



BERMUDA MONETARY AUTHORITY

**CONSULTATION PAPER**

Proposed Enhancements to the Regulatory Regime for  
Commercial Insurers

28 July 2023

**TABLE OF CONTENTS**

**I. INTRODUCTION..... 3**

**II. ENHANCEMENTS TO THE REGULATORY REGIME ..... 9**

**A. TECHNICAL PROVISIONS ..... 9**

**1. RISK MARGIN ..... 9**

**2. SCENARIO-BASED APPROACH (SBA) ..... 9**

**3. STANDARD APPROACH ..... 54**

**B. BSCR COMPUTATION ..... 55**

**4. LONG-TERM LAPSE AND EXPENSE RISK ..... 55**

**5. PROPERTY & CASUALTY CATASTROPHE RISK..... 65**

**C. SECTION 6D..... 71**

**6. SECTION 6D ENHANCEMENTS ..... 71**

## I. INTRODUCTION

1. The Bermuda Monetary Authority (Authority or BMA) proposes to make enhancements to the regulatory and supervisory regime for commercial insurers and insurance groups.<sup>1</sup>
2. The BMA strives to ensure that the cornerstones of the regulatory regime for commercial insurers continue to be sound, serving the double goal of protecting policyholders and contributing to financial stability.
3. The BMA also seeks to ensure that the framework continues to capture risks and detect new risks while serving the needs of the Bermuda market. For this purpose, the Authority continually monitors trends and market developments, including evolving risks and business models. Like other peer regulators, the BMA assesses the adequacy of existing regulatory tools to ensure it continues capturing the risks and enhancing the level of disclosures and transparency.
4. On 8 December 2022, BMA published a Notice informing stakeholders about targeted enhancements to Bermuda's regulatory and supervisory regime for commercial insurers<sup>2</sup> primarily focused on long-term (life) insurers. The majority of the enhancements to the supervisory review process have been fully implemented, with the remaining being diligently implemented. Additionally, since January 2023, the BMA required prior approval of all long-term block reinsurance transactions and, in this process, requires a comprehensive set of information, namely information on rationale, economics and key features of the transaction; information on fit to business, strategy (underwriting and investment), expertise, and risk and capital management; information on governance, risk management and Asset Liability Matching (ALM); reinsurance, collateral and investment agreements; impact on solvency and stress testing; total asset requirements (technical provisions plus capital requirements) under both the BMA and cedent regulatory basis.

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<sup>1</sup> Commercial insurers: Classes 3A, 3B, 4, C, D and E.

<sup>2</sup> <https://www.bma.bm/viewPDF/documents/2022-12-08-14-56-47-Notice---Targeted-Enhancements-to-the-Regulatory-and-Supervisory-Regime.pdf>

This information facilitates the processing of the applications and discussions with the cedant regulator.

5. The Authority continues to support and implement strong cross-border collaboration and transparent exchange of information through transaction-specific regulator-to-regulator discussions, ongoing exchange of information through written supervisor-to-supervisor enquiries and supervisory colleges where group-wide joint risk assessments are performed, and action plans formulated.
6. On 24 February 2023, the Authority published a consultation paper on proposed enhancements to its regulatory regime and fees for long-term commercial insurers (CP1). The Authority is thankful to insurers, key stakeholders and other market participants who provided feedback on CP1. The Authority's assessment of the feedback received, along with its continuous efforts to enhance the regulatory regime form the basis of this second consultation paper (CP2). A summary of the main findings of the CP1 and associated trial-run exercise is provided in our Stakeholder Letter titled "Re: Consultation Paper – Updates to "Proposed Enhancements to the Regulatory Regime and Fees for Commercial Insurers" posted on BMA's website.
7. Accordingly, the changes in this consultation paper compared with CP1 are changes made because of (i) feedback received and/or (ii) the Authority's own fit-for-purpose considerations unrelated to the feedback received. These enhancements, if adopted as proposed, will primarily focus on the regulatory framework for long-term insurers. The Authority acknowledges that the desired outcome of enhancing its regulatory regime may be achieved in a variety of ways. Accordingly, the Authority will consider the views of the insurance industry and other interested persons to, where necessary, amend the proposed enhancements or consider alternative proposals. This approach is consistent with the Authority's normal practice, which regards all proposed changes to the regulatory regime as subject to change until the conclusion of the consultation period and required legislative changes have been effected.
8. The enhancements are proposed to cover:

- Technical provisions;
- Bermuda Solvency Capital Requirement (BSCR) computation and the flexibility of the BSCR framework; and
- Section 6D enhancements. The Authority proposes to make these changes to the reporting forms and the prudential rules.

### **Proposed Enhancements to Regulatory Regime**

9. In terms of technical provisions, the Authority seeks to perform changes to the standard discount curve for liabilities denominated in Euros, changes to the calculation of the risk margin for Insurance Groups (to be thereafter done on an unconsolidated basis) and changes to the Scenario-Based Approach (SBA). The SBA changes will include enhanced modelling, governance, validation, stress testing and reporting requirements. An overview of the main changes to CP1 that are reflected in this consultation paper on the proposals relating to technical provisions is as follows:

- Section 2.2 (SBA Approval) – The Authority’s original proposal in CP1 required existing entities that are already using the SBA to obtain prior approval from the BMA for all new insurance policies written post-implementation. The revised proposal in CP2 requires BMA’s prior approval where there are material changes to the existing entities’ SBA model. Additionally, the SBA models used by existing insurers are currently and will continue to be subjected to appropriately tailored in-depth supervisory review processes. The information to include in the application package has been outlined in greater detail.
- Section 2.4 (Lapse Risk) – The Authority has renamed the Base Lapse Adjustment (BLA) to Lapse Cost (LapC) to better reflect the intended outcome and rationale for introducing the proposal, which is to assign a specific cost to lapsable products within the SBA. CP2 goes further to provide a methodology to calculate the LapC which shall be required to meet SBA eligibility, noting that insurers can use other approaches, provided the other approaches are shown to be prudent. The proposed methodology is expected to reduce modelling complexity as insurers will not need additional model runs as previously implied by CP1.

- Section 2.7 (Default and Downgrade Costs) – For insurers seeking to use assets for which the BMA has not published the default and downgrade costs, the Authority has provided examples of limited cases where the BMA shall consider varying required criteria, i.e., where an insurer has a BMA approved internal model that can model default and downgrade costs under different scenarios or a BMA approved internal rating approach is in place.
- Section 2.11 (Ring-Fencing Assets backing the SBA/BEL) – The Authority underscored the fact that the SBA uses the actual portfolio of specific assets assigned to back specific liabilities being valued under the SBA. As such, assets shall not be used or pledged for any purpose other than meeting the policyholder liabilities for which the assets are assigned. Insurers shall establish adequate controls to ensure that assets backing the SBA liabilities are only exposed to and used to meet payment of the liabilities being valued under the SBA. The assets assigned to back the liabilities being valued under the SBA cannot be used to cover losses arising from other activities of the insurer.
- Section 2.17 (Accountability) – To ensure that accountability is not unduly outsourced, the Authority has outlined its expectation of the chief internal auditor (CIA) to review SBA model(s) as part of the CIA’s regular program of assessing the effectiveness of an insurer’s risk management program. While the Authority will not require an annual attestation from the CIA, it will monitor the activities of the CIA and the internal audit function relating to SBA model risk management. The Authority will require holistic annual regulatory reporting of the SBA model risk management activities, including any activities conducted by an internal audit.

The substance of other changes in the section on technical provisions does not differ materially from the proposals presented in CP1.

10. Regarding the calculation of the Bermuda Solvency Capital Requirement (BSCR), changes will be made to the ‘other long-term insurance risk capital charge’ to increase its risk sensitivity for lapse and expense risks. Section 4.1 (Separate Identification of Lapse and Expense Risk) of this consultation paper is the Authority’s proposal to apply a ten-year

transitional period to the new lapse and expense risk charges, including a description of key aspects of the proposal. Further, in section 4.2 (Lapse Risk), the Authority's refined its initial proposals for lapse risk charges. The Authority recognises that lapse risk has a time-sensitive liquidity dimension. As part of the refined approach to mass lapse risk, additional prudential requirements are outlined with significant attention and focus on adequate liquidity to support adverse lapse scenarios. This is in recognition of the fact that mass lapse is better managed by assessing both the solvency and liquidity resilience of insurers.

11. Changes will also be made to Property and Casualty (P&C) catastrophe risk charges to capture man-made risks better. CP2 includes some revisions against the originally proposed man-made catastrophe risk module. The revisions are made with two objectives in mind, 1. closer alignment to the corresponding Solvency II (SII) solvency capital requirement (SCR) man-made catastrophe risk scenarios and 2. better alignment between the prescribed man-made scenarios and insurers' risk profile. The former is achieved by revising the Terrorist Catastrophe scenario to be in line with the SII SCR Fire scenario and introducing the SII Credit & Surety Scenario as an alternative option to the already proposed International Association of Insurance Supervisors (IAIS) Insurance Capital Charge (ICS) Credit & Surety scenario. The latter is achieved by extending the horizon of the ICS mortgage stress and enabling the explicit allowance for outwards reinsurance for the ICS Trade Credit stress.
  
11. The BMA aims to revise its framework regarding application processes for modifying specific BSCR parameters in situations where the BSCR framework may not adequately reflect the insurer's risk profile as per Section 6D of the Insurance Act 1978. The revisions will seek to ensure that the framework is more clearly defined, standardised and transparent in terms of scope and requirements. Among other things, it will help provide insurers with a better understanding of the areas and/or circumstances where an application for adjustments to the standard BSCR framework may be allowed if it does not adequately reflect an insurer's risk profile without requiring the approval of a full or partial internal model for regulatory capital purposes. While the second consultation paper includes some revisions to the text in this section, the substance is materially the same. The greatest

change relates to the introduction of a paragraph that clarifies the adjustments that will continue to be allowed but fall outside the new three Routes S6D regime that is being proposed.

12. The Authority received a broad range of support on the long-term entity fee proposals and is not re-consulting on the fee proposals in CP2.
13. The Authority invites the views of the insurance industry and other interested persons on the proposals set out in this consultation paper and encourages commercial insurers to field test the proposals using the field-testing template that accompanies the consultation paper. The field-testing template should be populated on three different bases (details on the bases are included within the guidance sheet of the field-testing template) and therefore, three different copies of the template should be submitted for this exercise. Comments should be addressed to [riskanalytics@bma.bm](mailto:riskanalytics@bma.bm) no later than **15 September 2023**.
14. The associated draft bill, revised draft rules and guidance notes are expected to be published for consultation at the end of August 2023. This will include moving the Authority's requirements on technical provisions from guidance notes into the insurance prudential rules for applicable insurance classes. The Authority intends that the new requirements will enter into force on 31 March 2024.



## II. ENHANCEMENTS TO THE REGULATORY REGIME

### A. TECHNICAL PROVISIONS

#### 1. RISK MARGIN

The Authority is looking to change the risk margin calculation of Insurance Groups to be on an unconsolidated basis (i.e., to be determined as the sum of legal entity risk margins). This will align the calculation with the principles behind the risk margin construction, where the transfer scenario on which the risk margin determination is conceptually based assumes a separate transfer of each Insurance Group entity's liabilities; in the transfer scenario, no diversification benefits between the entities exist. The Insurance Group calculation will be updated to reflect this.

#### 2. SCENARIO-BASED APPROACH (SBA)

##### **2.1. Introduction, Principles and Grandfathering**

The proposed changes to the SBA and to the *Guidance Notes for Commercial Insurers and Insurance Groups' Statutory Reporting Regime* (Guidance Note), which was first issued on 30 November 2016, aim to ensure the BMA continues to maintain a robust regulatory framework review process, in light of evolving business models and industry practices. In developing these proposed changes, the following key principles have been considered as a frame of reference by the Authority:

1. The changes, while targeted, should benefit from a holistic view of the regulatory framework and, at an aggregate level, result in enhanced policyholder protection;
2. The Best Estimate Liability (BEL) should reflect economic reality as closely as possible while also recognising the need for appropriate conservatism and practicality guardrails;
3. The regulatory framework should remain principles-based and in line with the broad range of assets and liabilities that the industry manages while at the same time ensuring it keeps pace with international best practices and regulatory developments. The framework should not encourage pro-cyclical behaviour;

4. The regulatory framework, including the SBA, must be applied within the context of clear structures of accountability, disciplined risk management and strong governance in a proportionate manner;
5. Dynamic assumptions and parameters within the framework should be sufficiently prudent and transparent in their calculation and impact; and
6. The changes should encourage prudent risk management behaviours by insurers and insurance groups.

The main principle of the SBA is to reflect the illiquidity premium embedded in the insurer's asset yields in the discounting of liabilities if the liabilities can be demonstrated to have predictable and stable cashflows across a range of scenarios and are matched with suitable fixed-income assets that produce predictable and stable cash flows. As a starting point, the SBA assumes the existence of a high degree of matching for all portfolios for which the SBA is proposed to be used. Where a mismatch exists, the SBA assigns an explicit cost by running the calculation through eight alternative interest rate scenarios and picking the worst of the eight scenarios to determine the BEL. Nonetheless, it should be noted that the fact that the SBA penalises cashflow mismatches does not automatically open the door for mismatched portfolios. Insurers should note this principle and ensure that asset and liability portfolios for which the SBA is proposed to be used have a high degree of matching. As part of its supervisory process, the Authority carries out several assessments, which include requiring insurers to demonstrate the degree of matching quantitatively and qualitatively for the insurer's existing asset and liability portfolios for which the SBA is used or proposed to be used.

As part of the supervisory process, the BMA scrutinises the assets used in the SBA and the underlying liabilities to understand the ALM risks associated with the business. This level of scrutiny goes beyond what is typically done for business under other reserving approaches. The BMA aims to fully understand all the moving parts and risks in a registrant's business. The SBA is, therefore, not just a liability reserving methodology but also a potent supervisory tool that provides supervisory insights to support a risk-based and tailored supervisory process. As such, the Authority may, in exceptional cases and under

certain circumstances, require an insurer to use the SBA even where the insurer has not elected to do so.

While the Authority may require the use of the SBA for business with a high degree of optionality to capture various cashflow interactions and the BEL impact thereof, it has been noted that insurers would benefit from greater clarity on the Authority's expectations on the level of granularity in modelling. The overall implementation of the SBA requires a robust cashflow modelling process and a tightly embedded model risk management framework. Simplifying assumptions or implementations is thus discouraged and should only be used as an exception after substantive tests. Where these are deemed less prudent and material based on the company's own materiality definition, discussions should be held with the Authority to demonstrate and confirm appropriateness.

The SBA is a tailored and dynamic approach and, therefore, quite demanding compared to other reserving approaches when it comes to implementation. In practice, this means that a significant investment is needed in governance, risk management systems, models and people. Not every insurer can qualify to use the SBA and manage its business under the principles of this approach in a manner that satisfies the regulatory standard sustainably over time. With the SBA having been in use by Bermuda insurers for several years now, the Authority has drawn from these years of supervisory experience and reviews and noted the need to enhance guidance and regulatory requirements to ensure the use of the approach continues to meet the BMA's enhanced expectations.

