



BERMUDA MONETARY AUTHORITY

The Bermuda Solvency Capital Requirement – Long-Term 2010 Instruction Handbook

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Section 1: Introduction to Bermuda Solvency Capital Requirement

Introduction

- 1 The Bermuda Solvency Capital Requirement (“the BSCR”) establishes a measure of solvency capital that is used by the Bermuda Monetary Authority (“the BMA”) to monitor the capital adequacy of Class IV general business (re)insurers. The Authority is in the process of extending the BSCR requirements to other license classes including long-term (re)insurers.
- 2 The BSCR model calculates a risk-based capital measure by applying capital factors to statutory financial statement and capital and solvency return elements, including investments and other assets, premiums and reserves, operational risk, and company-specific catastrophe exposure measures, in order to establish an overall measure of capital and surplus for statutory solvency purposes. The capital factor established for each risk element, when applied to that element, produces a required capital and surplus amount. The individual capital amounts generated for each risk element (excluding operational risk) are then summed. Covariance adjustments are made to arrive at the BSCR (after covariance adjustment), which is further adjusted to include company-specific operational risk and capital add-on as assessed by the BMA.
- 3 The capital factors in the BSCR model have been developed to produce capital requirements at the 99% TVaR confidence level over a one year time period.
- 4 A company’s available statutory capital and surplus divided by the BSCR gives the BSCR ratio and a company’s available statutory capital and surplus divided by the Enhanced Capital Requirement (“the ECR”) gives the ECR ratio. The BSCR and ECR ratios will assist the BMA regulators in evaluating the financial strength of each company.

Purpose

- 5 This document presents the BSCR model instructions for use by persons responsible for computing the required capital and surplus and for submitting the completed BSCR model to the BMA.
- 6 Instructions are provided herein to aid in the completion of the BSCR model. This model contains diverse risk elements of a company’s operation and will likely require the participation of experienced individuals within the accounting, finance, and actuarial areas of the company in order to assure accurate completion.

Overview

7 Each of the following sections describes a different risk element contained in the BSCR model for long-term insurance. Screenshots of each section of the BSCR model are provided in the appendix to aid in understanding the instructions.

8. The instructions contain the following sections:
1. Company Info
 2. Declaration
 3. Form 4 – Statutory Balance Sheet
 4. Form 8 - Statutory Statement of Capital and Surplus
 5. Schedule II (long-term business)
 6. Schedule III (long-term business)
 7. Schedule IV (long-term business)
 8. Summary
 9. Operational Risk
 10. Fixed Income Investments
 11. Equity Investments
 12. Interest and Liquidity Risk
 13. LT Insurance Risk
 14. LT Variable Annuity Guarantee Risk
 15. LT Other Insurance Risk
 16. Credit Risk

9. The input sections of the long-term BSCR model that require companies to complete are:

1. Company Info
2. Declaration
3. Form 4 – Statutory Balance Sheet
4. Form 8 - Statutory Statement of Capital and Surplus
5. Schedule II
6. Schedule III
7. Schedule IV
8. Operational Risk

The rest of the sections in the long-term BSCR model are calculations based on the data on the input sections.

10 Also included in the appendices are system requirements for the BSCR model, basic worksheet instructions, BSCR model template screen shots, and a glossary of terms. The glossary is meant to clarify the meaning of any terms used within the BSCR model worksheets, as well as provide guidance on reconciling totals.

Changes to the BSCR Formula

- 11 Periodically, changes to the BSCR formula may be necessary due to changes in statutory financial statements, capital and solvency return, accounting requirements, and enhancements to the formula or to the capital factors. Any such changes will be communicated to companies in a timely fashion, in order to allow adequate time for companies to collect any additional information required.

Submissions of Model Data

- 12 Both a printed report and an electronic worksheet should be forwarded by the date and time deadline specified by the BMA. Electronic data should be submitted using the worksheet template as provided to companies. There may be instances where the screen display and printout of certain parts of the model may differ from the format shown within this report. If instances arise where the actual content and/or calculations of the worksheet template differ from what is shown in this report, companies should contact the BMA directly for clarification and guidance. Companies should not alter or modify the worksheet template in any way.

