LLOYD'S

Lloyd's Minimum Standards MS12 – Scope, Change and Use

January 2021

Contents

MS12 – Scope, Change and Use

Minimum Standards and Requirements

These are statements of business conduct required by Lloyd's. The Minimum Standards are established under relevant Lloyd's Byelaws relating to business conduct. All managing agents are required to meet the Minimum Standards. The Requirements represent the minimum level of performance required of any organisation within the Lloyd's market to meet the Minimum Standards.

Within this document the standards and supporting requirements (the "must dos" to meet the standard) are set out in the blue box at the beginning of each section. The remainder of each section consists of guidance which explains the standards and requirements in more detail and gives examples of approaches that managing agents may adopt to meet them.

Guidance

This guidance provides a more detailed explanation of the general level of performance expected. They are a starting point against which each managing agent can compare its current practices to assist in understanding relative levels of performance. This guidance is intended to provide reassurance to managing agents as to approaches which would certainly meet the Minimum Standards and comply with the Requirements. However, it is appreciated that there are other options which could deliver performance at or above the minimum level and it is fully acceptable for managing agents to adopt alternative procedures as long as they can demonstrate the Requirements to meet the Minimum Standards.

Definitions

EIOPA: The European Insurance and Occupational Pensions Authority

ESG: Economic Scenario Generator

LIM: Lloyd's internal model

SCR: Solvency Capital Requirements

The Board: Where reference is made to the Board in the standards, managing agents should read this as Board or appropriately authorised committee. In line with this, each agent should consider the matters reserved for the Board under the Governance Standard in order to evidence appropriate full Board discussion and challenge on the material items.

Section 1: Scope

SCU 1.1 Model Scope

Managing agents shall have within scope of the internal model all material risks and processes.

Managing agents shall ensure that the scope of the model:

- includes all material risks;
- allows for the appropriate calculation of the regulatory and ultimate SCRs: and
- allows sufficient risk coverage such that the requirements of the use test are met.

Managing agents should note that the scope of the internal model is significantly broader than the capital calculation kernel and it will not be sufficient to have a sophisticated capital model alone. To secure both initial internal model approval and continued compliance/approval, agents will need to demonstrate that the internal model plays a key part in the running of the business, that there are sufficient governance and standards around the model and that the risk management process is embedded within capital setting.

Agents must be able to define the scope of the internal model for each managed syndicate. Lloyd's does not mandate use of a specific scope for internal models as this should be relevant to the business and risk profile of each syndicate.

Agents should note that any component or process that can have a significant impact on the one-year and ultimate SCR must satisfy Lloyd's Minimum Standards, irrespective of whether or not it has been defined as "within scope" of an internal model.

Agents should note that Lloyd's review of internal models will not be limited by the scope of the internal model but will cover all material risks and anything which is considered material to its review and decision-making process.

Issues to consider when choosing scope

There is a wide range of elements that could be defined as being within the scope of an internal model and the choice of whether or not to include these may impact how Lloyd's minimum standards are met. Agents must understand the implications of including or excluding certain elements from the scope of an internal model and should be able to explain how the scope of the model was determined and why specific elements are included or excluded. In defining the scope of an internal model, an agent must consider a number of issues. Examples of the types of issues to consider are set out below.

Coverage of material risks

Managing agents must demonstrate that the internal model covers all material risks. Lloyd's recommends that all risks included in the managing agent's risk register (or emerging from its risk assessment process) are listed and individually identified as being included within the internal model or not. If a risk is not covered by the internal model then an explanation, including how appropriate capitalisation is assured, should be provided. This demonstration must be based on a combination of qualitative and quantitative 'risk indicators'.

Demonstrating the use test

The wider the scope of the internal model, the easier it may be to demonstrate that the internal model is widely used within the risk management of the organisation. This is one of the potential drivers for the broadest scope of the internal model.

Documentation

All processes that are included within the scope of the internal model need to be documented to a suitable standard as required under Lloyd's Minimum Standards. This will obviously increase resource requirements for supporting the internal model. Excluding a process from the scope of the internal model does not mean however that Minimum Standards can be ignored, and other documentation standards will still apply consistent with the overall risk management system of the business.

Model change policy

Changes that expand the scope of a model should be classified according to the model change policy.

Validation

Managing agents are required to have a comprehensive validation process to demonstrate that an internal model is suitable for setting capital both for Lloyd's capital requirements and under Solvency II. Many validation processes are mandatory under Lloyd's Minimum Standards, including reverse stress testing, stress and scenario testing, sensitivity testing, testing against experience and profit and loss attribution. The scope of the validation will depend on the scope of the internal model itself. The validation policy must cover all quantitative and qualitative aspects of the internal model. If, exceptionally, there are parts of the internal model not covered by the policy, agents will be required to state this and detail why it is appropriate to exclude those parts from the validation process.

Section 2: External Model Guidance

SCU 2.1 Identification of external models and data

Managing agents shall be able to explain the role of external models and data in the internal model.

Managing agents shall be able to:

- identify external models and external data sources used in the internal model;
- assess the materiality of the external models and data sources; and
- explain the role in the internal model of any external models and data used.

Standard SCU 2.1 sets out requirements for agents to identify and understand the use and importance of external models and datasets used as part of their internal models.

This guidance applies to external models and datasets within the scope of the internal model. Some examples of external models or external data sources that managing agents may wish to include in their internal models are:

- models or data in relation to specialist areas of underwriting risk such as natural catastrophes;
- industry loss, loss development, loss distribution or exposure databases, or models derived from such data, that can be used to validate, augment or substitute for the managing agent's own data or models;
- models or data in relation to economic variables or economic scenarios, such as ESGs, yield curves, exchange rates, default rates; and
- studies carried out by professional advisors that support parameterising the internal model, such as models used by brokers to model exposure and reinsurance.

