

Guidelines on the use of internal models

Introduction

- 1.1. According to Article 16 of Regulation (EU) 1904/2010 of 24 November 2010 (hereafter, EIOPA Regulation)¹ EIOPA is issuing Guidelines addressed to supervisory authorities and insurance or reinsurance undertakings on the Use of Internal Models in application of Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)², in particular in Articles 112, 113, 115, 116, 120 to 126 and 231 as further developed by Title I, Chapter VI and Title II, Chapter II of Commission Delegated Regulation (EU) 2015/35 of 10 October 2014 supplementing Directive 2009/138/EC (hereafter, Commission Delegated Regulation 2015/35)³. These Guidelines also take into account the EIOPA Implementing Technical Standards on Internal Models Approval Processes and on the Process to Reach a Joint Decision for Group Internal Models⁴.
- 1.2. The EIOPA Guidelines on the use of internal models aim to provide guidance on what supervisory authorities and insurance or reinsurance undertakings should consider in order to enable supervisory authorities to approve and continue to allow the use of an internal model for the calculation of the Solvency Capital Requirement and to enable insurance and reinsurance undertakings to use an internal model for the calculation of its Solvency Capital Requirement in compliance with the Solvency II requirements as further specified in Commission Delegated Regulation 2015/35.
- 1.3. The Guidelines also aim to increase convergence of supervisory practices with regard to the assessment of internal models. In the case of internal models for groups, there should be appropriate level of communication between supervisory authorities within the colleges, in particular between the supervisory authorities involved.
- 1.4. The Guidelines are addressed to supervisory authorities under Solvency II.
- 1.5. All the Guidelines apply, unless otherwise explicitly stated, to the use of:
 - An internal model, full or partial, submitted for decision to use or currently used for the calculation of the Solvency Capital Requirement of an insurance or reinsurance undertaking.
 - An internal model for a group, full or partial, as defined below, submitted for decision to use or currently used for the calculation of the Solvency Capital Requirement.
- 1.6. These Guidelines shall apply from 1 April 2015.
- 1.7. For the purpose of the Guidelines following definitions apply:

¹ OJ L 331, 15.12.2010, p. 48–83

² OJ L 335, 17.12.2009, p. 1-155

³ OJ L 12, 17.01.2015, p. 1-797

⁴ <https://eiopa.europa.eu/Pages/Supervision/Insurance/draft-implementing-technical-standards-on-the-supervisory-approval-processes-for-solvency-ii.aspx>

- “*Internal model(s) for a group (or for groups)*” should be understood as both an internal model that is applied to be used for the calculation only of the consolidated group Solvency Capital Requirement (under Article 230 of Solvency II) and an internal model that is applied to be used for the calculation of the consolidated group Solvency Capital Requirement as well as the Solvency Capital Requirement of at least one related insurance undertaking included in the scope of this internal model for the calculation of the consolidated group Solvency Capital Requirement (referred as group internal model under Article 231 of Solvency II in the Guidelines).
- The concept of “*richness of the probability distribution forecast*” is determined mainly in two dimensions: the undertaking’s extent of knowledge about the risk profile as reflected in the set of events underlying the probability distribution forecast and the capability of the calculation method chosen to transform this information into a distribution of monetary values that relate to changes in basic own funds. The concept of richness should not be reduced to the granularity of the representation of the probability distribution forecast because even a forecast in form of a continuous function might be of low richness.
- The “*reference risk measure*” should be understood as the Value-at-Risk of the basic own funds subject to a confidence level of 99.5% over a one-year period as set out in Article 101(3) of Solvency II.
- “*Analytical closed formulae*” should be understood as direct mathematical formulae that link the risk measure chosen by the undertaking to the reference one as defined above.
- “*t=0*” should be understood as the date of which the Solvency Capital Requirement computation is made by the undertaking according to its internal model.
- “*t=1*” should be understood as one year after the date of which the Solvency Capital Requirement computation is made by the undertaking according to its internal model.

Chapter 1: Application

Guideline 1 – Pre-application

- 1.8. Supervisory authorities should consider putting in place a pre-application process in order to form a view on how prepared an insurance or reinsurance undertaking is to submit an application for the use of an internal model for the calculation of the Solvency Capital Requirement under Solvency II and to meet the internal models requirements set out in Solvency II.

Guideline 2 - Information to be submitted in an application for the use of group internal models under Article 231 of Solvency II

- 1.9. In the case of an application for the use of a group internal model under Article 231 of Solvency II, the applicant should include for each related undertaking that applies to use the group internal model for the calculation of its Solvency Capital Requirement the information set out in Article 2 of the EIOPA Implementing Technical Standard on Internal Models Approval Processes which is specific to this related undertaking, unless this information is already covered in the documents submitted by the participating insurance or reinsurance undertaking.
- 1.10. The applicant should also explain, for each related undertaking included in the application to use the group internal model for the calculation of its Solvency Capital Requirement, to what extent the development, implementation or validation of the group internal model components which are necessary for the calculation of the Solvency Capital Requirement of the related undertaking, are performed by another related undertaking within the group.

Guideline 3 - Request for further information in the case of an application for the use of internal models for groups

- 1.11. In the case of an application for the use of an internal model for a group, a request for further information from a related undertaking by the supervisory authorities involved as defined in Article 343(2) of Commission Delegated Regulation 2015/35 supervising this undertaking, should first be made to the group supervisor. The group supervisor should then forward the request to the related undertaking, or provide the supervisory authority involved requesting the information with the relevant documents if they have already been provided to the group supervisor.
- 1.12. In the case of an application for the use of a group internal model under Article 231 of Solvency II, any supervisory authority concerned as defined in Article 347(3) of Commission Delegated Regulation 2015/35, should be able to directly request further information from the related undertaking it supervises in order to assess the compliance of the group internal model with the internal models requirements in respect of the Solvency Capital Requirement of this related undertaking. In such case, this supervisory authority concerned should inform promptly the group supervisor about such request for information.