Workpapers and Supporting Documents

- 13 Workpapers and documents used to prepare the BSCR submission should be retained and kept available for examination and discussion with the BMA, should the need arise.

Contact Person for Questions

- 14 Questions pertaining to the content or meaning of any of the items in this report should be directed to the Director of Policy, Research & Risk Assessment Department of the BMA, Craig Swan (cswan@bma.bm or 441-295-5278).

Section 2: BSCR Template

2.1 Company Information

1 ITEMS

Company Name — Input the company name as it appears on the Certificate of Registration.

Date Incorporated or Organized — Input the date that the company was licensed by the BMA to conduct business in Bermuda.

Date Commenced Business — Input the date that the company began writing business as a licensed Bermuda company.

Contact Person — The company's contact person will be the main conduit through which the BMA will make and respond to inquiries about the BSCR and related information. The contact person also has the responsibility to ensure that all amounts reported in the BSCR capital formula correspond to the company's statutory financial return and capital and solvency return, where appropriate.

2.2 Declaration

1 BACKGROUND

This section is to declare that the information provided in the BSCR template fairly represents the financial condition of the company.

2 ITEMS

Line Item		Description
1	Signatory	Signature of the person who completed the BSCR template. Two directors and one principal representative should sign this declaration.
2	Print name	Input the name of the person who completed the BSCR template.
3	Date	Input the date in which the BSCR template was completed.

2.3 Form 4 – Statutory Balance Sheet

1 BACKGROUND

Form 4 is the statutory balance sheet for companies to complete. See Form 4 filing instructions in Insurance Returns and Solvency Regulations.

2.4 Form 8 - Statutory Statement of Capital and Surplus

1 BACKGROUND

Form 8 is the statutory statement of capital and surplus for companies to complete. See Form 8 filing instructions in Insurance Returns and Solvency Regulations.

2.5 Schedule II (Long-term business)

1 BACKGROUND

Schedule II contains fixed income investment amounts by rating category.

(a) — Bonds by Rating Category - Total must reconcile to Form 4, Lines (2b) & (3b).

Line Item		Description
1	Government Bonds	All quoted and unquoted bonds or mortgage-backed securities issued by any government authority (including non-US jurisdiction, government agencies, and government-sponsored enterprises); as reported on Schedule II, Line (1) in the “Total” Column.
2	High Investment Grade Bonds (AAA & AA)	High Investment Grade (AAA & AA) — All quoted and unquoted non-government bonds rated AAA & AA by any of the rating agencies mentioned above or equivalent; as reported on Schedule II Line (2) in the “Total” Column.
3	Medium Investment Grade Bonds (A)	All quoted and unquoted non-government bonds rated A by rating agencies mentioned above or equivalent; as reported on Schedule II, Line (3) in the “Total” Column.
4	Low Investment Grade Bonds (BBB)	All quoted and unquoted non-government bonds rated BBB by rating agencies mentioned above or equivalent; as reported on Schedule II, Line (4) in the “Total” Column.
5	Non-Investment Grade Bonds	All quoted and unquoted non-government bonds rated as non-investment grade by rating agencies mentioned above or equivalent; as reported on Schedule II, Line (5) in the “Total” Column.
6	Mortgage-backed securities	All quoted and unquoted mortgage-backed securities not issued by any government agencies; as reported on Schedule II, Line (6) in the “Total” Column.
7	Mutual Funds	All quoted and unquoted mutual funds; as reported on Schedule II, Line (7) in the “Total” Column.
8	Non-Rated Bonds	All quoted and unquoted non-government bonds non-rated by rating agencies mentioned above or equivalent; as reported on Schedule II, Line (8) in the “Total” Column.

(b) — Other Fixed Income Investments

Line Item		Description
1	Mortgage Loans	Based on current year Form 4, Line (5).
2	Other Loans	Based on current year Form 4, Line (8).
3	Cash and time deposits	Based on current year Form 4, Line (1).

2.6 Schedule III (Long-Term business)

1 BACKGROUND

Schedule III (long-term business) of the BSCR model is an input sheet for companies to complete. The information entered is used to calculate the various insurance risk components for the BSCR.