All external models that are within scope of the internal model need to operate to the same set of standards as the internal model itself. For external models this poses additional challenges because the managing agent does not always have direct access to or control of the model.

Each year an identification and materiality assessment process should take place to ensure that all external sources in the internal model are captured, and managing agents’ work is focused on external models that have a material impact on the outcome of the internal model. Views on materiality should be supported by sensitivity tests, where practicable.

SCU 2.2 Understanding external models and data

Managing agents shall be able to explain the nature and reasons for use of external models and data.

Managing agents shall be able to:

- explain and document the reasons for preferring external models and data to internally developed models and data;
- list the alternatives considered and explain the decision in favour of a particular external model or a set of external data; and
- demonstrate a detailed understanding of external models and external data used in their internal model, including model and data limitations.

Standard SCU 2.2 sets out requirements to explain why agents use external models or datasets, to justify their specific choices and show that these are based on a sound understanding of the external models and datasets.

Managing agents must document a justification for their selection of material external models, including reasons for choosing an external model over an internal one, and implement a regular review system to ensure such selections remain appropriate.

Managing agents can demonstrate their understanding of external models by addressing areas such as:

- Showing that the Board and senior executives have a good basic understanding of the key assumptions, outputs and operation of the external models, and link them to relevant decisions;
- Showing that users understand the external models in detail and understand the nature and use of the key model components;
- Identification and documentation of model limitations and uncertainties, and communication of these to relevant stakeholders at all levels; and
- Documentation of major changes to external model and adaptations for use within the agent's internal model.

A good understanding of an external model or dataset provides a sound basis for the application of expert judgement in determining the key areas for validation and the extent of validation required. This may be necessary where managing agents do not have full access to the underlying theory, structure and documentation of the external model.

SCU 2.3 Application of internal model standards to external models

Managing agents shall ensure that use of external models or data within the internal model does not compromise the internal model meeting any of the relevant tests and standards.

Managing agents shall explain how the internal model continues to meet the tests and standards including:

- use test;
- validation; and
- documentation.

Lloyd's Minimum Standards for internal models apply in full to external models and data sets, though managing agents should consider the principle of proportionality when assessing their approach. Where an external model has limitations, these should be monitored, and alternatives considered where these are material.

For each material external model the managing agent should additionally explain why the data used to populate the external model is appropriate, and whether it is internally sourced data or externally sourced data. For example, managing agent data or broker data can be used to populate external catastrophe models. Where external data is used to populate the external model, the managing agent needs to apply the same standards to this as they would to an internal model.

Following are examples of how the internal model standards apply to external models. Managing agents should refer to the other Lloyd's standards for more information.

Use test

Managing agents should be able to explain how they use the external model within the internal model and how the Board and senior management obtains comfort over its adequacy in reflecting risk profile and its limitations. Use of an external model falling within the scope of the internal model can itself contribute to the use of the internal model.

Statistical quality standards

Obtaining the data sources used within external models is often not possible because they contain proprietary knowledge. Nevertheless, managing agents should be able to show that they understand the underlying data sources used in the external model (such as major attributes, limitations, characteristics of data used and approximations used for missing or unreliable data), and, at a high level, how the methodology works within the external model. Particularly important here is the ability to highlight the material assumptions within the external model and the level of sensitivity that the external model has to these assumptions in the context of the agent's internal model.

Calibration standard

The external model itself does not need to be calibrated to a 99.5% probability over a 12 month time period because this requirement applies to the internal model calculation kernel directly. However, the contribution of the external model to this default probability within the internal model should be understood so that its materiality can be assessed.

Profit and loss attribution

This standard does not apply directly to external models other than when considering the profit and loss attribution of the internal model; the external model should be able to give the required level of granularity of information to make this possible.

Validation standards

Validation is an important element in demonstrating an understanding of and identifying limitations and future improvements needed in the internal model. This applies to external models and data in just the same way as to the internal model. Managing agents' validation policies, processes and reports must cover external models and data to the same extent and standards as they do the rest of the internal model.

Documentation standard

Documentation of external models is an important component of the documentation of the internal model, and agents should work with vendors to ensure there is sufficient material available to understand the methodology underlying the external model, its limitations and weaknesses (particularly circumstances where the internal model may become ineffective as a result of the external model), the key assumptions in the external model, and material areas of expert judgement that drive the external model results.

Section 3: Use Test Guidance

SCU 3.1 Use and role of model

The internal model shall be widely used in and play an important role in managing agents' systems of governance.

Managing agents shall:

- ensure that their model uses include the following as a minimum:
  - calculation of economic capital;
  - capital allocation; and
  - use in the ORSA.
- explain their approach to important internal model uses in a policy or other Board-approved document, covering:
  - a description of each model use;
  - the governance and controls applying to each model use;
  - action to be taken in case of issues arising from model use; and
  - regular reporting of model use to the Board;
- ensure that the internal model is capable of ranking risk adequately to support wide and important use of the internal model;
- ensure consistency is achieved between outputs for different uses;
- be able to explain and justify where the internal model is not used as part of the material decision making process;
- document how the internal model is used to support decision making processes; and
- ensure that key model outputs are regularly discussed and reviewed by the Board as part of its decision-making process.

Scope of model use

Managing agents must be able to demonstrate that the internal model is widely used in and plays an important role in the system of governance. The uses of an internal model are expected to vary according to the definition and scope of the model. Apart from the minimum uses set out in the requirements (i.e. economic capital, capital allocation, ORSA), there is no checklist for uses of an internal model, so each agent must have its own list of uses which are both relevant and material to the business. A policy or other Board-approved document is useful in demonstrating that model use is understood and properly managed by the Board.