The BMA notes that the tentatively proposed changes, which may be subject to amendments, may have a material financial impact on some Bermuda long-term (life) insurers that have adopted the SBA, in addition to the considerable investment these insurers will need to make (e.g., governance, model risk management, systems, reporting, people) to qualify to use the SBA and to pass the ongoing and intensive supervisory oversight and engagement. The BMA also recognises that given the lumpy nature of the life reinsurance business model, most metrics and triggers, as known and used under the current regime, are locked in and referenced in reinsurance agreements. As such,

the Authority proposes to grandfather treatment of the existing portfolio of liabilities that use the SBA until their run-off. It should also be noted that the SBA changes will be building upon other significant regulatory changes made by the BMA in 2018, the full impact of which will be effective for 2028 year-end reporting when the transition period ends. Nonetheless, the new SBA changes will apply immediately to all new business that is written after the changes come into effect on 1 January 2024 (i.e., there will be no transition period for new business beyond 2023). Additionally, the following enhancements will not be grandfathered and, therefore, will apply to both existing and new business from the first filing date post-implementation of 31 March 2024:

1. SBA approval requirement (section 2.2)
2. Liquidity risk management requirements (section 2.3)
3. Requirements for demonstrating lapse risk is not significant<sup>3</sup> (section 2.4)
4. Assets with optionality (section 2.5)
5. Changes on sellable assets (section 2.6)
6. Changes to default and downgrade cost assumptions (section 2.7)
7. Guidance on liquidity and transaction costs (section 2.8)
8. Affiliated investments (section 2.9)
9. Reinvestment and disinvestment strategies requirements (section 2.10)
10. Ring-fencing requirements for assets backing the SBA BEL (section 2.11)
11. Documentation requirements (section 2.12)
12. Data requirements (section 2.13)
13. SBA governance requirements (section 2.14)
14. Model risk management requirements (section 2.15)

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<sup>3</sup> The Authority proposes to grandfather the waiver of performing Lapse Cost for existing business. Consequently, the proposal to demonstrate that the residual lapse risk arising from policyholder lapse options is not significant will not affect the waiver (grandfathering) of existing business from the Lapse Cost.

15. SBA enhanced reporting requirements (section 2.16)
16. Accountability requirements (section 2.17)
17. Spread caps on assets that are not generally accepted. (Section 2.18)
18. Clarifications (section 2.19)

Lapse Cost (section 2.4) will be grandfathered for existing SBA asset and liability portfolios.

Where the SBA liability portfolio is a flow reinsurance transaction, new policies of the underlying cedant shall constitute new business for the Bermuda insurer and, therefore, are proposed not to be grandfathered. Insurers can opt to calculate technical provisions for both existing and new business under the revised regime upon application and approval by the Authority. Nevertheless, once approved, insurers cannot switch back to the prior regime.

## **2.2. SBA Approval**

The Authority proposes to introduce a requirement for prior approval of the SBA. This will be in addition to the existing approval process already applicable to assets admissible on a limited basis. The proposed approval requirements are as follows:

1. Newly licensed insurers that propose to use the SBA will require BMA approval;
2. Existing entities not using the SBA will be required to obtain BMA approval before using the SBA for all liability types not using the SBA; and
3. Existing entities that are already using the SBA will be required to obtain prior approval from the BMA for material changes to their SBA model. Additionally, the SBA models used by existing insurers are currently and will continue to be subjected to appropriately tailored in-depth supervisory review processes.

Before the SBA can be used, an entity will have to send an application to the Authority for approval (as proposed under 2.2. 1-3 above). The application should include all the information required for the use of SBA as outlined in this Consultation Paper to enable the Authority to assess if all requirements that are met. The application package should include:

1. Evidence that the requirements for using the SBA are met for each sub-portfolio in the scope of SBA;
2. Completed SBA reporting template. In the template, detailed data (quantitative and qualitative) is requested on assets and liabilities in the scope of SBA, the process of how the applicant determines the scope of sub-portfolios, assumptions around any fungibility assumed, liquidity risk, lapse and surrender risk in products, among other relevant data;
3. Full SBA model calculations, including asset and liability models and/or cashflows used for the purpose of SBA;
4. Stress tests (more details are included under the Lapse Risk Section 2.4 in this Consultation Paper):
  - a. Including two stresses to be prescribed by the Authority—one involving a single notch rating downgrade of all assets and another that combines liability-asset stress: 20% mass lapse stress test with assets being sold at stressed market values (effected through haircuts) to meet additional cashflows
  - b. Insurer-specific liquidity stress tests: varying degrees of stressed conditions should be considered in various stressed scenarios over different time horizons. Substantiation should be included on why these specific stress tests are appropriate given the specific risk profile of the applicable SBA sub-portfolio. The insurer-specific liquidity stress tests are in addition to the standard liquidity stress tests prescribed by the BMA as described under the Lapse Risk Section 2.4 and item (a) above;
  - c. Liquidity risk management and liquidity plans (see more details in this Consultation Paper);
  - d. lapse stress tests: the most conservative of a 40% lapse-up or lapse-down stress test representing a permanent increase or decrease in base lapse rates;
5. Documentation including:
  - a. Key assumptions;
  - b. Data used;
  - c. Detailed explanation of the calculation process;
  - d. Methodologies;

- e. Governance structure, including validation framework;
  - f. Model change policy;
  - g. Validation report by an external party and/or independent validation function.
6. Model risk management in place;
  7. Overview (graphically) and description of systems, infrastructure and people resources relevant to the SBA model; and
  8. External dependencies (e.g., on vendors and consultants);
  9. All other items listed in the SBA reporting template and any other relevant information that the applicant considers may be necessary for the assessment and decision by the Authority.

An application for SBA approval may be submitted at any time, but the Authority encourages insurers to engage the Authority in pre-application discussions prior to formal submission. The pre-application engagement is not a mandatory part of the approval process, but our experience has shown it can facilitate an efficient review of the application for SBA approval. In advance of the initial pre-application meeting, the prospective applicant shall provide high-level summary information and draft documentation of the proposed application. The exact timeframe for approval of the application for SBA is expected to vary from application to application. Where applications are supported by effective pre-application engagement and complete good-quality documentation, the Authority expects to reach a decision within 4-8 weeks. Applications which do not meet these criteria may require additional review time.

### ***Splitting Liabilities***

With the introduction of approval requirements for using the SBA, some liabilities may qualify while others may not. As a result, the Authority seeks to avoid the unintended consequence of insurers splitting liabilities for purposes of SBA eligibility. The proposal is to disallow the splitting of insurance contracts purely to achieve SBA eligibility.

### **2.3. Liquidity Risk Management Programme**

This section remains largely unchanged from CP1, except that the requirements have been extended to apply to companies that do not use the SBA but are exposed to mass lapse risk. The BMA's aim is to embed liquidity risk requirements in a broader sense and on an ongoing basis as part of an insurer's enterprise risk framework.

The SBA is a dynamic cashflow matching approach that works in the context of a robust liquidity risk management framework. The BMA proposes to introduce a requirement for insurers to implement a liquidity risk management programme. An insurer's liquidity risk management programme is proposed to, at a minimum, cover the following:

### ***Governance and Risk Appetite***

An insurer's board of directors (board) is responsible for ensuring that an insurer has an effective liquidity risk management framework. The board should ensure clear ownership in the organisation of key elements of the risk management framework. The framework should be reviewed annually or more frequently as circumstances require. The roles of the first and second-line functions in liquidity risk management should be clearly defined, including mechanisms to identify and mitigate conflicts of interest.

An insurer should identify and thoroughly understand the sources of demand and supply of cash and how the dynamics of supply and demand could change under different scenarios. The level of liquidity risk the insurer has an appetite to seek or accept should be formalised through a board-approved liquidity risk appetite. The liquidity risk appetite in this context could be documented on a standalone basis or as part of the insurer's other governance documents. The risk appetite should be clear about the types, duration and severity of liquidity stress scenarios the insurer targets to withstand. The insurer should be able to demonstrate that its liquidity risk appetite has been set concerning liquidity stress and scenario testing. The insurer's liquidity risk management framework should be integrated into its wider risk management framework and demonstrated to inform day-to-day operations and key business decisions.



The insurer should have clearly defined liquidity metrics and target thresholds in operationalising the board-cascaded risk appetite. These could take the form of liquidity coverage ratios or excess liquidity measures. The insurer should consider setting prudent risk limits for each source of liquidity risk. Where this is not the case, the rationale should be clear, documented and subjected to independent challenge.

### ***Cash Needs and Sources Register***

Insurers should maintain a cash needs and sources register, which systematically documents each need and a potential source of liquidity. This register should also critically assess the key characteristics associated with each need and source and the relevant uncertainties and risks. Such assessment should feed into how the different liquidity needs and sources are used and categorised (e.g., in terms of liquidity quality, within the insurer's liquidity risk management framework).

### ***Liquidity Buffer***

This refers to a pool of highly liquid assets that the insurer shall specifically set aside to address any deficiencies in cash inflow that may arise to meet cash outflow requirements over a specified scenario horizon. The insurer should be able to clearly demonstrate the process and criteria used to determine the appropriate size of the liquidity buffer and how it aligns with the insurer's defined risk appetite.

### ***Stress and Scenario Testing***

Varying degrees of stressed conditions should be considered in various stressed scenarios. A balance should be struck between severity and plausibility. Liquidity risk should be assessed over different time horizons with a focus on those horizons over which particular risks are expected to arise. Insurer-specific and market-wide scenarios should be considered, including their combinations. The scenarios should cover fast-moving and more sustained scenarios where the insurer's liquidity position deteriorates slowly. Tests should also be carried out to test the insurer's liquidity breaking point (i.e., liquidity reverse stress tests).

### ***Liquidity Contingency Plan***

An insurer should put in place and document a liquidity contingency plan to serve as a playbook to meet potential liquidity deficits. Clear triggers should be identified and regularly reviewed. An assessment should be made on how this interacts with stress and scenario testing. For example, particular stress scenarios may adversely alter the efficacy of certain liquidity contingency measures.

The liquidity contingency plan should be regularly tested and enhanced through dry-run simulation exercises. The results of such testing should be reported to the relevant committee(s), subjected to appropriate challenge and integrated into decision-making.

### ***Monitoring and Reporting***

Reporting should be of the appropriate detail while capturing the key liquidity risk areas. It should be proportionate, forward-looking (e.g., through early warning indicators) and able to facilitate informed decision-making. An insurer should put in place appropriate infrastructure and systems to access relevant data and, thus, assess and monitor its liquidity exposures.

## **2.4. Lapse Risk<sup>4</sup>**

The SBA is a dynamic approach that requires the modelling to be as close as possible to what happens in practice. For instance, actual asset sales and purchases need to be explicitly modelled and projected, dynamic lapses should be captured, and cashflows should respond to the particular interest rate scenario just as they would in practice. This feature allows the SBA to incorporate some of the asset and liability dynamics (e.g., those related to lapse risk and reinvestment) within the scenarios in a way that would not be possible under a static approach.

A major premise of the SBA is that when illiquid liabilities are matched with suitable fixed-income assets producing predictable and stable cash flows, it is appropriate to reflect the

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<sup>4</sup> Lapse risk charges for capital requirements are discussed separately under the BSCR's Computation section. Section 3.4 is only focused on the treatment of lapse risk within the SBA.

illiquidity premium embedded in the insurer's own asset yields in the discounting of those liabilities. The illiquidity premium in the wide sense (i.e., including other non-credit premiums, e.g., complexity premium) corresponds to the part of the total asset spread that is not attributable to actual credit risk. Nevertheless, this also means that liabilities subject to convexity risk, despite having been historically illiquid, can quickly turn liquid (and hence payable) under rising interest rate environments.

Lapse risk is one key contributor and has the potential to cause a breakdown of the matching assumed by an insurer, for example, by forcing the insurer to sell assets at unfavourable prices to meet increased liability outflows and/or cause losses if the cash surrender value is higher than the technical provisions held. While unexpected deviations in lapse risk should be and are handled as part of the capital requirements and the SBA is an approach to determine the best estimate value of liabilities, it is the Authority's assessment that more conservatism and guardrails should be in place on how this is applied in practice.

As a guiding principle of the proposed changes on lapse risk, within the SBA, the scope and impact of potential unexpected lapse deviations that would result in uncertainty in cashflows cannot be significant (i.e., liabilities subject to lapse risk shall be allowed only to the extent that the lapse risk arising from such is appropriately and prudently managed in the context of a robust ALM programme). The Authority does note that some insurers may have various mitigants in place to limit the extent and impact of lapse risk. The impact of such mitigants shall be considered only to the extent that it can be demonstrated to be satisfactorily effective, both quantitatively and qualitatively, as part of the insurer's overall ALM programme and liquidity risk management framework.

The Authority aims to ensure that the lapse assumption used in the BEL calculation is robust where products subject to lapse risk are included. This implies that to qualify to use the SBA, insurers would need to demonstrate this, both quantitatively and qualitatively. In addition, it is vital that the dynamic nature of the SBA is reflected in the modelling of dynamic lapses and that their impact on the BEL is separately identified and reported. The

BMA recognises the complexity and very tailored nature of the Bermuda (re)insurance market and the variety of bespoke risk management approaches/techniques used by insurers to manage balance sheet risks. In more detail, the proposed changes seek to reflect this and are as follows:

For eligibility to use the SBA, insurers would need to satisfy one of the two conditions below:

1. The contracts underlying the insurance or reinsurance obligations include no options for the policyholder; or
2. Where policyholder options exist, the residual risk arising from asset/liability portfolios with such options is demonstrated to be insignificant through adequate modelling, robust ALM, stress testing and liquidity risk management. To satisfy this condition, insurers shall meet the following requirements:
  - a. Hold a Lapse Cost (LapC) as part of the SBA BEL. The LapC required to meet SBA eligibility conditions shall be calculated as outlined below:
    - Calculate the difference between the historical actual and expected lapse rates expressed as a percentage of expected lapse rates.
    - Calculate the 1 standard deviation of lapse rate differences obtained from 1 above. Round up the result to the nearest 1% to obtain the 1 standard deviation, i.e., lapse rate sigma. Insurers can use other approaches to calculate the lapse rate sigma provided they are shown to be prudent.
    - Calculate the capital charge for lapse up or down using the prescribed lapse up or down BSCR shock, i.e., lapse up down capital requirement.
    - The LapC shall be given by the following formula:  $(Lapse\ Rate\ Sigma \div BSCR\ lapse\ up\ down\ shock) \times Lapse\ up\ down\ capital\ requirement$
  - b. Pass a 100% Enhanced Capital Ratio (ECR) under a 40% lapse-up or lapse-down stress test representing a permanent increase or decrease in base lapse rates;
  - c. Pass a 3-month horizon liquidity stress test with a minimum 105% Liquidity Coverage Ratio (LCR). The LCR shall be defined by the formula:  $(Eligible\ Liquidity\ Sources \div Liability\ Outflows) \times 100$

The liability outflows are the total cash outflows arising from a mass lapse stress with the shocks as specified in the table below:

	Time Restraint					
	Low (less than < 1 week)		Medium (between 1 week and < 3 months)		High (more than > 3 months)	
Economic penalty	Retail	Institutional	Retail	Institutional	Retail	Institutional
Low (no economic penalty)	25%	50%	12.50%	25%	0%	0%
Medium (less than 20% economic penalty)	12.50%	25%	6.25%	12.50%	0%	0%
High (more than 20% economic penalty)	0%	1.25%	0%	0%	0%	0%

Time restraint: Time restraints are based on the average time between the request by a policyholder and the settlement under the normal course of business. A substantial delay in access may create a disincentive for counterparties to surrender their contracts and, therefore, shocks are reflected as zero where the time restraint is higher than three months.