2 ITEMS

Line Item		Description
1	Mortality (term assurance, whole life, universal life)	Products include term assurance, whole life, and universal life products. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs. Column (5): Net amount at risk for adjustable products/treaty. Definition of adjustable: re/insurer has the ability to make a material adjustment to the cost of insurance, based on recent experience. Net amount at risk is defined as the net face amount less net reserves. Column (6): Net amount at risk for non-adjustable products/treaty.
2	Critical Illness - including accelerated CI products	For critical illness (including accelerated CI) products: Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs. Column (5): Net amount at risk for adjustable products/treaty. Definition of adjustable: re/insurer has the ability to make a material adjustment to the cost of insurance, based on recent experience. Column (6): Net amount at risk for non-adjustable products/treaty.

Line Item		Description
3	Longevity (payout annuities, contingent annuities, pension blocks)	Products that are subject to longevity risks include payout annuities, contingent annuities, and pension blocks. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs.
4	Deferred annuities (including index linked products with no guarantees)	Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs.
5	Disability income: active lives - incl. waiver of premium and LTC	Include the disability income products with active lives. These include waiver of premium benefits and long term care insurance. Complete the following: Column (1): Total net (of reinsurance) Bermuda statutory reserves for disabled income products with active lives Column (2): Reported DAC (if applicable) Column (3): Total Best estimate reserves for disabled income products with active lives. The best estimate reserves are the gross premium reserves without PfADs. Column (5) and (6): Complete the net annual premiums (separated by the benefit periods) for each premium guarantee period specified.
6	Disability income: active lives - other accident and sickness	Include all other disability income products with active lives. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs Column (6): Complete the total net annual premiums

Line Item		Description
7	Disability income: claims in payment - incl. waiver of premium and LTC	Include the disability income products with claims in payment that cover waiver of premium benefits or long term care insurance. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs
8	Disability income: claims in payment - other accident and sickness	Include all other disability income products that have claims in payment. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs
9	Group life	Include all group life insurance products. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs
10	Group disability	Include all group disability insurance products. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs
11	Group health	Include all group health insurance products. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs

Line Item		Description
12	Non-proportional covers	Include any non-proportional reinsurance. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs Column (6): Net annual premiums for non-proportional product/treaty
13	Other product riders not included above	Include any other product riders not stated above. Complete the following: Column (1): Net (of reinsurance) Bermuda statutory reserves Column (2): Reported DAC (if applicable) Column (3): Best estimate reserves. The best estimate reserves are the gross premium reserves without PfADs Column (6): Net annual premiums
14	Weighted average of the difference in asset duration and liability duration (weighted by reported reserves)	Calculate the absolute value of the difference between the duration of the assets and the duration of the liabilities (measured in years). Use the Macaulay duration measure to calculate the duration. If this is not available, use effective duration or other duration measures that are consistent with the company's asset liability management process. The liability cash flows should be measured on an economic basis. For companies with more than one block of business, the duration difference is equal to the weighted average of the difference between assets duration and liabilities duration of the blocks of business. The weight is the proportion of the reported Bermuda Statutory reserves.
15	Reserves with known difference in duration / Total Reserves	Enter the proportion of the reported Bermuda Statutory reserves where the extent of the duration difference is known.
16a	Funds held by ceding companies: (a) in which the ceding company has a AAA, AA rating	This item is a breakdown of the total funds held by ceding companies from Form 4 line 12. Enter the amount of funds held by AAA or AA-rated ceding companies. The latest available ratings from AM Best, S&P, Moody's, or Fitch can be used. Where the ratings differ between agencies, companies are to segregate according to the most conservative rating. The sum of item 16(a), 16(b), and 16(c) should equal to the current year's total funds held by ceding companies in Form 4 line 12(c).
16b	Funds held by ceding companies: (b) in which the ceding company has a A rating	This item is a breakdown of the total funds held by ceding companies from Form 4 line 12. Enter the amount of funds held by A-rated ceding companies. The latest available ratings from AM Best, S&P, Moody's, or Fitch can be used. Where the ratings differ between agencies, companies are to segregate according to the most conservative rating. The sum of item 16(a), 16(b), and 16(c) should