Managing agents should assess each use according to the criteria of relevance and materiality, as a long list of trivial or irrelevant uses will not help towards satisfying the use test. Solvency capital and decision making are mandatory uses, and Lloyd's requires that agents use their internal models for capital setting. Other common, important uses include pricing, reinsurance, risk management and investment, though there are many others agents should consider. The internal model should normally be used to support decisions where these are within scope, unless a rationale it can be demonstrated that an alternative approach produces better results.

Model use policy

Managing agents should ensure that they have documented their model uses in a model use policy or similar documentation, as this helps to ensure a common understanding amongst the Board, senior management and model users of how it is intended that the internal model will be used within the organisation.

The information captured in a model use policy would typically include the following:

- a summary description of each use including:

    - brief details of how it will support business decision-making; and
    - model outputs for the use.
- key stakeholders, e.g. individuals, teams, committee(s), the Board;
- roles and responsibilities in relation to model use;
- governance considerations – e.g. documentation and validation of model uses;
- how feedback from model use will be captured and the link to model development and change.

There should be regular reporting on model use to the Board which enables them to see whether the uses set out in the policy are fully in use and embedded. Typically such a report would be produced on an annual or quarterly basis and should provide an overview in addition to the reporting that the Board will see as a consequence of specific model uses.

Managing agents may wish to distinguish in their model use policies those uses that are seen as 'core' (i.e. regular and important uses of the model), as well as identifying the uses where further development is planned. Alternatively, this information could be included in a procedure document if not in the policy itself.

Evidencing model use

Meetings, internal review and discussion of model outputs are vital evidence of use. There should be clear evidence of the information presented to the meeting and minutes should be taken of the relevant committee or Board meetings capturing the decision made as well as the key points of any discussion. If different options or approaches are discussed these should be clearly presented in papers circulated to those present at the meeting and/or clearly outlined in the minutes of the meeting. Documentation should always show the extent of use of and reliance on the output of the internal model.

Outputs from the internal model may be used more extensively than simply within committee or Board meetings and form part of the information used on a day-to-day basis to manage the business. Such information may be produced for different functions within the business and may take many different forms. To evidence model use managing agents should be able to provide examples of such information derived from the internal model and identify where this is used to help with both governance and decision-making. It should be noted however that an error in the outputs of the internal model shall be considered material where it could influence the decision making or the judgement of the users of the information, including the supervisory authorities.

A model use log can provide useful evidence of model uses, both for internal purposes and for external parties such as Lloyd's. The log should record where the model has been used for the uses set out in the model use policy and would typically include the following information:

- date of use;
- description of use eg capital assessment, assess impact of change in RI programme (with brief details of the change) etc;
- end user – i.e. individual/committee or Board;
- business decision outcome/summary – high level details;
- record of decision e.g. Meeting minutes (date…), email etc;
- model output used (e.g. reference to specific report);
- note whether decision is consistent with internal model output; and
- where decision is not consistent with internal model output, reasons why output rejected and/or model improvements/change required.

Consistency

Managing agents must be able to show how different uses are based on consistent model outputs. There should be robust, controlled and documented procedures for monitoring consistency. The internal model version used in decision making should be consistent with the version used to calculate the latest approved SCR1 or where there is a model change in progress the version considered the best representation of the business.

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[1]Where the internal model use standards and guidance refer to the SCR this covers both the one-year and ultimate numbers generated by the internal model

The internal model should be fundamentally consistent with other tools used in the decision-making process, such as accounting, reserving and external models. Where there are divergences between the internal model and other tools used in decision making, the managing agent must be able to explain the impact of and reason for these divergences. Note that section 1.2 below comments on the circumstances where an agent is awaiting approval for a major model change.

Risk ranking

Risk ranking analysis should enable managing agents to identify the most material risks in the business and therefore ensure that their use of the model and risk management actions focus on the most important areas.

Where risk components are excluded from the model, managing agents must be able to demonstrate that this approach is appropriate. Usually, the reason will be materiality, in which case, agents must be able to show and subsequently monitor figures to support their views. Exclusion by reason of inability to quantify the risk, the other main exclusion criterion, requires careful analysis and justification, especially where the risk could be material.

Decision making

The internal model must be used in managing agents' decision-making processes, specifically:

- to support the relevant decision-making processes, for example, reporting to address the needs of different participants in the process;
- to assess the potential impact of material decisions; and
- regular discussion and review by the Board of the internal model and its results.

It is not expected that the outputs of the model will always be followed in terms of decisions made. However, it is expected that the outputs are an important consideration as part of those decisions and that this consideration is demonstrable. Managing agents should ensure that they take account of any known limitations of the internal model when they consider model outputs as part of the decision-making process. It is therefore important that model users are aware of the impact of any limitations for their specific area of use.

The internal model should give prospective support to decision-making and retrospective verification of decision-making.

A model use log, as outlined in the section ‘Evidencing Model Use’ above, can provide good evidence to demonstrate where the internal model has been used to support specific decisions.

SCU 3.2 Understanding the internal model

Managing agents shall ensure that there is an adequate understanding of the internal model, both on an overall basis and in detail, within the managing agency.

Managing agents shall ensure that:

- the Board and senior management have an overall understanding of the model including:
  - the structure of the internal model, the way the model fits to the business and is integrated in the risk-management system;
  - the scope and purposes of the internal model and the risks covered/not covered by the internal model the general methodology applied in the internal model calculations;
  - the limitations of the internal model; and
  - the diversification effects in the internal model.

- all users have a sufficiently detailed understanding of the parts of the internal model relevant to the uses for which they are responsible.

