model change is due.

In principle DNB will issue an opinion only on formally reported major model changes. However, under conditions it is possible that DNB provides its tentative opinion on the concept before the factual implementation of a model change. The conditions are that there is sufficient documentation of the intended model change and a model validation report covering the concept. It should also be management's unambiguous intention to implement this particular model change.

26. Under conditions it is possible that DNB provides a tentative opinion on a conceptual model change before it is implemented.

Chapter 6: Model change process in the pre-application

Once an appropriate MCP has been established, undertakings should seek to provide the supervisor with comfort that qualifying changes are submitted for approval as major changes (see also Chapter 4 paragraph b). To arrive at an agreement on the criteria applied and achieve this before the formal application, it is deemed best to use the pre-application period, especially when (large) parts of the model have already been assessed by the supervisors. Undertakings then have an effective model change process in the pre-application period as a dry run to see what the effect is of the quantitative and qualitative criteria. Of course, no formal prior approval of major changes is required during the pre-application.

Also, past changes made to the developing model or to a capital model can provide valuable insights. 'Back-testing' the model change policy, by retrospectively applying the criteria in the in-development policy to changes made to the capital model in the past, can be part of the internal development of the policy but is also useful to provide the supervisor with examples and reassurance that the policy is fit for purpose.

27. The pre-application period is used to have a dry run of the model change process and discuss the outcome with the supervisor to provide enough comfort before the formal application.

Please note that having an adequate MCP is a precondition for firms that are aiming to receive a 'minded to approve' opinion by DNB, as a result of a trial application or a subset of the application package.

Although DNB encourages a dry run and/or backtesting during the pre-application it is DNBs expectation that during the remainder of the pre-application the number of model changes will not be enough to obtain enough comfort about the proper functioning of the model change process. Therefore DNB envisages that this will be subject to an evaluation some years after approval.

Chapter 7: Other matters

After model approval, the proper functioning of the MC process will be one of the pillars supervisors will rely on. Therefore, the continuous functioning of this process is important and needs to be assessed regularly by Model Validation and/or Internal Audit.

28. The MC process is subject to assessment by Model Validation and/or Internal Audit.

From the stage in which the model change process becomes effective, undertakings might learn of areas where they can or should improve their process. Undertakings need to have a feedback loop to implement lessons learned and adjust the MCP accordingly.

29. Undertakings have a feedback loop to implement lessons learned and adjust the MCP accordingly.

Under Solvency II, the formally required scope of the MCP is limited to the internal model. However, within every undertaking there are many other important models that would also benefit from a structured model change process. Therefore, DNB recommends undertakings to apply the MCP also to models outside the internal model, obviously without supervisory approval and reporting.

30. The MCP is also applied to models outside the internal model.

Version control

Version	Date	Author	Change
0.1	13-08-2013	Ravi Bharos	First draft
0.2	21-08-2013	Ravi Bharos	Comments by L. Flink, G. Wiersma and E.J. Bodemann
0.3	02-09-2013	Ravi Bharos	Comments by L. Flink and W. Baart
0.4	12-09-2013	Werner Baart	Sources and triggers
0.5	08-10-2013	Ravi Bharos	Minor changes, Basel II experiences
0.6	16-10-2013	Ravi Bharos	Addition of triggers paragraph
0.7	24-11-2013	Ravi Bharos	Text revisions, comments by L. Flink
0.8	2-12-2013	Ravi Bharos	Language and textual corrections
1.0	6-12-2013	Ravi Bharos	Draft version for informal consultation
1.1	2-2-2014	Ravi Bharos	Comments industry in consultation round
2.0	11-2-2014	Ravi Bharos	Comments M. Kamphuis

Annex 1 Section 3.18 of the explanatory text on the EIOPA guidelines (September 2013) on pre-application for IM

3.18. As potential sources for change, the model change policy may for instance, cover changes to or arising from but not limited to, the following areas:

- Structure of the model (including use of IT systems and platforms).
- Methods used to calculate the probability distribution forecast (including external models and data).
- Assumption and parameter, or process to derive such assumption and parameter if such process is clearly defined, documented and part of the model governance.
- Data governance, processing and application of data as well as the data policy.
- System for measuring diversification effects or to take into account the dependencies across risks categories.
- Use of the internal model including changes in reporting and outputs from the model.
- Nature, scale and complexity of the risk profile (including material changes in business model, business strategy, products and lines of business, emerging risks, asset management policy and any other relevant changes to the risk profile).
- Outsourcing (or insourcing activities previously outsourced) activities related to the internal model or the identification, measurement, monitoring and reporting of risks.
- Legal environment may impact the internal model either through changes in jurisdiction or changes in law relevant to the undertakings within the same regulation.
- Where applicable, any change that might impact the internal model, for example changes that might impact inputs to the internal models.

Annex 2 Possible reporting items (non-exhaustive)

Major change:

- Title or short description of the change
- Summary or outline of the (nature of) the change
- Background and underlying reasons/rationale for the change
- Implications for the design and functioning of the IM, including effects of the change on different business lines, risk categories etc. (qualitative description of organisational impacts etc., comparison of the situation before and after the change)
- Model documentation with a clear description of the ex-ante and ex-post situation
- Model Validation report
- Calculation of the effects of the change on different business lines, risk categories (calculation with the old model and with the changed model based on the same dataset)
- Substantiation why it is qualified as a major change

Quarterly report on minor changes:

- Title or short description of the change
- Summary or outline of the (nature of) the change
- Background and underlying reasons for the change
- Effect of the accumulated changes on different business lines, risk categories, etc.
- Model Validation outcome or date of planned model validation
- Ex-ante: Indication/estimation of the quantitative and/or qualitative effects of the change
- Ex-post: Outcome of movement analysis
- Substantiation why it is qualified as a minor change