		equal to the current year's total funds held by ceding companies in Form 4 line 12(c).
16c	Funds held by ceding companies: (c) in which the ceding company has a rating lower than A	This item is a breakdown of the total funds held by ceding companies from Form 4 line 12. Enter the amount of funds held by ceding companies with rating lower than A. The latest available ratings from AM Best, S&P, Moody's, or Fitch can be used. Where the ratings differ between agencies, companies are to segregate according to the most conservative rating. The sum of item 16(a), 16(b), and 16(c) should equal to the current year's total funds held by ceding companies in Form 4 line 12(c).
17	License Class	License Class is used to determine the Minimum Solvency Margin on the Summary Page

2.7 Schedule IV (Long-term business)

1 BACKGROUND

This input section contains the information related to the variable annuities for companies to complete. The five main variable annuity benefit types are Guaranteed Minimum Accumulation Benefit (GMAB), Guaranteed Minimum Death Benefit (GMDB), Guaranteed Minimum Income Benefit (GMIB), Guaranteed Minimum Withdrawal Benefit (GMWB), Guaranteed Enhanced Earnings Benefit (GEEB).

The variable annuity risk factors under the long-term BSCR model do not recognize the benefits of hedging due to its complexity and lack of uniformity across insurers..

2 ITEMS

Column #		Description
1	Bermuda Statutory Reserves	Enter the net Bermuda statutory reserves for each variable annuity type.
2	Account Value	The account value is differentiated by volatility levels (see definition of volatility below). For funds where the annual historic volatility is less than or equal to 10%, enter the corresponding account value in column (2). For funds where the annual historic volatility is greater than 10%, enter the corresponding account value in column (3). Note that the proportion used for the account value under reinsurance is the proportion used for net amount at risk.
3	Volatility	Volatility is defined as the annual historic volatility of the fund. In the case where there is no, or limited, history of the fund, use the volatility of the benchmark.

Column #	Description												
4	Net Amount at Risk (NAR) Report the Net Amount at Risk (NAR) net of reinsurance. NAR is defined below for each variable annuity type: <table><tr><th>VA Type</th><th>NAR Definition</th></tr><tr><td>GMAB</td><td>Total claim payable if all contracts mature immediately. That is, NAR = Guaranteed value (GV) – Account value (AV)</td></tr><tr><td>GMDB</td><td>Total claim amount payable upon immediate death of all policyholders. That is, NAR = GV – AV</td></tr><tr><td>GMIB</td><td>Total claim payable upon full and immediate annuitization of all policies using an 80% factor applied to the GV (the 80% represents the ratio between current market annuitization factors and the guaranteed annuitization factors). 80% is used for consistency purposes in deriving the current market annuitization factors. That is, NAR = 80% x GV – AV</td></tr><tr><td>GMWB</td><td>Total claim payable if 100% of the guaranteed withdrawal benefit base in excess of the current account value is withdrawn immediately. That is, NAR = GV – AV</td></tr><tr><td>GEEB</td><td>Total guaranteed enhanced payments upon immediate death of all policyholders. That is, NAR = GV – AV</td></tr></table>	VA Type	NAR Definition	GMAB	Total claim payable if all contracts mature immediately. That is, NAR = Guaranteed value (GV) – Account value (AV)	GMDB	Total claim amount payable upon immediate death of all policyholders. That is, NAR = GV – AV	GMIB	Total claim payable upon full and immediate annuitization of all policies using an 80% factor applied to the GV (the 80% represents the ratio between current market annuitization factors and the guaranteed annuitization factors). 80% is used for consistency purposes in deriving the current market annuitization factors. That is, NAR = 80% x GV – AV	GMWB	Total claim payable if 100% of the guaranteed withdrawal benefit base in excess of the current account value is withdrawn immediately. That is, NAR = GV – AV	GEEB	Total guaranteed enhanced payments upon immediate death of all policyholders. That is, NAR = GV – AV
VA Type	NAR Definition												
GMAB	Total claim payable if all contracts mature immediately. That is, NAR = Guaranteed value (GV) – Account value (AV)												
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GMWB	Total claim payable if 100% of the guaranteed withdrawal benefit base in excess of the current account value is withdrawn immediately. That is, NAR = GV – AV												
GEEB	Total guaranteed enhanced payments upon immediate death of all policyholders. That is, NAR = GV – AV												

3

NOTES

For the GMDB product, where ratchets, resets and roll-ups exist, enter the information on line 4: Guaranteed Minimum Death Benefit: Enhanced Benefits (Roll up).