Understanding the model

The Board and senior management of the managing agent will be expected to know and discuss the principles of:

- how the model is governed as well as the committee or forum charged with developing the model, overseeing the framework for designing the model and ensuring the effective operation of the model;
- main uses of the model, and how it can inform certain decisions; examples of its use within the agent, including challenge provided to assumptions and outputs;
- the process, in general terms, by which the model is validated;
- how the model is materially consistent with the business profile of each syndicate managed by the agent; and
- material limitations of the model, and whether the limitations aggregate to material under-estimation of capital
- for any error in the model that is considered material, where it will have influenced the decision made

An essential part of the embedding process for managing agents is the demonstration that a process of education and communication has occurred. Examples of how this could be achieved may include:

- a training programme assigning categories to the Board and senior management in accordance with the appropriate level of knowledge of the model that is required;
- documenting elements of understanding that are appropriate for each grouping (e.g. by breaking down the ‘internal model’ into a number of areas and documenting the level of detailed knowledge required for each aspect); and
- evidence that training sessions and workshops were held, attendees present and the information presented. Agents should note that whilst receipt of training will help demonstrate understanding, it does not equate with “use”: this can only be demonstrated through the utilisation of the model in material business decisions.

Appropriate methods should be in place to assess the effectiveness of training. This can include formal assessments, such as post training follow up reviews and consideration as part of the Board effectiveness review, as well as more informal feedback and model user discussions. Whichever method is used, it is important to ensure that the purpose of the training is clear and that there is appropriate follow up to ensure that the training delivered has met its objectives and that any further training needs identified are addressed.

It is recognised that the level of knowledge expected from senior management and Board members will vary according to their role. Senior management on the committee primarily charged with responsibility for the design, implementation and enhancement of the model will be expected to have more detailed knowledge of the model than those not on such a committee.

It is important to ensure that sufficient understanding of the internal model is maintained over time. Appropriate training should be provided for new directors and staff, where there is a change in responsibilities within the managing agent or where there is significant change to the internal model.

SCU 3.3 Integration with Risk management

The internal model shall appropriately reflect the risk profile of the syndicate and be integrated into the syndicate's risk management systems.

Managing agents shall ensure that:

- the internal model reflects the nature, scale and complexity of the risks inherent in the business;
- the outputs of the internal model and internal and external reporting are consistent and are taken into account in formulating risk strategies;
- internal model outputs are sufficiently granular to support decision-making, and as a minimum differentiate between:
    - lines of business;
    - risk categories; and

  - major business unit.

- model change policy provides for changes to the scope and nature of the business and changes in the risk management system.
- all material quantifiable risks identified by the risk management system which are within the scope of the internal model are covered by the internal model; and
- the quantifications of risks and the risk ranking produced by the internal model trigger risk management actions where relevant.

Fit to business

The internal model must fit the business model in a sufficiently granular manner. As well as the requirement to differentiate between lines of business, risk categories and major business units, managing agents should consider the following:

- The uses of the internal model and whether these are strategic decisions or more detailed, day-to-day decisions;
- The managing agents' risk management framework and how granular this is;
- The granularity required for the decision-making process;
- The structure of decision-making bodies in the managing agent; and
- The debate that is facilitated by the design of the output from the internal model.

Managing agents should be able to evidence that the model works in terms of these factors, and that the resulting feedback and debate results in improvement to the model.

Impact of model scope and change on use test

The scope of the internal model should cover sufficient uses to inform significant risk management and business decisions. Adequate scope is also essential to allow a wide range of uses to contribute towards continuous improvement of the internal model.

Managing agents need to have a clear process for changing the internal model, as set out in the standard on model change. Any time lag between changes in the risk management system and the internal model must not impair the use of the internal model in decision making or risk management. Agents will need governance and controls to ensure that they are always using the appropriate version of the model: in most cases, this will mean using the latest self-authorised version for decision-making and other internal uses, but with the ability to revert to the relevant previous authorised version of the model, should any changes fail to achieve Lloyd's approval.

Operation

The frequency of calculation of the Solvency Capital Requirement must be at least in line with Lloyd's SCR submission requirements. Managing agents are expected to run the SCR more frequently, dependent upon their use of the model. Managing agents may use a simplified calculation for this purpose as long as the method/approach used is part of the model and therefore within model Scope and model Change. Any calculation for assessing the SCR must be from a full run of the internal model, whether or not reduced scope or fewer simulations are considered appropriate for other uses. Managing agents should consider whether further full runs are appropriate during the year and be able to justify their decision.

There must be a documented process in place to monitor the syndicate's risk profile and trigger a recalculation if there is a significant change. This should be consistent with the model change policy.

Risk management actions

Risk management action may be required where internal model outputs show that the quantifications or ranking of risk has changed, leading to a different understanding of the materiality of some risks. Actions could include increased validation or investigation of the reasons for change and may lead to model change.

SCU 3.4 Profit and loss attribution

Managing agents shall demonstrate an understanding of the causes and sources of profits and losses, show how they are explained by the categorisation of risk in the internal model and make appropriate use of the profit and loss attribution within the business. The profit and loss attribution should be on the same basis as the modelling (i.e. consider the solvency II balance sheet).

Managing Agents shall, when conducting the Profit & Loss attribution:

- understand the key drivers of profit;
- understand the reasons for deviations from the profit expectation; and
- apply this understanding to business decisions made.

Use of Profit & Loss (P&L) attribution

Lloyd’s does not intend to prescribe how managing agents should use the P&L attribution. The information provided by the attribution is a key element in an agent being able to demonstrate use of the model. P&L attribution sheds light on how the different elements of the economic balance sheet and the internal model interact, which is important in understanding the model. This information is potentially valuable in the validation process, the system of governance, ORSA, decision support, risk management and other areas, so its use is an essential part of meeting the use test. Managing agents need to evaluate and document their use of the P&L attribution and review it on a regular basis. They will need to ensure that feedback results in improvement both to the internal model and to the attribution itself. The P&L is expected to be carried out on a one-year basis, where actual outcomes are compared to model predicted outcomes, for the particular prior SCR being tested. Furthermore, managing agents should ensure that profit or loss is attributed to risk category level, as a minimum, although Lloyd’s expects this to be done at class of business level where possible.