Guideline 4 - Intention to extend the scope of an application for the use of internal models for groups

- 1.13. In the case of an application for the use of an internal model for a group, as part of the justification of the scope of the internal model described in Articles 343(5) or 347(6) of Commission Delegated Regulation 2015/35, the applicant should describe in the application the intention, if any, to extend the scope of the internal model in the future in order to include, for the purposes of the calculation of the group Solvency Capital Requirement, any of the related undertakings within the scope of group supervision but which are not included according to the current application in the scope of the internal model for the calculation of the group Solvency Capital Requirement.
- 1.14. In the case of an application for the use of a group internal model under Article 231 of Solvency II, as part of the justification of the scope of the internal model, the applicant should also describe the intention, if any, to extend in the future the scope of the internal model in order to include the calculation of the Solvency Capital Requirement of any related undertaking which is not included in the scope of the current application for the calculation of its Solvency Capital Requirement with the group internal model.

Guideline 5 - Technical specifications in the case of an application for the use of group internal models under Article 231 of Solvency II

- 1.15. In case of an application for the use of a group internal model under Article 231 of Solvency II, the applicant should explicitly state in the application to what extent the technical specifications of the group internal model may differ when the internal model is used for the group Solvency Capital Requirement calculation and the calculation of the Solvency Capital Requirement of related undertakings, including:
 - a) the treatment of intra-group transactions for the calculation of both the Solvency Capital Requirement of related undertakings and where applicable the group Solvency Capital Requirement;
 - b) the list of parameters within the internal model that may be set differently for different calculations performed with the group internal model, for the purposes of the calculation of the group Solvency Capital Requirement and the calculation of individual Solvency Capital Requirements; and
 - c) the description of group specific risks only relevant in the group Solvency Capital Requirement calculation.

Chapter 2: Model changes

Guideline 6 - Scope of the policy for model changes

- 1.16. The insurance or reinsurance undertaking, when establishing the policy for changing the model, should ensure that this policy covers all relevant sources of change that would impact its Solvency Capital Requirement and at least the changes:
- a) in the system of governance of the undertaking;
 - b) in the undertaking's compliance with the requirements to use the internal model;
 - c) in the appropriateness of the technical specifications of the undertaking's internal model; and
 - d) in the risk profile of the undertaking.
- 1.17. The undertaking should also ensure that the policy for changing the model:
- a) specifies when a change to the internal model shall be considered as major or minor and when a combination of minor changes shall be considered a major change.
 - b) sets out the governance requirements in relation to changes to the internal model, including internal approval, internal communication, documentation and validation of changes.
- 1.18. The insurance and reinsurance undertaking should not cover the inclusion of new elements, such as the inclusion of additional risks or business units, as part of the changes to the internal model pursuant to the policy for changing the internal model. The inclusion of new elements in the internal model should be subject to supervisory approval following the procedure described in Article 7 of the Implementing Technical Standard on Approval Processes for Internal Models.
- 1.19. The insurance or reinsurance undertaking should take into account the update of the parameters of the internal model as a potential source of changes to the internal model.

Guideline 7 - Defining a major change

- 1.20. Whilst the quantitative impact of a model change on the Solvency Capital Requirement or on individual components of the Solvency Capital Requirement may be one of the indicators the insurance or reinsurance undertaking decides to use to identify major changes, the undertaking should develop and use a number of other key qualitative and quantitative indicators to define a major change.

Guideline 8 – Report of minor and major changes as a combination of minor changes

- 1.21. The insurance or reinsurance undertaking should report minor changes to the internal model to the supervisory authorities quarterly or more frequently where appropriate. Minor changes to the internal model should be communicated in a summarised report that should describe both the quantitative and qualitative impacts of changes and the approximate cumulative quantitative and qualitative effects of the changes on the approved internal model.
- 1.22. The insurance or reinsurance undertaking should use the latest internal model approved by supervisory authorities as the reference for evaluating whether a combination of minor changes is considered as a major change, unless otherwise agreed with supervisory authorities.

Guideline 9 – Policy for changing the model for group internal models under Article 231 of Solvency II

- 1.23. In the case of a group internal model under Article 231 of Solvency II, the participating undertaking and the related undertakings applying to use a group internal model to calculate their individual Solvency Capital Requirement should develop one policy for changing the model.
- 1.24. The participating undertaking and the related undertakings applying to use a group internal model to calculate their individual Solvency Capital Requirement should ensure that the policy for changing the model includes a specification of major and minor changes with regard to the group, as well as each of the related undertakings included in the application to use the group internal model to calculate their individual Solvency Capital Requirement.
- 1.25. The participating undertaking and the related undertakings applying to use a group internal model to calculate their individual Solvency Capital Requirement should ensure that any change that is major for a related undertaking included in the application is classified as a major change within the policy.

Guideline 10 – Extension of use and extension of the scope of group internal models under Article 231 of Solvency II

- 1.26. The following extensions of the group internal model should be submitted by the applicant to the group supervisor following the same process as for a major change to the internal model as set out in Article 7 of the EIOPA Implementing Technical Standard on Internal Model Approval Processes:
 - a) the extension to calculate the Solvency Capital Requirement of a related undertaking currently included in the scope of the group internal model for the calculation of the group Solvency Capital Requirement but which is currently not using the group internal model for the calculation of its Solvency Capital Requirement;
 - b) the extension to cover new elements at the level of the group; and

- c) the extension to cover new elements at the level of a related undertaking currently using the group internal model for the calculation of its Solvency Capital Requirement, including the extension related to elements already used at the level of the group or of other related undertakings.