2.8 Summary

1 BACKGROUND

The Summary exhibit has the following key results: required capital and surplus, available statutory capital and surplus, minimum margin of solvency, enhanced capital requirement & target capital level, ratios, solvency capital distribution chart, and regulatory action level graph. Each measure is described below. At the bottom of the summary exhibit is the BSCR formula for the long-term business. The only financial data input on the Summary exhibit is the BMA approved Capital Contribution of the company.

2 REQUIRED CAPITAL AND SURPLUS

The long-term BSCR is determined according to the following formula:

$$\text{BSCR}_{\text{LT}} = \sqrt{\{C_{\text{fi}}^2 + C_{\text{eq}}^2 + C_{\text{LTint}}^2 + (C_{\text{LTmort}} + C_{\text{LTnp}} + C_{\text{LTTr}})^2 + C_{\text{LTmorb}}^2 + C_{\text{LTlong}}^2 + C_{\text{LTVa}}^2 + C_{\text{LTOTH}}^2 + C_{\text{LTcred}}^2\} + C_{\text{op}}}$$

Where:

C_{fi}	= capital charge for fixed income investment risk;
C_{eq}	= capital charge for equity investment risk;
C_{LTint}	= capital charge for interest and liquidity risk
C_{LTmort}	= capital charge for insurance risk - mortality
C_{LTnp}	= capital charge for insurance risk - non-proportional
C_{LTTr}	= capital charge for insurance risk - riders
C_{LTmorb}	= capital charge for insurance risk - morbidity and disability
C_{LTlong}	= capital charge for insurance risk - longevity
C_{LTVa}	= capital charge for variable annuity guarantee risk
C_{LTOTH}	= capital charge for other insurance risk
C_{LTcred}	= capital charge for credit risk; and
C_{op}	= capital charge for operational risk

The square root formula utilizes the square root to aggregate the various risks under the assumption that the risks are at least partially independent of one another, and therefore, some diversification benefit is provided when combining the risk charges. The mortality risk, non-proportional risk and the morbidity risk are combined to reflect the assumption that these three risks are related. The end result is the long-term BSCR (after covariance adjustment).

The operational risk capital charge is the operational risk factor multiplied by the long-term BSCR. The operational risk charge ranges from 1% to 10% based on each company's input to the operational risk questions.

Capital add-ons / reductions may be assessed where the BMA believes that a company's risk profile deviates significantly from the risk assumptions underlying the Enhanced Capital Requirement (ECR) or from the company's assessment of its risk management policies and practices. These include, but are not limited to, items such as: provisions for reserve deficiencies or premium inadequacies, significant growth in premiums, and quality of risk management surrounding operational risk.

A reserve adjustment is made to the required capital in order to give insurers some credit for the provision for adverse experience accounted for in the actuarial reserves. The reserve adjustment is equal to:

50% of:

1. The Bermuda Statutory Reserves (less reported DAC), less
2. Gross premium best estimate reserves, subject to a floor of zero.

The final BSCR is equal to the sum of the BSCR (after covariance adjustment) including operational risk capital charge, capital add-ons / reductions (if assessed), and reserves adjustment.

3 AVAILABLE STATUTORY CAPITAL AND SURPLUS

Available Statutory Capital and Surplus is defined as the Total Eligible Capital and Surplus of the company including subsequent Capital Contribution plus Capital Add-ons / Reductions (BMA assessment). All capital contributions are to be approved by the BMA, and all capital add-ons / reductions are determined at the discretion of the BMA.