Section 4: Expert Judgement

SCU 4.1 Expert Judgement

Managing agents shall document the use of expert judgement within their internal model.

Managing agents shall ensure that where expert judgement is used:

- they document why the expert is appropriately qualified to make the judgements;
- they document the judgements made;
- the judgements are falsifiable; and
- the judgements are kept under regular review.

Where expert judgement is applied it must meet the following criteria:

- The expert judgement must be falsifiable, i.e. circumstances under which the expert judgement would be considered false can be defined;
- The expert judgement must be able to make transparent the uncertainty surrounding the judgement, e.g. by providing the context of the judgement, its scope, basis and limitations;
- Standards concerning the operation of the methodology used must exist and be maintained;
- The expert judgement must be documented. In particular, a track record of the expert judgements used must be available; and
- The expert judgement must be validated. Validation may include assessing the track record of expert judgements to assess reliability; challenging the expert judgement using scrutiny from other experts; comparing the expert judgement with existing and emerging data.

Managing agents will need to consider carefully the additional risks that arise when relying on expert judgement (e.g. conscious or subconscious biases in estimates). Care needs to be taken to minimise these risks when using expert judgement to calibrate or validate the internal model.

Expert judgement should be evidenced where it forms part of the internal model and this should be provided to Lloyd’s with the validation report. The selection of the level and scope of documentation should consider proportionality and materiality. Examples of ways to document expert judgement could include:

- name of expert;
- date of opinion;
- what expert opinion is being used;
- reason why expert judgement is required in this particular instance;
- rationale for the opinion itself (e.g. the stress test backing a particular view of risk);
- comment on any potential conflicts of interest that may arise from the use of this expert judgement;
- review by an independent third party;
- date of next review/period of validity
- back-testing of the historic expert opinion in this class and from this particular expert; and
- where expert opinion is contradicted by otherwise applied standard statistical techniques, the judgement should be documented further to explain the deviation.

This list is not intended to be prescriptive; it is intended to give examples of what might be appropriate.

Section 5: Model Change

SCU 5.1 Model change policy

Managing agents shall implement a written policy which sets out how they will manage model change.

The policy shall specify:

- the procedure to determine if a change in the internal model is needed as a consequence of:
  - any relevant change in the system of governance;
  - change in compliance with the requirements to use the internal model;
  - change in the appropriateness of the technical specifications of the internal model;
  - any relevant change to the risk profile of the business;
  - validation results; and
  - general model improvement.
- the criteria for considering an internal model change a major change;
- when a combination of minor changes shall be considered a major change;
- the governance requirements in relation to changes to the internal model, including, but not limited to :
  - internal approval of changes;
  - internal and external communication;
  - documentation of changes; and
  - validation of changes.
- that changes to the model change policy itself fall outside of the scope of the policy, but shall still be treated in the same way as major model changes; and
- that changes to the scope of the model fall outside the scope of the model change policy but shall still be treated in the same way as major model changes.

Purpose of model change controls

The objective is that managing agents should develop a simple, reliable system for classifying changes to enable them to be managed more easily.

The classification of change and the indicators used to assist in it are closely related to the business and risk profiles of the syndicate. Classification should be specific to the syndicate and cover both quantitative and qualitative criteria. Criteria might cover matters such as impact on the SCR, impact on tests and standards, the difficulty or sophistication of validation and the governance required.

In order to set out criteria for major changes, managing agents will need to:

- establish triggers for major change;
- identify qualitative as well as quantitative triggers; and
- set out criteria for the identification of combinations of minor changes which might be equivalent to major changes. In such cases, the major change process will apply.

Classification into major and minor changes

The model change policy must include a specification of major or minor changes to the model. The model change process, as set out in the model change policy, will differ according to whether changes have been classified as either a minor or a major change. This classification will affect how model changes are to be reported and reviewed by Lloyd's, with all major model changes requiring agreement before the previous version of the model can be retired in favour of the amended version.

As well as being different in nature, model changes will also differ in terms of materiality to the internal model and the resultant output and use of the model. Managing agents must consider a range of criteria in determining whether a change is to be treated as major or minor, and must not focus solely on the impact on the SCR.

All model changes will need to be reported to Lloyd's but the process will vary according to whether it is deemed to be a major or a minor change. The Board or committee responsible for model oversight must decide whether the change is major or minor as per the model change policy control process.

Lloyd's would expect agents to estimate the potential effect of any change before the model is amended so that the Board or relevant committee can approve development work on the change. Agents are encouraged to notify Lloyd's at an early stage that a major change is expected to enable engagement at the earliest stage.

A number of the criteria that a managing agent should take into account in determining whether a change is minor or major are set out below.

An LCR submission alone should not trigger a major model change application.

Impact on the SCR

One of the key criteria an agent should take into account for deciding whether a model change is major or minor, is the effect the change has on the SCR. Managing agents should document the rationale for their selected major change trigger, based on historic experience and previous model changes. More detail is given in the latest model change guidance.

The criteria must also take into account the change in the sensitivity of the SCR. For example, a change in methodology increasing the capital requirements in respect of holding equities would have no effect if no equities are held at that point in time; the SCR may remain constant. However, a change in investment portfolio in the future could then increase the SCR significantly and this type of effect must be considered when determining if a model change is major or minor. i.e. it should be considered at the time the methodology changes, not just when there is a change in investment strategy which means that the SCR is impacted.