Chapter 3: Use test

Guideline 11 – Incentive to improve the quality of the internal model

- 1.27. The insurance or reinsurance undertaking should ensure that the internal model is used in its risk-management system and decision-making processes in a way that creates incentives to improve the quality of the internal model itself.

Guideline 12 - Use test and changes to the internal model

- 1.28. In the process of improving the quality of the internal model, when a major change has been internally approved by the administrative, management or supervisory body, the insurance and reinsurance undertaking should be able to demonstrate compliance with the use test taking into consideration:

- a) the different components of the use test;
- b) the different uses of their system of governance.

- 1.29. The insurance or reinsurance undertaking should monitor and be able to demonstrate that any time lag between identifying that a change to the internal model is needed and the actual implementation of the change is appropriate. In the case of an application for a major change during the approval period, the insurance and reinsurance undertaking should ensure that the use of the internal model in its decision making process is appropriate.

Guideline 13 – Understanding of the internal model

- 1.30. The insurance or reinsurance undertaking should consider different approaches for ensuring the understanding of the internal model by the administrative, management or supervisory body and by relevant users of the internal model for decision-making purposes.

- 1.31. With the aim of assessing their understanding of the internal model, supervisory authorities should consider interviewing persons from the administrative, management or supervisory body and persons who effectively run the insurance or reinsurance undertaking.

- 1.32. Supervisory authorities should also consider reviewing the documentation of the minutes of the board meetings or appropriate decision-making bodies to assess the insurance or reinsurance undertaking's compliance with the use test requirements.

Guideline 14 – Support of decision-making

- 1.33. The insurance or reinsurance undertaking should ensure and should be able to demonstrate that the internal model is used for decision-making.

1.34. In particular, when calculating the notional Solvency Capital Requirement for a ring-fenced fund, the insurance or reinsurance undertaking should comply with Article 81 of Commission Delegated Regulation 2015/35 and explain how it ensures consistency between these outputs as required by Article 223 of Commission Delegated Regulation 2015/35.

Guideline 15 – Use test specificities for group internal models under Article 231 of Solvency II

1.35. The participating undertaking and the related undertakings applying to use a group internal model under Article 231 of Solvency II to calculate their individual Solvency Capital Requirement should cooperate to ensure that the design of the internal model is aligned with their business. They should provide evidence that the internal model governance provides that:

- a) their individual Solvency Capital Requirement is calculated with the frequency required by Article 102 of Solvency II and whenever it is needed in the decision-making process;
- b) they can propose changes to the group internal model, especially for components that are material to them or following a change in their risk profile and taking into account the environment in which the undertaking is operating;
- c) the related undertakings possess the adequate understanding of the internal model for the parts of the internal model which cover the risks of that undertaking.

1.36. The insurance or reinsurance undertakings applying to use a group internal model to calculate their Solvency Capital Requirement should ensure that the design of the internal model is aligned with their business and their risk-management system, including the production of outputs, at group level and at related undertaking level, that are granular enough to allow the group internal model to play a sufficient role in their decision-making processes.

Chapter 4: Assumption setting and expert judgement

Guideline 16 – Materiality in assumptions setting

1.37. The insurance or reinsurance undertaking should set assumptions and use expert judgment, in particular taking into account the materiality of the impact of the use of assumptions with respect to the following Guidelines on assumption setting and expert judgement.

1.38. The insurance or reinsurance undertaking should assess materiality taking into account both quantitative and qualitative indicators and taking into consideration extreme losses conditions. The insurance or reinsurance undertaking should overall evaluate the indicators considered.

Guideline 17 – Governance of assumptions setting

- 1.39. The insurance or reinsurance undertaking should ensure that all assumption setting and the use of expert judgement in particular, follows a validated and documented process.
- 1.40. The insurance or reinsurance undertaking should ensure that the assumptions are derived and used consistently over time and across the insurance or reinsurance undertaking and that they are fit for their intended use.
- 1.41. The insurance or reinsurance undertaking should approve the assumptions at levels of sufficient seniority according to their materiality, for most material assumptions up to and including the administrative, management or supervisory body.

Guideline 18 - Communication and uncertainty in assumptions setting

- 1.42. The insurance or reinsurance undertaking should ensure that the processes around assumptions, and in particular around the use of expert judgement in choosing those assumptions, specifically attempt to mitigate the risk of misunderstanding or miscommunication between all different roles related to such assumptions.
- 1.43. The insurance or reinsurance undertaking should establish a formal and documented feedback process between the providers and the users of material expert judgement and of the resulting assumptions.
- 1.44. The insurance or reinsurance undertaking should make transparent the uncertainty of the assumptions as well as the associated variation in final results.

Guideline 19 - Documentation of assumptions setting

- 1.45. The insurance or reinsurance undertaking should document the assumption setting process and, in particular, the use of expert judgement, in such a manner that the process is transparent.
- 1.46. The insurance or reinsurance undertaking should include in the documentation the resulting assumptions and their materiality, the experts involved, the intended use and the period of validity.
- 1.47. The insurance or reinsurance undertaking should include the rationale for the opinion, including the information basis used, with the level of detail necessary to make transparent both the assumptions and the process and decision-making criteria used for the selection of the assumptions and disregarding other alternatives.
- 1.48. The insurance or reinsurance undertaking should make sure that users of material assumptions receive clear and comprehensive written information about those assumptions.

