



BERMUDA MONETARY AUTHORITY

GUIDANCE NOTES

FOR COMMERCIAL INSURERS AND INSURANCE GROUPS'
STATUTORY REPORTING REGIME

30th NOVEMBER 2016

Table of Contents

INTRODUCTION	5
I. AMENDMENTS TO COMMERCIAL INSURERS’ STATUTORY REGULATORY FRAMEWORK.....	5
GAAP Financial Statements – Section 17A of the Insurance Act (1978)	5
Consolidated and Unconsolidated Statutory Financial Statements.....	6
Reporting Regime Illustrative Work Flow	7
Prudential Filters.....	9
Treatment of Investments in Affiliates for Consolidated SFS	10
Insurance Risk Transfer and Schedule of Deposit Accounting	11
Segregated Accounts Companies.....	11
Revisions to the Statutory Financial Return	11
Approved Auditors	12
II. ECONOMIC BALANCE SHEET (EBS) VALUATION PRINCIPLES GUIDANCE	13
Overarching Principles	14
Intangible Assets.....	14
Contingent Liabilities	15
Income Taxes.....	15
Investments in Affiliates.....	15
Insurance Risk Transfer.....	16
Modified Coinsurance (Mod-co) Arrangements.....	16
Deferred Acquisition Costs.....	16
Contractual Liabilities Other Than Technical Provisions.....	16
III. GUIDANCE FOR THE STATUTORY ECONOMIC BALANCE SHEET BY LINE OTHER THAN TECHNICAL PROVISIONS	16
Cash and Cash Equivalents (Line 1).....	16
Quoted Investments (Line 2)	16
Unquoted Investments (Line 3)	17
Investments in and Advances to Affiliates (Line 4)	17
Investment in Mortgage Loans on Real Estate (Line 5)	17
Policy Loans (Line 6)	17
Real Estate (Line 7)	17
Collateral Loans (Line 8).....	18
Investment Income Due and Accrued (Line 9).....	18

Accounts and Premium Receivable (Line 10)	18
Reinsurance Balances Receivable (Line 11).....	18
Funds Held by Ceding Reinsurance (Line 12).....	18
Sundry Assets (Line 13)	18
Letters of Credit Guarantee and Other Instruments (Line 14).....	19
Insurance and Reinsurance Balances Payable (Line 28)	19
Commissions, Expenses, Fees, and Taxes Payable (Line 29)	19
Loans and Notes Payable (Line 30).....	20
Tax Liabilities (Line 31).....	20
Amounts Due to Affiliates (Line 32).....	20
Accounts Payable and Accrued Liabilities (Line 33)	20
Funds Held Under Reinsurance (Line 34).....	20
Dividends Payable (Line 35)	20
Sundry Liabilities (Line 36).....	21
Letters of Credit, Guarantees and Other Instruments (Line 37)	21
Notes to the EBS.....	21
IV. GUIDANCE ON TECHNICAL PROVISION FOR EBS	22
Technical Provisions – General Principles	22
Calculation of the Best Estimate.....	22
Cash Flows.....	23
Best Estimate – Probability Weighted Average.....	24
Allowance for ENIDS.....	25
Expenses in Best Estimate	26
Allowing For Business In Different Currencies	27
Reinsurance Recoveries.....	27
Possible Simplification For Reinsurance Recoverables	28
Allowance for Reinstatement Premiums in Reinsurance Recoverable Balances	30
Adjustment for Expected Losses on Reinsurance Recoveries Due to Counterparty	30
Default (for all reasons).....	30
Allowing for Management Actions / Policyholder Behaviour	34
Allowing for Material Guarantees and Contractual Options	35
Taxation.....	36
Technical Provisions as a Whole	36
Expert Judgement	38
General Business Insurance Technical Provisions	38

Long-Term Insurance Technical Provisions	41
Approaches to Estimating BBNI Business and Expected Losses Thereon.....	41
Risk Free Discount Rates and Adjustments.....	43
Risk Margin	49
Variable Annuity Guarantees.....	54
Transitional Arrangements	59

INTRODUCTION

1. The Bermuda Monetary Authority (the Authority) continues to review Bermuda’s regulatory and supervisory regimes, to ensure that the jurisdiction adheres to international standards and best practices for insurance regulation and supervision. In that regard, the Authority in 2015 instituted a number of changes to its regime for commercial insurers and insurance groups to enhance its statutory and prudential reporting requirements for its commercial insurers. References in this document to “insurer” shall also include “reinsurers” and “Bermuda Groups” unless specifically excluded.

2. In 2015, the Authority implemented the Economic Balance Sheet (EBS) framework which will now be used as the basis to determine the Insurer’s Enhanced Capital Requirement (ECR). The Authority also revised the basis in which Statutory Financial Statements (SFS) for commercial insurers are prepared. Before the changes, commercial insurers were required to prepare SFS under Section 15 of the Insurance Act 1978 (the Act), as prescribed under the Insurance Accounts Regulations 1980 (the Accounts Regulations) as well as “additional GAAP financial statements” under section 17 of the Act. Under the new changes financial statements prepared under section 17A will act as the basis on which SFS will now be prepared subject to application of certain prudential filters. These financial statements will in turn, form the starting basis for the preparation of the EBS. The SFS will have statements both on a consolidated and unconsolidated basis. The unconsolidated information will form the basis for assessing the Insurer’s liquidity position, Minimum Solvency Margin, and class of registration while the consolidated information will form the starting point for the EBS. The EBS, will be the basis to calculate the Insurer’s Enhanced Capital Requirement (ECR).

3. The EBS framework is now embedded in the Authority’s legislative and regulatory regime through the Insurance (Prudential Standards) (Insurance Group Solvency Requirement) Amendment Rules 2015, the Insurance (Prudential Standards) Class 4 and 3B Solvency Requirement) Amendment Rules 2015, the Insurance (Prudential Standards) (Class 3A Solvency Requirement) Amendment Rules 2015, the Insurance (Prudential Standards) (Class C, Class D, Class E Solvency Requirement) Amendment Rules 2015.

4. Section 6A of the Act has been now been amended to provide for the Insurance Accounts Rules which provide prudential rules prescribing the format and rule pertaining to the SFS. The Insurance Accounts Rules replace the Accounts Regulations for commercial Insurers. The Accounts Regulations will still be applicable to the limited purpose insurers.

I. AMENDMENTS TO COMMERCIAL INSURERS’ STATUTORY REGULATORY FRAMEWORK

GAAP Financial Statements – Section 17A of the Insurance Act (1978)

5. Section 17A of the Act requires commercial insurers to prepare financial statements according to one of the following standards:

- a. International Financial Reporting Standards (IFRS);
- b. GAAP that apply in Bermuda, Canada, the United Kingdom or the United States of America; or

c. such other GAAP as the Authority may recognise.

6. These financial statements are audited by an approved auditor and published by the Authority in accordance with Section 17A(6) of the Act. These financial statements will now form the basis for the preparation of both the EBS and SFS. Except in a few areas specifically in the Insurance Account Rules and discussed below, amounts in the SFS shall be assessed and valued in line with the insurer's general purpose financial statements or where general purpose financial statements are not prepared, in line with the GAAP principles adopted by the insurer, as notified to and agreed by the Authority. Where a commercial insurer is a private company, versus a publicly-traded company, the insurer should be guided by those rules applicable to it.

7. Smaller commercial insurers, specifically Class 3A, Class C and Class D insurers, have the option to produce consolidated GAAP financial statements with abbreviated notes to the financial statements (condensed consolidated GAAP financial statements). While the Authority encourages these insurers to produce the full consolidated GAAP financial statements, the option is intended to mitigate the costs incurred to meet the requirements of Section 17A for insurers who do not currently prepare GAAP financials. The Authority has prescribed the format and rules governing the condensed consolidated GAAP financial statements in Schedule VIII and Schedule IX of the Insurance Account Rules. The Authority under Section 17A of the Act now, allows Class 3A, Class C and Class D insurers the option to produce condensed consolidated GAAP financial statements. These statements must be audited by the insurer's approved auditor.

Consolidated and Unconsolidated Statutory Financial Statements

8. Prior to the development of the EBS regime, the SFS was used as the basis to calculate the insurer's ECR. The EBS regime, which will determine the insurer's ECR, uses the consolidated GAAP financial statements subject to certain prudential filters and EBS valuation rules. The SFS now forms the basis to produce the EBS by amending the SFS to reflect the consolidated or condensed consolidated GAAP financial statements values, subject to certain prudential filters (consolidated SFS) that are consistent with the EBS framework.

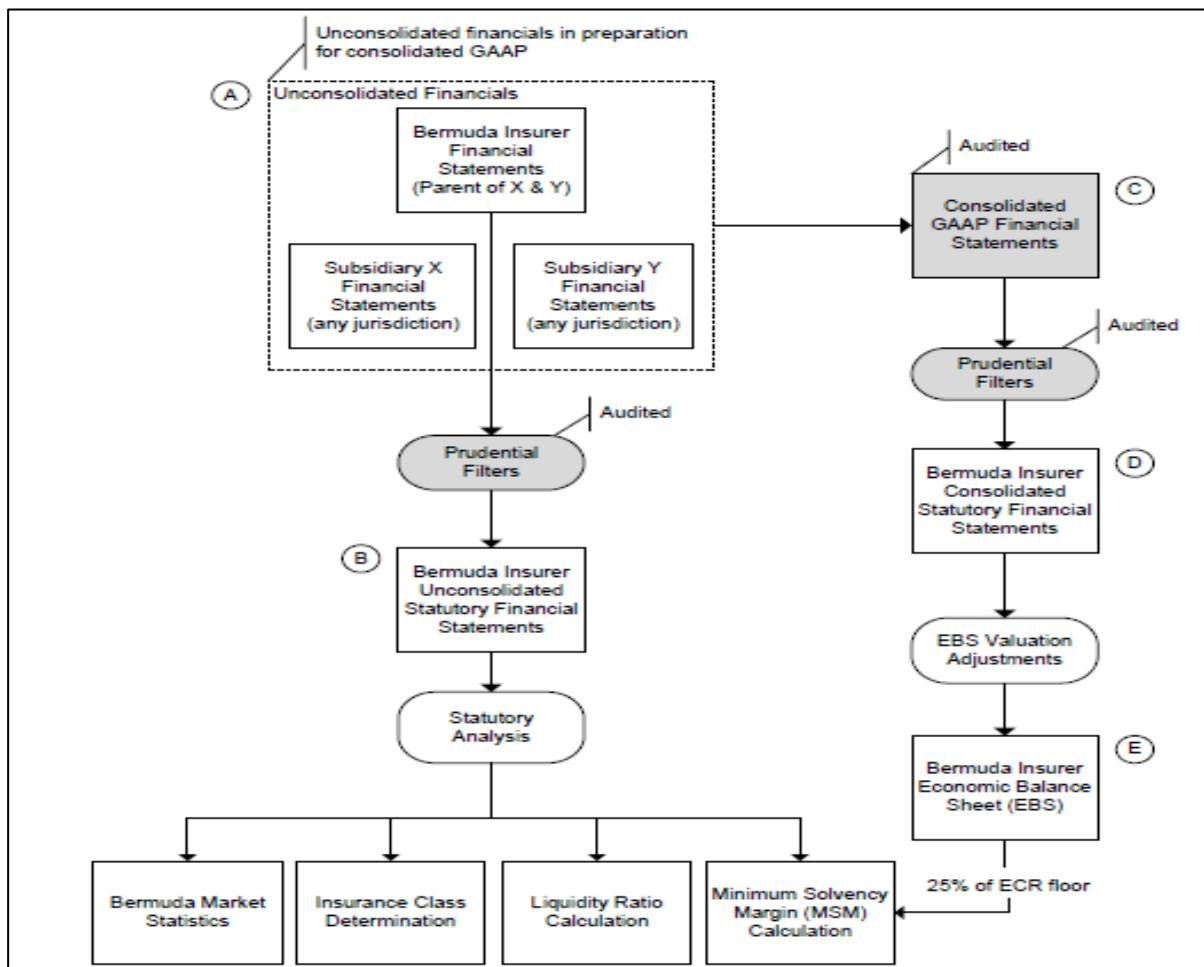
9. For insurers that have subsidiaries which are consolidated in their GAAP financial statements, the Authority still needs information on an unconsolidated basis. This relates to information necessary to assess the insurer's liquidity position, MSM and class of registration to prevent a migration up in MSM and class which could arise from the consolidation approach, and also to assess liquidity applicable to Bermuda policyholders. The Authority considered requesting this information separately, but after considering the extent of the information required, it was determined that it would be more practical to include unconsolidated statutory financial statements in the SFS. The basis of the unconsolidated balance sheet and income statement is the legal entity's unconsolidated balance sheet and income statements on a GAAP basis adjusted for prudential filters and reserves as discussed below. The existing unconsolidated statutory accounting valuation standards have been amended to make them consistent with GAAP accounting valuation e.g. allowance of deferred acquisition costs and deposit accounting. Accordingly, insurers are therefore, able to base the unconsolidated amounts on legal entity information that is used for GAAP accounting purposes.

10. Commercial insurers are now required to file a statutory balance sheet, statutory income statement and statutory statement of capital and surplus on an unconsolidated basis

(unconsolidated SFS) reflecting the legal entity’s unconsolidated financial position. The format and the rules governing the unconsolidated SFS are prescribed in the Insurance Account Rules. The information contained in the unconsolidated SFS will be used as one of the basis for computation of the MSM with the other consideration being 25% of ECR which is computed from the EBS. The information will also be the basis for computation of the insurer’s liquidity ratio, determination of the insurer’s class of registration and to generate market statistics that are published on the Authority’s website and Annual Report.

11. The Insurance Accounts Rules contain the reporting forms for the balance sheets, income statements, statements of capital and surplus and notes to the financial statements. These reporting forms are similar to those contained in the Accounts Regulations. To avoid duplication, the Insurance Accounts Rules only prescribe additional notes to the financial statements that are not already contained in consolidated GAAP financial statements. The Account Regulations have been amended to remove the requirements pertaining to commercial insurers and transfer these requirements to the Insurance Accounts Rules. Section 53 of the Act has also been amended to provide clarity that anything that is permitted or required to be prescribed under this section may be prescribed in regulations by the Minister; other than those matters prescribed by prudential rules made by the Authority under section 6A.

Reporting Regime Illustrative Work Flow



12. Classes 3A, 3B and 4 insurers General Business Loss and Loss Expenses
- i. Insurers are required to set aside an adequate amount of loss and loss

expense provisions for general insurance business to meet estimated unpaid losses in respect of events occurring before the last day of the relevant year and to meet expected loss adjustment expenses. The provisions and reserves will therefore, include adequate amounts in respect of losses reported and losses incurred but not reported to the insurer before the last day of the relevant year.