Qualitative criteria

There must be allowance for qualitative criteria in determining whether a model change is major or minor. For example, a significant change in methodology may result in an immaterial change in the SCR but such significant changes should still be classed as major.

Where a syndicate is novated to a new agent or merged with another syndicate, agents will be expected to consider this as a major model change, even if existing models continue to be used. Significant changes in capital support are likely to lead to a revised risk appetite and should normally be treated as major model changes. Changes in the material ownership of managing agencies are also likely to trigger a major model change.

Any corporate transaction leading to a change in the modelling platform will trigger the major model change process.

Model governance procedures

The internal model has a key role in the system of governance and managing agents must ensure that the model continues to reflect appropriately the risk profile of the syndicate. There must be appropriate internal governance around changes to the model as well as appropriate communication of these both internally and to Lloyd's.

No changes should be made to the internal model without following the relevant governance procedures which must be set out in the model change policy. These procedures should be clearly documented and understood by all staff for whom they are relevant.

Internal approval

Potential changes to the internal model may be notified to an appropriate function within a managing agent (such as a Model Steering Committee) who will assess the potential change in accordance with the internal model change control process. This process may be used to identify the necessary actions in response to the potential change. One of the initial stages of this process would be to determine what type of change is proposed and to classify the change as either minor or major.

Escalation path

As part of model governance, proposed model changes must be classified into either major or minor changes, according to a process set out in the model change policy, as discussed above. The classification will affect how changes are to be recorded and reported to Lloyd's, as well as defining the timetable for reporting the change to Lloyd's.

Internal and external communication

Managing agents should ensure that all appropriate individuals have been advised of the change and this notification must be wider than the Board or committee approving the change. The level of understanding required of changes will vary across the business but sufficient notification and explanation will be key to maintaining a good understanding of the model and its uses.

The model change policy must also cover the requirements for external reporting of changes, in line with the standards and guidance set out in section 5.2 below.

Change documentation

Managing agents must ensure that documentation of major model changes addresses the implications for both the design and operational details of the internal model and an assessment of continued compliance with technical quality, robustness, data and use requirements after the model change has been implemented.

When a major change has had a significant impact on the outcome of the internal model, the outcome must be calculated with both the revised version and the previous version of the internal model and the outcomes compared. Any differences arising from the model change must be identified, quantified and documented.

Internal model documentation must be updated to ensure all model changes are recorded, both in terms of historical development of the model and documented methodology. Agents should also consider any update needed to the model change policy itself.

Validation of changes

Where changes are made to the internal model, whether major or minor, the model validation procedures will need to be followed to confirm the appropriateness of the change As part of reviewing any proposed change and its impact Lloyd's will expect agents to have carried out a validation process and agents should be able to provide the results to Lloyd's as part of the change application. This validation process should include consideration of whether the managing agent continues to comply with the requirements to use the internal model post the change.

Changes to the model change policy

Changes to the model change policy are likely to follow the same governance approval process as major model changes, unless they are immaterial.

Model scope extension

All model scope changes require the approval of the Board and Lloyd's, and effectively trigger the major model change process.

Maintaining compliance

Managing agents are required to ensure that major or combinations of minor changes to the internal model do not result in failure to comply with any Lloyd's or Solvency II requirements. This requires that managing agents conduct sufficient validation on model change, such that they can demonstrate continuing compliance. Such validation must be included in the model change policy and should cover the circumstances triggering validation and the relationship with the validation policy.

SCU 5.2 Supervisory approval

Managing agents shall report changes to model scope, the model change policy and the internal model to Lloyd's and where necessary, external regulatory authorities.

Managing agents shall:

- obtain Lloyd's approval of the model change policy;
- apply for approval by Lloyd's of any material changes to the model change policy;
- apply for approval by Lloyd's of any extension to the internal model scope;
- apply for approval by Lloyd's of all major changes (including where combined minor changes result in a major change);
- report to Lloyd's all minor changes in accordance with Lloyd's published timetable and in the form prescribed from time to time by Lloyd's; and
- maintain prior versions of the model until major changes/scope extensions are approved by Lloyd's and, where necessary, external regulatory authorities.

Changes to the model change policy and model scope

The model change policy should be reviewed regularly (at least annually) and should be re-approved by the Board or appropriate committee for continued use. As noted in section 5.1, unless immaterial, changes to the model change policy must be approved by the Board and notified to Lloyd's for review and approval, before being implemented.

Changes to the scope of the internal model will often lead to changes in the model change policy, and so trigger a pre-approval application. Whether a change or extension of scope leads to an amendment of the model change policy or not, it must still be approved by Lloyd's.

Major model changes

Major changes to the internal model must be approved before the revised model can be considered authorised by Lloyd's, without which the previous version of the model cannot be retired. All model changes will need to be reported to Lloyd's but the process will vary according to whether the changes are major or minor. The Board or committee responsible for model oversight must decide whether the potential change is major or minor, consistent with the model change policy, and where the change is considered major it must be approved by the Board. Board minutes should be provided to Lloyd's as part of the major model change application.

Minor model changes

Minor changes must be reported in accordance with Lloyd's requirements under Solvency II by recording them in the Model Change Template and submitting this to Lloyd's regularly. They must be treated in accordance with the authorised model change policy. This will include ensuring that minor changes do not exceed major change tolerances when considered in combination. So long as minor changes are treated in accordance with the model change policy, they do not need pre-authorisation by Lloyd's, unless they are considered as a major change when combined.

Use of unauthorised model

Following a major change to the model, managing agents may have to wait for a period of time before Lloyd's gives authorisation for that change. In such circumstances, there is a risk that Lloyd's will not authorise the change, and agents will be required to revert to their previous model, at least for capital setting and regulatory reporting purposes. It is essential that agents are able to revert to previous versions with relative ease, and the governance process should explicitly ensure that the necessary processes are in place.