Guideline 20 - Validation of assumptions setting

- 1.49. The insurance or reinsurance undertaking should ensure that the process for choosing assumptions and using expert judgement is validated.
- 1.50. The insurance or reinsurance undertaking should ensure that the process and the tools for validating the assumptions and in particular the use of expert judgement are documented.
- 1.51. The insurance or reinsurance undertaking should track the changes of material assumptions in response to new information and analyse and explain those changes as well as deviations of realizations from material assumptions.
- 1.52. The insurance or reinsurance undertaking, where feasible and appropriate, should use validation tools such as stress testing or sensitivity testing.
- 1.53. The insurance or reinsurance undertaking should review the assumptions chosen, relying on independent internal or external expertise.
- 1.54. The insurance or reinsurance undertaking should detect the occurrence of circumstances under which the assumptions would be considered false.

Chapter 5: Methodological consistency

Guideline 21 - Consistency check points

- 1.55. The insurance or reinsurance undertaking should ensure consistency between the methods used to calculate the probability distribution forecast and the methods used for the valuation of assets and liabilities in the balance sheet for solvency purposes.
- 1.56. The insurance or reinsurance undertaking should check consistency at the following steps of the calculation of the probability distribution forecast, in case that they are relevant to the model part under consideration:
 - a) the consistency of the transition from the valuation of assets and liabilities in the balance sheet for solvency purposes to the internal model for the purpose of Solvency Capital Requirements calculations;
 - b) the consistency of the valuation of assets and liabilities in the internal model at the valuation date with the valuation of assets and liabilities in the balance sheet for solvency purposes;
 - c) the consistency of the projection of risk factors and their impact on the forecast monetary values with the assumptions on those risk factors used for the valuation of assets and liabilities in the balance sheet for solvency purposes;
 - d) the consistency of the re-valuation of assets and liabilities at the end of the period with the valuation of assets and liabilities in the balance sheet for solvency purposes.

Guideline 22 - Aspects of consistency

1.57. The insurance or reinsurance undertaking, when assessing consistency, should take at least the following aspects into account:

- a) the consistency of the actuarial and statistical techniques applied in the valuation of assets and liabilities in the balance sheet for solvency purposes, and in the calculation of the probability distribution forecast;
- b) the consistency of data and parameters that are used as input for the respective calculations;
- c) the consistency of the assumptions underlying the respective calculations, in particular assumptions on contractual options and financial guarantees, on future management actions and on expected future discretionary benefits.

Guideline 23 - Consistency assessment

1.58. The insurance or reinsurance undertaking should conduct regular consistency assessments on a quantitative basis whenever possible and proportionate.

1.59. The insurance or reinsurance undertaking, in its consistency assessment, should:

- a) identify and document any deviation between the calculation of the probability distribution forecast and the valuation of assets and liabilities in the balance sheet for solvency purposes;
- b) assess the impact of the deviations, both in isolation and in combination;
- c) justify that the deviations do not result in an inconsistency between the calculation of the probability distribution forecast and the valuation of assets and liabilities in the balance sheet for solvency purposes.

Chapter 6: Probability distribution forecast

Guideline 24 - Knowledge of the risk profile

1.60. To ensure that the set of events of the probability distribution forecast underlying the internal model is exhaustive, the insurance or reinsurance undertaking should put in place processes that enable it to maintain sufficient and current knowledge of its risk profile.

1.61. In particular, the insurance or reinsurance undertaking should aim to maintain the knowledge of risk drivers and other factors which explain the behaviour of the variable underlying the probability distribution forecast, so that the probability distribution forecast can reflect all relevant characteristics of its risk profile.

Guideline 25 - Probability distribution forecast richness

1.62. In assessing the appropriateness of the actuarial and statistical techniques used to calculate the probability distribution forecast Article 229 of Commission

Delegated Regulation 2015/35, the insurance and reinsurance undertaking should consider the capability of the techniques to process the knowledge of the risk profile as an important criterion.

- 1.63. The insurance or reinsurance undertaking should choose techniques that generate a probability distribution forecast that is rich enough to capture all relevant characteristics of its risk profile Article 229(e) of Commission Delegated Regulation 2015/35 and to support decision-making Article 226 of Commission Delegated Regulation 2015/35.
- 1.64. The insurance or reinsurance undertaking, according to Article 229(g) of Commission Delegated Regulation 2015/35 and as part of this methodological assessment, should consider the reliability of adverse quantiles resulting from the probability distribution forecast.

Guideline 26 – Assessment of the richness of the probability distribution forecast

- 1.65. To form a view according to Guideline 25, supervisory authorities should take into account at least:
 - a) the risk profile of the undertaking and to what extent it is reflected by the probability distribution forecast;
 - b) the current progress in actuarial science and the generally accepted market practice Article 229(a) of Commission Delegated Regulation 2015/35;
 - c) with respect to the level of probability distribution forecast richness, any measures that the insurance or reinsurance undertaking puts in place to ensure compliance with each of the internal model tests and standards set out in Articles 120 to 126 of Solvency II;
 - d) for a particular risk under consideration, the way in which the techniques chosen and the probability distribution forecast obtained by the insurance or reinsurance undertaking interact with other risks in the scope of the internal model as regards the level of richness of the probability distribution forecast Article 232 of Commission Delegated Regulation 2015/35;
 - e) the nature, scale and complexity of the risk under consideration as set out in Article 29(3) of Solvency II.

Guideline 27 – Probability distribution forecast enrichment

- 1.66. The insurance or reinsurance undertaking should ensure that the effort to generate a rich probability distribution forecast does not impair the reliability of the estimate of adverse quantiles resulting from the probability distribution forecast.
- 1.67. The insurance or reinsurance undertaking should take care not to introduce into the probability distribution forecast unfounded richness which does not reflect the original knowledge of its risk profile (see also Guideline 24).

1.68. The insurance or reinsurance undertaking should ensure that the methodology followed to enrich the probability distribution forecast complies with the statistical quality standards regarding methods, assumptions and data Articles 229, 230 and 231 of Commission Delegated Regulation 2015/35. Where these techniques involve the use of expert judgement, the undertaking should take into account the relevant Guidelines on assumptions setting and expert judgement.