- ii. The Authority applies a floor whereby the Loss and Loss expense provision should not be less than the net insurance reserves calculated using values in the insurer's audited consolidated GAAP financial statements.

13. Classes C, D and E Insurers Long Term Insurance Reserves

- i. Reserves for reported claims: insurers are required to carry in their SFS an adequate amount to meet claims unpaid at the end of the relevant year and made under contracts of insurance and reinsurance in respect of incidents occurring and reported to the insurer before the end of that year.
- ii. Reserves for unreported claims: insurers are required to carry an amount set aside by the insurer to meet claims under contracts of insurance and reinsurance in respect of incidents occurring, but not reported to the insurer, before the end of the relevant year.
- iii. Policy reserves—life: The Authority proposes that this be an amount, actuarially computed, which is considered adequate to provide future guaranteed benefits as they become payable under the provisions of life insurance policies in force. Amounts applicable to other life contract benefits (such as disability waiver of premium, disability income benefits and additional accidental death benefits) and to annuities and supplemental contracts with life contingencies, may also be included. The said amount shall not include reserves in respect of accident and health policies.
- iv. Policy reserves—accident & health: These reserves are an amount, actuarially computed, which are considered adequate, and consist of an active life reserve, that is to say, that portion of due and collected premiums which has been set aside to be recognised as earned in the future consisting of:
 - the unearned portion of the current premium;
 - additional reserves, that is to say, the reserves applicable to policies which provide for the payment of uniform rate premiums in respect of a risk, the cost of which increases with the age of the insured;
 - reserves for rate credits;
 - a claims reserve, that is to say, the present value of amounts not yet due on claims provision for future contingent benefits being included in both cases.
- iv. Policyholders' funds on deposit: These funds consist of premiums paid in advance of the due date, whether or not interest is paid for early payment.

These liabilities shall be valued at the amounts received by the insurer, plus any interest credited.

- v. Liability for future policy-holders' dividends: This are the amount of dividends payable, as declared by the directors, on participating life policies which qualify for such dividends, and shall be recorded at the amount declared.
- vi. Other insurance reserves —Long-Term business: These consist of any other reserves required by the terms of life or accident and health contracts or as a result of special riders or options attaching to any such contracts, not being reserves provided for in the items above. These must be actuarially determined and be considered adequate.
- vii. Similar to the general insurance business, a floor is applied whereby the insurer's net Long-Term insurance reserves will not be less than the net Long-Term insurance reserves calculated using values in the insurer's audited consolidated GAAP financial statements.
- ix. The SFS includes a note to Line 27 of the statutory balance sheet for Class C, Class D and Class E insurers disclosing the movements in the Long- Term business insurance reserves. The reserves are to be split between reserves relating to insurance contracts and reserves relating to investments contracts as per Schedule II of the Insurance Account Rules.

Prudential Filters

14. The Insurance Accounts Rules contain the prudential filters, in preparation for EBS, and valuation rules that insurers need to apply to the GAAP financial statements in order to derive the SFS. Prudential filters refer to:

- a. adjustments to eliminate non-admitted assets including goodwill and other similar intangible assets, not considered admissible for solvency purposes; and
- b. adjustments to include certain assets and liabilities that are generally off-balance sheet under general purpose reporting. These include items such as guarantees and other instruments that do not relate to the insurer's own insurance contracts.

15. The following prudential filters will be applied to GAAP values to for both consolidated and unconsolidated SFS. These filters are consistent with the filters applied to GAAP values for the EBS.

- i. Goodwill and intangibles: Goodwill is to be valued at nil in the consolidated SFS. Other intangible assets can be recognised and measured at a value other than zero only if they can be sold separately and the expected future economic benefits will flow to the insurer and the value of the assets can be reliably measured. These assets must be separable and there should be evidence of exchange transactions for the same or similar assets indicating that they are saleable in the market place. If the value assessment of an intangible asset cannot be reliably measured, then such asset should be valued at nil.

- ii. Prepaids and deferred expenses: There is no existing market value option for prepaid assets and deferred expenses. In this regard and since prepaids cannot generally be utilised to pay policyholders, they should be valued at nil in the consolidated SFS.
- iii. Deferred Acquisition Costs (DAC): Insurers will be allowed to carry DAC on the statutory balance sheet. The amount of DAC carried shall be valued consistently with the generally accepted accounting standards adopted by the insurer.
- iv. Contingent Liabilities: Contingent liabilities other than the insurer's own insurance contracts related guarantees are to be recognised as liabilities in the consolidated SFS and valued based on the expected present value of future cash-flows required to settle the contingent liability over the lifetime of that contingent liability, using the basic risk-free interest rate. Where the present value of the contingent liability cannot be determined because the timing of likely scenarios cannot be reliably estimated, the amount of the liability should be recorded at its undiscounted value. In coming up with the expected values, insurers should take into account both a profit element and risk premium required by market participants. For cases in which the contingent liability has asymmetrical outcomes, the valuation of the contingent liability should take account of a range of possible outcomes. This may be accomplished through option pricing models or models that consider multiple outcomes.
- iv. Taxes: Current tax liabilities or assets are to be measured at the amount expected to be paid to or recovered from the taxation authorities, using the tax rates that have been enacted or substantively enacted by the end of the reporting period. Insurers shall recognise and value deferred tax assets and liabilities in relation to all assets and liabilities in conformity with the GAAP principles adopted by the insurer. Notwithstanding the above, insurers shall value deferred taxes, other than deferred tax assets arising from the carry-forward of unused tax credits and the carry-forward of unused tax losses, on the basis of the difference between the values ascribed to assets and liabilities recognised and valued in accordance with SFS prudential rules, and the values ascribed to assets and liabilities as recognised and valued for tax purposes.
- v. Insurers should only ascribe a positive value to deferred tax assets where it is probable that future taxable profit will be available against which the deferred tax asset can be utilised, taking into account any legal or regulatory requirements on the time limits relating to the carry-forward of unused tax losses or the carry-forward of unused tax credits.

Treatment of Investments in Affiliates for Consolidated SFS

16. Where they have control, commercial insurers shall consolidate their investments in affiliates in the consolidated SFS. An insurer will apply the adopted GAAP principles to value and determine whether it controls or has significant influence over an affiliate. The insurer will also apply the aforementioned prudential filters, where relevant, as it consolidates these

investments in the financial statements.

17. Where the insurer has significant influence but no control over the subsidiary, the value of these investments (with the applied prudential filters) will be included in Line 4 of the SFS balance sheet.

18. When an amalgamation occurs during the year between two insurers, the combined entity should report the results of the acquired entities from the date of the amalgamation. The insurer will not be required to restate comparatives of the combined entity in the amalgamation.

Insurance Risk Transfer and Schedule of Deposit Accounting

19. In situations where the GAAP principles adopted by the insurer require insurance contracts that do not transfer significant insurance risk, to apply deposit accounting in deriving the GAAP financial statements, insurers will be required to apply the same approach for the consolidated and unconsolidated SFS. The deposit assets and liabilities shall be included in Lines 13 (e) and 36 (c) respectively of the balance sheet.

Segregated Accounts Companies

20. Commercial insurers which are SACs shall have consolidated and unconsolidated SFS reflect the following:

- a. The information in the segregated accounts and the General Account be viewed as one, therefore, the insurer should prepare the SFS aggregating the segregated accounts and General Account balances.
- b. The insurer's license class will be determined based on the aggregated General Account and segregated accounts net premiums or total assets.
- c. The insurer's MSM will be calculated using the aggregated General Account and segregated accounts' assets.

21. Insurers will have to apply for an exemption from aggregating the segregated accounts and the general account balances in cases where the Insurers deem there to be appropriate ring fencing of the cells.

Revisions to the Statutory Financial Return

22. Section 18 of the Act requires all insurers to file a Statutory Financial Return (SFR) with the Authority. For commercial insurers, the Authority has amended the Insurance Account Regulations and Insurance Return and Solvency Regulations to remove any references to commercial insurers, and place these requirements in the Insurance Accounts Rules, subject to modifications as noted below.

23. The SFR for commercial insurers will not include the solvency certificate as each commercial insurer will be required to prepare a Declaration of Compliance certificate, which will be published in accordance with Section 17A(6) of the Act. The Cover Sheet has been renamed the Insurer Information Sheet (IIS), and will include the calculations for the MSM and liquidity ratios (refer to paragraphs 11 to 13 of the Insurance Accounts Rules.)

24. The liquidity ratio computation now includes line 36 of the unconsolidated SFS pertaining to “Sundry Liabilities” as a relevant liability for the purposes of the calculation.

25. The Authority proposes that the SFR be signed by the insurer’s principal representative and two directors attesting that it was prepared in accordance with the Insurance Accounts Rules.

Approved Auditors

26. Section 16 of the Act requires every insurer to appoint an auditor approved by the Authority and that the approved auditor is required to audit the SFS. The Approved Auditor will be required to:

- a. audit the consolidated GAAP or consolidated condensed GAAP financial statements as will be required under Section 17A of the Act.
- b. audit the consolidated and unconsolidated SFS as required in Section 15 of the Act read together with paragraph 7 of the Insurance Accounts Rules.

27. Section 16A of the Act has been amended by revoking subsection 16A(1)(A), which allows the Minister to make regulations prescribing facts or matters which are likely to be of the material significance for the discharge of the Authority’s functions, and replace it with a new subsection that expressly states those conditions or situations which are of material significance. The conditions or situations are consistent with the principles currently found in the guidance note “Role of the Approved Auditor”. These include:

- a. identification of a material misstatement in the insurer’s statutory financial statements or group financial statements resulting from fraud, error or illegal acts or the consequences of them;
- b. conclusion that there is substantial doubt as to the ability of the insurer or group to continue as a going concern for a period of one year from the balance sheet date;
- c. identification of adjustments to the group financial statements, which individually or in aggregate, indicates to him/her that the previous year’s audited annual financial statements, prepared according to GAAP, were materially misstated;
- d. identification of adjustments to the insurer’s financial statements, which individually or in aggregate, indicates to him/her that the previous year’s audited annual financial statements, were materially misstated;
- e. identification of a material weakness in internal control during the conduct of normal audit procedures;
- f. identification of a material conflict of interest during the conduct of normal audit procedures; or
- g. unresolved disagreements with management pertaining to the application of GAAP or statutory reporting.

II. ECONOMIC BALANCE SHEET (EBS) VALUATION PRINCIPLES GUIDANCE

28. The fundamental approach is that the EBS should use the insurer's existing GAAP balance sheet as a starting point. The EBS should be produced on a consolidated basis for both commercial insurers and insurance groups following the consolidation model in line with the GAAP principles adopted by the insurer as notified to and agreed by the Authority (GAAP).

29. Except where mentioned below, assets and liabilities (other than technical provisions) should be assessed and included on the EBS at fair value in line with the GAAP principles adopted by the insurer as notified to and agreed by the Authority (GAAP). Investments in affiliates shall be consolidated using the GAAP consolidation model. In situations where the GAAP principles permit both a fair value and a non-economic valuation model for valuing an asset or liability, the insurer should apply the fair value model.

30. For cases where the GAAP principles do not require an economic valuation, the insurer should value the asset or liability using the following hierarchy of high level principles governing valuation of assets and liabilities (EBS valuation hierarchy):

- a. insurers should use quoted market prices in active markets for the same or similar assets or liabilities;
- b. where the use of quoted market prices for the same assets or liabilities is not possible, quoted market prices in active markets for similar assets and liabilities with adjustments to reflect differences should be used;
- c. if there are no quoted market prices in active markets available, insurers should use mark-to-model techniques, which are alternative valuation techniques that have to be benchmarked, extrapolated or otherwise calculated as far as possible from a market input;
- d. insurers should make maximum use of relevant observable inputs and market inputs and rely as little as possible on undertaking-specific inputs, minimising the use of unobservable inputs;
- e. When valuing liabilities, no adjustments should be made to take account of the own credit standing of the Insurer.

31. Insurance technical provisions would be valued based on best estimate cash flows, adjusted to reflect the time value of money using a risk-free discount rate term structure with an appropriate illiquidity adjustment. In addition there would be a risk margin to reflect the uncertainty contained inherent in the underlying cash flows. Certain intangible assets would be disallowed as they are considered too uncertain to form part of a solvency assessment.

32. Subject to prior approval of the Authority, insurers may elect to produce some or all of their EBS using principles of other EBS regulatory frameworks (like Solvency II, or such other economic valuation principles that the Authority has approved in advance for this purpose).

33. We have provided below specific recognition and valuation requirements for selected

balance sheet areas that require more clarity.

Overarching Principles

Substance over form

34. When applying the EBS framework, the principle of substance over form should be followed wherever applicable. In other words, the application of the EBS framework should reflect the nature of the risks underlying the contract (substance), rather than the legal form of the contract (form).

35. Specific examples where this may be relevant are as follows:

- a. The choice between P&C and Long-Term life actuarial methodologies should be based on substance over form.
- b. The segmentation of contracts between lines of business should be based on substance over form.

Proportionality

36. When applying the EBS framework, insurers should use methods and approaches which are proportionate to the nature, scale and complexity of the risks underlying their insurance and reinsurance obligations. The Authority may consider simplifications that use GAAP or Statutory approaches and figures as a starting point which are then adjusted so to provide figures that are similar to the figures that would have been directly derived under a pure “EBS” valuation basis to be acceptable, especially for items that are likely to be immaterial from a balance sheet and solvency position. Hard and fast rules cannot be set in such matters – consideration needs to be on a case-by-case basis and upon analysis of the justification provided by the insurer and taking into account the nature, scale and complexity of the issues under analysis. The Authority does not generally consider it acceptable to use GAAP or Statutory valuation approaches and values that are not in line with the EBS valuation approach and that are not further adjusted on the basis of materiality/proportionality.

37. An evaluation, in either qualitative or quantitative terms, should be undertaken to assess the error introduced into the results as a result of using a particular approximate method or approach. An approximate method or approach is considered to be disproportionate to the nature, scale and complexity of the risks if the error leads to a misstatement that could influence the decision-making or judgment of the intended user of the information.

38. Such a method or approach may still be acceptable, however, if no other method or approach with a smaller error is available and the method or approach selected is pessimistic.

Intangible Assets

39. Goodwill is to be valued at nil. Other intangible assets can be recognised and measured at a value other than zero only if they can be sold separately and that the expected future economic benefits will flow to the insurer and the value of the assets can be reliably measured. These assets must be separable and there should be evidence of exchange transactions for the same or similar assets indicating that they are saleable in the market place. If the value

assessment of an intangible asset cannot be reliably measured, then such asset should be valued at nil.

Contingent Liabilities

40. Contingent liabilities shall be recognised as liabilities in the EBS and valued based on the expected present value of future cash-flows required to settle the contingent liability over the lifetime of that contingent liability, using the basic risk-free interest rate.