Economic penalty: Economic penalty only includes contractual penalties (e.g., surrender charges) imposed by the insurer on policyholders that surrender early. It does not include market value adjustments or penalties that are imposed by third parties, or are not explicitly quantified in the contract, such as the economic value of foregone benefits (e.g., tax penalties or other tax implications).

The eligible liquidity sources shall be defined as follows:

Liquidity Source Type (unencumbered)	Liquidity Tier	Haircut
Cash and currency on hand	1	0%
Demand deposits	1	0%
Publicly traded equity	3	65%
Certificates of Deposit	3	60%
Undrawn committed lines	3	90%
Investment funds: Liquid mutual and Money Market Funds	3	85%
Investment funds: Liquid Exchange Traded Funds	3	90%
Sovereigns rated AA- and above	1	0.70% * WAL
Sovereigns rated BBB- and above	1	1.40% * WAL
Public Corporates rated AA- and above	2	1.40% * WAL
Public Corporates rated BBB- and above	2	1.50% * WAL

Mortgage Based Securities rated AAA with WAL less than 10 years	3	1.90% * WAL
Other Structured Securities rated AAA with WAL less than 10 years	3	2.20% * WAL
All Other Potential Liquidity Sources	4	100%

1. Where WAL is the weighted average life of the instrument.
2. Assets with liquidity tier 3 shall be limited to a maximum of 30% of total liquidity sources for purposes of calculating the LCR. Liquidity sources of tier 2 and 3 are not eligible to defease cash outflows for which the time restraint is low, i.e., required to be paid within one week – only tier 1 liquidity sources shall be used for these.
3. Through the Commercial Insurer Solvency Self-Assessment (CISSA) process and reporting, demonstrate robust:
  - a. ALM, capital and liquidity management;
  - b. lapse risk management through diligent underwriting, experience analysis and risk monitoring; and
  - c. insurer-specific solvency and liquidity stress testing.
4. Provide detailed SBA, lapse and liquidity reporting as prescribed by the BMA. See Section 2.16 on Enhanced Reporting

***Optionality assumptions in BEL calculation***

Optionality assumptions such as lapses and all other rate-sensitive assumptions shall be appropriately modelled under all the SBA scenarios (e.g., through the use of dynamic formulas for lapses).

**2.5. Assets with Optionalities or Behavioural Components**

In general, assets used in the SBA should provide highly predictable and stable cash flows with no or limited optionality (unless required to match liability cash flows, where appropriate and allowed). The existence of material options or behavioural sensitivities may render assets ineligible for the SBA, particularly where the effect of these cannot be prudently accounted for, as far as these result in asset cash flows being deemed not predictable or stable enough, as per the existing SBA instructions and guidance. In cases where, in the normal course of prudent investment, some optionality or behavioural components may reasonably exist (e.g., call options for corporate bonds or prepayments for certain mortgage-backed securities), all such features must be explicitly and properly

modelled. The resulting asset cash flows should differ between the SBA scenarios as appropriate. The foregoing does not constitute a change (i.e., it is already a requirement). Nevertheless, additional disclosure will be mandated to make the assumptions more transparent and to enable the Authority to undertake better benchmarking, including the identification of potential outliers. The BMA is currently considering possible ways the disclosure could be implemented.

All the relevant assumptions (e.g., call, prepayment or other) should be explained and justified and will be subject to enhanced disclosure and sensitivity testing. The justification should include an appropriate comparison of prior experience to that reflected in the current (forward-looking) assumptions. Where material uncertainty exists, whether concerning (a lack of) historical data or uncertainty around the forward-looking behaviour, the assumptions should be set to reflect this uncertainty prudently. The sensitivity testing will look at the impact of changes in relevant assumptions (e.g., prepayment assumptions).

## **2.6. Restrictions on Assumed Asset Sales – Unsellable Assets**

The concept of the SBA relies on insurers being able to collect the illiquidity premium embedded in asset yields by holding those assets to maturity. If a sale of the assets intended to be held to maturity was required, this would happen at an uncertain price dependent upon the market circumstances at the time. This uncertainty is magnified for less liquid and/or relatively more volatile/risky assets.

The Authority intends to clarify and set restrictions on what can be assumed regarding asset sales within the SBA projections. Specifically, no 258E assets should be assumed to be sold within the SBA projections ('unsellable assets'). It may be noted that insurers generally assume holding these assets to maturity in reality (i.e., this is an integral part of the business models), and this should be already reflected in the SBA modelling, assuming the modelling has been done appropriately. Therefore, the nature of this change is more to codify the appropriate practice rather than to introduce a new restriction per se.

The following is envisaged to apply:

1. No ‘unsellable asset’ should be sold to meet cashflow shortfalls. Where this is the case, the insurer should increase its holding of sellable 258C assets. Otherwise, a material mismatch exists, and the reserve should increase accordingly;
2. The SBA projections should end with zero surpluses (zero assets and zero liabilities), meaning there should be no assets left. In terms of unsellable assets, this requires appropriate management of the investment portfolio: 258E assets (e.g., BB-rated bonds) reaching maturity should eventually be reinvested in sellable assets (rather than reinvesting in the same unsellable asset) in such a way to ensure that no sales of the unsellable assets are required within the projections;
3. In general, almost all the assets eligible for the SBA have a fixed contractual maturity date. For the unsellable assets in this category, avoiding sales comes down to the appropriate management of reinvestments, as per the point above. In the exceedingly rare case of approved alternative assets with no fixed maturity date, an asset that is due to be sold would need to be replaced by a 258C eligible asset sitting under the surplus bucket; otherwise, the alternative asset will be assigned a ‘zero value’ on sale: In practice, this will require tracking and modelling the value of 258C eligible surplus assets within the SBA projections. Any required sale of a 258E asset due to run-off would then be deducted from the remaining value of eligible surplus assets (on the premise that the 258E is swapped into surplus, and the eligible surplus asset is sold instead). This could be done until no 258C eligible surplus remains in the projection. At this point, further disposals of 258E assets would be assigned zero value.

### **2.7. Default and Downgrade Costs**

The SBA is based on the premise that when illiquid liabilities are matched with suitable fixed-income assets producing predictable and stable cash flows, it is appropriate to reflect the illiquidity premium embedded in the insurer’s own asset yields in the discounting of those liabilities. The illiquidity premium in the wide sense (i.e., including complexity premium, etc.) corresponds to the part of the total asset spread that is not attributable to actual credit risk. Accordingly, this latter part of the spread must be excluded from the asset spreads used in the SBA. Nevertheless, the Authority recognises there are potentially



various approaches to determine the spread component attributable to credit risk (and hence the remaining illiquidity premium).

The BMA intends to clarify and standardise the calculation of ‘default and downgrade costs’ within the SBA. This is to ensure the appropriateness of the calculation and consistent

application in light of divergent practices and magnitudes of spread reductions observed across the market. The BMA proposes to publish the default and downgrade costs for some asset types where data is publicly available and provide guiding principles for those assets where BMA approval will be required.

The default and downgrade costs will be reflected through a negative adjustment to the investment spread. Like the default costs, the downgrade costs would be based on long-term historical data and are, therefore, not expected to fluctuate significantly from one year to the next.

***Assets for which the BMA publishes the default and downgrade costs***

The Authority will provide default and downgrade costs for assets with publicly available data as follows:

1. Realised default losses from past data shall be used as a baseline for default costs; and
2. An uncertainty margin, assessed on top of the baseline default cost, shall be used as a downgrade cost estimate.

For field testing purposes, the default and downgrade costs shall be published on the BMA website post release of this consultation paper.

***Assets for which the BMA has not published default and downgrade costs***

Insurers seeking to use assets for which the BMA has not published the default and downgrade costs should, at a minimum, follow the approach being considered by the BMA as described above with the necessary adjustments. BMA approval shall be required for these assets.

Where default data is limited, the insurer shall consider taking an even more prudent approach, including but not limited to the following:

1. Ensuring the ultimate default and downgrade cost estimate assumption proposed for use in the SBA is more prudent than that used for similar publicly quoted assets of comparable credit quality;
2. The ultimate default and downgrade cost estimate assumption proposed for use in the SBA is no less prudent than that obtained using the approach proposed by the BMA as described above;
3. Conducting benchmarking analysis where applicable; and
4. For assets acceptable on a limited basis in line with paragraph 258E of the Guidance Note, the BMA shall consider if further measures of prudence are required. The BMA expects the uncertainty adjustment for the default cost on 258E assets to be not less than a 1 standard deviation of the baseline default costs. Other measures the BMA shall consider include but are not limited to:
  - a. Assessing a higher uncertainty adjustment than proposed by an insurer; and
  - b. Spread caps applied on a case-by-case basis (see section 2.18).

Additionally, insurers may be required to demonstrate that only the illiquidity premium that can be earned over the tenor of the asset is reflected in the BEL. Insurers shall be required to provide an assessment of the relevant liability liquidity profile and the extent to which any estimated asset illiquidity premia could be earned.

In limited cases, the BMA shall consider varying the above criteria, e.g., where:

1. The insurer has obtained BMA approval as per the provisions of a Rule made under section 6 of the Insurance Act 1978 to use its own internal model to calculate the capital requirements for default and downgrade risks, e.g., through an internal ratings-based approach.
2. An internal ratings-based approach has been approved by the BMA as per Section 6D of the Insurance Act 1978 (route 3 as explained in section II.C of this consultation paper).

The chief actuary and chief investment officer shall attest to the prudence and appropriateness of the default assumptions submitted for approval to the Authority, including confirming compliance with regulatory requirements as outlined above.

### **2.8. Transaction Costs**

Realistic transaction costs must be applied to all assets sold and bought within the SBA projections. Where historical transaction costs for an asset type may not be representative of expected future transaction costs, the assumptions should be adjusted accordingly, where that adjustment would lead to an increase in the transaction costs. Where there is a lack of credible data for a specific asset type or other uncertainty around the level of the assumptions, the assumptions should be set prudently.

For liquid publicly traded assets, a minimum requirement is to reflect observed bid-ask spreads, where it can be demonstrated that this adequately captures (and does not understate) the price impact. If current bid-ask spreads are lower than long-term average bid-ask spreads, a grading-in from current market to long-term average bid-ask spreads should be applied; the same shall apply if current bid-ask spreads are wider than long-term average bid-ask spreads, except that the grade-in period shall be set to be more prudent. This applies to both existing assets and potential reinvestments. The bid-ask spreads should be the effective bid-ask spreads that consider the size of the company's positions and the volumes traded in relation to the liquidity and depth of the market for the relevant asset; marginal bid-ask spreads (e.g., the bid-ask spread involved in buying/selling an incremental unit of quantity at the market) should not be used. In case a company considers that the effective bid-ask spreads do not provide an appropriate reflection of economic reality, then a company may use more realistic bid-ask spreads that explicitly vary based on the quantities sold/bought. The derivation of such bid-ask spreads should be based on observed market data and consider all the principles noted within this section.

Generally, for all assets, the full expected price impact of selling (or buying) the asset should be reflected within the SBA projections. This applies to liquid assets in case the market bid-ask spreads do not provide a full reflection of the price impact, but in particular,

it applies to all less liquid assets. The impact is expected to vary by degree of (il)liquidity and between asset classes. For less liquid assets, the magnitude of the impact is expected to be higher than the bid-ask spreads based on advertised or displayed prices/quotes (including broker quotes or other non-binding prices). The transaction cost assumptions incorporating full price impacts should also not be lower for any asset type than the implied bid-ask spreads or discounts/premiums observed based on past actual trades for that asset type. The price impacts and bid-ask spreads for illiquid or less liquid assets should be no less than those for similar liquid publicly quoted assets of equivalent credit quality/rating.

In addition to the price impacts of trading, any applicable fees, commissions and expenses required to purchase or sell assets—whether implicit or explicit—should be included within the transaction cost assumptions.

The calibration of the bid-ask spreads and liquidity/price impacts should be regularly reviewed and tested against actual market data and the company’s own experience.

Like all other assumptions in the SBA, these assumptions shall be subjected to internal challenge within the insurer, independently assessed by the approved actuary and reported to the Authority as part of the enhanced SBA reporting.

## **2.9. Affiliated Investments**

Insurers generally fund long-term liabilities using investments in unaffiliated counterparties. The Authority proposes to require prior approval of all assets having counterparty credit exposure to an affiliate, related party or connected party. In practice, such investments falling under Paragraph 258C of the Guidance Note will require prior regulatory approval on a going-forward basis. Insurers shall look-through through the underlying counterparties in determining whether they are affiliates, related parties or connected parties.

Proposed Definitions:

“Affiliated” means one company is affiliated with another company only if one of them is the subsidiary of the other or both are subsidiaries of the same company or each of them is controlled by the same person.

“Related party” means related party as defined under the respective insurer’s accounting standards, namely the: International Financial Reporting Standards (IFRS); generally accepted accounting principles (‘GAAP’) that apply in Bermuda, Canada, the United Kingdom or the United States of America; or such other GAAP as the Authority may recognise

“Connected party” means associated in any other way other than those defined above, i.e., affiliated, or related, and that association could give rise to a conflict of interest in relation to the investment.

## **2.10. Reinvestment and Disinvestment Strategies**

While the principles for reinvestment and disinvestment listed below are reflected as proposed changes, the nature of this change is more to codify the appropriate practice and the Authority’s expectations regarding reinvestment and disinvestment rather than to introduce a new change per se.

### ***Reinvestment Strategy***

In the SBA model, excess net cash flow can be reinvested. Reinvestment should reflect the key underlying SBA principle that the SBA is only to be used on asset-liability portfolios with a high degree of matching. Reinvestment assets can be purchased only in line with the insurer’s existing and board-approved ALM and investment policies.

The following principles shall be observed in building and modelling the reinvestment assumptions:

1. Assumed asset purchases shall be made from a set of clearly defined asset classes in line with the insurer’s current asset allocation and compliance with its ALM policy and investment policy asset allocation targets. The Authority does not envisage an insurer

- having an existing asset allocation that is not in line with its approved investment policy. Where such is the case, the most prudent approach shall be taken by default after discussion with the Authority;
2. While simplifications can be made to categorise some different non-standard assets into one bucket for reinvestment purposes, this should only be done as an exception, and even then, it should be clearly demonstrated, quantitatively and/or qualitatively, that such simplification results in a more prudent BEL output than if no simplification had been made;
  3. At a minimum, the list of assets from which purchases can be made should vary by rating and tenor within each asset class. The ratings should be at the appropriate level of granularity. While the tenor may be simplified into buckets, there should be no less than three buckets (i.e., short-term, medium-term and long-term maturities, each defined depending on the company's liability and asset cash flow profile). Exceptions should be discussed with the Authority before implementation;
  4. The asset purchase prices should be in line with the market values as projected under each scenario at a given time step for different asset classes for each combination of rating and tenor;
  5. While the reinvestment strategy and, hence, asset purchases, should be in line with the insurer's investment policy, these should not materially depart from the insurer's current asset allocation. Over the projection period, long-term historical market averages may be used; this, however, should be done prudently in the context of the performance of the insurer's existing asset portfolio. The grade-in period for moving from short-term spreads to long-term spreads should be set prudently, such that it is longer when short-term spreads are lower than long-term spreads and shorter when short-term spreads are higher than long-term spreads. Any departures from this requirement should be demonstrated to be of immaterial impact. Superior performance on the current portfolio cannot be assumed to continue over the projection period at variance with long-term historical market averages. All such assumptions shall be set robustly and critically, subjected to independent challenge and clearly documented as part of the internal governance process;

6. To remove any doubt, asset types cannot be assumed to be purchased in the SBA model that the company does not already currently hold in its approved SBA asset portfolio;
7. It should be demonstrated that the choice and implementation of the reinvestment strategy, and any simplifications thereof, result in a more prudent BEL output than would have been produced had the existing asset allocation been used for reinvestment purposes, with or without similar simplifications. A key underlying principle of the SBA is a high degree of matching. An insurer meeting this and other key principles would have a limited need for reinvestment. Where an insurer assesses that its reinvestment strategy does not fully meet this principle, a more prudent approach should be taken by default. Otherwise, the Authority's approval would be required; and
8. The Authority recognises that an insurer's reinvestment strategy can change from time to time in response to several internal and external factors. It is not the Authority's expectation that such changes would be material. . Where this is projected to be the case, the above principles should still be observed, including discussing the same with the Authority.