Chapter 7: Calibration - approximations

Guideline 28 - Knowledge of approximations under extreme loss conditions

1.69. When an undertaking uses approximations instead of using the reference risk measure directly, the insurance or reinsurance undertaking should challenge and justify the reliability of the output of these approximations over time and, under extreme loss conditions, according to its risk profile.

1.70. In particular, when the insurance or reinsurance undertaking uses analytical closed formulae to recalibrate its capital requirement from the internal risk measure to the reference one, the insurance or reinsurance undertaking should demonstrate that the assumptions underlying the formulae are realistic and are also valid under extreme losses conditions.

Guideline 29 - Use of another underlying variable

1.71. The insurance or reinsurance undertaking, if it uses the variation of an underlying variable different from the basic own funds to derive the value of basic own funds for the calculation of the Solvency Capital Requirement, should demonstrate that:

- a) it is able to reconcile the difference between the basic own funds and the underlying variable at $t=0$;
- b) it understands the difference between the basic own funds and the underlying variable in any situation up to and including $t=1$, especially under extreme losses conditions, according to the undertaking risk profile.

Guideline 30 - Management actions if using a time period longer than one year

1.72. If the insurance or reinsurance undertaking, chooses in its internal model a time period longer than one year, the insurance or reinsurance undertaking should take into account management actions in the context of the Solvency Capital Requirement calculation, and should ensure that such management actions have effects on the balance sheet for solvency purposes between $t=0$ and $t=1$.

Chapter 8: Profit and loss attribution

Guideline 31 – Definition of profit and loss

- 1.73. The insurance or reinsurance undertaking should consider profit and loss as changes over the relevant period in:
- a) basic own funds; or
 - b) other monetary amounts used in the internal model to determine changes in basic own funds, such as the actual change in economic capital resources.
- To this end the profit and loss attribution should exclude movements attributable to the raising of additional own funds, the repayment or redemption of those funds and the distribution of own funds.
- 1.74. When it uses a variable other than the basic own funds in its internal model, the insurance or reinsurance undertaking should use this variable for the purposes of profit and loss attribution.
- 1.75. The undertaking should identify through the profit and loss attribution how changes in the risk drivers relate with the movement in the variable underlying the probability distribution forecast.

Chapter 9: Validation

Guideline 32 – Validation policy and validation report

- 1.76. The insurance or reinsurance undertaking should establish, implement and maintain a written validation policy which specifies at least:
- a) the processes and methods to validate the internal model and their purposes;
 - b) the frequency of regular validation for each part of the internal model and the circumstances that trigger additional validation;
 - c) the persons who are responsible for each validation task; and
 - d) the procedure to be followed in the event that the model validation process identifies problems with the reliability of the internal model and the decision-making process to address those concerns.
- 1.77. The insurance or reinsurance undertaking should document in a validation report the results of the validation as well as the resulting conclusions and consequences from the analysis of the validation.
- 1.78. The insurance or reinsurance undertaking should include in the validation a reference to the validation data sets as mentioned in Guideline 42 as well as the sign-off from the main participants in the process.

Guideline 33 – Scope and purpose of the validation process

- 1.79. The insurance or reinsurance undertaking, when specifying the purpose of the validation, should clearly set out the specific purpose of the validation for each part of the internal model.
- 1.80. The insurance or reinsurance undertaking should cover both qualitative and quantitative aspects of the internal model within the scope of the validation.

1.81. When considering the scope of the validation, in addition to considering the validation of the various parts of the internal model, the insurance or reinsurance undertaking should consider the validation in its entirety and in particular the appropriateness of the calculated probability distribution forecast to ensure that the level of regulatory capital will not be materially misstated.

Guideline 34 – Materiality in validation

1.82. The insurance or reinsurance undertaking should consider the materiality of the part of the internal model being validated when using materiality to decide on the intensity of the validation activities.

1.83. The insurance or reinsurance undertaking should consider the materiality of the parts of the internal model not only in isolation but also in combination when deciding how they should be validated appropriately.

1.84. The insurance or reinsurance undertaking should consider sensitivity testing when determining materiality in the context of validation.

Guideline 35 – Quality of the validation process

1.85. The insurance or reinsurance undertaking should set out all the known limitations of the current validation process.

1.86. Where there are limitations to the validation of parts which are covered by the validation process, the insurance or reinsurance undertaking should be aware of them and document these limitations.

1.87. The insurance or reinsurance undertaking should ensure that the assessment of the quality of the validation process explicitly states the circumstances under which the validation is ineffective.

Guideline 36 – Governance of validation process

1.88. The insurance or reinsurance undertaking should have in place appropriate governance around the communication and internal reporting of the results of the validation it carries out.

1.89. The insurance or reinsurance undertaking should form and communicate internally an overall opinion based on the findings of the validation process.

1.90. The insurance or reinsurance undertaking should pre-define criteria in order to determine whether the results, or part of the results, of the validation, are required to be escalated within this undertaking.

1.91. The insurance or reinsurance undertaking should clearly define the escalation path in such a way that the validation process remains independent from the development and operation of the internal model.

Guideline 37 – Roles in validation process

1.92. If parties other than the risk-management function contribute to specific tasks in the validation process, the insurance or reinsurance undertaking should

ensure that the risk-management function fulfils its overall responsibility as set out in Article 44 of Solvency II and Article 269(2)(a) of Commission Delegated Regulation 2015/35, including the responsibility to ensure the completion of the various tasks within the validation process.

- 1.93. The insurance or reinsurance undertaking should formally explain the role of each party in the validation process defined.