41. Where the present value of the contingent liability cannot be determined because the timing of likely scenarios cannot be reliably estimated, the amount of the liability should be recorded at its undiscounted value. In coming up with the expected values insurers should take into account both a profit element and risk premium required by market participants. For cases in which the contingent liability has asymmetrical outcomes, the valuation of the contingent liability should take account of a range of possible outcomes. This may be accomplished through option pricing models or models that consider multiple outcomes.

Income Taxes

42. Current tax liabilities or assets shall be measured at the amount expected to be paid to or recovered from the taxation authorities, using the tax rates that have been enacted or substantively enacted by the end of the reporting period.

43. Insurers shall recognise and value deferred tax assets and liabilities in relation to all assets and liabilities that are recognised for solvency or tax purposes in conformity with the GAAP principles adopted by the insurer.

44. Notwithstanding above, insurers shall value deferred taxes, other than deferred tax assets arising from the carry-forward of unused tax credits and the carry-forward of unused tax losses, on the basis of the difference between the values ascribed to assets and liabilities recognised and valued in accordance with the requirements of the Economic Balance Sheet and the values ascribed to assets and liabilities as recognised and valued for tax purposes.

45. Insurers shall only ascribe a positive value to deferred tax assets where it is probable that future taxable profit will be available against which the deferred tax asset can be utilised, taking into account any legal or regulatory requirements on the time limits relating to the carry-forward of unused tax losses or the carry-forward of unused tax credits.

Investments in Affiliates

46. Insurers shall consolidate holdings in affiliates where they have control. Insurers shall utilize its adopted GAAP principles to assess and determine whether it controls an affiliate. The Insurer shall apply uniform GAAP and Economic Balance Sheet valuation principles to consolidated affiliates.

47. Holdings in related affiliates where the Insurer does not hold a majority equity interest but has the ability to exercise significant influence over operating and financial matters shall be valued with the equity method. Economic balance sheet valuation principles shall be applied to the affiliates before deriving the values.

48. Holdings where the Insurer has neither control nor significant influence shall be valued at the quoted market price or if this valuation is not available the Insurer shall follow the

EBS valuation hierarchy.

Insurance Risk Transfer

49. In situations where GAAP principles adopted by the Insurer require insurance contracts that do not transfer significant insurance risk to be deposit accounted, Insurers will be allowed to apply deposit accounting for the Economic Balance Sheet. The deposit assets and liabilities should be fair valued using the EBS valuation hierarchy and included in Line 13 (e) and 36 (f).

Modified Coinsurance (Mod-co) Arrangements

50. The treatment of mod-co business under EBS is to be treated in a similar manner to its treatment under GAAP, provide that a fair value approach to valuation is adopted.

Deferred Acquisition Costs

51. Deferred acquisition costs (DAC) shall be implicitly included in the premium provisions valuation and not reflected as an asset.

Contractual Liabilities Other Than Technical Provisions

52. All contractual liabilities shall be recognised on the EBS. Contractual liabilities should be valued consistent with GAAP. In cases where the GAAP principles do not require fair value, the insurer should value the contractual liabilities using the EBS valuation hierarchy.

53. Where the Authority has issued a direction under sections 6C or 56 of the Insurance Act to effectively allow an Insurer to treat a contractual liability as capital in its Statutory Financial Returns, rather than as a liability as GAAP would dictate, then a similar treatment may be adopted for the EBS.

III. GUIDANCE FOR THE STATUTORY ECONOMIC BALANCE SHEET BY LINE OTHER THAN TECHNICAL PROVISIONS

Cash and Cash Equivalents (Line 1)

54. Cash equivalents shall include money-market funds and fixed interest deposits placed with a maturity of under 90 days when purchased. This will also include restricted cash. Cash and cash equivalents shall be included in the EBS at fair value in line with the GAAP with both changes in fair value and realised gains/losses netted off Statutory Economic Capital and Surplus.

Quoted Investments (Line 2)

55. Quoted investments shall be recorded at fair value in line with GAAP with both changes in fair value and realised gains/losses netted off Statutory Economic Capital and Surplus. In cases where the GAAP principles do not require fair value, the insurer should value the quoted investment using the EBS Valuation hierarchy.

56. Residential Mortgage Backed Securities, commercial Mortgage Backed Securities, Asset Backed Securities and Bond Mutual Funds shall be included under bonds and debentures

and separately shown on Schedule II.

Unquoted Investments (Line 3)

57. Unquoted investments shall be recorded at fair value in line with GAAP with both changes in fair value and realised gains/losses netted off Statutory Economic Capital and Surplus. In cases where the GAAP principles do not require fair value, the insurer should value the unquoted investment using the EBS valuation hierarchy.

Investments in and Advances to Affiliates (Line 4)

58. Insurers shall consolidate holdings in affiliates where they are deemed to have control under the Insurer's GAAP principles.

59. Investments in related affiliates where the Insurer does not hold a majority equity interest but has the ability to exercise significant influence over operating and financial matters shall be valued with the equity method. Economic balance sheet valuation principles shall be applied to the affiliates before deriving the values to be included for equity method accounted entities including deduction of goodwill and other intangible assets.

60. Investments in affiliates where the Insurer has neither control nor significant influence shall be valued at the quoted market price or if this valuation is not available the Insurer shall follow the hierarchy of high level principles governing valuation of assets and liabilities outlined above.

61. Advances to affiliates shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy. Amounts receivable or payable on account of policies of insurance or reinsurance with affiliates shall not be included in this line. Such amounts shall be included in accounts and premiums receivables line (Line 10) and reinsurance payable (line 28) respectively. Funds held by ceding reinsurers which are affiliates (line 12) and funds held under reinsurance contracts with affiliates (line 34) shall also not be included.

Investment in Mortgage Loans on Real Estate (Line 5)

62. Investment in mortgage loans on real estate shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

Policy Loans (Line 6)

63. Policy loans shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation.

Real Estate (Line 7)

64. Commercial investments occupied by the Insurer shall be included here.

65. Real estate including properties owned and occupied by the Insurer shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

66. Insurers shall apply fair value and revaluation models when valuing real estate even in situations where the cost model is permitted under the GAAP principles.

Collateral Loans (Line 8)

67. Collateral loans shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

Investment Income Due and Accrued (Line 9)

68. Investment income due and accrued shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

69. Balances due in more than one year shall be discounted at the relevant risk free rate.

Accounts and Premium Receivable (Line 10)

70. Accounts and premium receivable shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

71. Premiums due but not yet received shall be included on this line while premiums not yet due shall be included as part of premium provisions.

72. Balances due in more than one year shall be discounted at the relevant risk free rate.

Reinsurance Balances Receivable (Line 11)

73. Reinsurance balances receivable shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

74. Losses and loss expenses recoverable shall be included on line 16.

75. Balances due in more than one year shall be discounted at the relevant risk free rate.

Funds Held by Ceding Reinsurance (Line 12)

76. Funds held by ceding reinsurers (whether affiliate or not) shall be included here.

77. Funds held by ceding reinsurers receivable shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

Sundry Assets (Line 13)

78. Any asset not accounted for in lines 1 to 12 and 14 shall be included here if it has a readily realizable value. Any other assets, prepaid and deferred expenses, goodwill and similar intangible assets shall be non- admitted assets.

79. Derivative instruments - shall be recorded at fair value in line with GAAP with both changes in fair value and realised gains/losses netted off Statutory Economic Capital and Surplus.

80. See above for Deferred Tax Assets (paragraphs 42-45) and Intangible Assets (paragraph 39).

81. All other assets categorised under sundry assets shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

Letters of Credit Guarantee and Other Instruments (Line 14)

82. Where additional fixed capital has been secured to the insurer by means of an irrevocable letter of credit, a guarantee or any other instrument, an asset may, with the approval of the Authority obtained on an application made for that purpose, be recorded and the capital increased by a corresponding amount. Where such an asset is recorded, it must be shown net of any allowance for its collectability.

83. Letters of credit, guarantees and other instruments in favour of the insurer which relate to insurance or reinsurance contracts shall not be recorded here. While these are not included in the EBS, they have an impact in potentially reducing counterparty default risk for capital assessment.

84. Other than with approval from the Authority contractual rights arising from off-balance sheet arrangements and other contingent assets shall not be recognised in the EBS.

Insurance and Reinsurance Balances Payable (Line 28)

85. Amounts, including premiums and other balances, payable to insured persons and reinsurers (whether affiliates or not) under insurance and reinsurance contracts shall be included. Funds held by the insurer under reinsurance contracts (shown on line 34) shall not be included.

86. Insurance and reinsurance balances payable shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

87. Amounts payable in more than one year shall be discounted at the relevant risk free rate.

Commissions, Expenses, Fees, and Taxes Payable (Line 29)

88. All liabilities in respect of commissions (including profit commissions) underwriting expenses, fees and taxes (other than income taxes) shall be included. All unearned commissions shall be included here.

89. Commissions, expenses, fees and taxes payable shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

90. Amounts payable in more than one year shall be discounted at the relevant risk free rate.

Loans and Notes Payable (Line 30)

91. Loans and notes payable to any person other than an affiliate shall be included here.

92. Loans and notes payable shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

Tax Liabilities (Line 31)

93. See Income Taxes section above (paragraphs 42-45)

Amounts Due to Affiliates (Line 32)

94. All balances due to affiliates, not being amounts payable under reinsurance contracts (shown on line 28 or line 34), shall be included here.

95. Amounts due to affiliates shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

96. Amounts payable in more than one year shall be discounted at the relevant risk free rate.

Accounts Payable and Accrued Liabilities (Line 33)

97. Any other (non-insurance) accounts payable and accrued liabilities shall be included here.

98. Accounts payable and accrued liabilities shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

Funds Held Under Reinsurance (Line 34)

99. Funds held under reinsurance contracts shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

Dividends Payable (Line 35)

100. The amount of dividends payable to shareholders in the insurer declared prior to the last day of the relevant year and remaining unpaid on that day shall be included here.

101. Dividends payable shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

102. Amounts payable in more than one year shall be discounted at the relevant risk free

rate.

Sundry Liabilities (Line 36)

103. Any liabilities (including prospective and contingent liabilities) not assigned to another line of the balance sheet shall be included here.

104. Sundry liabilities shall be recorded at fair value in line with GAAP. In cases where the GAAP principles do not require fair value, the insurer shall value the balances using the EBS valuation hierarchy.

105. See discussion on contingent liabilities above (paragraph 40).

Letters of Credit, Guarantees and Other Instruments (Line 37)

106. Where letters of credit and guarantees are given by the insurer in favour of another person, being letters of credit, a guarantee or any other instrument not relating to the insurer's insurance operations and in effect encumbering the insurer's assets, a liability shall be recorded and the statutory economic capital and surplus decreased by a corresponding amount, whether the insurer has pledged specific assets or not under the letters of credit, a guarantee or any other instrument. Letters of credit, guarantees and other instruments relating to insurance operations shall not be recorded.

107. The value of the contingent liability in the letters of credit, guarantees and other instruments shall be obtained based on the expected present value of future cash-flows required to settle the contingent liability over the lifetime of that contingent liability using the risk free interest rate. Where the present value of contingent obligations cannot be determined because the timing of likely scenarios cannot be reliably estimated, the liability should be valued at its undiscounted value.

108. See Contingent Liabilities discussion above (paragraph 40).

Notes to the EBS

109. Line 10 – Collateral balances: The Insurers shall disclose the amounts of any collateral issued in favour of the Insurer related to accounts and premiums receivable.

110. Line 11 (e) – The Insurer shall disclose the nature, terms and amounts of any collateral issued in favour of the Insurer relating to reinsurance balances receivable.

111. Line 13 (k) – The Insurer shall provide a detailed breakdown of what makes up other sundry assets.

112. Line 15 – Encumbered Assets for Policyholder Obligations - Details of the total encumbered assets securing policyholder obligations shall be provided including asset type and the amount.

113. Line 15 – Encumbered Assets not Securing Policyholder Obligations - The details of the total encumbered assets not securing policyholder obligations, including asset type, purpose of the encumbrance, and the amount shall be included.

114. Line 17 (c) – Total reinsurance recoverable balance - The Insurer shall disclose the

nature, terms and amounts of any collateral issued in favour of the Insurer relating to reinsurance balances receivable.

115. Line 37 – Letter of Credit, Guarantees and Other Instruments - The Insurer shall disclose the nature and terms and amounts of the letters of credit, guarantees and other contingent liability instruments. The Insurer shall also disclose the valuation basis and the key assumptions made in coming up with the expected net present value.

116. Line 40 – Reconciliation between Line 40 of 1EBS and Line 40 of Form 1A - The insurer shall provide details of the differences between the Total Statutory Economic Capital and Surplus under Form 1EBS and the Total Capital and Surplus under form 1A. For the purposes of the trial run the Insurer should prepare the reconciliation between the Capital and Surplus as per the GAAP financial statements and the Total Statutory Economic Capital and Surplus using schedule V(e). This is in line with the Authority's aim of replacing current Statutory financial statements with consolidated GAAP financial statements. Items listed under "Others" in schedule V(e) should be specified and broken down by Statutory Economic Balance Sheet Line.

IV. GUIDANCE ON TECHNICAL PROVISION FOR EBS

Technical Provisions – General Principles

117. Technical provisions comprise the sum of a best estimate and a risk margin. However, where cash flows associated with insurance obligations can be reliably replicated using financial instruments, then it may be possible to use the market values of those financial instruments as the technical provisions. (See Section - Technical provisions as a whole).

Calculation of the Best Estimate

118. The best estimate should be calculated using the following guidelines:

- a. The best estimate should reflect gross amounts, without deduction of amounts recoverable from reinsurance contracts or other risk transfer mechanisms.
- b. The best estimate of recoverable amounts should be calculated, and shown, separately.
- c. The calculation of the best estimate should take into account the time value of money, using the relevant risk-free interest rate term structure with an appropriate illiquidity adjustment.
- d. The best estimate should not make any allowance for the insurer's own credit standing.
- e. In line with actuarial best practices, insurers should segment their reinsurance obligations into homogeneous risk groups. The segmentation is a matter for individual insurers to determine, but insurers should be aware of the need to provide information on their best estimate technical provisions by statutory line of business for Bermuda Solvency Capital Requirement (BSCR) reporting and calculation purposes.

119. The best estimate should correspond to the probability-weighted average of future cash flows, discounted using the relevant risk-free interest rate term structure. It should therefore allow for uncertainty in future cash flows, and reflect the full potential range of possible outcomes, each weighted to reflect their respective probability of occurrence. However, this does not mean that additional margins should be held within the best estimate to reflect this uncertainty.

120. It is recognised that a probability-weighted average of future cash flows' is an aim, not a requirement, and that it may not be necessary to explicitly identify all such scenarios in the valuation, or apply stochastic valuation techniques. Traditional valuation methodologies common in Long-Term insurance and general insurance may be capable of adequately allowing for all possible scenarios. However, due regard would need to be paid to events that may not be adequately reflected in the data used for such traditional approaches (these events have been referred to in the recent past as 'Binary Events', but the scope is wider than remote but potentially severe events, and they are now often referred to as 'ENIDS' (Events Not In Data Set).