Line Item		Description
1	Total Capital and Surplus	Total capital and surplus represents the capital to meet the ECR test. It is comprised of total capital as reported on Form 8.
2	Capital Contribution	Capital contribution that the Company can inject after the end of the year if the Company is failing to meet the BSCR requirement. The capital contributions must be approved by the BMA. Note that a capital contribution increased the Total Statutory Capital and Surplus.
3	Capital Add-Ons / Reductions (BMA assessment)	Capital Add-ons / Reductions may be assessed where the BMA believes that a company's risk profile deviates significantly from the risk assumptions underlying the ECR.

4 MINIMUM SOLVENCY MARGIN

The Minimum Solvency Margin ("MSM") varies by licence class according to the following table:

<u>Class</u>	<u>Minimum Solvency Margin</u>
A	greater of \$ 120,000 or 2.5% of total assets less segregated accounts
B	greater of \$ 250,000 or 2.5% of total assets less segregated accounts
C	greater of \$ 1,000,000 or 2.5% of total assets less segregated accounts
D	greater of \$ 5,000,000 or 2.5% of total assets less segregated accounts
E	greater of \$ 10,000,000 or 2.5% of total assets less segregated accounts

Note that all classes are subject to the MSM requirements in 2011.

5 Enhanced Capital Requirement (ECR) & Target Capital Level (TCL)

The ECR is the higher of the MSM and the BSCR / approved internal capital model.

The TCL is equal to 120% of the ECR.

6 RATIOS

The BSCR Ratio is the ratio of the Total Capital to the BSCR.

The ECR Ratio is the ratio of the Total Capital to the ECR.

7 SOLVENCY CAPITAL DISTRIBUTION

The solvency capital distribution chart displays the relative contribution of each charge to the BSCR, prior to the covariance adjustment.

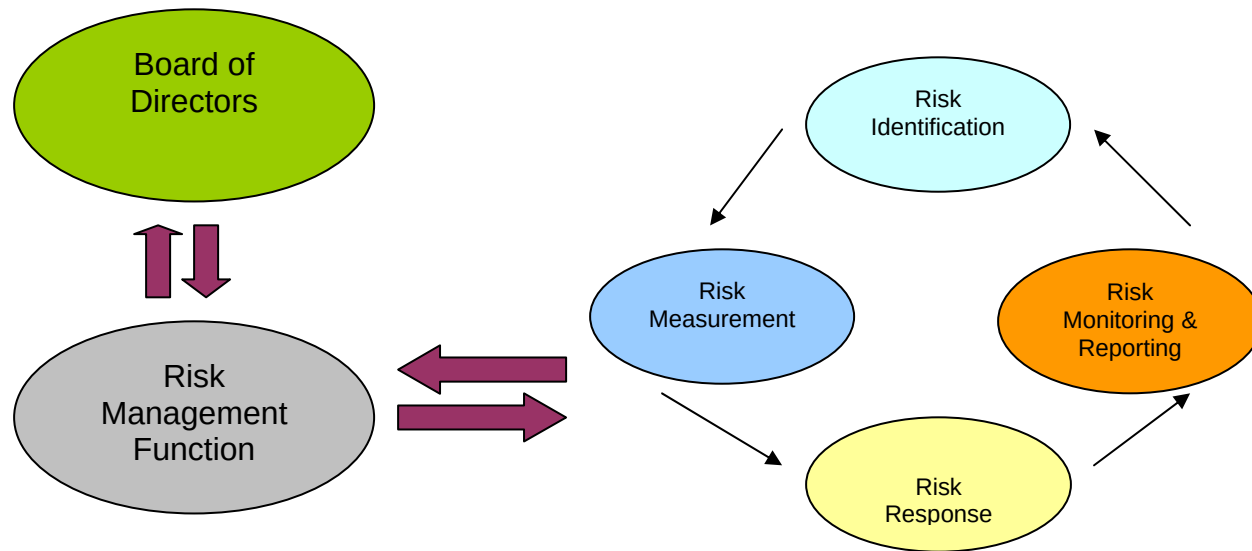
8 REGULATORY ACTION LEVEL

The Regulatory Action Level graph displays the company's Available Statutory Capital and Surplus position relative to the BMA's regulatory action guidelines, where Regulatory Action Level 1 is equal to the company's ECR and Regulatory Action Level 2 is equal to the company's TCL.