Section 6: Documentation

SCU 6.1 Documentation System

Managing agents shall maintain an appropriate system for the storage of internal model documentation.

Managing agents shall ensure that the documentation system:

- contains all internal model documentation; and
- is capable of producing an index of the internal model documentation including mapping of the documents to the Solvency II requirements.

Solvency II requirements do not specify the use of document management systems however Lloyd's considers that managing agents could experience difficulties managing the volume of documentation required without a well-designed and controlled system.

An electronic storage system, whether wiki, portal or SharePoint style will allow the documentation to be managed in accordance with the documentation policy as detailed in section 6.2. The documents can be tagged with metadata e.g. owner, review date, tiering (see 6.3 for more details) and mapping to Solvency II EIOPA requirements. Lloyd's would recommend that these are also mapped to the Lloyd's Minimum Standards. This allows the agent to establish the full suite of documents that they may need to present upon request to the supervisory regulator and/or Lloyd's.

SCU 6.2 Documentation Policy

Managing agents shall maintain a Board approved policy for internal model documentation to ensure that all relevant requirements are met.

Managing agents shall maintain a documentation policy covering at least the scope of the internal model. The policy shall:

- cover documentation of all risks within the scope of the internal model and explain how continuing coverage will be ensured;
- demonstrate compliance with relevant requirements;
- address maintenance of a documentation repository, including systems and controls for document ownership, review and update;
- cover regular review of documentation, which shall be at least annual; and
- include a process for ad-hoc revision of documentation in response to feedback from application of the policy.

For the purposes of documentation it is necessary to understand the distinction between these differing types of documents – policy, process and procedure:

Process document

A process document sets out what has to be completed:

- Set of interdependent and linked procedures;
- Process specific and details the steps taken to achieve an objective;
- Defined start and end points;

- A process usually has more than one procedure;
- Consists of a set of predefined actions;
- Defines the users approach to performing the process;
- Consistent approach; and
- Aim is to achieve the requirements of the policy.

Procedure document

A procedure sets out how to complete a series of steps, from inputs through to outputs:

- Specified series of actions or operation;
- Consistent execution of which will produce the same results under the same conditions; and
- The outputs of one procedure may serve as inputs to the next and so on until a known goal or end result is achieved.

Procedure documents are inherently detailed and intended for users who are knowledgeable about the process, for this reason it recommended that procedures are customised to the specific requirements of the department/group with minimal standardisation albeit filename, path and version control.

Policy document

A policy document sets out why things are done in a specific way:

- Background; an indication of reasons, history and intent that led to the creation of the policy for example, change policy;
- ‘Policy Purpose’ outlining why the policy is needed and the desired effect or outcome;
- Scope and applicability; i.e. who or what, including actions, is and isn’t affected. This will ensure focus and avoid unintended consequences;
- Roles and responsibilities; definitions of and any related oversight or governance structures;
- Definitions; providing clear and unambiguous definitions for terms and concepts;
- Guides users in their duties;
- Consistent approach; and
- A policy may have more than one process.

Policy documents are standalone i.e. require no further explanation and should be written to the same standard to ensure consistency.

Managing agents are obliged to maintain a wide range of documents for the purposes of model approval and use and to enable them to demonstrate compliance with both the requirements for Lloyd’s and external regulatory authorities. To meet the requirements of Articles 120-125, managing agents need to do more than merely maintain a specific set of documents in line with the scope of the internal model, no matter how extensive the set is. Managing agents must have effective control procedures in place for model documentation, which should be brought together in a documentation policy document. The control procedures should be based on a precise, transparent document reference system; they should ensure that the documentation is kept up to date and regularly reviewed and provide an audit trail of the implementation of documentation changes.

Internal model use is predicated on users having access to the information needed to understand and make effective use of the model. Managing agents must therefore ensure that such access is provided, using a mechanism such as tiering of documentation (see standard 6.3) into categories appropriate for different audiences. Appropriately categorised information will be good evidence when assessing the use test.

Lloyd’s also believes that the way for managing agents to meet this standard is to approach documentation management by use of a clear, Board-approved policy which complies with the documentation requirements against which performance, validation and improvements can be measured.

An approach frequently taken by agents is to manage their entire documentation set to the standards required for internal model documentation, thus ensuring that no relevant document is unintentionally omitted. In that case, the required inventory of documents will include not only all the required documents for the internal model but many more in addition. In this respect the agent should include a flag against internal model document so that should a regulator ask for all internal model documentation this can be simply and easily supplied.

The documentation policy will detail the approach to keeping documentation up to date. This involves regular review and revision, at least annually, of all policies and manuals. There should also be a system for capturing issues arising outside the regular review and making revisions where appropriate. Potential changes should be considered on the basis of materiality before deciding whether to make any ad-hoc revisions.

SCU 6.3 Design & Operational details

Managing agents shall document the design and operational details of the internal model which shall demonstrate compliance with all relevant requirements.

The documentation of the internal model shall be sufficient to ensure that any independent knowledgeable third party would be able to:

- understand the design and operational details of the internal model; and
- form a sound judgement as to its compliance with Article 101 & articles 120-124 relating to internal model design and operation, data, use and validation.

The documentation shall include at least the following information:

- an inventory of all the documents which form part of the documentation;
- the policy for changing the internal model;
- policies, controls and procedures for the management of the internal model, including responsibilities assigned to staff members of the managing agent;
- a description of the information technology used in the internal model, including any contingency plans relating to the information technology used;
- all material assumptions and their justification;
- the explanation of the methodology used to set assumptions;
- the directory of data used in the internal model;
- the data policy;
- the qualitative and quantitative indicators for the coverage of risks;
- a description of the risk-mitigation techniques that are taken into account in the internal model and an explanation of how the risks arising from the use of risk-mitigation techniques are reflected in the internal model;
- documentation of the future management actions taken into account in the internal model;
- the specifications for the profit and loss attribution;
- the validation policy; and
- the role in the internal model of external models and external data and the reasons for their use

Managing agents shall consider whether further documents are needed in order to comply with the above requirements.