121. The valuation should use unbiased current assumptions, which should be based on a combination of relevant, credible experience as well as expert judgement as to potential future trends and developments. At each valuation date, the insurer should consider whether the assumptions used are still appropriate, and be able to justify any changes (or non-changes).

Cash Flows

122. The cash flow projections used in the calculation of the best estimate should take account of all future cash in- and out-flows required to settle the insurance obligations attributable to the lifetime of the policy. This is defined to continue up to the point at which:

- a. the insurer is no longer required to provide coverage;
- b. the insurer has the right or the practical ability to reassess the risk of the particular policyholder and, as a result, can set a price that fully reflects that risk;
- c. the insurer has the right or the practical ability to reassess the risk of the portfolio that contains the contract and, as a result, can set a price that fully reflects the risk of that portfolio.

123. The cash flows expected to be taken into account in the valuation should be based on unbiased current estimates and would include:

- a. future best-estimate premium payments;
- b. benefit payments to cedants, policyholders, and beneficiaries, including an allowance for any discretionary benefits, e.g. ex gratia payments, or if certain contracts are designed with the right to participate in the performance of a specified pool of assets;
- c. expenses, including any payments to intermediaries, claim costs, servicing costs and profit commissions etc.;

- d. investment costs;
- e. payments to and from reinsurers or other providers of risk mitigation, including reinstatement premiums; and
- f. other cash flow items which are expected to be charged to policyholders or required to settle the obligations.

Best Estimate – Probability Weighted Average

124. When setting best estimates, the definition set out above can be more challenging to meet in practice than a number of historical definitions of best estimate.

125. Historically, many actuaries set best estimate assumptions with a desire that actual experience exceeds the best estimate as often as it is lower than the best estimate. This is known as a “median” approach.

126. In principle, the BMA definition is more of a “mean” approach, requiring consideration of the full distribution of the risk.

127. In practice, for symmetric risks, a median and mean definition should lead to the same best estimate. For asymmetric risks with emphasis on the adverse tail of the distribution, as is often the case with distributions for insurance risks, the mean is typically greater than the median – in some cases materially so. In addition, many non-economic risks can also be asymmetric in nature, although not always materially so.

128. In principle, best estimate assumptions should be set based on what is observable about any particular experience item or can be reasonable inferred from observable information.

129. This position leads to best estimate assumptions that are, for a significant part, based on an insurer’s past experience where that past experience is credible, as this past experience is an observable item. While this is the case, an insurer’s own past experience is only one of a range of observable areas. In setting best estimate assumptions there are many other factors to take into consideration as set out below:

- a. Take into account the product features, target market, distribution channel and competitor dynamics.
- b. Where there is credible internal data, perform a robust experience analysis. This should analyse the data at least by duration year and calendar year of inception.
- c. Any recent trends should be considered. The analysis should consider how recent experience compares to the best estimate assumption.
- d. Bear in mind the credibility of data when determining how much weight to put on company specific experience and how much to put on external sources.
- e. Consider external data sources such as industry analyses, reinsurers’ experience, and guidance from local actuarial associations or experts with knowledge of insurance industry in the country in question.

- f. Consider other issues of relevance, for example, recent or expected future changes in fiscal and regulatory frameworks.
- g. Focus efforts more on the material product lines and material assumptions.
- h. Bear in mind the potential for asymmetries, particularly where there are discrete truncations in the possible experience. An example is the lapse rate for low lapse savings products, where there is a natural limit of 0% in considering how far lapse rates can fall, but less of a limit when considering possible increases in lapse rates.
- i. Consider lapse and similar decrement assumptions bearing in mind other assumptions in the basis.
- j. For new product launches where data is limited and volumes are rapidly increasing, the assumptions for other similar products can be used as a starting point but should be critically reviewed in terms of the relevance to the new product. This review should consider a comparison of product features and pricing. For example, a more costly product may have higher lapses than a lower cost equivalent if policyholders later believe the product is poorer value for money.
- k. Consider the extent to which non-economic experience, e.g. lapses, switching and other policyholder options, may vary with market movements.

130. The assumptions must appropriately reflect the uncertainty inherent in the cashflows, although without the explicit addition of prudence. Note that this does not necessarily imply best estimates have to be calculated using a stochastic methodology; the only requirement is correspondence to the probability-weighted average.

131. Indeed, for the estimation of many non-life and long-term business best estimate liabilities, deterministic and analytical techniques may be as appropriate as simulation techniques. Given that the best estimate of simulation and deterministic methods may well be the same, not least because deterministic results are often used to calibrate simulation methods, this means that the best estimate may be the same in practice for either method.

132. It may be possible to implicitly allow for all possible scenarios through the chain-ladder technique in non-life insurance – providing that the estimate is based on a sufficient volume and history of data, as discussed further in an ‘Allowance for ENIDS’ (see next section).

133. The best estimate should be the average of the discounted cashflows and not the discounted average of the cashflows, where this is different.

Allowance for ENIDS

134. Although these events are sometimes referred to as ‘binary events’ or ‘extreme events’, such terms suggest that events not found in the data are necessarily extreme or rare. This is not necessarily the case, and so they are now often referred to as “ENIDS” – i.e. Events Not In Data Set.

135. The approach to ENIDs should be governed by a judgmental (but well informed) assessment of the tail risks that apply to the portfolio being reviewed. The aim is to reflect the full range of outcomes in the best estimate. The intention is not to create a margin in the best estimate, and the best estimate assumptions should not include any explicit margin for uncertainty.

136. In some situations, an insurer may conclude that the available historical claims data set is sufficiently extensive and credible that it covers the full distribution of outcomes, and therefore no additional allowance for ENIDS is needed. In other situations, however, insurers may conclude that the available historical claims data set is not representative of the full distribution of outcomes and in these circumstances they may decide to adjust the projection of future claims that underlies the best estimate to allow for the “missing tail” of experience.

137. Any such adjustment for ENIDS should not be carried out arbitrarily. Applying simple percentage uplift to technical provisions without justification is not an appropriate approach.

138. A possible approach to calculating an allowance for ENIDS is to calculate the best estimate reserve separately under the assumptions that an ENIDS does or does not occur. The two projections could then be combined using a probability weighting.

139. An alternative approach would be to add an explicit amount or loading to the best estimate reserve, providing that any such loading is based on a robust and justifiable analysis.

140. Where outliers are removed from the data as part of the reserving process, this removes events from the data. Insurers should make an allowance for this in the technical provisions calculation unless they have shown that it would not be possible for these, or similar, events to occur again in the future.

141. It is a helpful exercise to formally document the elements that are considered in the best estimate assumption setting process. This would help to avoid, within the ENIDS assessment process, the possibility of risks either being ignored or their costs being double counted.

Expenses in Best Estimate

142. The best estimate should reflect all cash-flows arising from expenses that will be incurred servicing existing policies during their lifetime. This should include:

- a. Administrative expenses
- b. Claims management expenses
- c. Acquisition expenses
- d. Investment expenses
- e. Overhead expenses included in the expenses mentioned above. Overhead expenses include, for example, salaries to general managers, auditing costs and regular day-to-day costs for utility bills, rent and IT costs. These overhead expenses also include expenses related to the development of new insurance

business, advertising and improvements of the internal processes such as IT systems and software.

143. Insurers should undertake an expense analysis to allocate all expenses recently incurred by the insurer to one of acquisition, administrative, claims management, investment or overhead.

144. Investment related expenses can be included as a separate series of cashflows or may be offset against the discount rate. If investment related expenses are included as separate cash-flows rather than an offset to the discount rate, it is important to make sure that they are not double counted. The investment related expenses allowed for can be based on the hypothetical costs relating to a theoretical risk free investment portfolio for business for which the Standard approach has been adopted. However, where the Scenario based approach is being used, then investment expenses should reflect the costs associated with the insurer's actual investment portfolio, as this is a key assumption underlying the best estimate technical provision.

145. Current administrative, claims management, investment and overhead expenses should be projected forward for the in force business using an appropriate rate of expense inflation.

146. Insurers should consider whether sufficient future new business will be sold to enable existing per policy expenses to be maintained (with an appropriate rate of inflation). For closed books or declining businesses, consideration should be given to whether additional expense reserves are required to reflect increasing per policy expenses as the business runs off.

Allowing For Business In Different Currencies

147. The probability weighted average cash-flows should take into account the time value of money. The time value of money of future cash-flows in different currencies should be calculated using the risk-free term structure for each relevant currency. Therefore, in principle, the best estimate should be calculated separately for cash-flows in different currencies - with the future cash-flows by currency being discounted using the appropriate discount rates for each relevant currency.

148. The discounted future cash-flows should be converted to the reporting currency at the exchange rates in effect as of the valuation date to obtain the best estimate.

149. The requirement for best estimates to be calculated "by currency" should be subject to the principle of proportionality, such that it may be appropriate to produce specific estimates only by the most material currencies as well as the reporting currency.

150. Insurers should consider data availability in setting up homogeneous risk groups by currency, to ensure that appropriate discount rates are available.

151. The uncertainty around future exchange rates should not be considered in the calculation of the best estimate. The risk of fluctuations in exchange rates is covered in the currency risk section of the BSCR calculation.

Reinsurance Recoveries

152. The best estimate of reinsurance recoveries should be based on principles similar to, and consistent with, those underlying the gross best estimate. Relevant cash flows to be considered for the best estimate may extend to include reinstatement premiums required to be paid to the reinsurer, and will include expenses in relation to the management and administration of reinsurance claims.

153. Where recoveries from reinsurers are not dependent directly on gross claims payments, e.g. they are dependent on some type of index or other trigger, then the insurer will need to take into account any structural mismatch between gross claims payments and amounts recoverable (basis risk) in determining their best estimate.

154. Insurers should consider the potential impact of timing differences between payment of gross claims and receiving related recoveries from reinsurers.

155. The best estimate of reinsurance recoveries should be adjusted to reflect expected losses due to counterparty default for whatever reason, including reinsurer insolvency and contractual disputes (see paragraphs 170-194 below for discussion of some possible calculation approaches). The adjustment should be shown separately as part of supplementary notes to the EBS. It should be based on an assessment of the probability of default by the counterparty and the average expected loss should the default occur. Where the insurer is holding collateral against potential recoveries, then this can be taken into account to reduce the adjustment that would otherwise be needed. Where specific assets / investments form part of the collateral, then the ratings for those instruments should be taken into account rather than the rating for the reinsurer, as counterparty risk of the reinsurer has effectively been replaced with market risk of the collateral. Where a letter of credit is involved, then the approach taken should be that the rating of the letter of credit issuer should replace that of the reinsurer in the assessment. Details of any collateral or letters of credit providing security for reinsurance recoveries should be shown as part of supplementary notes to the EBS.

156. The amount of expected losses due to counterparty default will also need to be commented on as part of EBS Actuarial Opinion.

Possible Simplification For Reinsurance Recoverables

157. With respect to the principle of proportionality, in some circumstances it may be reasonable for insurers to use methods to derive the net best estimate (before making adjustments for losses due to expected counterparty default) from the gross best estimate without an explicit projection of the cash-flows underlying the amounts recoverable from reinsurance contracts.

158. In particular, gross-to-net techniques may be used providing that the particular methodology selected is proportionate to the underlying risk. This approach also presupposes that an estimate of the technical provisions gross of reinsurance (compatible with the EBS framework) is already available, with a “gross-to-net factor” being applied to these gross technical provisions. The value of reinsurance recoverables is then derived as the excess of the gross over the net estimate, and would be subject to adjustment for expected losses due to counterparty default.

159. Insurers are expected to make use of gross-to-net methods in a flexible and proportionate way, by applying them to either premium provisions or provisions for claims outstanding or to a subset of lines of business or accident years, having regard to, for

example, the complexity of their reinsurance programmes, the availability of relevant data, the importance (and significance) of the sub-portfolios in question or by using other relevant criteria.

160. An insurer would typically use a simplified gross-to-net technique, for example, when the insurer cannot ensure the appropriateness, completeness and accuracy of the data or the underlying reinsurance programme has changed.

161. It seems unlikely that a gross-to-net simplified technique being applied to the overall portfolio of a non-life insurance insurer would provide reliable and reasonably accurate approximations of the best estimate of technical provisions net of reinsurance. Accordingly, if such techniques are to be adopted, non-life insurance insurers should, in general, carry out the gross-to-net calculations at a sufficiently granular level. In order to achieve this level of granularity a suitable starting point would be:

- a. to distinguish between homogenous risk groups or, as a minimum, classes of business;
- b. to distinguish between “large claims” and “small claims”;
- c. to distinguish between the premium provisions and provisions for claims outstanding (for a given homogenous risk group or class of business); and
- d. with respect to the provisions for claims outstanding, to distinguish between the accident years not fully developed and – if the necessary data is available and of sufficient quality – to distinguish further between provisions for outstanding claims and IBNR claims, respectively.

162. A further refinement that may need to be applied when stipulating the gross-to-net factors would be to take into account the type of reinsurance cover and especially the relevant (i.e. most important) characteristics of this cover.

163. When applying such refinements, the appropriate level of granularity for the calculation should be selected taking into account the principle of proportionality and having regard to the nature, scale and complexity of the underlying risks (and in particular the corresponding reinsurance programme).

164. For certain kinds of reinsurance covers (e.g. in cases where the cover extends across several lines of business, so that it is difficult to allocate the effect of the reinsurance risk mitigation to individual lines of business or even homogeneous groups of risk, or where the cover is only with respect to certain perils of a class of business), increasing the granularity of gross-to-net techniques as described above will not suffice to derive an adequate determination of provisions net of reinsurance. In such cases, individual approaches tailored to the specific reinsurance cover in question would need to be used.

165. As an alternative to gross-to-net calculations, it may be contemplated to use a direct calculation of net provisions based on triangular claims data on a net basis. However, it should be noted that such a technique would generally require adjustments of the underlying data triangle in order to take into account changes in the reinsurance programme over time, and therefore would generally be rather resource intensive. Also, an application of such “direct” techniques may not yield a better quality valuation than an application of more granular gross-to-net techniques as discussed above.

Allowance for Reinstatement Premiums in Reinsurance Recoverable Balances

166. Projected outwards reinstatement premiums payable should be included within the premium provisions unless these are immaterial.

167. The best estimate of these reinstatement premiums should capture the uncertainty of claims experience, taking into account the likelihood and severity of outcomes. The approach could either be stochastic or consist of a series of deterministic projections with attributed probabilities.

168. The approach used to assess the level of outwards reinstatement premiums payable should be consistent with the valuation of the best estimate claims costs allowed for in the premium provisions.