### ***Disinvestment Strategy***

An insurer should have a clearly defined disinvestment strategy aligned with its investment and other relevant policies. Within the SBA, assets shall only be sold for purposes of meeting excess liability cashflows otherwise not met through cash flows from asset maturities and coupon payments. Selling related to portfolio rebalancing to maintain the existing asset allocation within existing duration limits over time is noted to be in the spirit of the underlying SBA principles and therefore required. To remove any doubt, negative cashflows cannot be rolled forward in the SBA model.

An insurer's disinvestment strategy should, at a minimum, take the following into account:

1. The insurer's investment management practice regarding the order or sequential steps to follow when selling assets;
2. The insurer's investment management practice regarding the sale of assets before maturity;

3. The insurer's investment management practice regarding the sale of assets with unrealised losses;
4. The insurer's investment management practice regarding selling assets to cover liabilities denominated in currencies different from the asset sold;
5. The insurer's investment management practice regarding the selling of long-duration versus short-duration assets;
6. The assets classified as 'unsellable'. To be clear, illiquid assets cannot be assumed to be sold in the model for the purposes of meeting liability cashflows;
7. Existing constraints for each block<sup>5</sup> of business that govern whether its supporting assets can be used to settle cash flow shortfalls arising in other blocks of business;
8. That the assets to be sold must be compliant with regulatory guidance. For example, 258E assets cannot be assumed to be sold in the model. Even in the case where assets assumed to be sold are not explicitly disallowed, the insurer should be able to demonstrate that the associated price impacts and transaction costs are reflective of the liquidity (or lack thereof) of the asset; and
9. That the asset sale prices must be in line with the market values as projected under each scenario at a given time step for different asset classes for each combination of rating and tenor.

Simplifications to the above are only permitted to the extent they can be demonstrated, quantitatively and/or qualitatively, that they are prudent.

The chief investment officer (or another suitable and appropriate executive officer as agreed with the Authority) shall attest to both the reinvestment and disinvestment strategy

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<sup>5</sup> A fundamental premise underpinning the application of the SBA is the existence of a high degree of matching of the expected cash flows of assets to the expected cash flows of liabilities valued under the SBA. In practice, insurers use different approaches to assign specific assets to meet projected liability cashflows. One common approach used by insurers is to define and establish discrete blocks or portfolios of liabilities – containing a defined set of policies that are typically similar (e.g. corresponding to a product, to a group of similar products, or to a common coverage type) or corresponding to a distinct transaction/deal; and are typically considered separately for each individual cedant in the case of reinsurance – and assign specific assets that achieve a high degree of matching. The blocks or portfolios are typically established based on how the insurer implements its ALM taking into account any regulatory, legal, administrative and other operational considerations.



modelled in the SBA model, confirming alignment with the insurer's practices and declaring compliance with the insurer's policies and the above principles.

### **2.11. Ring-Fencing Assets Backing the SBA BEL**

The scenario-based approach uses the actual portfolio of specific assets assigned to back specific liabilities being valued under the SBA. The Authority proposes separate identification and reporting of assets assigned to back the SBA BEL and a requirement that such assets shall not be used or pledged for any purpose other than meeting the policyholder liabilities for which the assets are assigned. Insurers are expected to establish adequate controls to ensure that assets backing the SBA liabilities are only exposed to and used to meet payment of the liabilities being valued under the SBA. The assets assigned to back the liabilities being valued under the SBA cannot be used to cover losses arising from other activities of the insurer.

Insurers may use different approaches to assign assets to back liabilities valued under SBA, provided the assignment for purposes of the SBA model is consistent with how the insurer manages its business and operates its ALM program. The approach adopted by the insurer should demonstrate a high degree of matching while reflecting all constraints (e.g., legal, regulatory, and operational limitations or encumbrances) that may govern specific portfolios of assets and liabilities, restricting full fungibility (under normal and adverse scenarios) of cashflows and assets between different blocks of SBA liabilities. Where constraints exist, the insurer shall demonstrate that such constraints have been appropriately considered and fully reflected in the valuation of BEL under the SBA. For example, where an insurer has a block of SBA liabilities backed by legally or operationally ring-fenced assets, the cashflows arising from such assets can only back liability cash flow needs arising from the same block.

The Authority shall require an insurer to explain how it assigns specific assets to back specific liabilities and justify any fungibility assumed across SBA models.

### **2.12. Model Documentation Requirements**

The Authority proposes to introduce model documentation requirements for the application of the SBA, with the details as follows:

1. Model documentation should allow a knowledgeable third party to understand the design and details of the model, assess the materiality of assumptions, identify limitations and form a sound judgment as to the model's compliance with regulatory requirements;
2. The documentation should provide a proportionately detailed description of the structure, scope, theory, data, assumptions, expert judgment, parameterisation, results, validation, model changes, model governance and model policies. Furthermore, the documentation should detail all the key software, external models (including their customisation), data and the reasons for their use;
3. Insurers should have a model documentation standard (e.g., as part of supporting standards to the model risk management policy) that defines the approach to document various aspects of the model, such as roles, development, sign-off, update and review processes, and sets out mechanisms that ensure that the standard is adequately implemented;
4. The documentation should be appropriately structured, complete, and kept up to date and include an inventory of all the documents forming the model documentation;
5. The documentation should identify the main limitations, simplifications and weaknesses of the model and conditions under which the model may not adequately determine the insurer's best-estimate liability and technical provisions;
6. Proportionate documentation applies to all model risk management activities, including but not limited to model development, implementation, testing, ongoing monitoring, review, validation and management deliberation on model risk reports with escalation to board committees, as necessary; and
7. Model documentation should clearly show how the model for the BEL and technical provisions calculation interacts with other models (upstream and downstream models). This should help the insurer appreciate the scope of the individual risks connected to an insurer's model and the aggregate risks emerging from interactions or interdependencies among models, processes and data across the firm. Being able to

- map and understand the end-to-end processes may help spot places where risk management is weak, or controls are lacking.
8. The level and detail of documentation shall be proportionate with the materiality of each model area and independent control functions shall be required to review and challenge how the proportionality principle is applied to avoid risk leakages.

### **2.13. Data Requirements**

The Authority proposes to introduce data requirements for the application of the SBA, details as follows:

Insurers shall ensure that they have an approved data policy in place supported by documented internal processes and procedures to ensure data used in the calculation of technical provisions is complete, accurate and appropriate. This applies to all SBA data, including liability and asset data. More specifically, insurers should align their policy with the following:

1. Data used in the calculation of technical provisions should, at minimum, meet the following conditions to satisfy the completeness requirement:
  - a. The data includes sufficient historical information to assess the characteristics of the underlying risks and to identify trends in the risks; and
  - b. The data is available for each of the relevant homogeneous risk groups used in the calculation of the technical provisions, and no relevant data is excluded from being used in the calculation of the technical provisions without justification.
2. Data used in the calculation of technical provisions should, at minimum, meet the following conditions to satisfy the accuracy requirement:
  - a. The data is free from material errors;
  - b. Data from different time periods used for the same estimation is consistent;
  - c. The data is recorded in a timely manner and consistently over time; and
  - d. Data extensions, capping or modifications should be documented and justified. The process for dealing with outliers and data-smoothing should be performed prudently such that there is no material underestimation of the technical provisions.

3. Data used in the calculation of technical provisions should, at a minimum, meet the following conditions to satisfy the appropriateness requirement:
  - a. The data should be consistent with the purposes for which it will be used;
  - b. The amount and nature of the data ensure that the estimations made in the calculation of the technical provisions based on the data do not include a material estimation error;
  - c. The data is consistent with the assumptions underlying the actuarial and statistical techniques that are applied to them in the calculation of the technical provisions;
  - d. The data appropriately reflects the risks to which the insurer is exposed as relevant to the technical provisions calculation;
  - e. The data is used consistently over time in calculating the technical provisions. Where data is not used consistently over time, a description of the inconsistent use and its justification should be documented and disclosed in the SBA memorandum and approved actuary's opinion and report; and
4. Insurers may use data from external sources provided that, in addition to fulfilling the requirements set out above in paragraphs 1 to 2, all the following requirements are met:
  - a. Insurers can demonstrate that the use of that data is more suitable than the use of data that is exclusively available from an internal source;
  - b. Insurers know the origin of that data and the assumptions or methodologies used to process the data;
  - c. Insurers identify any trends in that data and the variation, over time or across data, of the assumptions or methodologies in the use of that data;
  - d. Insurers can demonstrate that the assumptions and methodologies referred to in points (b) and (c) reflect the characteristics of the insurer's portfolio of insurance and reinsurance obligations; and
  - e. Insurers can demonstrate what other data could have been used, its impact and why it was not chosen. This also includes choices within the same data where a different choice could have been made.

Where insurers cannot satisfy requirement 4 above due to other considerations, e.g., due to the external data being proprietary, an assessment shall be carried out by the independent

control functions to assess the materiality of use of such data and such assessment shall be subjected to annual review by the Approved Actuary and disclosed as part of regulatory reporting.

Insurers should formally document the data controls in place and checks carried out on data used to calculate technical provisions and include an assessment of why the checks are considered adequate and appropriate.

#### **2.14. Governance and Internal Control Requirements**

The Authority proposes to introduce governance and internal control requirements on the use of the SBA with the following details:

1. The board shall approve the initial use of the SBA and any major changes thereafter. Major changes should be defined in advance within the SBA model change policy, or where not defined, a second-line opinion should be sought at the time of the change on whether the change requires board or board committee approval;
2. The board shall be responsible for ensuring the ongoing appropriateness of the design and operations of the SBA model and that the SBA model continues to be appropriate for the insurer;
3. There shall be an appropriate and suitably constituted committee(s) to effectively challenge new and ongoing model use, model and assumption change approval, and use and reporting of model output. Model validation reports should also be discussed at the committees' level;
4. The insurer shall implement policies to guide its model risk management activities as part of the overall risk management framework. At a minimum, an insurer shall have a model risk management policy, a model change policy and a data quality policy. The model change and data quality policies can be standalone or part of the model risk management policy. The policies should cover all model risk management and data aspects, including but not limited to data storage and quality, model development, model testing, model use, model change, validation, documentation, model outsourcing, reporting and governance. Other documentation, such as standards, processes and procedures, could be considered, if appropriate and proportionate, to support the implementation of the policies;

5. The SBA model change policy shall distinguish between minor and major changes, including changes triggered by the expansion of the scope of the SBA model (e.g. to cover new types of businesses that require materially different model specifications);
6. Roles of the control functions shall be clearly defined concerning the development, use, ongoing maintenance, monitoring and review, validation and reporting of results and risks of the SBA model;
7. A mechanism to identify and prevent conflicts of interest shall be in place and addressed in the model's governance framework, including clear guidance on reporting lines, allocation of responsibilities and escalation paths within the insurer and to the Authority, as necessary. Where conflicts of interest cannot be avoided, e.g., due to proportionality considerations such as the size of the insurer, the potential for conflict shall be taken into account and the requirement applied in an appropriate but proportionate manner.
8. Insurers shall ensure the systems, infrastructure and resources in place are adequate;
9. There shall be adequate and effective controls in place regarding the SBA model's operation and maintenance; and
10. Insurers can use third-party actuarial and investment software as part of their SBA model suite, including for SBA feeder models (a model which produces outputs that are used as inputs for the SBA model(s)). However, outsourcing of the process for running, maintaining and managing the SBA model and its feeder models is not encouraged. Nevertheless, where outsourcing is used either externally to third parties or internally to other affiliated entities, the insurer should have demonstrable oversight and clear accountability for all outsourced activities as if these were performed internally and subject to the insurer's own standards on governance and internal controls. Such outsourcing should be discussed with the Authority before implementation or, where already in place, will be subject to the Authority's onsite review process.

## **2.15. Model Risk Management**

The Authority proposes to introduce model risk management requirements on the use of the SBA. Model risk management activities shall be guided by the insurer's model risk management policy and supporting standards. The insurer should have a materiality definition specific to the use of the SBA model, which shall be developed in consultation with the control functions. The insurer's definition of materiality should determine whether model and assumption changes, enhancements, findings and other relevant considerations are material. The first and second-line functions should collaborate and ensure a clear definition and ownership for model risk management activities. This should be performed by considering the need for independence for some activities (e.g., validation). An attestation of the adequacy of the model risk management practices employed by the insurer, including compliance with the regulatory requirements in the areas below, shall be obtained from the chief risk officer and the chief executive officer.

### ***Model Inventory***

Insurers should maintain a comprehensive set of information as part of the model inventory in line with best-practice model risk management. This applies to the SBA models implemented for use, under development or recently retired and any associated downstream and upstream models (e.g., liability models, asset models or stress testing models).

### ***Model Development, Testing, Implementation and Use***

The model development and implementation processes should be structured and executed in a manner that is in keeping with the spirit and letter of regulatory guidance.

Software, computer code, algorithms, mathematical formulas and other information technology systems used to implement the model should undergo rigorous quality control and change control procedures even though they may not be considered models. This ensures that the code and its implementation are correct. It can only be edited by authorised parties and all changes are recorded and auditable.

Testing is a crucial component of model development and should be conducted as part of the SBA model's lifecycle. Here, the many aspects of a model and its overall functionality are assessed to see if it is functioning as intended. This comprises determining the model's accuracy, proving its stability and robustness, identifying potential flaws, and analysing how the model responds to various inputs and scenarios.

Testing activities should include the goal, design, and execution of test plans and the summary results with commentary and evaluation, including a detailed analysis of samples. The documentation of test activities should be fit for purpose.

Model users can provide insight into whether the SBA models are functioning as intended, including assessing model performance as models are in use. Feedback should be sought on both the SBA model and the associated upstream and downstream models, as these are connected in their impact. Insurers should ensure adequate processes are in place to address user feedback and that the mechanism for assessing model use over time is functional and effectual.

### ***Model Limitations and Uncertainty***

All models, by definition, have limitations and create uncertainties in their use. The insurer should demonstrate that it understands the limitations and uncertainties of the SBA model and its feeder models, including how these are accounted for. To the extent possible, the impact of such uncertainties should be quantified. The quantification should avoid spurious accuracy (e.g., using ranges instead of single-point estimates).