Guideline 38 – Independence of the validation process

- 1.94. The insurance or reinsurance undertaking should demonstrate that its risk-management function, in order to provide an objective challenge to the internal model, ensures that the validation process is done independently from the development and operation of the model. The risk management function of the undertaking should ensure that the validation tasks are set out and completed in a way that creates and maintains the independence of the validation process as set out in Article 241(2) of Commission Delegated Regulation 2015/35.

- 1.95. The insurance or reinsurance undertaking should decide on the parties which contribute to the tasks related to the validation process, taking into account the nature, scale and complexity of the risks that this undertaking faces, the function and the skills of people to be involved and how it ensures the independence of the validation process.

Guideline 39 – Validation specificities for group internal models under Article 231 of Solvency II

- 1.96. The participating undertaking and the related undertakings included in the application to use the group internal model under Article 231 of Solvency II for the calculation of their Solvency Capital Requirement, should establish a single validation policy to cover the validation process both at group and individual level.

- 1.97. The participating undertaking and the related undertakings should design the validation process of the internal model in the context of the calculation of both the consolidated group Solvency Capital Requirement and the Solvency Capital Requirement of related undertakings included in the application to use a group internal model. The participating undertaking and the related undertakings should explicitly set out this consideration in the validation policy established for the group internal model.

Guideline 40 – Application of validation tools

- 1.98. The insurance or reinsurance undertaking should consider using quantitative or qualitative validation tools besides those referred to in Article 242 of Commission Delegated Regulation 2015/35.

- 1.99. The insurance or reinsurance undertaking should understand the validation tools it uses and choose the appropriate set of validation tools in order to ensure an effective validation process. The insurance or reinsurance

undertaking should consider at least the following characteristics when selecting the validation tools:

- a) characteristics and limitations of the validation tools;
- b) nature: validation tools being qualitative, quantitative or a combination of both;
- c) knowledge required: the extent of knowledge required by the persons performing the validation;
- d) information required: potential restrictions to the amount or the type of information available for external versus internal validation;
- e) cycle of validation: validation tools relevant to cover every key assumption made at different stages of the internal model from development, to implementation and to operation.

1.100. The insurance or reinsurance undertaking should document in the validation report which parts of the internal model are being validated by each of the validation tools used and why these validation tools are appropriate for the particular purpose by describing at least:

- a) the materiality of the part of the model being validated;
- b) the level at which the tool is applied from individual risks, modelling blocks, portfolio, business unit to aggregated results;
- c) the purpose of this validation task;
- d) the expected outcome from the validation.

Guideline 41 – Stress tests and scenario analysis

1.101. The insurance or reinsurance undertaking should use stress tests and scenario analysis as part of the validation of the internal model.

1.102. The insurance or reinsurance undertaking should ensure that the stress tests and scenario analysis it uses cover the relevant risks and are monitored over time.

Guideline 42 – Validation data sets

1.103. The insurance or reinsurance undertaking should ensure that the selected data and expert judgement used in the validation process effectively allow it to validate the internal model under a wide range of circumstances that have occurred in the past or could potentially occur in the future.

Chapter 10: Documentation

Guideline 43 - Control procedures of documentation

1.104. In order to ensure the on-going quality of the documentation according to Article 243(3) of Commission Delegated Regulation 2015/35, the insurance or reinsurance undertaking should have in place at least:

- a) an effective control procedure for internal model documentation;
- b) a version control procedures for internal model documentation;
- c) a clear referencing system for internal model documentation which should be used in a documentation inventory required by Article 244(a) of Commission Delegated Regulation 2015/35.

Guideline 44 - Documentation of methodologies

1.105. The insurance or reinsurance undertaking should produce documentation which is detailed enough to evidence detailed understanding of the methodologies and techniques used in the internal model, including at least:

- a) the underlying assumptions;
- b) the applicability of such assumptions given the undertaking's risk profile;
- c) any shortcomings of the methodology or of the technique.

1.106. The insurance or reinsurance undertaking, when documenting the theory, assumptions and mathematical and empirical basis underlying any methodology used in the internal model, in accordance with Article 125(3) of Solvency II, should include, if available, the material steps of the development of the methodology, as well as any other methodologies which were considered but not subsequently used by the insurance or reinsurance undertaking.

Guideline 45 - Circumstances under which the internal model does not work effectively

1.107. The insurance or reinsurance undertaking should include in its documentation an overall summary of the material shortcomings of the internal model, consolidated in a single document, containing at least the aspects referred to in Article 245 of Commission Delegated Regulation 2015/35.

Guideline 46 - Appropriateness of documentation to addressees

1.108. The insurance or reinsurance undertaking should consider having documentation of the internal model that consists of more than one level of documentation for the internal model, commensurate with the different uses and target audiences.

Guideline 47 - User manuals or process descriptions

1.109. The insurance or reinsurance undertaking should have in place, as part of the documentation of the internal model, user manuals or process descriptions for operation of the internal model which should be sufficiently detailed to allow an independent knowledgeable third party to operate and run the internal model.

Guideline 48 - Documentation of model output

1.110. The insurance or reinsurance undertaking should retain, as part of the documentation of the internal model, the outputs of the model that are relevant to satisfy the requirements of Article 120 of Solvency II.

Guideline 49 – Documentation of software and modelling platforms

1.111. The insurance or reinsurance undertaking, in its documentation, should provide information about the software, modelling platforms and hardware systems used in the internal model.

1.112. When using software, modelling platforms and hardware systems, the insurance or reinsurance undertaking should provide in the documentation sufficient information to be able to assess and justify their use, and enable supervisory authorities to assess their appropriateness.

Chapter 11: External models and data

Guideline 50 – External data

1.113. The insurance or reinsurance undertaking, given the nature of external data, should be able to demonstrate an appropriate level of understanding of the specificities of external data used in the internal model including any material transformation, rescaling, seasonality and any other processing inherent in the external data.