169. The administrative expenses associated with the cost of handling the reinstatement should also be allowed for in the premium provisions.

Adjustment for Expected Losses on Reinsurance Recoveries Due to Counterparty Default (for all reasons)

Definition of the adjustment

170. The best estimate of reinsurance recoveries should be adjusted to take account of expected losses due to default of the counterparty. The adjustment should be calculated separately and should be based on an assessment of the probability of default of the counterparty (whether this arises from insolvency, dispute or any other reason) and the average loss resulting from the default (the loss-given-default).

171. Insurers are permitted to make allowance for counterparty credit risk mitigation techniques they have adopted. Where this involves the use of collateral assets, then the potential market risk on those assets should be taken into account. Where security has been obtained by way of letter of credit, guarantee or similar, then the rating of the reinsurer can be replaced with the rating of the security provider.

172. The adjustment should be calculated as the expected present value of the change in cash-flows underlying the amounts recoverable from the counterparty, resulting from a default of the counterparty at a certain point in time. This calculation should therefore take into account possible default events over the lifetime of the rights arising from the corresponding reinsurance contract or special purpose vehicle and the dependence on time of the probability of default.

Example

173. For example, let the recoverables from counterparty correspond to deterministic payments of C_1 , C_2 , C_3 in one, two and three years respectively, and let PD_t be the probability that the counterparty defaults during year t . Furthermore, assume that the counterparty will only be able to make 40% of the payments in case of default - i.e. the loss-given-default is 60%. For the sake of simplicity, this example does not consider the time value of money. The losses-given-default amounts are therefore as follows:

<u>Default during year</u>	<u>Loss-given-default</u>
1	60% * (C ₁ +C ₂ +C ₃)
2	60% * (C ₂ +C ₃)
3	60% * C ₃

174. The adjustment for counterparty default in this example is therefore the following:
Adjustment = 60% * (PD₁*(C₁+C₂+C₃) + PD₂*(C₂+C₃) + PD₃*C₃)

175. This calculation should, in principle, be carried out separately for each counterparty and each line of business, and in non-life insurance separately for premium provisions and provisions for claims outstanding. This is likely to require the allocation of reinsurance premiums and claims provisions to line of business. Proportionality considerations should be taken into account in deciding whether simplifications or approximations are appropriate in determining the adjustment.

Probability of default

176. The determination of the adjustment for counterparty default should take into account possible default events during the whole run-off period of the reinsurance recoveries. In particular, allowance needs to be made for the possibility that the counterparty may – after surviving the first year – default at a later stage during the period of the run-off of the recoveries.

177. The assessment of the probability of default of the counterparty should be based upon current, reliable and credible information. Among the possible sources of information are: credit spreads, information from credit rating agencies, information relating to the supervisory solvency assessment and financial reporting information of the counterparty. The insurer should not rely on information of a third party without assessing that the information is current, reliable and credible.

178. The insurer may consider for this purpose methods generally accepted and applied in financial markets (such as based on CDS markets), provided the financial information used in the calculations is sufficiently reliable and relevant for the purposes of the adjustment of the recoveries from reinsurance.

179. In the case of reinsurance recoveries from a special purpose vehicle (“SPV”), the probability of default should be calculated according to the average credit rating of the assets held by the SPV, unless there is a reliable basis for an alternative calculation. When the insurer has no reliable source to estimate its probability of default, the SPV should be considered as unrated.

180. Where possible in a reliable, objective and prudent manner, point-in-time estimates of the probability of default should be used for the calculation of the adjustment – i.e. estimates that reflect the current state of the insurance cycle rather than through-the-cycle estimates which try to determine a long-time average of the default probability. Where point-in-time estimates are used, the assessment should take the possible time-dependence of the probability of default into account. If point-in-time estimates are not possible to calculate in a reliable, objective and prudent manner or their application would not be proportionate, through-

the-cycle estimates of the probability of default can be used.

181. In many cases only through-the-cycle estimates may be available. For example, the credit ratings provided by rating agencies are usually based on through-the-cycle assessments. Moreover, the sophisticated analysis of the time dependence of the probability of default may be disproportionate in many cases. Hence, through-the-cycle estimates might be used if point-in-time estimates cannot be derived in a reliable, objective and prudent manner or their application would not be in line with the proportionality principle. If through-the-cycle estimates are applied, it can usually be assumed that the probability of default does not change during the run-off of the recoverables.

182. Often, only the probability of default during the following year is known. The assessment of the probability of default should take into account the fact that the cumulative probability increases with the time horizon of the assessment – i.e. the probability that the counterparty defaults during the next two years is higher than the probability of default during the next year.

Loss-given-default

183. The loss-given-default is the proportion of the debts that the counterparty will not be able to honour in case of default.

184. Owing to a low number of defaults little empirical data about the loss-given-default figure in relation to reinsurers is available, and hence estimations of loss-given-default are likely to be unreliable and a large degree of judgement is likely to be required. If no reliable estimate of the loss-given-default of a counterparty is available, then a rate no lower than 50% should be used.

185. The average loss resulting from the default of a counterparty should include an estimation of the credit risk of any risk-mitigating instruments that the counterparty provided to the insurer ceding risks to the counterparty. However, insurers should consider the adjustment for the expected default losses of these mitigating instruments, i.e. the credit risk of the instruments as well as any other risk connected to them should also be allowed for. This allowance may be omitted where the impact is not material. To assess this materiality it is necessary to take into account the relevant features, such as the period of effect of the risk mitigating instrument.

Application to outstanding claims and premium provisions and long-term technical provisions

186. For outstanding claims provisions, details of the counterparties underlying notified outstanding reinsurance recoveries may well be available. Assumptions will, however, need to be applied for the counterparties involved with recoveries on IBNR/IBNER. Assumptions here may use the same proportions of reinsurance by credit rating as for reinsurance on outstanding claims, paid reinsurance recoveries or reinsurance premium for recent years.

187. Assumptions regarding reinsurance recoveries for premium provisions or long-term technical provisions may need to take into account similar historical proportions but will also include assumptions underlying business plans.

188. Any selected assumptions should reflect the nature of the reinsurance programme, and

any changes in the programme over time – particularly any change in the distribution of reinsurers by rating.

Default due to dispute

189. The adjustment to take account of expected losses due to default of the counterparty should be based on an assessment of the probability of default of the counterparty whether this arises from insolvency, dispute or any other reason.

190. The probability of default selected for the adjustment should therefore reflect both expected defaults from insolvency and expected defaults from any other reason – particularly disputes. When calculating the adjustment, different probabilities of default may therefore be selected for reinsurers with the same credit rating, based on current, reliable and credible information as to the additional likelihood of the counterparty defaulting due to disputes. This information is likely to include the recent historical experience of the level of disputes with that counterparty.

191. Where the probability of default is adjusted in this way, the loss-given-default assumption is also likely to vary, to reflect the perhaps more likely loss-given-default of 100% arising from disputes.

192. Known disputes with reinsurers should also be reflected in the calculated best estimate reinsurance recoveries, with an attaching probability where the default is not certain.

Simplifications for the counterparty default adjustment

193. Where a separate calculation of default by counterparty is onerous, especially if the expected loss is small and the probability of default and recovery rate of several counterparties coincides, then the adjustment for these counterparties could be calculated together. In particular, it may be appropriate to calculate the adjustment by grouping together all reinsurers with the same rating.

194. In addition, where appropriate, and in accordance with the principle of proportionality, insurers may calculate the adjustment for expected losses due to default of the counterparty, for a specific counterparty and homogeneous risk group, to be equal as follows:

$$\text{AdjCD} = \max (0.5 * \text{PD} / (1 - \text{PD}) * \text{Dur}_{\text{mod}} * \text{BE}_{\text{rec}}; 0)$$

Where:

- a. PD denotes the probability of default of that counterparty during the following 12 months;
- b. Dur_{mod} denotes the modified duration of the amounts recoverable from reinsurance contracts with that counterparty in relation to that homogeneous risk group; and
- c. BE_{rec} denotes the nominal / contractual amounts recoverable from reinsurance contracts with that counterparty in relation to that homogeneous risk group

Allowing for Management Actions / Policyholder Behaviour

195. The best estimate should take into account potential management actions and potential changes in policyholder behaviour. The size of the best estimate could be influenced by the policyholder's decision to exercise options open to him as well as management's ability to exercise its discretion.

196. Management actions should be reflected in the valuation of the best estimate provided that the management actions:

- a. are clearly documented;
- b. have been approved by senior management;
- c. are consistent with representations made to policyholders;
- d. are realistic and consistent with the insurer's current business practice and business strategy;
- e. reflect the time and cost required to implement; and
- f. are consistent with past evidence of similar actions in similar circumstances.

197. Policyholder behaviour should reflect:

- a. analysis of previous data on policyholder actions, if available;
- b. analysis of the degree to which it would be in the policyholder's interest to exercise the available option;
- c. changes in the operating environment, e.g. if the level of guarantees is increasing in the market then policyholders are more likely to lapse and purchase a new product (and vice versa); and
- d. potential interaction with management actions.

198. The analysis of policyholder behaviour (which includes the possibility of recaptures for reinsurance transactions) should be prospective, thereby requiring some degree of expert judgment.

199. The company should consider whether the insurance liabilities may be materially affected by either management actions or policyholder behaviour across a range of potential future economic scenarios.

200. For liabilities that may be materially affected, management action and policyholder behaviour assumptions are required across a range of economic scenarios. Where such assumptions already exist, these should be used as a starting point but should be reviewed given that the purpose of this valuation may differ from those that already exist.

201. The allowance for both of these items should be disclosed, together with information indicating the possible materiality on the results (for example by providing the results with

and without management actions / with and without dynamic policyholder behaviour assumptions).

202. When considering the impact of economic sensitivities on building stochastic simulation models, assumed management actions may be a key determinant. Examples of possible management actions include:

- a. Setting of future dividends (bonus rates in the UK and/or Europe), including reducing future dividends or smoothing
- b. Changing the split of bonus rates across policies, e.g. to enable better matching of assets and liabilities
- c. Changing the asset allocation weight in equities or moving to a dynamic asset allocation
- d. Changing premium rates, fees and/or credited rates
- e. The purchase of future reinsurance to cover existing business
- f. Purchasing hedging options (may be difficult to model)
- g. Closing to new business

203. Dynamic policyholder behaviour can be extremely difficult to predict and can vary significantly between different blocks of business.

Allowing for Material Guarantees and Contractual Options

204. When calculating the best estimate, the insurer or insurance group should identify and take into account all material guarantees and contractual options included in the insurance policies.

- a. The value of options and guarantees would be influenced by the prevailing economic conditions and the likelihood of the policyholder to exercise the option.
- b. In order to properly value financial options, the insurer would typically need to examine a number of different scenarios.
- c. For the simpler and less material options, the analysis may be based on simplified methods, such as closed form solutions or the analysis of selected scenarios. However, for more complex and material options, a range of stochastic scenarios may be required.
- d. For valuation purposes, the stochastic scenarios used are typically calibrated to market prices.

205. Companies are required to consider all material guarantees and options in the insurance liabilities and assets backing the insurance liabilities. These include both financial and non-financial guarantees and options.

206. Financial options and guarantees are features of assets and liabilities whose value changes asymmetrically given symmetric movements in financial markets.

207. Within insurance contracts, such features typically allow the policyholder the more valuable of two (or more) benefits, with at least one being linked to the level of financial markets.

208. A “guarantee” is deemed to be included within this definition if the policyholder receives the higher of a guaranteed amount and the benefit had the guarantee not been in place.

209. Non-financial options and guarantees typically relate to insurance risk, such as guaranteed mortality charges or guaranteed renewal rates.

210. Insurers should analyse all the insurance liabilities and backing assets for material options and guarantees, both financial and non-financial.

211. In principle, for material options and guarantees, stochastic modelling may be required to measure the cost of the options and guarantees.

212. For non-financial options and guarantees, in practice a range of scenarios can be used to help estimate the potential cost, with weights placed on outcomes based on the likelihood of the scenario arising.

Taxation

213. In determining the best estimate, insurers should take into account taxation payments which are, or are expected to be, charged to policyholders or are required to settle the insurance obligations. The following tax payments should be included in the best estimate: transaction-based taxes (such as premium taxes, stamp duties, value added taxes and goods and services taxes) and levies (such as fire service levies and guarantee fund assessments) that arise directly from recognised insurance contracts. Assessments which are already included in other expense assumptions (such as levies to industry protection schemes) should not be included. All other tax payments should be taken into account under other balance sheet items.

Technical Provisions as a Whole

214. Where future cash flows associated with insurance obligations associated with Long-Term business can be replicated reliably using financial instruments for which a reliable market value is observable, the value of technical provisions associated with those future cash flows should be determined on the basis of the market price of those financial instruments. In this case, separate calculations of the best estimate and the risk margin should not be required.

215. For the purpose of determining the circumstances where some or all future cash flows associated with insurance obligations can be replicated reliably using financial instruments for which a reliable market value is observable, insurers should assess whether all the criteria set out in both the following two paragraphs are met. In this case, the value of technical provisions associated with those future cash flows should be equal to the market price of the financial instruments used in the replication. It may be necessary to separate a policy into two or more components (‘unbundling’) to be able to satisfactorily identify liabilities for this

purpose, with some parts valued 'as a whole' and others where a best estimate is calculated.

216. The cash flows of the financial instruments should replicate the uncertainty, in amount and timing, of the cash flows associated with the insurance obligations, in relation to the risks underlying the cash flows associated with the insurance obligations in all plausible scenarios. The cash flows of the financial instruments must provide not only the same expected amount as the cash flows associated with the insurance obligations, but also the same pattern of variability. The following cash flows associated with insurance obligations cannot be reliably replicated:

- a. Cash flows associated with insurance obligations that depend on the likelihood that policyholders will exercise contractual options, including lapses and surrenders;
- b. Cash flows associated with insurance obligations that depend on the level, trend, or volatility of mortality, disability, sickness and morbidity rates;
- c. All expenses that will be incurred in servicing insurance obligations.

217. To be used in the replications, the financial instruments should be traded in active markets, and satisfy the following criteria:

- a. A large number of assets can be transacted without significantly affecting the price of the financial instruments used in the replications.
- b. Assets can be easily bought and sold without causing a significant movement in the price;
- c. Current trade and price information are readily available to the public and in particular to the insurer.

218. Where future cash flows associated with insurance or reinsurance obligations can be replicated reliably using financial instruments for which a reliable market value is observable, the value of technical provisions associated with those future cash flows should be determined on the basis of the market value of those financial instruments. In this case, separate calculations of the best estimate and the risk margin should not be required.

219. The cash-flows of the financial instruments used in the replications should replicate the uncertainty in amount and timing of the cash-flows associated with the insurance or reinsurance obligations, in relation to the risks underlying the cash-flows associated with the insurance and reinsurance obligations in all possible scenarios (i.e. the cash-flows of the financial instruments must not provide only the same expected amount as the cash-flows

associated with insurance or reinsurance obligations, but also the same patterns of variability).