Where only a qualitative assessment is possible, insurers should have processes to deal with such, including considerations on whether this should be discussed with the Authority. This is an explicit assessment of the impact of model limitations and inaccuracies that is separate from the risk margin.



The quantitative and qualitative assessment results should be reported as part of the model risk reporting and a determination should be made on whether adjustments to the BEL are required.

### ***Pre-Model Adjustments, In-Model Adjustments and Post-Model Adjustments***

Pre-model adjustments refer to cases where an insurer overrides a data input or assumption to a model. In-model adjustments refer to cases where an insurer overrides (e.g., through a cap or floor) a calculated value in a model. Post-model adjustments refer to cases where the insurer overrides a model's output by applying a model overlay. The insurer's model risk management policy and standards should detail the circumstances under which such adjustments may or may not be used, including outlining processes regarding review, approval, continued use, removal and back-testing of such adjustments.

Such adjustments and overlays should not be viewed as permanent solutions that dissuade the insurer from making necessary improvements to the model. Processes to monitor and analyse such adjustments and overlays should be in place to address underlying limitations and issues through data enhancements, model recalibration or redevelopment.

All model adjustments and overlays should be well-documented in line with the insurer's documentation standards and subject to a transparent process that links appropriate justification to specific model issues and limitations. As part of the process, model adjustments should be clearly outlined, and model results should be reported through the insurer's internal governance processes with and without adjustments to enable decision-makers to understand the extent and impact of such adjustments.

### ***Model Validation***

Model validation is the set of processes and activities intended to verify that models perform as expected, in line with their design objectives, regulation and business uses. Effective model validation helps reduce model risk by identifying and assessing the impact of model limitations and errors, corrective actions and appropriate use. It also assesses the reliability of a given model based on its underlying assumptions, theory and methods. This

way, model validation provides information about the source and extent of model risk. Validation can also reveal deterioration in model performance over time and set thresholds for acceptable levels of error through analysis of the distribution of outcomes around expected or predicted values. Effective validation helps ensure that models are sound.

Model validation shall be performed by staff with appropriate incentives, competence, influence and authority so that there is an effective challenge mechanism. Insurers shall demonstrate that the model has been validated independently (externally or internally) from those who develop, change, update, run and use the model. Independence shall be demonstrated not just by the separation of lines but also by process, actions and outcomes. Overall, the quality of the validation process shall be judged by the degree and way in which models are subject to critical examination.

All SBA models shall be validated before being used for regulatory reporting and at fixed intervals of at least three years thereafter or such other higher frequency considered appropriate by the insurer in line with its model risk management policy requirements. The initial model validation shall be in-depth and detailed. Subsequent model validation activities shall be holistic and proportionate to the use and materiality of the SBA model to the insurer and the extent of model changes since the last validation.

The model validation process shall, at a minimum, specify the following:

1. Scope of validation:
  - a. Data and other input;
  - b. Assumptions;
  - c. Processing;
  - d. Methodologies;
  - e. Controls and governance;
  - f. Model review process;
  - g. Output and use; and
  - h. Documentation.
2. Processes, methods and tools to be used;
3. Frequency of validation;

4. Model changes;
5. Persons involved, roles, reporting lines and escalation paths; and
6. Output and reporting.

The model validation process shall apply to all SBA model components and cover all requirements. It shall also equally apply to models developed in-house and those purchased from or developed by vendors or consultants. Material model changes, for example—in terms of scope, structure, methodologies, assumptions and governance, and all model redevelopment—should be subject to validation activities of appropriate range and rigour before implementation.

It is important to ensure that upstream and downstream models are also taken into consideration as part of the model validation processes. If a model is used as a feeder model (a model which produces outputs that are used as inputs for another model(s)) in the SBA model that is undergoing validation, an effective validation programme ensures that those models are also evaluated for soundness and acceptable performance. The same applies to downstream models where the SBA model undergoing validation is used within other existing models. Validators should consider the extent to which downstream models should be included. Where there is limited access to such models (e.g., code, formulas), the requirements specified under ‘Use of and Reliance on Third Party Models’ shall apply.

Model validation should go beyond reviewing or replicating model developers’ work/code. As part of the validation process, insurers could consider a number of items, including but not limited to the following:

1. Review of conceptual soundness elements, including developmental evidence;
2. Sensitivity, stress and scenario testing;
3. Dynamic and static validation;
4. Roll-forward analysis;
5. Unit/cell testing;
6. Reconciliation against the input source or ledger;
7. Outcome analysis, including back-testing;
8. Trend analysis and stability testing;

9. Profit and loss attribution;
10. Independent full model replications, sample recalculations and formula inspection, as appropriate;
11. Process and controls verification;
12. Benchmarking or alternative design methods/models; and
13. Other validation tools as determined to be relevant and appropriate.

The above items are not expected to be limited to independent validation work. Many of them could be considered part of the first-line actuarial activities, such as a model review.

The SBA model validation shall require insurers to produce detailed model validation reports. The reports should document the validation process and conclude on the adequacy of the model component or model being validated and the appropriateness of the resulting technical provisions for regulatory reporting purposes.

There shall be a clearly defined reporting structure to senior management and the board, a remediation and follow-up process for model validation findings, an action plan and implementation monitoring.

If significant deficiencies are noted as an outcome of the validation process, the model's use shall not be allowed or shall only be permitted under very tight constraints, including escalation to, and approval by, the Authority. The reference to 'significant', in this case, does not refer to every material finding. The Authority notes that it may be challenging to define what significant means in this context and shall allow insurers to determine this internally in consultation with the model validators and the internal control functions.

Validation activities should continue on an ongoing basis after a model goes into use to track known model limitations and identify any new ones.

### ***Model Review, Ongoing Development and Monitoring***

Insurers shall establish a requirement for periodic review of the SBA models as part of the model risk management programme. A model review does not need to be done by an independent party. It may be done by model developers, implementers or users. The purpose of a model review shall be to highlight potential changes since the last validation or reporting cycle, determine the sufficiency of the latest validation activities, highlight areas needing a deeper dive, model performance monitoring and reverify the technical aspects of the model. A model review shall be carried out regularly but no less frequently than annually. The insurer should consider whether feeder models, such as asset and liability models, should be considered in the model review process and what reliance is placed on work already done on those models. The model review shall not be as detailed as model validation, but the level and scope of review should be assessed to be proportionate and fit for purpose in line with the model tier, frequency of review and depth of the most recent review.

The model's performance shall be regularly monitored, and key metrics observed and reported. As part of the monitoring process, an assessment should be carried out to determine if the model's performance in production is in line with model development and testing stage expectations/results. Insights could be gathered by applying key controls, such as the BEL and/or spread movement analysis, where the current-period BEL and/or spread is reconciled with that from the prior period.

The work carried out by first-line actuarial teams as part of ongoing reporting (e.g., regular model and control updates as part of quarterly or half-yearly reporting) does qualify as a model review to the extent that such work also covers a proportionate review of the technical aspects of the model, including model performance. To avoid doubt, the Authority does not expect insurers to set up a separate model review team but would expect the model review to be embedded in the work by first-line actuarial teams. A log should be kept listing all model and control updates and changes. Updates considered material should be subject to testing, and the testing results also captured in the log. The decision and rationale to include or exclude feeder models from the model review process should also be logged. Material changes and the decision to include or exclude feeder models shall also

be subject to the challenge of an appropriate management committee. Testing is not required for changes considered immaterial. Nevertheless, the insurer should have mechanisms to monitor the aggregate impact of a combination of such changes to the extent they become material. No further documentation of the model review process is expected besides maintaining the model review log. The model review log shall be subject to annual review by the Approved Actuary.

### ***Model Risk Reporting and Deliberation***

Insurers should ensure model risk is captured promptly and reported to a management committee regularly. This could take the form of standalone model risk management reports or dedicated sections within the existing wider risk and actuarial functions reporting. An insurer's risk, investment and actuarial functions should collaborate and ensure there is clarity within the firm on ownership for model risk reporting for both the SBA and its feeder models to avoid leakages in reporting. Management should be able to demonstrate (e.g., through management committee minutes, report improvements and ultimate decisions taken) that the level of deliberation on model risk reports offers appropriate challenge and is adequate considering the insurer's nature, scale and complexity. While no explicit deliberation by the board on model risk reports is mandated, it is important that the board recognises it is the ultimate owner of the use of the SBA model and is, therefore, expected to have and be able to demonstrate an overall understanding of the application of the SBA and its importance for the insurer's business.

Model risk management reports should be of the appropriate detail, covering all relevant key information proportionately. Information submitted to management committees on the use and application of the SBA shall include at least a reasoned analysis of the reliability and adequacy of the calculation and the sources and degree of uncertainty of the output. The reasoned analysis should be supported by a sensitivity analysis that includes an investigation of the sensitivity of the output to each of the major risks underlying the obligations covered in the technical provisions, including an assessment of the impact of identified limitations. The risk and/or actuarial function should clearly state and explain any concerns they may have regarding the adequacy of the BEL and technical provisions.

Tolerance levels should be in place and reviewed periodically to ensure they are not set too low or too high in line with the insurer's definition of materiality. Other items to be considered for reporting, including how they measure against tolerances, may include but shall not be limited to:

1. The volume of models considered high-risk;
2. Models with temporary exemptions or provisional approvals;
3. Status of model issues (e.g., past due, work in progress, partially completed);
4. Summary of model performance metrics, including a list of underperforming models and actions being taken;
5. Lists and trends by the tier of the number of models:
  - a. With past-due validations;
  - b. In use without validation;
  - c. Used outside of approved purpose; and
  - d. Used despite rejection outcome from review/validation.
6. Model risk events/incidents reported for the period;
7. Quantification and treatment of material and/or aggregate model uncertainties;
8. Model development and enhancement efforts in progress and allocated resources;
9. Resource-related indicators (e.g., budget, people, infrastructure) and an assessment of the impact on other areas (e.g., impact on model testing, documentation, ongoing monitoring); and
10. Summary of key model outputs plus the outputs of key model risk management activities for the period under review.

#### ***Use of and Reliance on Third-Party Models and Outside Experts***

Vendor models should be included in the insurer's broader model risk management framework following the same principles as applied to in-house models, with any modifications appropriately justified and documented. Insurers should, for both SBA and SBA feeder models, obtain the following:

1. Developmental evidence explaining the model's components, design and intended use to determine whether the model is appropriate for the insurer's products and risk exposures;
2. Information regarding the data used to develop the model, including the use and effect of alternative data;
3. Sufficiently detailed testing results that show the third party's model works as expected;
4. Documentation of the model's limitations and assumptions about when the model's use may be unsuitable or problematic;
5. Clear instructions for model implementation, including any decisions that should be made regarding parameters or thresholds;
6. Insurers should require vendors to conduct ongoing performance monitoring and outcomes analysis, with disclosure to their clients, and to make appropriate modifications and updates over time;
7. Insurers are expected to validate their use of vendor products;
8. Insurers should obtain information regarding the data used to develop the model and assess the extent to which that data is representative of their circumstances;
9. The insurer should conduct ongoing monitoring and an outcomes analysis of vendor model performance using the insurer's outcomes;
10. Additionally, where third-party/vendor models do not provide complete access to development codes, the insurer should be able to demonstrate how they obtain confidence from using third-party models (e.g., through using in-house models for benchmarking and or building challenger models); and
11. Insurers should have contingency plans for instances when the vendor model is no longer available or cannot be supported by the vendor.

Where reliance was placed on outside experts and third-party models (e.g., on asset assumptions) in developing the SBA models, systems and processes should be in place to determine the appropriate level of reliance. The following should be considered at a minimum:



1. Whether the individual or individuals upon whom reliance has been placed are experts in the applicable field;
2. The extent to which the model has been reviewed or validated by experts in the applicable field, including known material differences of opinion among experts concerning aspects of the model that could be material to the actuary's use of the model;
3. Whether there are industry or regulatory standards that apply to the model or the testing or validation of the model, and whether the model has been certified as having met such standards; and
4. Whether the science underlying the expertise is likely to produce useful models for the intended purpose.

The Authority recognises that some of the above-proposed requirements may be difficult to comply with in certain cases, e.g., use of and access to proprietary information. Where such is the case, the insurer shall make practical reasonable efforts to meet the intended outcomes of the requirement and any remaining gaps shall be subject to internal challenge by the control functions and reported to the Authority.

#### ***Model Risk Management Audit***

Internal audit shall review model risk management to ensure there is an effective challenge provided by second-line and model validators to the model owner, developers, users and implementers and that the model risk management policy and procedures are kept current, in keeping with regulatory requirements and best practices. Internal audit should provide assurance on the level of critical review and challenge provided by the validation and model review activities, adequacy and frequency of model risk reporting and the manner of challenge (and decisions thereof) by management and board to such reporting. Overall, internal audit should form its own independent opinion and provide assurance or otherwise on the adequacy of the model risk management activities performed by both the first-line and second-line functions given these proposed changes to the Guidance Note.

## **2.16. Enhanced Reporting – SBA, Lapse and Liquidity Return**

The Authority proposes to enhance the data and information provided as part of the memorandum of supplementary actuarial information as required under paragraph 261 of the Guidance Note. The enhancements shall cover a broad range of areas, including but not limited to:

1. Asset and liability selection;
2. Detailed asset listing
3. Detailed liability profile
4. Asset assumptions;
5. Liability assumptions;
6. Lapse risk profile
7. Cashflow analysis and matching;
8. Analysis of change;
9. Liquidity risk analysis;
10. Modelling;
11. Sensitivity analysis of asset and liability assumptions;
12. Stress testing;
13. Governance; and
14. Model risk management.

Insurers should note that this reporting is not limited to companies using the SBA. It equally applies to all companies not using the SBA but have exposure to lapse and/or liquidity risk.

The aim of introducing the SBA, Lapse and Liquidity Return is to collect data and information for the purpose of SBA, lapse and liquidity supervisory review process. This information will be used to further tailor the supervisory review process in assessing the resilience of the solvency and liquidity risk of long-term insurers and inform supervisory measures.

The proposed reporting template is shared along side this Consultation Paper for feedback.

## **2.17. Accountability**

1. While the approved actuary is responsible for providing independent assurance to the Authority that the technical provisions have been assessed to be reasonable, it should be noted that this does not take away responsibility from both the insurer's management and board. Accountability cannot be outsourced and officers, including but not limited to the chief executive officer, chief investment officer, chief finance officer, chief actuary and other appropriate members of senior management, shall be accountable for the accuracy of the BEL. The BMA shall obtain attestations from The chief risk officer, regarding the adequacy and independence of their challenge and oversight on how the insurer applies the SBA.
2. The Authority expects the chief internal auditor (CIA), to review SBA model(s) as part of the CIA's regular program of assessing the effectiveness of the wider model risk management program. The objective of the assessment performed by the internal audit function is to:
  - a. Assist management, the board of directors and other stakeholders in performing their duties and
  - b. Confirming that the activities by both the first-line and second-line functions provide adequate assurance that the principles and requirements of the Guidance Note regarding the application of the SBA are fully met.

As the Authority increases its supervisory intensity of the SBA, including model risk management, the Authority envisages that the CIA and the internal audit function will play a key role in assessing the associated model risk management framework. For clarity's sake, the Authority will not require an annual attestation from the CIA. Instead, the Authority will monitor the internal audit activities relating to SBA model risk management through its regular on-site and off-site supervisory review process. The Authority will require holistic annual regulatory reporting of the SBA model risk management activities, including any activities conducted by the internal audit.