1.114. In particular, the insurance or reinsurance undertaking should at least:

- a) understand the attributes and limitations or other peculiarities of the external data;
- b) develop processes for identifying any missing external data and other limitations;
- c) understand the approximations and processing made for missing or unreliable external data;
- d) develop processes to run timely consistency checks including comparisons with other relevant sources to the extent that data are reasonably available.

Guideline 51 – Understanding of the external model

1.115. The insurance or reinsurance undertaking should be able to demonstrate that all parties involved in the use of the external model have a sufficiently detailed understanding of parts of the external model relevant to them including assumptions, technical and operational aspects.

1.116. The insurance or reinsurance undertaking should give particular attention to the aspects of the external model that are more relevant to its risk profile.

Guideline 52 – Reviewing the choice of external model and data

- 1.117. The insurance or reinsurance undertaking should periodically review its justification for selecting a particular external model or set of external data.
- 1.118. The insurance or reinsurance undertaking should be satisfied that it is not overly reliant on one provider and should have in place plans to mitigate the impact of any failures of the provider.
- 1.119. The insurance or reinsurance undertaking should pay attention to any updates of the external model or of the data that allows the undertaking to better assess its risks.

Guideline 53 – Integration of external models within the internal model framework

- 1.120. The insurance or reinsurance undertaking should be able to demonstrate that the approach for incorporating the external model into the internal model framework is appropriate; including the techniques, data, parameters, assumptions selected by the undertaking and the external model outputs.

Guideline 54 – Validation in the context of external models and data

- 1.121. The insurance or reinsurance undertaking should perform its own validation of the aspects of the external model that are relevant to its risk profile and of the process for incorporating the external model and data within its own processes and internal model.
- 1.122. The insurance or reinsurance undertaking should assess the appropriateness of the selection or the non-selection of features or options which are available for the external model.
- 1.123. As part of the validation the insurance or reinsurance undertaking should consider appropriate information and in particular the analysis performed by the vendor or other third party, and, when doing so, the insurance or reinsurance undertaking should ensure at least that:
- a) the independence of the validation is not compromised;
 - b) it is consistent with the validation process the insurance or reinsurance undertaking sets out and is clearly laid out in the validation policy;
 - c) any implicit or explicit bias in the analysis performed by the vendor or other third party is taken into account.

Guideline 55 - Documentation in the context of external models and data

- 1.124. The insurance or reinsurance undertaking should ensure that the documentation of external models and data meets the documentation standards.
- 1.125. The insurance or reinsurance undertaking should produce documentation on at least the following:

- a) the aspects of the external model and external data that are relevant for its risk profile;
- b) the integration of the external model or external data within its own processes and internal model;
- c) the integration of data, in particular inputs, for the external model, or outputs from the external model, within its own processes and internal model;
- d) the external data used in the internal model and its source and use.

1.126.If, as part of its own documentation, the insurance or reinsurance undertaking leverages on the documentation produced by the vendors and service providers, the insurance or reinsurance undertaking should ensure that its ability to meet the documentation standards is not compromised.

Guideline 56 - Responsibility of the undertaking in the context of external models and data

1.127.The insurance or reinsurance undertaking should keep its responsibility for discharging its obligations related to its internal model and for the role of external model or data in the internal model and any other requirements.

Guideline 57 - Role of service providers when using external models and data

1.128.The insurance or reinsurance undertaking should put in place an outsourcing agreement when it chooses not to operate the external model directly.

1.129.Similarly, the insurance or reinsurance undertaking should put in place an outsourcing agreement when it chooses to mandate a service provider to perform some tasks related to the external data.

1.130. The insurance or reinsurance undertaking should, when putting in place an outsourcing agreement, comply with the requirements from Article 49 of Solvency II and Article 274 of Commission Delegated Regulation 2015/35.

Chapter 12: Internal models for groups - Functioning of colleges

Guideline 58 - Assessing the scope of the internal model

1.131.When assessing the appropriateness of the scope of the internal model, the group supervisor, the other supervisory authorities involved as defined in Article 343(2) of Commission Delegated Regulation 2015/35 and other supervisory authorities identified by the college in accordance with Article 344(2) of Commission Delegated Regulation 2015/35 should consider at least:

- a) the significance of related undertakings within the group with respect to the risk profile of the group;
- b) the risk profile of related undertakings within the group compared to the overall group risk profile;

- c) if applicable, a transitional plan by the group to extend the scope of the model at a later stage and the timeframe to do so;
- d) the appropriateness of the standard formula or another internal model approved or in the process of approval for the calculation of the Solvency Capital Requirement of any related insurance or reinsurance undertaking included in the scope of the internal model;
- e) the appropriateness of the standard formula or another internal model approved or in the process of approval for the calculation of the Solvency Capital Requirement of any related insurance or reinsurance undertaking within the group but not included in the scope of the internal model for the group.

1.132. When assessing the appropriateness of the exclusion of related undertakings within the group from the scope of the internal model, the supervisory authorities referred to in the previous paragraph should assess whether the exclusion of the undertakings could lead to:

- a) an improper allocation of own funds based on individual undertaking Solvency Capital Requirements rather than on its contribution to the risk profile of the group;
- b) inconsistencies that would derive from the use of the internal model to calculate the group solvency capital requirement and the use of the standard formula or a different internal model, approved or in the process of approval, by any related undertaking within the group to calculate its Solvency Capital Requirement;
- c) weaknesses in risk management of the group and related undertakings within the group resulting from the limited scope of the internal model; or
- d) an inadequate group Solvency Capital Requirement in relation to the risk profile of the group.

Guideline 59 - Internal model work plan for the assessment and the approval process of internal models for groups

1.133. The group supervisor, in consultation with the other supervisory authorities involved, should set up an internal model work plan and the communication rules to follow among these authorities during the assessment and the approval process of internal models for groups.