Expert Judgement

220. Expert judgement may apply in respect of data used in the calculation of the best estimates, the assumptions underlying the calculations, and the method applied to derive the best estimates.

221. It is accepted that expert judgement is a key element within the EBS framework, and is appropriate within the following constraints:

- a. The use of expert judgement should not replace appropriate collection, processing and analysis of data.
- b. Expert judgement should not be used in isolation unless there is no reliable alternative.
- c. If expert judgement is applied in isolation or has a significant impact on the best estimates, reasonable alternative assumptions should be tested to ensure the selected assumption appropriately reflects the uncertainty in the outcome.
- d. Persons applying expert judgment should have adequate experience and sufficient relevant knowledge and understanding of the subject.

General Business Insurance Technical Provisions

222. The best estimate shall be shown separately for outstanding claims provisions (in respect of claims incurred whether reported or not) and premium provisions (in respect of expected future claims events). The best estimate of reinsurance recoveries shall also be shown separately for outstanding claims and premium provisions.

223. Although segmentation of the business for the purposes of calculating best estimates is left to the insurer's discretion, insurers will need to produce best estimate outstanding claims by BSCR line of business for the purposes of calculating the BSCR.

Outstanding Claims

224. For outstanding claims, the best estimate should reflect cash flows related to claim events that have already occurred, whether these have been reported to the insurer or not. They should also include allocated and unallocated loss adjustment expenses, any relevant administrative expenses, investment expenses, and overhead expenses.

225. Where an insurer has settled a claim and is making a series of payments over the lifetime of a claimant (e.g. as part of a periodic payment settlement of an injury claim), and the insurer is managing the claim using techniques similar to those usually employed by Long-Term insurers for pay-out annuity business, then the insurer may elect to establish best estimate provisions for the outstanding claims for this business in a similar manner to a Long-Term insurer, including use of the 'Scenario-based approach' to determine the appropriate adjusted risk-free discount curve, if appropriate.

226. The Authority recognises that certain GAAPs already have a requirement that technical provisions be stated at (undiscounted) best estimate levels. Although the definition of ‘best estimate’ may not be precisely the same as the definition stated in the Authority’s EBS framework, it may still be acceptable to set the EBS best estimate by discounting the existing GAAP technical provision, providing that there are no margins for prudence included, and additional appropriate allowance is made for other expenses that are included in EBS technical provisions, but typically not included in the GAAP reserves – in particular investment related expenses.

227. The insurer should disclose the amount of the discount adjustment applied to the outstanding claims best estimate in a supplementary note to the EBS.

Premium Provisions

228. For premium provisions, the best estimate should reflect the following cash flows:

- a. Cash flows from future premiums falling within the contract boundary;
- b. Cash flows resulting from future claims events (taking into account the potential for claims that have very high severity but with a low probability of occurrence);
- c. Cash flows arising from allocated and unallocated loss adjustment expenses;
- d. Cash flows arising from ongoing administration of the in-force policies, including any commission payments, any premium collection costs and investment related expenses.

229. It is noted that the present value of cash in-flows may exceed the expected present value of cash outflows for premium provisions, particularly of a policy with premiums payable in instalments that is expected to be profitable. This could result in a negative amount for premium provisions – there is no need to eliminate such negative amounts.

230. It may be appropriate for the premium provision to be derived using approximations based on the existing GAAP Unearned Premium Reserve (UPR), allowing for a premium deficiency reserve where appropriate:

- a. One approximation might be to take the existing UPR (together with any premium deficiency reserve) and deduct the existing GAAP Deferred Acquisition Costs (DAC). The value of expected future premiums would also be deducted. There would be no further discounting of claims payments, or addition of investment expenses, as these are implicitly included in the UPR amount. It should be noted that this approximation does not recognise any implicit profit in the UPR may well result in an over-estimation of the true premium provision, which could be material for some lines of business.
- b. An alternative simplification might be to apply expected future loss and expense ratios to the UPR to derive expected future claims and expense payouts, and then to apply appropriate claims pay-out patterns to derive cash flows for discounting. Care would be needed over the choice of relevant future loss and claims ratios. Relevant ratios forming part of next year’s business plan may well also cover future business written after the valuation date on different premium rating strength

and terms and conditions, and so may need further adjustment for use for premium provision calculations. See paragraph 233 for further discussion of some of the considerations to take into account.

231. Where approximations have been used for outstanding claims or premium provisions, there should be an appropriate supplementary note disclosure, and the EBS Actuarial Opinion would need to explain why the approach adopted is considered reasonable / appropriate.

Possible Simplifications for General Business Premium Provisions

232. The premium provision is the expected present value of future cash flows relating to future claim events on existing policies. One approach to calculating this element of the best estimate is using a loss ratio approach – whereby a “loss ratio” is applied to the unearned premium to come up with an estimation of the total undiscounted claims and expenses. A payment pattern can then be applied to generate future cash flows that can be discounted and summed to generate a present value.

233. The selected “loss ratio” should represent the expected ultimate experience of the unearned premium. When selecting a suitable “loss ratio” the following points should therefore be considered:

- a. The “loss ratio” should allow for claims and any claims-related expenses that have not been separately allowed for.
- b. The “loss ratio” will also need to reflect any additional expenses that will be incurred in respect of this business, including any remaining acquisition related expenses, investment related expenses and administrative expenses.
- c. The selected “loss ratio” needs to be consistent with the written and unearned business, bearing in mind the underlying assumptions around premium rating strength and terms and conditions.
- d. The “loss ratio” should give appropriate consideration to the expected incidence and cost of future claims, including consideration of the likelihood of infrequent, high severity claims and latent claims.
- e. The “loss ratio” should be determined at a suitable level of granularity.
- f. Inflation associated with claims and claims related expenses should be allowed for. It is usually implicitly allowed for in data, with the assumption that future inflation will continue in the same way as historical inflation. Any deviation from this assumption should be considered and documented carefully, particularly given the recent very low levels of inflation currently being experienced in many countries.
- g. Where historical experience is used to assess the appropriate “loss ratio”, adjustments may be required to adjust the historical experience to the future exposure period covered by the unearned premium. Such adjustments may take account of, for example, changes in:

- Exposure

- The rating or legal environment
 - Policyholder behaviour
 - Business mix
 - Seasonality (such as the hurricane season).
- h. The selected “loss ratio” should not include margins for optimism or conservatism.

Long-Term Insurance Technical Provisions

234. The cash-flow projections used in the calculation of best estimates for Long-Term insurance obligations shall be made separately for each policy. Where the separate calculation for each policy would be a burden on the insurer, it may carry out the projection by grouping policies, provided that:

- a. There are no significant differences in the nature and complexity of the risks underlying the policies in the same group
- b. The grouping of policies does not misrepresent the risk underlying the policies and does not misrepresent their expenses
- c. The grouping of policies is likely to give approximately the same results for the best estimate calculation as a calculation on a per policy basis, in particular in relation to financial guarantees and contractual options included in the policies.

235. In certain circumstances the best estimate element of technical provisions may be negative (e.g. for some individual contracts). Insurers should not set the value of the best estimate with respect to those contracts to zero.

236. No implicit or explicit surrender value floor should be assumed for the amount of the market consistent value of liabilities for a contract. (e. g. if the best estimate of a contract is lower than the surrender value of that contract, there is no need to increase the best estimate to the surrender value of the contract).

237. See also paragraphs 253 - 261 below for further guidance on the use of the Standard approach and the Scenario based approach.

Approaches to Estimating BBNI Business and Expected Losses Thereon

238. Where an insurer has committed to write a policy with an inception date after the valuation date, and the terms of that policy cannot be changed unilaterally by the insurer, then that policy should be included in the best estimate – this is often referred to as ‘Bound But Not Incepted’ (“BBNI”) business. An example of policies falling into this category for a 31st December valuation date might be policies due to start on or after 1st January the following year.

239. The insurer should disclose the amount of the premium included as BBNI business, along with the technical provisions determined for this business, in a supplementary note to the EBS.

240. Premiums that relate to unincepted exposure (i.e. policies which incept after the

valuation date, also called Bound But Not Incepted business or “BBNI”) could include:

- a. Premiums written before the valuation date, but incepting afterwards.
- b. “Tacit” renewals, which are renewals relating to offers that were made 1 or 2 months (or possibly a greater period) prior to the valuation date, but advice has not yet been received from the customer(s) that they wish to take them up.

241. The crucial point, when considering whether to include such business within the premium provisions, is whether or not the contracts are legally enforceable or on what terms the insurer could avoid the liability associated with the exposure. If the insurer is legally obliged to write the business, and is not able to materially change the terms or premium associated with the policy, then the business should be included within the premium provisions or long-term best estimate as BBNI business.

242. For example, typically 1st January renewal business would be expected to be included in the technical provisions for a valuation as at 31st December.

243. BBNI premium provisions should take account of expected profits and of the time value of money over the period until settlement of the relevant cash out-flows. In such circumstances the best estimate may well be negative – in other words the BBNI business is being treated as an asset of the company. Insurers are not required to set the value of the best estimate to a minimum of zero. Cash-flows should allow for all the usual features as for other best estimate calculations, including premiums payable, acquisition costs, claims, ENIDS, reinsurance recoveries, outwards reinsurance premiums and commissions where relevant.

244. The allowance of profit from BBNI premium provisions requires an allowance for associated cancellations or lapses, for example in calculating an estimate of what proportion of any “tacit” renewals will be accepted by the customer(s). Any such discontinuance assumptions should be realistic and based on current experience and anticipated future experience.

245. The cash inflows and outflows in respect of BBNI premium provisions need not necessarily be calculated separately. The Authority expects outwards reinsurance treaties to have a treatment consistent with the one followed for the underlying contracts whose risks these treaties are covering but also reflective of underlying legal and economic substance of these treaties. The Authority may consider on a case-by-case basis different treatment for multi-year contracts where there may be potential mismatches between underlying insurance contracts (e.g. written on a multi-year basis) and associated outwards reinsurance treaties (e.g. written on a one-year basis and renewed annually).

246. The estimated claims on BBNI business may in principle be estimated in a similar way to that set out for premium provisions more generally in paragraphs 228 - 231 above and can make use of the simplifications set out in paragraphs 232 - 233 above. However the exposure period of BBNI business is after the valuation date and this distinguishes it from the remainder of the premium provisions. This specific aspect needs to be allowed for when making assumptions for BBNI business, for example around appropriate “loss ratios”, claims inflation and underlying terms and conditions.

Risk Free Discount Rates and Adjustments

247. The risk-free yield curve is based on swap rates that are adjusted down by 10bp to reflect credit risk and that are extrapolated to an ultimate forward rate (UFR) at duration 60 and then extended to a duration of 100 years. This curve will be provided quarterly by the BMA for eight major currencies (USD, CAD, GBP, CHF, EUR, JPY, AUD, and NZD).

248. The UFR will be set at a single rate across all currencies in recognition of the difficulty of projecting national differences over such a long time span.

- a. The UFR will initially be set at 4.2%

249. It is anticipated that the UFR may be recalibrated from time to time if there is a material change in long term expectations (such as occurred between the 1970's and the present date).

250. Interest rate swaps that cover a period no longer than a specified duration (the "Last Liquid Point", or LLP) are used to develop the yield curve; however, in recognition of the fact that the swap market is thin in certain jurisdictions, sovereign bonds are first used to establish the smooth shape of the curve before it is adjusted using the swap spreads.

251. The LLP will be set equal to 30 years for all currencies.

252. The steps for producing each yield curve are as follows:

- a. Sovereign bond prices as of the specified date (31st December) are input to a Nelson-Siegel-Svensson process with a pre-specified beta parameter (the UFR). This results in a preliminary yield curve of spot rates extending to 100 years where the corresponding year 100 forward rate is equal to beta.
- b. Spot rates corresponding to the selected swaps are estimated; if swaps are not available at the LLP, then that value is estimated using differences from the sovereign bond curve from the previous step.
- c. Spreads of the selected swaps over the preliminary yield curve are calculated and any missing values estimated using linear interpolation (selected for its simplicity).
- d. The resulting spreads from duration 1 to the LLP are combined with a zero spread at year 60 and then smoothed and interpolated using cubic splines.
 - This method has been found to provide reasonable results while matching first and second derivatives at the LLP.
- e. The smoothed and interpolated spreads are adjusted down to reflect a 10bp credit spread and added to the yield curve from the first step.
- f. A final linear adjustment is applied to the spot rates between the LLP and year 60 to ensure that the final UFR is equal to the pre-specified value.

Standard Approach

253. In recognition of the fact that most insurers have significant liabilities that are typically not fully liquid, all insurers will be permitted to include an adjustment to the risk-free rate to partially reflect the illiquidity premium implicit in the underlying assets held and avoid artificial volatility on their balance sheets. This also has the aim of preventing pro-cyclical investment behaviour by mitigating the effect of exaggerations of bond spreads.

254. Discount rates for this approach will be provided by the Authority for the same currencies as the risk-free rate. They will be determined as follows:

- a. The starting point is the risk-free yield curve as already described.
- b. A liquidity adjustment is added to these rates. This liquidity adjustment is based on current yields for a representative asset portfolio and is reduced to reflect the cost of defaults and ratings class transitions and multiplied by an uncertainty margin.
- c. For simplicity, the representative asset portfolio is based solely on corporate bonds of various ratings classes and durations. Published bond data is used where it is readily available; for currencies where liabilities are much smaller or the available assets more limited, approximations may be used. The Authority currently uses Bloomberg as the source of data, although other sources may be used in future. The yield curve is built using the same Nelson-Siegel-Svensson method as was used to develop the yield curve for sovereign bonds. The gross spread over the risk-free curve is then smoothed to mitigate against noise in the results.
- d. The adjustment for cost of defaults and transitions is also market-based where feasible. Currently, this data is taken from EIOPA for different combinations of maturities ratings classes and financial vs. non-financial companies, although other sources (such as Standard & Poor's (S&P)) may be used in future.
- e. The uncertainty margin is currently 35%.
- f. The spread net of default costs and transitions is calculated as above for durations 1-15 and remains level thereafter.

Scenario Based Approach

255. Bermuda has a number of Long-Term insurers with a significant amount of highly bespoke reinsurance structures and asset portfolios. For these insurers, the standard approach may be too blunt an instrument to properly capture the market sensitivity of their business.

256. The Authority will permit the use of an alternative scenario-based approach that is designed to capture both the sensitivity to interest rates and the degree to which the assets and liabilities are cash-flow matched. The Authority may also consider requiring this method for lines of business that have significant optionality that would not be captured under the standard approach.

- a. 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.