The insurer's officers have a fiduciary duty to ensure the BEL and technical provisions are calculated responsibly and transparently, in keeping with the objective of protecting

policyholder interests. The Authority shall, at any time, require the approved actuary and officers of the company to evidence their satisfactory fulfilment of this fiduciary duty.

### **2.18. Spread caps on assets that are not generally accepted**

Insurers are expected to fund long-term liabilities using assets that have cashflows that are well-defined such as fixed-income instruments. These assets must be investment grade and are referred to as “assets that are generally acceptable” – see paragraph 258C. However, the Authority recognises that other asset types may be appropriate as part of a balanced and conservatively managed portfolio, but appropriate diversification must exist to satisfactorily address any non-interest rate and non-default risk. These assets are commonly known as “asset classes that are not acceptable (except as described in paragraph 258F)” and “asset classes that may be acceptable on a limited basis” (i.e., paragraph 258E). Insurers are required to obtain prior approval from the BMA to use 258E and 258F assets on a limited basis and subject to the strict conditions outlined in the Guidance Note. Where assets are approved, the Authority sets additional limitations in the form of caps to the illiquidity premium that can be recognised in relation to these assets. These caps are typically applied by the BMA on a case-by-case basis during the approval process. The primary purpose of the caps is to retain the original intention of 258E and 258F assets by limiting the overall impact of assets that are acceptable on a limited or exceptional. The Authority is looking to standardise and formalise the already applied caps on spreads/illiquidity premia of assets approved under paragraphs 258E and 258F. The caps will be applied consistently during the approval process.

### **2.19. Clarifications**

The Authority has identified a need to clarify its position on the areas of the SBA’s application discussed below. These are not changes to the regulatory regime, and as such, no grandfathering or transition will be applied. Insurers that may have used any of the practices below should notify the Authority and stop forthwith.

1. Repositioning or redeployment of asset portfolios is not allowed in the SBA. Paragraph 256 a. of the Guidance Note states, “the scenario-based approach uses the actual portfolio of assets assigned to the block of business (as well as any projected

- reinvestments) to determine market yields net of default costs.” For the avoidance of doubt, repositioning or redeployment is not a form of future management action that is allowed to be reflected in the valuation of best estimate pursuant to Paragraph 195-195 of the Guidance Note. The Authority’s expectations regarding repositioning or redeployment are stated in section 2.10 above.
2. Fungibility of asset cashflows between blocks of business is not allowed in the SBA except to the extent that it is transparent, practical, and allowed by the relevant law and contractual and governance arrangements. Even where this can be demonstrated to be the case, it should be documented, tested, taken through the appropriate governance challenge and limited to the legal-entity level. Where fungibility is demonstrated to exist under normal circumstances, insurers shall also test and evidence successful fungibility across a range of unexpected and potentially severe scenarios, such as counterparty default and market dislocations. Where assets are held in separate collateral accounts, fungibility is not allowed without the approval of the Authority. No fungibility can be assumed to occur between legal entities in an insurance group.
  3. Borrowing of any form to meet cashflow shortfall is not allowed in the SBA;
  4. Using leverage to enhance investment returns is not allowed in the SBA. Insurers should reach out to the Authority if they need further clarity;
  5. Implementation of the SBA methodology shall be in line with the Guidance Note. This requires explicitly projecting all asset and liability cash flows at a very granular level for the base scenario and under each of the eight scenarios. Methodology approximations are not allowed;
  6. No credit for active portfolio management is allowed (e.g., in terms of assumed yield pickup);
  7. Active trading (frequent purchases/sales of assets) within the SBA is not allowed. Reinvestment in the SBA is intended to cover reinvesting proceeds from asset maturities and any positive net cash flows for the period. Similarly, disinvestment is intended to cover the selling of assets to settle any negative net cash flows at the given time step, not to transition from one asset class to another for purposes other than maintaining the existing asset allocation;

8. The Authority recognises that derivatives can serve as an important risk management tool if used appropriately within a mature and robust governance and risk management framework. However, the use of derivatives in the SBA is allowed for hedging purposes only upon approval by the Authority, either separately or as part of the SBA model approval process. In making its determination, the Authority will review several factors, including but not limited to the risk-mitigating nature of the derivatives, insurer's hedging strategy, governance, risk management, stress testing, associated costs and risks and demonstrations of how these are reflected in the mechanics of the SBA calculation. Derivatives that are an inherent part of product design, as is the case with fixed index annuities, do not need explicit approval from the Authority. However, the same considerations noted above would apply and will be subject to review as part of the SBA model approval and the subsequent supervisory processes; and
9. Realistic transaction costs should be reflected in projected sales or purchases of assets.
10. The default and downgrade costs should be applied by adjusting cash flows. When having to sell any assets, the cumulative loss rate up to the point of sale should be accounted for in the sale proceeds (i.e., any cash flows, including sale proceeds, can only be assumed to be received for the 'non-defaulted' part of an asset, i.e. the part left after deducting cumulative defaults and downgrade costs up to and including the relevant time point).<sup>6</sup>

### 3. STANDARD APPROACH

The Authority has been considering adjusting the Euro-denominated (EUR) discount curves for the Standard Approach. The change would eliminate differences between EUR

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<sup>6</sup> For example, assume a hypothetical bond with 10% annualized expected loss rate. This means that, at the end of year 1, 10% on the balance would have defaulted on expected basis, with 90% of the initial holding remaining. During year 2, another 10% of the remaining balance (or  $10\% \times 90\% = 9\%$  of the initial balance) would default on expectation, leaving 81% of the initial balance at the end of year 2. If the bond then had to be sold at year 2, the sale proceeds – calculated by multiplying the scenario- and time-step dependent market price by the quantity held, less transaction costs and/or liquidity impacts – would only be received on the remaining non-defaulted part (i.e. 81% of initial), not on the full initial holding (i.e. 100%). The same applies to any cash flows during the life of the asset, such as coupon payments, which would only be received on the remaining (as-yet non-defaulted) part. The Authority notes that there could be acceptable alternative approaches and approximations to applying the default and downgrade costs, as long as it can be demonstrated that those achieve substantially the same (or more prudent) outcomes than the principles-based approach, and adequately account for all the aspects of the default costs e.g. as noted on the sale of assets.

rate curves provided by EIOPA and those provided by the BMA. The Authority has, however, noted that Bermuda insurers with EUR-denominated liabilities often carry out internal calculations using the EIOPA EUR-curve. Having observed that the two curves produce results that are not materially different, the Authority proposes to allow insurers to use the EIOPA EUR curve for EUR liabilities by default without seeking separate approval from the BMA.

**Consultation Questions – Technical Provisions:**

Q.1 Do you see any practical issues that the proposals on the technical provisions may introduce?

Q.2 Do you have proposals on the proposed liquidity sources and the applicable haircuts that should be applied under stress?

Q.3 On default and downgrade costs, do you have any proposals on the proposed methodology for assets other than corporate bonds?

Q.4 Are there other areas in the Guidance Note covering the use of the SBA that, in your view, the Authority should further clarify?

**B. BSCR COMPUTATION**

**4. LONG-TERM LAPSE AND EXPENSE RISK**

**4.1. Separate Identification of Lapse and Expense Risks**

Currently, lapse and expense risks are covered by the long-term ‘other insurance risk’ charge, with no explicit identification of the risk components. To better reflect these risks and enhance the BSCR standard formula’s transparency and aid the Authority in its supervision, it is proposed that the other insurance risk charge be broken down into separate lapse and expense risk components, with explicit diversification incorporated. This change will be done in the context of changing the risk charge itself, as described in the following subsections.

In terms of the concrete BSCR standard formula structure, the proposal is to replace the current long-term ‘other insurance risk’ charge with new lapse and expense risk

submodules. The correlation matrix for aggregating the long-term insurance risk components into the overall long-term ‘insurance risk’ charge would be modified (expanded) accordingly.

The proposed correlations would be as follows:

	Mortality	Stop loss	Riders	Morbidity and disability	Long	VA Guarantee	<b>Lapse</b>	<b>Expense</b>
Mortality	1							
Stop loss	0.75	1						
Riders	0.75	0.75	1					
Morbidity and disability	0.25	0	0	1				
Longevity	-0.5	-0.5	-0.5	0	1			
Variable annuity guarantee	0	0	0	0	0	1		
<b>Lapse</b>	0	0	0	0	0.25	0	1	
<b>Expense</b>	0.25	0.5	0.5	0.5	0.25	0.5	0.5	1

The Authority proposes to apply a ten-year transitional period to the new lapse and expense risk charges. When projecting forward the total LT Insurance Risk charge on the ‘new BSCR basis’ for the purposes of the Risk Margin calculation, the transitional weights applied within the total LT Insurance Risk charge should be kept fixed at the actual level prevailing as of the valuation date.

Companies would be able to reflect management actions (the Loss-Absorbing Capacity of Technical Provisions) within the lapse and expense risk calculations, in line with the other existing shock-based BSCR risk modules. However, such management actions must comply with all the Instructions set out in the BSCR Handbook and are restricted to those allowed under the current BSCR framework, i.e., to management actions directly affecting the value of Future Discretionary Benefits (FDB).



## **4.2. Lapse Risk**

The current long-term ‘other insurance risk’ charges, meant to capture lapse and expense risks, are simple in nature, as they are factors applied to the regulatory reserves (i.e., BEL). There are a number of issues identified with the charges that require addressing. The current charges have the potential to result in capital held that is too low for certain types of liabilities and too high for some others. They also could lead to the same charge for any two policies/products with the same reserve amount, regardless of the characteristics of the products/policies, and are not readily applicable to products with negative reserves. The BEL is also generally not the most appropriate risk driver, as the extent of lapse risk on the Economic Balance Sheet (EBS) valuation basis is closely tied to the difference between the EBS BEL and the surrender value of a policy rather than to the BEL alone.

The changes aim to make the capital requirements more risk-sensitive within the constraints of the BSCR standard formula framework. The Authority proposes to achieve this by introducing lapse (and expense) shocks to replace the factor-based calculation. Applying principles-based shocks from first principles will ‘automatically’ enable capturing all policy/product features and characteristics in a granular and realistic manner. The determination of the charges will follow the same conceptual and general principles as all the other existing shock-based calculations in the BSCR.

The Authority expects insurers to quantify and manage lapse risk appropriately within their portfolios and, as part of that, to be able to run lapse shocks. It is also noted that Schedule V(e) of the BSCR already requests relevant underwriting shocks; for any liabilities with material lapse risk, this would have included lapse shocks. Given the above, no extraordinary operational or infrastructure challenges would be expected to arise from the changes. Nevertheless, the introduction of certain simplifications or approximations could be considered for products with no material lapse risk, where appropriate.

Details of the proposal are as follows:

### ***BSCR – Lapse Risk Capital Requirement***

1. Determined by applying specified shocks, and (re)calculating the net asset value (capital and surplus) under the shocks:
  - a. Capital requirement will be equal to the change in the net asset value (assets – liabilities) resulting from the shocks; and
  - b. In practice, it involves calculating the post-shock BEL (by re-projecting liability cash flows) and comparing it to the before-shock BEL to determine the change resulting from the shock. Further implementation details will be confirmed.
2. Three shocks would be applied, with the most adverse determining the capital requirement:
  - a. Lapse-up - Relative change to base lapse rates (i.e., option take-up rates); permanent (i.e., applied in all future years);<sup>7</sup>
  - b. Lapse-down - Relative change to base lapse rates (i.e., option take-up rates); permanent (i.e., applied in all future years); and
  - c. Mass-lapse - Immediate discontinuance of a large number of policies within the first year.
3. Additional details on the approach:
  - a. Each of the shocks would be applied only to those policies, or homogeneous groups of policies, for which the shock results in an adverse outcome (i.e., to an increase in liabilities);<sup>8</sup>
  - b. No offset between (homogeneous groups of) policies or products would be assumed within the lapse-up and lapse-down scenarios (e.g., while policyholders are not completely rational, it is, in general, not appropriate to assume material increases /decreases in lapses where lapsing/not lapsing is disadvantageous for the policyholder);
  - c. For the mass-lapse shock, three options will be field-tested for certain businesses (as further specified later in this section): 1) no offset (as per the above bullet); 2)

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<sup>7</sup> All options that can affect the amount of insurance coverage, including options that allow for partial or full termination or increase in the insurance cover, are affected by the lapse shocks.

<sup>8</sup> 'Homogenous groups' are defined in the Guidance Notes.

full offset; and 3) partial offset (being the average of the preceding two sets of results); and

- d. Certain diversification would, however, be included in the construction. Taking the maximum of the three shocks means that some liabilities may not attract a charge under the capital calculation (e.g., if lapse-up is the biting scenario, then policies exposed to lapse-down would effectively not get charged). This contrasts with the current charges, where all policies get a charge.
- e. For the avoidance of doubt, the lapse shocks apply to all Long-Term business where any relevant policyholder options exist, including without limitation “separate account” and “segregated account” business.

The lapse shocks must align with international best practices and be adequate, considering the one-year 99% Tail Value at Risk (TVaR) calibration target. The Authority is considering regulatory benchmarks in relevant jurisdictions and regimes, particularly Solvency II and the Insurance Capital Standard (ICS). Nevertheless, at the same time, the Authority recognises the judgmental component inherent in the mass-lapse calibrations due to the nature of the risk. The Authority also notes the wide variety and complexity of products within the Bermuda market and acknowledges that there are important differences between product types (e.g., protection versus annuity), geographical differences in product features (e.g., surrender charges, market value adjustments), and legal and fiscal rules (e.g., tax (dis)incentives), which are likely to necessitate differentiated mass-lapse shock calibrations. For example, there is evidence of higher persistency and lower volatility for protection-type products, for which the (in)ability to obtain new coverage (or the same amount of coverage under similar economic terms) is a further important consideration influencing policyholder behaviour. There is also less incentive to surrender the policy (even in the conditions of a mass-lapse scenario) where there is no savings component, or the cash surrender value payable is of small importance relative to the protection provided. The calibration of the approaches has been performed using a mix of benchmarking with other major risk-based supervisory regimes (namely Solvency II and the ICS), empirical data and expert judgment. The charges are calibrated to the underlying nature of risks underwritten in Bermuda.

For products written from markets where a dedicated and long-established shock-based lapse framework exists (as proposed in this consultation paper), i.e., the European and UK markets, the lapse risk charges shall be determined in line with the methodology and calibration under those solvency regimes, i.e., Solvency II and Solvency UK.

For products written in the US and other markets, the approach outlined below, partly informed by the ICS, shall be taken with modifications on the mass lapse risk charge to reflect differences across products outlined in the paragraph above. In addition to requiring companies to be subject to a mass lapse risk charge, companies shall be expected to pass the prescribed mass lapse liquid stress test and provide enhanced reporting. This is to reflect the BMA's assessment that solvency and liquidity resilience are all key in managing mass lapse risk in a holistic manner.