2.9 Operational Risk

1 BACKGROUND

The CIRA Framework assesses the quality of the company's risk management function surrounding its operational risk exposures. Operational risk is the risk of loss arising from inadequate or failed internal processes, people, systems or external events. Operational risk also includes legal risks. Reputational risks arising from strategic decisions do not count as operational risks. The CIRA Framework emphasizes the interrelationships between the Risk Management and Corporate Governance functions as seen below:



- 2 The Board of Directors has an influential role in establishing, inter alia, the strategic direction and risk culture of the company. The BMA views the Risk Management function as a critical tool to furnish the Board with the necessary information to make appropriate decisions and assist the company's management in steering the organization forward.
- 3 The Risk Management function within the CIRA has 4 components: Risk Identification, Risk Measurement, Risk Response, and Risk Monitoring & Reporting. The company will undertake the self-assessment by answering the questions related to the calibre of its risk management processes in place to address the material risk arising from each operational risk area.
- 4 The CIRA Framework embodies a maturity model approach to identify a company's developmental stage with respect to a specific operational risk area. It rewards the company for achieving progress in each risk management area. It reviews the following 8 operational risk exposures as follows:
 - a) Business Processes Risk – includes a risk of errors arising from data entry, data processing, or application design.
 - b) Business Continuity Risk – includes a risk of an event that threatens or disrupts a company's continuous operations.
 - c) Compliance Risk – includes a risk of legal or regulatory breaches or both.
 - d) Information System Risk – includes a risk of unauthorized access to systems and data, data loss, utility disruptions, software and hardware failures, and inability to access information systems.
 - e) Distribution Channels Risk – includes a risk of disruption to a company's distribution channel arising from employment of inexperienced or incapable brokers or agents.
 - f) Fraud Risk – includes a risk of misappropriation of assets, information theft, forgery, or fraudulent claims.
 - g) Human Resources Risk – includes a risk of employment of unethical staff, inexperience or incapable staff, failure to train or retain experienced staff, and failure to adequately communicate with staff.
 - h) Outsourcing Risk – includes a risk of miscommunication of responsibilities in relation to outsourcing, breach of outsource service agreements or entering into inappropriate service agreements.

- 5 The CIRA Framework applies the components within the Risk Management function to each operational risk area. The company assesses each operational risk area and selects the applicable descriptor under the “Dimension” column that reflects the developmental stage of the company’s process surrounding the specific risk area.
- 6 In order to be credited for a relevant score within the CIRA Framework, the company must fulfill the criteria in the “Dimension” column. In its assessment, if the company finds itself between stages, the company must select the lower stage. The company can supplement the selection with additional comments that can be made at the end of each risk management function.
- 7 The total scores for each component within the CIRA Framework are aggregated and produce the pertinent Operational Risk Charge percentage. The Operational Risk Charge ranges from 1% to 10%. The relevant Operational Risk Charge percentage is applied to the “BSCR (After Covariance Adjustment)” subtotal. The resultant figure is the Operational Risk Capital Charge.
- 8 The CIRA is to be signed off by two Directors of the company, one of which must be a resident Director, where the company has a resident Director on its Board.
- 9 ITEMS
(a) Corporate Governance – the company assesses each statement in the “Dimension” column and places an “X” in the column “Implemented” where the Corporate Governance function meets the criteria (200 points for each fulfilled area). The worksheet will automatically aggregate all scores.

The company may provide comments in the space provided to support its responses.

Board of Directors

Dimension	Implemented	Score
Sets risk policies, practices and tolerance limits for all material foreseeable operational risks at least annually and ensures they are communicated to relevant business units		200
Monitors adherence to operational risk tolerance limits more regularly than annually		200
Receives, at least annually, reports on the effectiveness of material operational risk internal controls as well as management’s plans to address related weaknesses		200

Dimension	Implemented	Score
Ensures that systems and/or procedures are in place to identify, report and promptly address internal control deficiencies related to operational risks		200
Promotes full, open and timely disclosure from senior management on all significant issues related to operational risk		200
Ensures that periodic independent reviews of the risk management function are performed and receives the findings of the review		200

(b) Risk Management Function – the company assesses each statement in the “Dimension” column and places an “X” in the column “Implemented” where the Risk Management function meets the criteria (150 points for each fulfilled area). The worksheet will automatically aggregate all scores.