- b. A set of interest rate stresses are then applied to determine the amount by which the market yields must be reduced to reflect interest rate risk and asset-liability mismatching. The resulting interest rate curve is reflected in the reserves.
 - c. In cases where the assets and liabilities are perfectly matched with no reinvestment required, the stress scenarios would have no impact and this approach in effect defaults to something similar to the Solvency II Matching Adjustment.
 - d. Specifics of the method (including calculation details) are provided below.
257. The Authority has developed a set of interest rate scenarios to be used in this method.
- a. These scenarios will cover a number of different interest patterns (such as increasing decreasing, increasing and decreasing, twists where the long and short term rates behave differently etc.)
 - b. These scenarios have been calibrated using an economic scenario generator such that the deviations are approximately one standard deviation away from the mean so as target events that may reasonably be expected to occur. More extreme scenarios would be reflected in the capital requirement.
 - c. The specific scenarios are as follows:
 - i. All rates decrease annually to total decrease of 1.5% in tenth year; unchanged thereafter.
 - ii. All rates increase annually to total increase of 1.5% in tenth year; unchanged thereafter.
 - iii. All rates decrease annually to total decrease of 1.5% in fifth year, then back up again by tenth year.
 - iv. All rates increase annually to total increase of 1.5% in fifth year, then back down again by tenth year.
 - v. Decrease with positive twist to the following net change after ten years (interpolate for other durations):
 - i. Year 1 spot rate -1.5%
 - ii. Year 10 spot rate -1.0%
 - iii. Year 30 spot rate -0.5%
 - vi. Decrease with negative twist to the following net change after for ten years (interpolate for other durations):
 - i. Year 1 spot rate -0.5%
 - ii. Year 10 spot rate -1.0%
 - iii. Year 30 spot rate -1.5%

vii. Increase with positive twist to the following net change after ten years (interpolate for other durations):

- i. Year 1 spot rate +0.5%
- ii. Year 10 spot rate +1.0%
- iii. Year 30 spot rate +1.5%

viii. Increase with negative twist to the following net change after for ten years (interpolate for other durations):

- i. Year 1 spot rate +1.5%
- ii. Year 10 spot rate +1.0%
- iii. Year 30 spot rate +0.5%

257A. For purposes of calculating best estimate liabilities under the scenario-based method, the future yield curves under each scenario would be determined as follows:

- a. Convert initial spot rates to the corresponding forward rates.
- b. Build spot rate curves at years 2,3, etc. using the appropriate forward rates from step 1
- c. Apply adjustments from the previous paragraph to determine the spot rate curve at each future year along each scenario. These spot rate curves can then be used, together with the assumed spreads for each modelled asset class, to calculate the yields and prices of each asset at the moment it is purchased or sold.

For each scenario, at each future year, the liability cash-flows will be compared to the asset cash-flows; where there is an asset cash-flow shortfall, assets would be sold at the indicated yields to cover the shortfall, and where there are excess asset cash-flows, assets would be purchased at the indicated yields in accordance with the company's investment and reinvestment guidelines. Under the different scenarios, the required asset purchases and sales will be different depending on the degree to which there is interest rate matching.

258. The calculation steps for calculating the best estimate liability are as follows:

- a. Using the asset portfolio and reinvestment guidelines backing the block of business, determine the amount of held assets required to cover the liability cash-flows under the base scenario. This in turn can be used to determine the unadjusted market yields (net of default costs).
- b. Under each alternative stress scenario, determine the revised amount of assets required to cover the liability cash-flows. Where the assets and liabilities are less than fully matched (and there is a corresponding reinvestment risk), the asset requirement may be higher than under the base scenario. As with the base scenario, the revised asset requirement can be used to determine adjusted market yields (net of default costs).
- c. The reserve is set equal to the highest asset requirement across all scenarios.

258A. It is possible that the scenario with the highest asset requirement will vary depending on

the nature of the business. In such cases, it is appropriate to use the scenario that produces the highest asset requirement in aggregate.

258B. It is expected that companies would primarily fund long term liabilities using assets that have cashflows that are well-defined such as fixed income instruments. However, it is recognised that other asset types may be appropriate as part of a balanced and conservatively managed portfolio, and that the risks for such assets may extend beyond interest rate and default risk. Rather than enumerate every acceptable/unacceptable asset class, we will categorise them as follows:

- a. Assets that are generally acceptable.
- b. Asset classes that are not acceptable (except as described in paragraph 258F).
- c. Asset classes that may be acceptable on a limited basis.

258C. Assets that are generally acceptable, should be investment grade assets and include the following:

- a. Government, municipal and corporate bonds.
- b. Mortgage backed securities and asset backed securities.
- c. Commercial mortgage loans.
- d. Collateralised loan obligations.
- e. Preferred stock.
- f. Certificates of deposit.
- g. Other debt instruments.

258D. Asset classes that are not acceptable (except as described in paragraph 258F):

- Most equities and equity tranches of securitised debt instruments and other instruments whose cash flows are not well-defined and whose (future) asset values are difficult to predict.

258E. Asset classes that may be acceptable on a limited basis under the following conditions:

- The company would need to obtain prior approval from the BMA after providing supporting information (including descriptions of the underlying business, investment and ALM strategy, a quantitative analysis of the risks for each asset class, detail on the company's investment function) to use such assets.
- Such assets would be limited to no more than 10% of the value of the portfolio used in the calculation at the time of the calculation.
- A minimum number of such instruments (such that the average size as a percentage of the total portfolio is no more than 0.5%) so that any non-interest and non-default risks are appropriately diversified.
- The Authority may set additional limitations on certain asset classes.
- Examples of asset classes that may be acceptable on a limited basis:
 - Assets mentioned in paragraph 258C that are below investment grade.
 - Commercial real estate.
 - Credit funds (containing fixed income instruments).

258F. The use of discount rates of long duration is an integral part of the best estimate calculations. However, there are very few investments available beyond 30 years, making such

rates highly theoretical. As a result, a number of entities (including the Canadian Office of the Superintendent of Financial Institutions and the Canada Pension Plan) have deemed it acceptable to use non-fixed-income instruments (including equities) to fund such liabilities. For long term liabilities beyond 30 years insurers can make an application to the Authority to allow for use of assets that would be otherwise not considered acceptable in the following adjustment that aims at providing appropriate capital relief where warranted:

- Best estimate liabilities are calculated as laid out in this document, i.e. with no allowance for not-acceptable assets.
- An alternative calculation would also be performed that uses alternative assets (including those deemed “not-acceptable” in the paragraph 258D and those assets referred to in paragraph 258E that are in excess of 10%) to cover liabilities 30 years into the future on a rolling basis. Each year, an annual cohort would be converted into investments that were generally acceptable (as defined in the prior paragraph) to cover liability cashflows 30 years beyond that year. Thus, over time the portfolio would shift to a greater percentage of generally acceptable investments.
- The yields on the alternative assets should be reduced by an amount that approximates one standard deviation of the cumulative return over the investment period for each cohort (ignoring any deviation related to interest rate risk or default risk).
- Subject to the approval of the Authority, the difference between the two calculations would be considered as a positive adjustment to Tier 1 capital. The Authority may limit the amount of this adjustment.
- The application to the Authority will need to be accompanied by:
 - An overview of the characteristics of the underlying liabilities in this calculation.
 - Projected liability cash-flows.
 - Detailed information on the asset portfolio used for the alternative calculation and explanation why these assets are considered to be appropriate.
 - An analysis estimating the non-interest related and non-default related variability of the assets used in the alternative calculation.

Other Calculation Issues

259. The Authority anticipates that companies may use both the standard approach for certain blocks of business and the scenario-based approach for other different blocks of business.

260. For business with a high degree of optionality, the Authority may require the use of the scenario-based method. Conversely, for blocks of business that fall below a certain level of matching, the Authority may require that the Standard approach be adopted. An appropriate measure and threshold may be developed in due course.

261. Companies using the scenario-based approach should provide a memorandum of supplementary actuarial information containing the following:

1. Best estimate under each of the scenarios for each type of business.
2. Best estimate under the standard approach.

3. Information on the liability projections used in the calculation, including:
 - a. Description of the type of business contained within each liability valuation block.
 - b. Detailed explanation of any underlying assumptions which are assumed to vary by interest rates.
4. Information on the assets used in the calculation, including:
 - a. Current investment mix by asset class (consistent with the company's investment guidelines).
 - b. Investment mix for reinvested assets by asset class (consistent with the company's investment guidelines).
 - c. Yield spreads by asset class.
 - d. How the estimates for investment expenses, default and ratings transition costs were developed.
 - e. Number of instruments in each asset class.
 - f. A brief description of how the assumptions for any nonguaranteed/optional elements (such as bond calls, mortgage prepayments, etc.) of each asset class were developed.
5. Signature of the appointed actuary.

Risk Margin

262. Technical provisions include a risk margin, in addition to the best estimate, to reflect the uncertainty associated with the probability-weighted cash flows. Whilst in principle, the best estimate reflects the amount required on average to meet policyholder obligations and associated insurer expenses, the insurer will also need to hold additional funds to meet those situations where cash flows exceed those expected. The risk margin is intended to reflect the compensation that the insurer needs to bear this risk.

263. The risk margin should meet the following characteristics:
- a. The greater the uncertainty associated with the cash flows, the larger the risk margin;
 - b. Risks which are more material, all else being equal, will result in a larger risk margin;
 - c. Risks which persist for longer, all else being equal, will result in a larger risk margin;
 - d. Similar risks should give rise to similar risk margins.

Determination of the Risk Margin

264. The Cost-of-Capital approach should be used.
- a. The cost-of-capital rate to be used is 6%;
 - b. The calculation should reflect Bermuda regulatory capital requirements; i.e. the Enhanced Capital Requirement (ECR), which may be calculated using the Bermuda Statutory Capital Requirement (BSCR) model or an approved internal model;
 - c. The calculation should cover the full period needed to run-off the insurance liabilities and be discounted using the risk-free discount curve (without the illiquidity adjustment);
 - d. The risks to be taken into account are insurance risk, counterparty credit risk and operational risk. Market risk does not need to be included except where non hedgeable market risk is material (for example for variable annuity products), as it is assumed that the asset portfolio would be adjusted to be consistent with assets held to justify a risk free portfolio;
 - e. The insurer may take credit for diversification between lines of business and risk types consistent with the assumptions underlying the BSCR model (or their approved internal model) when calculating the risk margin;

265. A risk margin is calculated at an aggregate level, separately for general business and for long-term business. It should be calculated net of reinsurance. For general business, the risk margin should not be calculated separately for premium provisions and outstanding claims provisions. Of course, this does not prevent an insurer determining a split of risk margin by line of business, or at other levels, for other internal purposes.

266. In general, the Risk Margin (RM) according to the cost-of-capital methodology should be calculated as follows:

$$RM = CoC \cdot \sum_{t \geq 0} ECR_t / (1+r_{t+1})^{t+1}$$

Where,

ECR_t = the projected ECR at time t, for insurance, counterparty credit and operational risk only. It should be calculated at the valuation date (t=0), and yearly thereafter until all claims / benefits have finally been settled;

r_t = the risk-free discount rate for maturity at time t, for the currency in which the EBS has been prepared in; and

CoC = the Cost-of-Capital rate – currently 6%.

267. The Authority supplied a template for general business and for long-term business to assist insurers in better understanding how the risk margin might be calculated. Both templates make use of several simplifications, which might or might not be appropriate for individual insurers. Insurers are invited to adopt more appropriate calculations wherever possible.

Use of approximations for the best estimate and the risk margin

268. The choice of the method to calculate the risk margin should be proportionate to the nature, scale and complexity of the risks undertaken by the insurer.

269. In determining whether a method of calculating technical provisions is proportionate, insurers shall carry out an assessment which includes:

- a. an assessment of the nature, scale and complexity of the risks underlying their insurance and reinsurance obligations;
- b. an evaluation in qualitative or quantitative terms of the error introduced in the results of the method due to any deviation between the following:
 - the assumptions underlying the method in relation to the risks;
 - the results of the assessment referred to in point (a).

270. When assessing the nature and complexity of the risks underlying the insurance contracts, insurers should take into account, at least, the following characteristics, where applicable:

- a. the degree of homogeneity of the risks;
- b. the variety of different sub-risks or risk components of which the risk is comprised;
- c. the way in which these sub-risks are interrelated with one another;
- d. the level of uncertainty i.e. the extent to which future cash flows can be estimated;
- e. the nature of the occurrence or crystallisation of the risk in terms of frequency and severity;
- f. the type of the development of claims payments over time;
- g. the extent of potential loss, including the tail of the claims distribution;
- h. the type of business from which the risks originate, i.e. direct business or reinsurance business;
- i. the degree of dependency between different risk types, including the tail of the risk distribution;
- j. the risk mitigation instruments applied, if any, and their impact on the underlying risk profile.

271. A method shall be considered to be disproportionate to the nature, scale and complexity of the risks if the error referred to in point (b) of paragraph 269 leads to a misstatement of technical provisions or their components that could influence the decision-making or judgment of the intended user of the information relating to the value of technical

provisions, unless one of the following conditions are met:

- a. no other method with a smaller error is available and the method is not likely to result in an underestimation of the amount of technical provisions;
- b. the method leads to an amount of technical provisions of the insurance or reinsurance obligations that is higher than the amount that would result from using a proportionate method and the method does not lead to an underestimation of the risk inherent in the insurance and reinsurance obligations that it is applied to.

272. Where, in specific circumstances, insurers have insufficient data of appropriate quality to apply a reliable actuarial method to a set or subset of their insurance and reinsurance obligations, or amounts recoverable from reinsurance contracts and special purpose vehicles, appropriate approximations, including case-by-case approaches, may be used in the calculation of the best estimate.

273. Where appropriate simplification methods may include scaling, mapping to similar products to gross up, using a deterministic model instead of stochastic model, performing an aggregate calculation instead of policy by policy calculation.

274. Where appropriate, simplifications may apply to the determination of best estimate liabilities and risk margin, including but not limited to expected losses on reinsurance recoverables due to counterparty default / reinstatement premiums on reinsurance recoverables, application of contract boundaries.

275. Examples of simplification methods in the guidance should not be viewed as a closed list. Insurers are in the best position to determine the best approach for them according to their circumstances.

Further clarity on risk margin (Long Term excluding Variable Annuities)

276. Insurers should assess whether a full projection of all future BSCR is necessary in order to reflect the nature, scale and complexity of the risks underlying the reference insurer's insurance and reinsurance obligations in a proportionate manner. In such case, insurers should carry out these calculations. Otherwise, alternative methods may be used to calculate the risk margin, provided that the method chosen is adequate to capture the risk profile of the insurer.

277. Where simplified methodologies are used to calculate the best estimate, the insurers should assess the consequent impact that the use of such methodologies may have on the methods available to calculate the risk margin, including the use of any simplified methods for projecting the future BSCRs.