The proposed shocks are as follows:

1. Lapse-up - A 40% permanent increase in lapse rates (option take-up rates) for all regions except Japan; a 20% permanent increase for Japan;
2. Lapse-down - A 40% permanent decrease in lapse rates (option take-up rates) for all regions except Japan, a 20% permanent decrease for Japan; and
3. Mass-lapse - An immediate mass surrender of policies, where the mass-lapse shock magnitude is equal to three times (3x) the base lapse rates, subject to the absolute floors shown in the table below.<sup>9</sup>
  - a. The base lapse rates used for the purposes of deriving the mass-lapse shock magnitudes refer to the base lapse assumptions used to determine the BEL (before adjustments for dynamic lapses and without Lapse Cost for SBA users);
  - b. The mass lapse shocks should be applied as absolute lapse rates for the first year (first 12-month period).<sup>10</sup>

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<sup>9</sup> For example, if the annual base lapse rate was 15%, then the immediate mass lapse shock to be applied would involve a surrender of  $3 \times 15\% = 45\%$  of the policies over the first 12 months. If the base lapse rate was 10%, the immediate mass lapse shock would be 30% p.a. (before the application of the floors, where applicable).

<sup>10</sup> For example, assume that the annual base lapse rate applicable to a given policy was 10% and the resulting mass lapse shock 30%. Applying the mass lapse shock would involve replacing the best estimate lapse rate for the policy with the absolute mass lapse shock rate (i.e., 30% annual lapse rate) for the first year within the projections.

- c. For field testing purposes, four categories have been defined for each of non-retail and retail products. BMA approval shall be required for certain categories as specified in the table otherwise a higher lapse shock per the preceding category shall apply by default. To obtain approval insurers shall be required to demonstrate the robustness of the mass lapse risk mitigants in place. Tax penalties and market value adjustments (MVA) shall not qualify as risk mitigating for mass lapse.

Type	Category	Products	Proposed Shock
Non-Retail	Category A	Guaranteed Investment Contracts (GICs) and Funding Agreements redeemable with no or insignificant penalties. All other institutional financial/investment/savings products	max(3bl, 60%)
	Category B	Category A products with significant mitigating features. BMA approval required.	max(3bl, 30%)
	Category C	General Account Bank or Corporate Owned Life Insurance (BOLI/COLI)	max(3bl, 20%)
		Separate Account COLI/BOLI	
		Retirement Variable Annuity (VA) (plan-level terminations) All other institutional protection products.	
Category D	Category C products with significant mitigating features. BMA approval required.	max(3bl, 10%)	
Retail	Category A	VA without guarantees or with guarantees and out of the money	max(3bl, 20%)
		Accumulation FIA and FA with guaranteed crediting rate or option budget less than 10-yr Treasury Rate – 200bps	
		All other financial/investment/savings products not specified elsewhere	
	Category B	Accumulation fixed index annuity (FIA) and fixed annuity (FA) products with risk profile in-between those under categories A and C	max(3bl, 15%)
		Universal Life (UL) (Indexed UL, Variable UL, UL)	
		All whole life products	
		Term without Return of Premium(ROP) or with cash value ROP	
		Individual disability	
All other protection-type products			
Category C	Accumulation FIA and FA with guaranteed crediting rate or option budget greater than 10-yr Treasury Rate + 200bps + with	max(3bl,10%)	

		at least 3 years of surrender charge period remaining + material GWLB	
		VA with material in the money GLWB/GMIB/GMAB	
		Retail Variable annuities with GMDB greater than account value	
		All products in Category B with at least 3 years of surrender charge period remaining excluding FIA/FA/savings/financial/investment products. BMA approval required.	
<b>Category D</b>	UL with secondary guarantees (lifetime or greater than age 90)	max(3bl, 5%)	
	Long-Term Care (base) and combo(non-acceleration)		
	Term with ROP at end of level term period (during level period)		

Where 3bl is the result of 3 x the base lapse rate (as specified above in point 3.a).

The Authority is considering allowing partial offsets (between ‘lapse-sensitive’ and ‘lapse-supported’ policies) and will be field-testing an option with 50% offset. This will be determined as the average of the results of the mass lapse shock with no offset and with full offset.

The lapse risk charge is part of the BSCR standard formula; therefore, the calibration is not company-specific; this is no different from any of the other BSCR charges. To remove all doubt, no Section 6D adjustments will be available on lapse risks. Nonetheless, the partial internal model route always remains open. The Authority would expect increased interest in partial internal models because of the changes, particularly where there may be specificities not captured by the standard shocks. The Authority would consider requests for partial internal models for lapse risk where appropriate, subject to internal model approval requirements, including justification of the scope and ‘no cherry-picking’.

The mass lapse risk charge shall be calculated using the standard curve for liability portfolios where the standard approach is used. For liability portfolios using the SBA, the discount curve as implied by the statutory book value of backing assets and the base liability cashflows shall be used to discount the shocked liability cashflows.

The Authority proposes to apply a ten-year transitional period to the new lapse risk charges.

***Additional mass lapse prudential requirements:***

The BMA recognises that mass lapse is better managed by assessing both solvency and liquidity. Including liquidity risk management in the assessment of mass lapse risk is crucial because even financially stable insurers can face severe liquidity challenges during a mass lapse event which may result in even more forced sales, thus further worsening the solvency position. It is the BMA's assessment, therefore, that liquidity resilience is closely tied to policyholder confidence in the case of a mass lapse. If policyholders are mass lapsing and perceive that an insurer is even struggling to meet claims, e.g., due to taking time to liquidate less liquid assets, more policyholders may be inclined to surrender their policies, exacerbating the mass lapse risk. By demonstrating strong liquidity risk management practices and the ability to manage liquidity shocks effectively, insurers can enhance policyholder confidence, reduce the likelihood or severity of mass surrenders as well as mitigate the associated financial impacts from forced sales of less liquid assets. On the basis outlined, the BMA proposes to extend liquidity management requirements to the assessment of mass lapse risk.

1. The Authority requires long-term insurers to meet the liquidity risk management programme requirements as outlined in Section 2.3.
2. The Authority requires long-term insurers to meet the enhanced reporting requirements for lapse and liquidity risk as outlined in Section 2.16, excluding those unique to the SBA.
3. The Authority expects insurers to pass all the stress tests prescribed for SBA eligibility, i.e., companies that do not use the SBA but are exposed to mass lapse risk are expected to meet the liquidity and solvency stress tests set out in Section 2.4 except for the LapC.

This information will be used as part of the supervisory review process in the determination of the solvency and liquidity risk of long-term insurers and inform supervisory measures.

**4.3. Expense Risk**

Breaking down and replacing the long-term other insurance risk charge necessitates a new, dedicated charge for expense risk. Like lapse risk, the aim is to increase risk sensitivity and transparency of the charges. This would be done by applying specific expense shocks.

Details of the proposal are as follows:

***BSCR – Expense Risk Capital Requirement***

1. The capital requirement will be determined by applying specified shocks and (re)calculating the net asset value (capital and surplus) under the shocks. In particular, this involves recalculating the BEL under the shocks. The difference between pre-shock and post-shock values will be the capital requirement.
2. A combination of the following two shocks will be used:
  - a. A relative increase in all (unit) expense assumptions; and
  - b. An absolute (basis points (bps)) increase in expense inflation rates per annum.
3. Additional details on the approach:
  - a. The shocks are to be applied simultaneously;
  - b. The application will be principles-based. For example, contractually fixed expenses would not be affected by the shock (i.e., would not change as a result of the shock); and
  - c. For the avoidance of doubt, the expense shocks apply to all Long-Term business, including without limitation “separate account” and “segregated account” business.

The Authority proposes to take the ICS expense shocks as a starting point. The following shocks are considered:

1. **x%** increase in all unit expenses; *plus*  
**y** bps increase in expense inflation rate per annum;  
 where the parameters depend on the region as follows:

<b>Region</b>	<b>x% (unit expense)</b>	<b>y (expense inflation), bps</b>
United States (US), Canada, European Economic Area, Switzerland, Japan	6%	100 bps
Other developed markets	8%	Year one – ten: 200 bps Year 11 onwards: 100 bps



China, other emerging markets	8%	Year one – ten: 300 bps Year 11 – 20: 200 bps Year 21 onwards: 100 bps
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To avoid doubt, no Section 6D adjustments will apply to expense risks. Nevertheless, for this specific risk, the Authority does not expect that there would be any need for adjustments due to the general nature of the expense shocks and the fact that the shock-based approach should already adequately reflect the nature of different parts of expenses (e.g., the degree to which they are or are not contractually fixed).

The Authority proposes to apply a ten-year transitional period to the new expense risk charges.

## 5. PROPERTY & CASUALTY CATASTROPHE RISK

Currently, the insurers' catastrophe risk requirement allows for natural catastrophe perils and terrorism catastrophe risk on an ad hoc basis when deemed material. It is proposed that the BSCR Catastrophe Risk module be enhanced to include a dedicated man-made catastrophe risk submodule. This offers several benefits, such as:

1. The BSCR adopts the trend followed by other internationally recognised insurance capital models by explicitly modelling man-made catastrophe risk perils;
2. A dedicated man-made catastrophe module offers the industry certainty as it reduces the need for ad hoc capital adjustments for non-modelled catastrophe perils; and
3. It promotes good risk management as the scenarios are risk-sensitive.

The dedicated man-made catastrophe risk submodule will be comprised of catastrophe scenarios for the following perils:

1. Terrorism
2. Credit and Surety
3. Marine
4. Aviation

The man-made catastrophe risk submodule must be in line with international best practices, credible, and adequate considering the one-year 99% TVaR calibration target. The Authority is considering regulatory benchmarks in relevant jurisdictions and regimes, particularly Solvency II and ICS. The specification of each scenario is as follows:

### **5.1. Terrorism Catastrophe Scenario**

The risk charge is calculated as follows:

1. The sum insured for the largest building concentration, after deduction of amounts recoverable from outwards reinsurance arrangements, covering property and content damage due to fire or explosion, including as a result of terrorist attacks; and
2. The measure of the concentration of exposure is defined as buildings fully or partially covered within a radius of 200 metres; this concentration may occur over one or multiple (re)insurance contracts.

### **5.2. Credit and Surety Catastrophe Scenario**

Two options are provided for estimating the Credit and Surety Catastrophe Scenario.

#### **Option A**

The risk charge is calculated as the aggregation of the losses from the following three components:

1. Mortgage insurance;
2. Trade credit; and
3. Surety.

A 75% correlation factor is assumed between the three components.

#### ***Mortgage Insurance***

The scenario is calculated as the aggregate average net of outwards reinsurance arrangements but gross of any inwards premiums, annual loss amount resulting from an increase in the frequency and severity due to a decline of 25% in home prices developing over a multi-year time period. The total loss amount includes the impact of both an increase

in the frequency of delinquency and defaults and an increased loss severity that results from the decline in home prices; and

In implementing the stress scenario and to account for differences in risk profiles across various exposures and activities, portfolios and business activities are segmented into categories based on common or related risk characteristics. Appropriate models should be used to translate the relevant risk factor (home price decline) into the financial impact (increased losses). Where applicable, those models that the (re)insurer already uses to calculate stress losses, premium deficiency reserves or other loss measures should be used.

***Trade Credit***

The credit stress scenario for trade credit is defined as the total loss amount due to the inability of the policyholder’s customers to pay for goods delivered and/or services provided. The trade credit coverage indemnifies the policyholder for bad debt losses incurred due to a customer’s inability to pay.

(Re)insurers should first calculate their aggregate gross earned premium for trade credit by an external credit rating category: investment grade versus non-investment grade. Then the following factors are applied to gross premiums earned over the next 12 months’ rating category.

<b>Credit stress factors for trade credit</b>	
<b>Rating category</b>	<b>Factor</b>
Investment grade	80%
Non-investment grade	200%

Finally, (re)insurers should adjust the gross figure to allow for their outward reinsurance protection.

***Surety***

The credit stress scenario for surety is defined as the total net potential loss amount based on the penal sum of the surety bond. A surety bond indemnifies the policyholder from the

principal’s inability to perform its contractual obligation. The penal sum represents the maximum amount that the (re)insurer must pay to the beneficiary. The re(insurer) calculates the largest net potential losses for its ten largest exposures to surety counterparties (principals) using the methodology described below. The total net potential loss amount assumes that the two largest net losses have occurred and is, therefore, equal to the sum of the two largest net losses;

The net potential loss amount for a principal is calculated using the gross exposure of the principal (after any contractual amortisation that has occurred). The loss severity model 95% Probable Maximum Loss (PML)<sup>11</sup> factor is applied to the gross exposure. For US exposures, the loss severity model 90% PML<sup>12</sup> for each principal can be calculated using the most current construction loss severity model developed by the Surety & Fidelity Association of America. For non-US exposures, a loss severity model 95% PML worst-gross-loss-to-exposure ratio for the past ten years in that country or for that exposure type is used, whichever is the most granular. The loss amount is then adjusted for any co-surety arrangements, acceptable cash collateral (currently in the (re)insurer’s custody) and reinsurance arrangements;

The co-surety amount and the adjustment for reinsurance are calculated using existing terms of the surety exposure. Adjustments can only be made for cash collateral already in custody with the (re)insurer or in a trust for which the (re)insurer is a beneficiary; and

Example of credit stress for surety:

	<b>Loss calculation</b>	<b>Surety exposure (US\$)</b>
1	Gross exposure for principal	\$10,000,000
2	Loss severity model 95% PML factor	0.4
3	Loss severity model 95% PML amount = (1) * (2)	\$4,000,000
4	Adjustment for co-surety (co-surety % * (3))	\$400,000

<sup>11</sup> i.e. 95<sup>th</sup> percentile

<sup>12</sup> i.e. 90<sup>th</sup> percentile

5	Net PML amount after co-surety = (3) - (4)	\$3,600,000
6	Acceptable cash collateral	\$100,000
7	Net PML amount = (5) - (6)	\$3,500,000
8	Adjustment for reinsurance	\$50,000
9	Net potential loss amount	\$3,450,000

### Option B

The risk charge is calculated as the aggregation of the losses from the following three components:

1. Credit / Surety - Default Risk
2. Credit / Surety - Recession Risk
3. Credit / Surety Non-Proportional Cat Charge

The three components are assumed to be independent of each other.

#### ***Credit / Surety - Default Risk***

The stress scenario for Credit/Surety - Default Risk is calculated as follows:

1. The loss which would arise from an immediate default of the two largest credit insurance exposures;
2. The calculation is based on the assumption that the loss-given-default, before the deduction of the amounts recoverable from any outwards reinsurance arrangements, of each credit insurance exposure is 10% of the sum insured in relation to the exposure;
3. The determination of the two largest credit insurance exposures of the insurance or reinsurance undertaking should be based on a comparison of the net loss-given-default of the credit insurance exposures, where the loss-given default is after the deduction of the amounts recoverable from any outwards reinsurance arrangements;
4. The calculation should consider direct and proportional credit and surety (Credit/surety) exposures only;

#### ***Credit / Surety – Recession Risk***

The stress scenario for Credit/Surety – Recession Risk is calculated as follows:

1. the loss that would result from an instantaneous loss of an amount that, before the deduction of the amounts recoverable from any outwards reinsurance arrangements, is

- equal to 100 % of the Credit/Surety line of business premiums earned during the following 12 months;
2. the estimated loss should be net of the amounts recoverable from any outwards reinsurance arrangements;

***Credit/Surety Non-Proportional Cat Charge***

The stress scenario for Credit/Surety Non-Proportional Cat Charge is calculated as follows:

1. The loss that would result from an instantaneous loss of an amount that, before the deduction of the amounts recoverable from any outwards reinsurance arrangements, is equal to 250 % of the Credit / Surety Non-Proportional line of business premiums earned during the following 12 months;
2. The estimated loss should be net of the amounts recoverable from any outwardreinsurance arrangements.