1.134. When appropriate, the group supervisor, in consultation with the other supervisory authorities involved, should update the internal model work plan.

1.135. In relation to the assessment of the internal model, the group supervisor should ensure that the internal model work plan covers the timeline, main steps and deliverables for this assessment. In the case of a group internal model under Article 231 of Solvency II, the group supervisor and the other supervisory authorities concerned should consider including in the internal model work plan specific provisions between them. The group supervisor should ensure that the internal model work plan, at least:

- a) establishes when and how to consult and involve in the assessment the other supervisory authorities involved referred to in Article 343(2) of Commission Delegated Regulation 2015/35;
- b) establishes when and how to allow the other supervisory authorities within the college of supervisors referred to in Article 344(2) of Commission Delegated Regulation 2015/35 to participate in the assessment;
- c) identifies the priorities for the assessment, taking into account the scope of the internal model, the specificities of each related undertaking within the group, the risk profile of the group and related undertakings within the group, and the available and relevant information about the internal model;
- d) establishes when and how to report the outcomes of the assessment made by the supervisory authorities involved to the other supervisory authorities involved.

1.136. In relation to the decision on an application to use a group internal model under Article 231 of Solvency II, the group supervisor, in consultation with the other supervisory authorities concerned, should ensure that the internal model work plan covers the timeline for all the steps and deliverables for reaching a joint decision as set out in the EIOPA Implementing Technical Standard on the Process to Reach a Joint Decision for Group Internal Models.

Guideline 60 - Concerns about the process

1.137. Whenever a supervisory authority involved identifies a substantial point of concern regarding the approval process, it should share its concern with the group supervisor and the other involved authorities as soon as feasible.

Guideline 61 - Joint on-site examinations carried out during the assessment of internal models for groups

1.138. The group supervisor and the other supervisory authorities involved should be able to request and discuss when and how to organize joint on-site examinations to verify any information concerning the assessment of an internal model for a group, with the aim of ensuring the effectiveness of the process.

1.139. The supervisory authorities requesting a joint on-site examination should inform the group supervisor by indicating the scope and purpose of this examination, taking into account the objectives of this examination in relation to the assessment as defined by the supervisory authorities involved.

1.140. The group supervisor should then notify the other supervisory authorities involved, EIOPA, and, where relevant, other members and participants of the college that may be affected or interested in the participation or in the outcome of the joint on-site examination.

- 1.141. Once the supervisory authorities participating in the joint on-site examination have been identified, they should discuss and agree the final scope, purpose, structure and allocation of tasks of the on-site examination, including who is leading the on-site examination.
- 1.142. The group supervisor should be kept informed on the progress and findings of the joint on-site examination.
- 1.143. The supervisory authority leading the on-site examination, if other than the group supervisor, should provide the relevant documentation to the group supervisor.
The group supervisor should make the relevant documentation available to the supervisory authorities involved, to the other supervisory authorities participating in the joint on-site examination and to EIOPA. The group supervisor should provide the other college members and participants with a list of the relevant documentation received and provide them with the documents upon specific request.
- 1.144. On the basis of a report stating the main findings of the joint on-site examination, the supervisory authority leading the on-site examination should discuss with the supervisory authorities involved the outcome of the joint on-site examination and the actions to be taken.
- 1.145. The group supervisor should notify the other college members and participants about the outcome and actions as part of the agreed communication within the college.

Guideline 62 - Sharing of reviews of internal models for groups

- 1.146. The supervisory authorities involved should share and discuss the main findings of their off-site and on-site activities related to the internal model with the group supervisor and the other supervisory authorities involved.
- 1.147. The supervisory authorities involved should share the approach they are following in the review of the elements of the internal model with the group supervisor and the other supervisory authorities involved.
- 1.148. If, as a result of this sharing, the supervisory authorities involved identify substantial differences in the approaches followed, they should discuss and they should agree on a process to develop consistent approaches when they consider appropriate to have this alignment.
- 1.149. When they deem appropriate, the supervisory authorities involved should consider sharing the tools and techniques they are using for the review of the elements of the internal model with the other supervisory authorities involved.

Guideline 63 - Involvement of third country supervisory authorities during the assessment of internal models for groups

- 1.150. The group supervisor and the other supervisory authorities involved should decide whether and which third country supervisory authorities should be consulted.
- 1.151. Before consulting the third country supervisory authority, the group supervisor, with the support of the other supervisory authorities involved, should take appropriate steps to ensure that the legislative provisions on the confidentiality of information of the jurisdiction where the third country supervisory authority is situated are equivalent to the professional secrecy requirements resulting from Solvency II.

Guideline 64 - Assessment of major changes to group internal models under Article 231 of Solvency II

- 1.152. In relation to the assessment of the application for approval of a major change to a group internal model under Article 231 of Solvency II, the group supervisor and the other supervisory authorities concerned should decide whether to delegate the assessment of changes at the level of a related undertaking to the relevant supervisory authority concerned.

Compliance and Reporting Rules

- 1.153. This document contains Guidelines issued under Article 16 of the EIOPA Regulation. In accordance with Article 16(3) of the EIOPA Regulation, Competent Authorities and financial institutions shall make every effort to comply with guidelines and recommendations.
- 1.154. Competent authorities that comply or intend to comply with these Guidelines should incorporate them into their regulatory or supervisory framework in an appropriate manner.
- 1.155. Competent authorities shall confirm to EIOPA whether they comply or intend to comply with these Guidelines, with reasons for non-compliance, within two months after the issuance of the translated versions.
- 1.156. In the absence of a response by this deadline, competent authorities will be considered as non-compliant to the reporting and reported as such.

Final Provision on Review

- 1.157. These Guidelines shall be subject to a review by EIOPA.