Approaches for the calculation of the risk margin:

278. When deciding whether an approach is appropriate, insurers should ensure that the complexity of the calculations does not go beyond what is necessary in order to reflect the nature, scale and complexity of the risks underlying the reference insurer's insurance and reinsurance obligations in a proportionate manner.

279. Insurers should use approaches consistently which recognise the proportionality principle and the necessity of assessing risks properly.

280. Some examples of possible approaches are presented in the next four paragraphs.

281. Example 1 – To approximate the individual risk capital charges or sub-components within some or all risk capital charges to be used for the calculation of future BSCR. This approach is used in the sample Risk Margin Calculators available on the BMA website.

282. Example 2 – To approximate the BSCR for each projection year, by using the ratio of the best estimate in the future to the best estimate at the valuation date.

- a. This method may not be appropriate when negative best estimate values exist at the valuation date or subsequent dates.
- b. Other risk drivers may also be used as alternatives to the best estimate such as amount at risk or annualized premium.
- c. This method takes into account the maturity and the run-off pattern of the obligations net of reinsurance. Consequently, some considerations should be given regarding the manner in which the best estimate net of reinsurance has been calculated. Further consideration should be given as well as to whether the assumptions regarding the risk profile of the insurer can be considered unchanged over time. This includes:
 - i. For all underwriting risks, to consider if the composition of the sub-risks in underwriting risk is the same;
 - ii. For counterparty default risk, to consider if the average credit standing of reinsurers and special purpose vehicles is the same;
 - iii. For operational risk, to consider if the proportion of reinsurers' and special purpose vehicles share of the obligations is the same;
 - iv. For adjustment, to consider if the loss absorbing capacity of the technical provisions in relation to the net best estimate is the same.
- d. If some or all of these assumptions do not hold, the insurer should carry out at least a qualitative assessment of how material the deviation from the assumptions is. If the impact of the deviation is not material compared to the risk margin as a whole, then this method can be used. Otherwise the insurer should either adjust the formula appropriately or be encouraged to use a more sophisticated method.

283. Example 3 – To approximate the discounted sum of all future BSCRs in a single step without approximating the BSCR for each future year separately, inter alia by using the modified duration of the insurance liabilities as a simplifying assumption.

- a. When deciding on the application of a method based on the modified duration of the insurance liabilities, attention should be paid to the value of modified duration to avoid meaningless results for the risk margin.
- b. This method takes into account the maturity and the run-off pattern of the obligations net of reinsurance. Consequently, some considerations should be given regarding the

manner in which the best estimate of technical provisions net of reinsurance has been calculated. Further consideration should be given as to whether the assumptions regarding the risk profile of the insurer can be considered unchanged over time. This includes:

- i. For basic BSCR, to consider if the composition and the proportions of the risks and sub-risks do not change materially over the years;
 - ii. For counterparty default risk, to consider if the average credit standing of reinsurers and SPVs remains broadly the same over the years;
 - iii. For operational risk and counterparty default risk, to consider if the modified duration is the same for obligations net and gross of reinsurance;
- c. An insurer that intends to use this method should consider to what extent these assumptions are fulfilled. If some or all of these assumptions do not hold, the insurer should carry out at least a qualitative assessment of how material the deviation from the assumptions is. If the impact of the deviation is not material compared to the risk margin as a whole, then the simplification can be used.
- d. Otherwise the insurer should either adjust the formula appropriately or be encouraged to use a more sophisticated method.

284. Example 4 – To approximate the risk margin by calculating it as a percentage of the best estimate.

- a. According to this method, the risk margin should be calculated as a percentage of the best estimate net of reinsurance at valuation date. When deciding on the percentage to be used for a given line of business, the insurer should take into account that this percentage is likely to increase if the modified duration of the insurance liabilities – or some other measure of the run-off pattern of these liabilities - increases.
- b. Insurers should give due consideration to the very simplistic nature of this approach; it should be used only where it has been demonstrated that none of the more sophisticated risk margin approaches in the above hierarchy can be applied.
- c. When insurers rely on this method for the calculation of the risk margin, they will need to justify and document the rationale for the percentages used by line of business. This justification and rationale should consider any specific characteristics of the portfolios being assessed. Insurers should not use this method when negative best estimate values exist.

Variable Annuity Guarantees

285. The calculation of the best estimate for business with guarantees (such as variable annuities) can be complex and the purpose of this section is to provide additional guidance.

Scope of Application

286. The scope of these guidelines applies to insured or reinsured business containing

guarantees linked to fund performance (including business commonly referred to as “variable annuities” (VA). This includes displaying some or all of the following characteristics: Business with guarantees which

- a. are usually linked to performance of a fund
- b. are external to the fund (i.e. not Constant Portfolio Protection Insurance “CPPI”)
- c. are individual (each guarantee relates to a single client)
- d. are explicitly and separately charged for

287. Typical contracts include:

- a. Guaranteed minimum accumulation benefit (return of premium or with some rate of return) (GMAB)
- b. Guaranteed minimum death benefits (GMDB)
- c. Guaranteed minimum withdrawal benefits (fixed term or for life) (GMWB/GLWB)
- d. Guaranteed minimum income benefit (GMIB)
- e. Guaranteed are explicitly and separately charged

288. We will take the approach of “substance over form”. In general, we would have a view that business with fund performance linked guarantees which is valued using stochastic techniques (or approximations to stochastic techniques) would fall under the scope of this guidance.

289. From the point of view of the reinsurer, if only the guaranteed portion of a contract has been reinsured, the company need only consider the reinsured amount in scope. However, where there is an interaction with parts of the contract that are not reinsured (e.g. the underlying funds) which impact on the reinsured contract (e.g. policyholder behaviour in exercising guarantees), the whole contract needs to be taken into consideration.

290. The following contracts are not covered by these guidelines:

- a. Fund performance linked contracts without guarantees (e.g. non-guaranteed unit linked or variable annuity contracts)
- b. Some structured contracts (e.g. guaranteed equity contracts where the benefit is directly linked to the payment from structured asset)
- c. Participating contracts

Technical Provisions – General Principles

291. Technical provisions correspond to the current amount companies would have to pay if they were to transfer their insurance obligations immediately to another insurer. This should be equal to the sum of two explicit components which are the best estimate plus an appropriate risk margin. Both components should be valued separately.

292. However companies can consider whether future cash flows associated with insurance or reinsurance obligations can be replicated reliably using financial instruments for which a reliable market value is observable, in which case they may use the market value of those financial instruments. In this case, separate calculations of the best estimate and the risk margin should not be required.

293. For variable annuity business, the best estimate calculation will normally be calculated based on stochastic techniques using a model calibrated to the relevant market. Under the principle of proportionality, companies may choose other techniques or approximations for less material business.

294. Cashflows should be calculated gross of reinsurance without deduction of the amounts recoverable from reinsurance contracts and special purpose vehicles. Recoverables and special purpose vehicles should be calculated separately.

Calculation Methodology

295. Where the company uses a model to produce future projections of market parameters (market consistent asset model, e.g. an economic scenario file), the model should comply with the following requirements:

- a. It should be risk neutral;
- b. It generates asset prices that are consistent with deep, liquid and transparent financial market;
- c. It assumes no arbitrage opportunity;
- d. The calibration of the parameters and scenarios is consistent with the relevant risk-free interest rate term structure.

296. The following principles should be taken into account in determining the appropriate calibration of a market consistent asset model:

- a. The asset model should be calibrated to reflect the nature and term of the liabilities, in particular of those liabilities giving rise to significant guarantee and option costs.
- b. The asset model should be calibrated to the current risk-free term used to discount the cash flows.
- c. The asset model should be calibrated to a properly calibrated volatility measure.

297. In principle, the calibration process should use market prices only from financial markets that are deep, liquid and transparent. If the derivation of a parameter is not possible by means of prices from deep, liquid and transparent markets, other market prices may be used. In this case, particular attention should be paid to any distortions of the market prices. Corrections for the distortions should be made in a deliberate, objective and reliable manner.

298. The calibration of the above mentioned assets models may also be based on adequate actuarial and statistical analysis of economic variables provided they produce market consistent

results, for example:

- a. to inform the appropriate correlations between different asset returns.
 - b. to determine probabilities of transitions between credit quality steps and default of corporate bonds.
299. The model and modelling process must be sufficiently accurate in that:
- a. If model points are used, the company must be satisfied that the model points are appropriate to the business being valued and sufficiently represent duration, moneyness, and fund choice.
 - b. The model must have sufficient iterations to ensure that a reliable result is being produced. Generally more iterations are required for more complex products and for options which are “out of the money”.
 - c. The model should be able to reproduce values of relevant market instruments and the assets of the company (particularly any hedging assets).
 - d. The time steps used must be sufficiently small to capture the essential features of the product and the hedging strategy.
300. For less material business (and potentially business that is heavily out of the money) alternative techniques may be used to determine the best estimate. This could include:
- a. Closed form solutions
 - b. Stress and scenario testing;
 - c. Systematic as well as other random features being captured through sensitivity testing, diagnostics or other techniques (this could be stochastic); and
 - d. The use of relevant assumptions or other external/portfolio specific data as an input to the calculation when there is lack of data or as a benchmark for comparison.

Hedging

301. The costs and inefficiencies involved in any hedging process should be included in the best estimate including:
- a. basis risks
 - b. market risks
 - c. liquidity risks
 - d. counterparty risks
 - e. operational risks (e.g. delay risk, model risk, errors in hedging, legal risks)

302. The allowance for hedging costs and charges in determining the best estimate should be consistent with the hedging programme.

Cash Flow Characteristics

303. The following cash-flow characteristics relating to variable annuities that should be taken into consideration:

- a. Uncertainty in policyholder behaviour. It is necessary to make assumptions regarding: choice of whether to continue paying premiums, choice of whether to switch funds, choice of whether to surrender or not, choice of whether to exercise formal options available (e.g. GMWB). Allowance for this behaviour should not just be based on past experience but also anticipated experience based on economic circumstances, and the “moneyness” of guarantees. For reinsured business, it should also take into account the actions of the cedant as well as the underlying policyholders.
- b. Potential future actions by the management of the insurer such as changes in asset allocation; management of liquidity according to the asset mix and duration strategy; actions for the dynamic rebalancing of the assets portfolio according to movements in liabilities and changes in market conditions. Assumptions for such future management actions used in the calculation of the technical provisions should be determined in an objective manner, should be realistic and consistent with the insurers current business strategy unless there is sufficient evidence that the (re)insurer will change its practices. They should be consistent with each other, and should take into account the time needed to implement it and any expenses caused by them;
- c. Path dependency, where the cash-flows depend not only on circumstances such as economic conditions on the cash-flow date, but also on those circumstances at previous dates. A cash-flow with path-dependency would need additional assumptions as to how the level of the equity market evolved (the equity market's path) over time in order to be valued;
- d. Uncertainty in the amount of expenses or fees (for example a common form of VA involves a guarantee given and charged for by deduction of a regular fee, either as a percentage of assets or a fixed monetary amount);
- e. Interdependency between two or more causes of uncertainty.

Time Horizon

304. With regard to the time horizon of the projection used in the calculation of the best estimate, it should cover the full lifetime of all the cash in - and out-flows required to settle the obligations related to existing insurance and reinsurance contracts on the date of the valuation.

305. The determination of the lifetime of insurance and reinsurance obligations should be based on up-to-date and credible information and realistic assumptions about when the existing insurance and reinsurance obligations will be discharged or cancelled or expired.

Risk Margin

306. The risk margin (RM) is a part of the technical provisions in order to ensure that the value of technical provisions is equal to the amount than an insurer would be expected to require to take over the insurance obligations.

307. For variable annuity business, it is recognised that the calculation of the risk margin may be onerous. In addition, some of the simplifications that work for non-variable annuity contracts may not be appropriate for variable annuity products as the run off of capital requirements may not be linear. Companies can use additional approximations such as combinations of the simplifications set out above or other simplifications such as:

- a. Calculation of the SCR at various intervals with interpolation between.
- b. Calculation of the SCR at inflexion points (i.e. where the SCR starts or stops growing/falling)
- c. Other methods which are appropriate to the business provided that they meet the principles set out in this guidance. Details of the proposal must be provided in the response.

Use of reinsurance or structured financial products

308. In the reinsurance asset (for ceded business) or the use of structured financial products, the allowance for counterparty risk should be calculated as set above.

309. However for variable annuity business some additional considerations are required:

- a. The same models should be used to calculate the asset as that used to model the underlying VA business.
- b. The model should take into consideration the extent to which the credit risk is correlated with the investment market risks (wrong way risk).
- c. Allowance should be made for any basis risk or mismatch between the benefits promised to policyholders and those reinsured or provided by the structured asset.

310. If a company can demonstrate that it has transferred risks to another entity then it may wish to consider applying a simplified approach to valuing the best estimate of those risks provided the resulting net assets in the economic balance sheet are not overstated.

Transitional Arrangements

311. The legislation includes an option for an insurer to apply to the Authority to make use of transitional arrangements for certain Long-Term technical provisions. These transitional arrangements would only apply to business written on or before 31st December 2015, and only for business for which the Standard approach has been used (i.e. it does not apply to business valued using the Scenario based method). The transitional arrangements allow an insurer to phase in the new valuation arrangements over a number of years. This would be achieved by the insurer calculating technical provisions for the relevant business at each year end using the EBS principles, and also using approaches consistent with their “current” approach,

which is defined as the valuation approach in force at 31st December 2015. The insurer would then interpolate linearly between the two values, such that the current approach would apply for year-end 31st December 2015, and the full EBS approach would apply 16 years later at year end 31st December 2031. Mathematically, this can be expressed as:

$$\text{TransAdj}_t = t/16 * \text{EBS Tech Prov}_t + (16 - t)/16 * \text{Current Reserves}_t$$

Where:

$t = 1$ for 2016, 2 for 2017 etc until 16 for 2031

$\text{EBS Tech Prov}_t =$ Technical Provision for business in force at end of year t as determined on the EBS reporting basis.

$\text{Current Reserves}_t =$ Reserves for business in force at end of year t as determined on the 2015 reporting basis. Note that this will need to be recalculated each year using the data set and assumptions appropriate to time t , but using the method in effect at the 2015 year end.

The transition adjustment requires both reserve calculations to be performed each year. Thus as business terminates, it will disappear from both the EBS and current reserve component in the formula.

312. The above paragraph demonstrates the principles of the methodology for the transition adjustment and applies to both the Best Estimate and the Risk Margin. Since the Risk Margin is determined on a company wide basis, it may not be possible to directly attributed it to business written pre and post the 2015 year end. Consequently, an allocation process may be necessary. In the application to use the transitional adjustments, the company should document the business subject to the transition adjustments and any allocations or approximations to be used. The transition adjustment related to the Technical Provisions should be incorporated into lines 20 – 27 of the EBS balance sheet. The transitional adjustment related to the Risk Margin should be incorporated into line 27A.