**5.3. Marine Catastrophe Scenario**

The scenario for marine risk combines the results from a vessel collision and a platform explosion where the two events are assumed to be independent;

The capital requirement for the vessel collision is based on the maximum sum insured for a single vessel across the hull, liability and pollution exposures; and

The capital requirement for the platform explosion is the maximum sum insured for a single (oil or gas) platform. This should cover the sum insured for compensation for property damage, wreckage removal, loss of production, capping/securing the well and liability losses arising from the explosion.

**5.4. Aviation Catastrophe Scenario**

The aviation scenario requires the single largest aircraft sum insured across the hull and liability perils.

**5.5. Other Considerations**

### ***Aggregation Assumptions***

Independence is assumed between:

1. The man-made catastrophe risk scenarios; and
2. The (existing) natural catastrophe submodule and the (new) man-made catastrophe submodule.

### ***Risk-Mitigating Effect of Inwards Reinsurance***

Allowance for the risk-mitigating effect of inwards reinsurance should be made where applicable. This should consider all contractual cashflows, both inflows (e.g., recoverables) and outflows (e.g., reinstatement premiums); and

When insurers allow for any reinsurance credit, they should ensure that there is no double counting (e.g., the total recoveries credited from a reinsurance contract across all the BSCR catastrophe scenarios should not exceed the total available protection from that contract).

### ***Transitional Arrangements***

The charges for the new catastrophe scenarios will be phased in over a period of three years.

### **Consultation Questions – BSCR Computation:**

Q.1. Do you see any practical issues that the proposals on the BSCR computation may introduce?

## **C. SECTION 6D**

### **6. SECTION 6D ENHANCEMENTS**

The section 6D framework, in its current format, could benefit from more clarity on the types of adjustments that are allowable or the standards an application is expected to meet. The BMA aims to revise its section 6D framework to be more defined, standardised and transparent in terms of the scope and requirements. Among other things, it will help insurers understand the areas where and circumstances under which they may elect to apply

for an adjustment to the standard BSCR framework. The BMA aims for the revised section 6D regime to allow for a certain pre-defined set of adjustments that fall under one of three different routes:

### **6.1. Route 1 – Simple Adjustments**

*Scope – Simplest adjustments, namely:*

1. Treatment of material (re)insurance limits/risk mitigation techniques (e.g., consideration of material adverse development covers, stop loss, long-term excess of loss insurance or simple longevity swaps bought for protection);
2. Removal of Loss Portfolio Transfer (LPT) premiums to avoid double-charging LPT transactions;
3. Early adoption of the new BSCR rules (in their totality only);
4. Application to use issuer external rating from an approved credit rating agency:
  - a. When no directly applicable (issue-level) credit rating exists; and
  - b. If the exposure in question ranks equally or senior to (other) senior unsecured exposures of that issuer.
5. Application to use ratings from a credit rating agency approved for regulatory capital purposes under other recognised regulatory regimes/jurisdictions (subject to limits on exposures/asset types/etc.)

### ***Requirements***

1. Support of application - Insurers should provide reasoning and supporting analysis as to why and how the arrangement results in the insurer's risk profile being materially different from the standard BSCR calculation;
2. BSCR consistency - The assumptions underlying the modified capital calculation should be consistent, or more prudent, than the assumptions underlying the BSCR calculation. Among other things, this would apply to the following aspects of the BSCR calculation: stress factors, correlation assumptions, statistical and methodological consistency and calibration; and
3. Data - The data used in the analysis should be demonstrated to be complete, accurate and appropriate.



## **6.2. Route 2 – Simple-Complex Adjustments**

***Scope – More complex than route 1, namely:***

1. Modification of premium or reserve risk factors; and
2. Consideration of risk mitigation techniques not addressed under route 1 (typically relating to the use of derivatives used in non-shock-based approaches or more complex longevity swaps bought for protection).

### ***Requirements***

Route 1 requirements (as relevant) and additionally;

1. ECR ratio - The insurer operates at an ECR ratio of equal to or greater than 120%;
2. Support - Insurers should provide reasoning and supporting analysis as to why and how the proposed revision is a more accurate reflection of the insurer's risk profile than the BSCR;
3. BSCR consistency - The proposed adjustment should not produce material inconsistencies in the BSCR calculation;
4. Cherry picking – The applicant should confirm that there are no other areas of risk where, based on their internal view of risk and capital, the BSCR is considered to be materially understating the insurer's risk exposure;
5. Calibration – Applicants should use the 1-in-100 TVaR over a one-year view. An alternative metric may also be used if it can be demonstrated to be at least as prudent in determining the ECR;
6. Statistical test:
  - a. The methodologies used should be based on rigorous actuarial and statistical techniques;
  - b. The modelling techniques used should be appropriate to the nature, scale and complexity of the risks to which the insurer is exposed;
  - c. All material assumptions/expert judgement have been assessed for veracity and suitability;
  - d. The areas that rely on expert judgement are known, and sufficient challenges have been applied to these areas; and

- e. The proposed capital modification should not introduce material statistical or methodological inconsistencies.
7. Validation - Key aspects of the exercise should undergo validation annually; and
  8. Documentation - Documentation should be kept for the following:
    - a. Internal sign-off process for the proposed modification;
    - b. Governance of the data underlying the analysis;
    - c. Process of estimating the modification and its governance;
    - d. Material assumptions/expert judgement used and their governance; and
    - e. Validation results.

### **6.3. Route 3 – Complex Adjustments**

#### ***Scope – Most complex cases, namely:***

1. Use of internal credit ratings when ratings from BMA-approved institutions are not available; and
2. Applications not covered elsewhere in the section 6D framework, if:
  - a. Application is within the spirit of the framework; and
  - b. Insurer's adjusted BSCR (after allowing for the benefit of any adjustments from any of the three routes) is no less than 10% lower than the standard BSCR.

#### ***Requirements***

Route 2 requirements and additionally:

1. Governance - A dedicated governance framework should be in place that ensures the ongoing appropriateness of the design and operations of the modelling that supports the capital modification and continues to reflect the insurer's risk profile appropriately. Among others, this would require the following:
  - a. A model change policy that distinguishes between minor and major changes;
  - b. Key stakeholders (risk management, users of modelling output, heads of affected business units, senior management) should understand the modelling, which is commensurate to their direct or indirect use;
  - c. Ensuring there are adequate, independent review procedures in place; and

- d. Documentation of the modelling process (i.e., data, assumptions/expert judgement, parameterisation, modelling and output) and any changes to it.
2. Use test - The modelling underlying the capital modification should be used in the insurer's risk management system and decision-making processes;
3. Validation - The data, assumptions/expert judgement, parameterisation, modelling and output should undergo independent validation annually. Among others, this would require the following:
  - a. A validation policy; and
  - b. The monitoring of performance, review of the ongoing appropriateness of modelling specifications, and testing of results against experience.
4. Documentation - there should be documentation to provide a detailed description of the structure, design, theory, operational details, input assumptions, parameters, governance process and controls of the modelling underlying the capital modification.

***The following additional requirements apply for the use of internal credit ratings:***

1. Identification of risks - The internal credit assessment should consider all relevant factors and sources of risk—qualitative, quantitative, systemic, and idiosyncratic—which could influence the credit risk associated with the exposure being rated, including:
  - a. The financial position (including liquidity) and financial policies of the issuer;
  - b. the issuer's financial track record and trends in the issuer's financial performance;
  - c. the complexity of the issuer's business model;
  - d. the issuer's size, growth and the level of diversity in its activities;
  - e. the quality of the issuer's management;
  - f. the competitive position of the issuer;
  - g. external market factors, including past and expected sector and industry dynamics and economic outlook;
  - h. impact of economic stresses;
  - i. terms and conditions of the instrument/loan agreement (including seniority, security and any covenants in place);
  - j. cash flow predictability;

- k. any collateral and volatility of its value;
  - l. the impact on the issuer's risk profile and financials of issuing the debt being rated;
  - m. refinancing risk;
  - n. the issuer's ownership structure;
  - o. risks arising from third parties (e.g., sponsors, parties involved in the servicing and managing of the debt, if applicable);
  - p. legal, political and regulatory risks;
  - q. country risk; and
  - r. potential future and emerging risks (e.g., the impact of climate risks).
2. Internal credit assessment methodology and criteria - The internal credit assessment methodology and criteria should:
- a. Set out the overall credit assessment philosophy and the rating process;
  - b. Set out the scope of the types of exposures and entities that the methodology applies to;
  - c. Set out the scope of risks covered and define the credit and other relevant risks being measured;
  - d. Where an accepted credit rating agency has published a credit rating methodology for an asset class, consider at least the same range of risks, qualitative and quantitative factors and risk mitigating aspects (or justify differences in the scope);<sup>13</sup>
  - e. Consider the characteristics of comparable assets for which a credit assessment by an accepted credit rating agency is available;
  - f. Describe how different asset features, risks and other relevant factors are assessed;
  - g. Set out the key assumptions and judgements underlying the assessment, including the treatment of any assumed risk-mitigating actions that rely on the firm's own or outsourced processes involved in managing assets through their lifecycles;
  - h. Define whether the credit assessment is calibrated to a through-the-cycle or point-in-time view, and comment on the appropriateness;
  - i. Use both qualitative and quantitative factors;

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<sup>13</sup> 'Accepted' (credit) rating agency means external credit rating agencies accepted for BSCR purposes, as laid out in the instructions in force.

- j. Explain the limitations of the internal credit assessment (e.g., risks which are not covered), and when it would not be appropriate to allow for these limitations by overriding judgements.
3. Internal credit assessment methodology and criteria - i.e.; where the insurer has decided that its internal credit assessment methodology for a particular asset class should be based on an accepted rating agency's published credit rating methodology applicable for that asset class, the insurer should apply that methodology in full in the manner applied by the rating agency. This is not intended to prohibit targeted enhancements where appropriate<sup>14</sup>; however, such adjustments must be clearly identified, justified, and their impact quantified. Based on the overall review, the Authority may further decide to disallow such adjustments at its discretion.
4. Data and expert judgments:
  - a. Insurers should consider the availability, appropriateness and quality of the data over the credit cycle on which their internal risk assessments and calibrations are based;
  - b. Insurers should clearly document how any incomplete or missing data has been allowed for in the internal credit assessment;
  - c. Expert judgements made in the determination of the internal credit assessment and BSCR mapping should be transparent, justified and documented, and consideration should be given to the circumstances in which judgements on the rating would be considered false. The key judgements should be subject to an appropriate level of governance within the overall credit assessment process;
  - d. The history of judgements applied to deviate from the results of the internal credit rating methodology should be well documented, as should any other end-of-process overriding adjustments to the internal credit ratings themselves.
5. Expertise and potential conflicts of interest:
  - a. The credit rating methodology and criteria development and approval, credit assessment, and BSCR mapping should be performed by individuals with relevant asset-specific credit risk expertise and competency who are independent and with

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<sup>14</sup> E.g., taking account of a specific credit enhancement feature which is otherwise ignored by the selected rating agency framework.

minimal conflicts of interest. This applies to both internal resources internal and those potentially external to the insurer;

- b. Insurers should demonstrate the independence of the internal credit assessment function and demonstrate that effective controls are in place to manage any potential conflicts of interest between different stakeholders involved in the overall management of the assets;
  - c. The internal credit assessment should be procedurally independent of the decision to underwrite;
  - d. Individuals deciding or approving the internal ratings (e.g., voting members of the credit committee) should be without conflicts of interest and independent of both the investment decisions and management of the assets; and
  - e. The rating approval process should be organised and structured in a way that ensures independence of the decisions and does not cause incentives or put pressure on the individuals to decide in a certain way.
6. On-going review and assessment:
- a. Insurers should perform validation of the internal credit assessment methodology and criteria, including how it has identified and allowed for all relevant sources of credit risk (whether quantitatively or qualitatively);
  - b. Insurers should have a robust process for the ongoing review of the credit assessments, including demonstrating how the insurer has satisfied itself that the assessments will remain appropriate over the lifetime of the assets and operate robustly under a range of different market conditions and operating experiences;
  - c. The credit assessments should be reviewed and the assets re-rated at regular intervals, as well as in response to changes in relevant external market conditions or other factors that are expected to impact the rating; and
  - d. Insurers should ensure and monitor that the internal credit assessment criteria are applied consistently both within and across asset categories and over time.
7. Limits and restrictions:
- a. Where, for an internally rated asset, external ratings exist from any one or several accepted credit rating agencies, the final rating used for BSCR purposes is capped to be no higher than the lowest of such external ratings;

- b. Internal credit ratings cannot be used for related, affiliated or connected assets for Section 6D applications<sup>15</sup>; they may, however, be allowed with an approved internal model;
- c. The amount of assets for which internal credit ratings can be used in the BSCR is subject to limits and will be no more than 20% of total investments; and
- d. The Authority may, based on a holistic evaluation of all aspects of an insurer's internal credit assessment framework and process, as a condition for approval, require a downward adjustment (notching down) on the insurer's internal credit ratings for BSCR purposes. The size of such adjustment will be determined on a case-by-case basis. The adjustment will be permanent, but its continued appropriateness may be reviewed periodically if circumstances warrant.

#### ***Loss-Absorbing Capacity of Deferred Taxes***

Under certain conditions, modifications to the scope of the Loss-Absorbing Capacity of Deferred Taxes (LAC DT) in the BSCR could be considered within Route 3, paragraph 2 of the Section 6D framework. This is expected to apply mainly to the recognition of additional DTA based on expected future taxable profits. The modifications would only be allowed for companies focusing on EU/UK business.<sup>16</sup> In addition to the standard requirements of the Route, the following would apply:

- Solvency II provisions on LAC DT should be followed.
- Independent studies substantiating future taxable profits and demonstrating the recoverability of DTA should be provided.

#### ***Application Process for New Section 6D Adjustments***

Insurers who wish to make adjustments under any of the section 6D routes should submit a formal application pack that, at a minimum, provides evidence that the requirements under the relevant route are met, along with any additional material requested. Following its review, the BMA will reach out to communicate its conclusions. For more complex

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<sup>15</sup> For the purposes of this section, 'related, affiliated or connected assets' include (credit) exposures to related, affiliated or connected party and (otherwise unrelated, unaffiliated or unconnected) assets originated by related, affiliated or connected party.

<sup>16</sup> Under exceptional circumstances, companies not focusing on EU/UK business may be allowed to apply using the ICS tax methodology.

cases (typically under route 3), insurers are encouraged to contact the BMA for preliminary discussions.

### ***Annual Review of Section 6D Adjustments***

BMA approvals under section 6D will continue to be subject to annual regulatory review. Insurers would need to submit an application pack that demonstrates ongoing compliance with the standards set out under the respective route.

### ***Transitional Arrangements***

Transitional arrangements will be offered for any adjustments already granted but that fall outside the revised section 6D regime, so long as there are no material changes that affect the adjustment. The following transitionals will be used:

1. For insurers with a liability duration of <5 years, a five-year transition will apply; and
2. For insurers with a liability duration of  $\geq 5$  years, a transition period equal to their liability duration will apply but be subject to a cap of ten years.

### **Consultation Questions – Section 6D Enhancements:**

Q.1. Do you see any practical issues that the proposals on 6D enhancements may introduce?