These are the principal documents explaining how the model is designed and operated so that a knowledgeable third party may understand the model. They form an integral part of the Lloyd's and regulatory review of the model. Managing agents need to make this documentation available to users, presented appropriately to the differing audiences, as discussed below. Users may need training to ensure that they can access essential information adequately. As part of the structure of the documentation it is important to ensure that it is tiered to the audience for which it is intended for example:

Executive level - high level summary suitable for Board members. This could include an outline of the model scope, uses of the model, the risk framework, model governance, and information systems.

Technical level - suitable for an independent knowledgeable third party to form a sound judgement as to the reliability of the model. This should include all the content at the executive level plus technical summaries and a description of the operation of the model.

Specialist level - suitable for individuals and teams involved in the detail of the model. The specialist level is best evidenced via appendices to the technical documentation and could include granular procedures, formulae, data, parameters, reasonableness checks and validation / sensitivity testing.

This will also help provide evidence that all levels of management understand the relevant aspects of the internal model. The level of understanding for different bodies and personnel would depend on their oversight responsibilities within the internal model.

SCU 6.4 Technical details

The internal model documentation shall be appropriately structured, detailed and complete and shall be kept up to date.

Outputs of the internal model shall in principle be reproducible using the internal model documentation and all of the inputs into the internal model. The documentation shall provide a detailed outline of the theory, assumptions, and mathematical and empirical bases underlying the internal model. This shall include a user manual for the operation of the model.

The explanation of assumptions should cover the following areas:

- the inputs on which the choice of assumptions is based;
- the objectives of the choice of assumptions and the criteria used for determining the appropriateness of the choice; and
- any material limitations in the choice of assumptions made.

These documents form the detailed internal model documentation including the information needed by technical specialists, such as the modelling team. Together with the design and operational use documents, they should constitute a complete documentation of the internal model and in total, should provide an adequate description of the model to enable an equivalent model to be built, should the need arise. The SCR methodology document that is supplied to Lloyd's annually for review does not replace the need for the detailed modelling documentation described above.

The documentation must include a user manual for the operation of the internal model, which would allow a knowledgeable third party to run the model, an important mitigant of key person risk. This essentially means a manual for the calculation kernel, though other elements of the internal model could be included if necessary. The manual should contain sufficient detail of the modelling platform and model design to allow a skilled user to run the model and produce results consistent with previous model output. A user manual does not need to be a single document; it can be a set of documents which can be easily accessed and are known in aggregation as the user manual.

The documentation of assumptions is an essential component of documenting the internal model and should demonstrate the appropriateness of assumptions in light of the syndicate risk profile. Agents should record adequate information about expert judgements forming the basis of assumptions, in order to be able to validate those judgements, and document that validation.

SCU 6.5 Circumstances where the model does not work effectively

The documentation shall consolidate any circumstances under which the internal model does not work effectively.

When assessing and documenting circumstances under which the internal model does not work effectively, managing agents shall take account of at least the following:

- the risks which are not covered by the internal model;
- the limitations in risk modelling used in the internal model;
- the nature, degree and sources of uncertainty connected with the results of the internal model including the sensitivity of the results for the key assumptions underlying the internal model;
- the deficiencies in data used in the internal model and the lack of data for the calculation of the internal model;
- the risks arising out of the use of external models and external data in the internal model;
- the limitations of information technology used in the internal model; and
- the limitations of internal model governance

The documentation should include a summary of the limitations of the internal model, consolidated in a single document. This document should also include a summary of the work done to identify the shortcomings of the model and any plans for model improvements. Managing agents will then be able to use this as a way of demonstrating continuous model improvement as the issues are addressed.

It is likely that managing agents will maintain separate records of limitations for different elements of the model, aggregation into a single document will assist managing agents, Lloyd’s and external regulators in assessing the materiality of limitations, the appropriateness of the model and the effectiveness of plans to address the limitations.

Managing agents should document both quantitative and qualitative limitations, as far as possible. The documentation should include a description of the process used to identify and document limitations, including the sources of information such as the model validation and the validation report.

Managing agents should assess the materiality of the cumulative impact of limitations and act accordingly based on the outcome. Agents should check that the aggregation of limitations does not cause a material underestimation of capital and if it does, to allow for this additional risk in their capital as a managing adjustment.

SCU 6.6 Model change documentation

Managing agents shall document all major changes to their internal model.

The documentation of the internal model shall include a record of minor and major changes to the internal model, including the following:

- a description of the rationale for each of the minor and major changes;
- a description of the implications of each of the major changes for the design and operations of the internal model; and
- where a major change or a combination of minor changes has a material impact on the outputs of the internal model, a quantitative and qualitative comparison of the outputs before and after the change relating to the same valuation date.

Model change documentation takes two forms:

Maintaining up to date model documentation

Managing agents must ensure that documentation of model changes addresses the implications for both the design and operational details of the internal. The documentation underlying the internal model should therefore be regularly updated for these changes. The timing of the update should reflect the materiality of the changes i.e. major changes should trigger prompt updates to documents.

Reporting of model changes

Model changes are reported in the Model Change Template with major change applications submitted when triggered in line with an agent's major change policy. The Model Change Templates should contain all model changes – even if these fall outside the scope of the model change policy. Hence the reports should reconcile to the year on year SCR changes and the documentation provided with the SCR submissions as analysis of change should clearly link back to the model change reports.

For further information on model change generally please refer to the model change guidance.