The company may provide comments in the space provided to support its responses.

Risk Management Function:

Dimension	Implemented	Score
Is independent of other operational units and has direct access to the Board of Directors		150
Is entrenched in strategic planning, decision making and budgeting process		150
Ensures that the risk management procedures and policies are well documented and approved by the Board of Directors		150
Ensures the risk management policies and procedures are communicated throughout the organization.		150
Reviews operational risk management processes and procedures at least annually		150
Ensures that loss events arising from operational risks are documented and loss event data is integrated into enterprise risk management		150

Dimension	Implemented	Score
Documents its risk management recommendations for operational units, ensures that deficiencies have remedial plans and progress on the execution of such plans are reported to the Board of Directors at least annually		150

(c) Risk Identification – the company is to answer the following question:

“Has your company taken steps to identify material risks arising from the Operational Risk Areas identified below?”

If the answer to the question is “No” then the company does not have to complete the matrix/grid. If the answer to the question is “Yes” then the company is to identify the stage of progression of each Operational Risk Area based on the Dimension descriptor. The company is then to input an “X” in the grid corresponding to the stage in the matrix table under the relevant Operational Risk Area.

The company may provide comments in the space provided to support its responses.

Risk Identification Processes:

Progression		Dimension	Operational Risk Areas							
Stage	Scoring		Fraud	HR	Outsourcing	Distribution Channel	Business Processes	Business Continuity	IT	Compliance
1	50	“ad hoc”								
2	100	Implemented but not standardized across the organization								
3	150	Implemented, well documented policies and procedures that are understood by relevant staff, and standardized across the entire organization								
4	200	In addition to Stage 3, processes are reviewed at least annually with the view to assessing effectiveness and introducing improvements								

(d) Risk Measurement – the company is to answer the following question:

“Has your company taken steps to measure material risks arising from the Operational Risk Areas identified below?”

If the answer to the question is “No” then the company does not have to complete the matrix/grid. If the answer to the question is “Yes” then the company is to identify the stage of progression of each Operational Risk Area based on the Dimension descriptor. The company is then to input an “X” in the grid corresponding to the stage in the matrix table under the relevant Operational Risk Area.

The company may provide comments in the space provided to support its responses.

Risk Measurement Processes:

Progression		Dimension	Operational Risk Areas							
Stage	Scoring		Fraud	HR	Outsourcing	Distribution Channel	Business Processes	Business Continuity	IT	Compliance
1	50	“ad hoc”								
2	100	Implemented but not standardized across the organization								
3	150	Implemented, well documented policies and procedures that are understood by relevant staff, and standardized across the entire organization								
4	200	In addition to Stage 3, processes are reviewed at least annually with the view to assessing effectiveness and introducing improvements								

(e) Risk Response – the company is to answer the following question:

“Has your company taken steps to control and/or mitigate material risks arising from the Operational Risk Areas identified below?”

If the answer to the question is “No” then the company does not have to complete the matrix/grid. If the answer to the question is “Yes” then the company is to identify the stage of progression of each Operational Risk Area based on the Dimension descriptor.

The company is then to input an “X” in the grid corresponding to the stage in the matrix table under the relevant Operational Risk Area.

The company may provide comments in the space provided to support its responses.

Risk Response Processes:

Progression		Dimension	Operational Risk Areas							
Stage	Scoring		Fraud	HR	Outsourcing	Distribution Channel	Business Processes	Business Continuity	IT	Compliance
1	50	“ad hoc”								
2	100	Implemented but not standardized across the organization								
3	150	Implemented, well documented policies and procedures that are understood by relevant staff, and standardized across the entire organization								
4	200	In addition to Stage 3, processes are reviewed at least annually with the view to assessing effectiveness and introducing improvements								

(f) Risk Monitoring & Reporting – the company is to answer the following question:

“Has your company taken steps to monitor and report material risks arising from the Operational Risk Areas identified below?”

If the answer to the question is “No” then the company does not have to complete the matrix/grid. If the answer to the question is “Yes” then the company is to identify the stage of progression of each Operational Risk Area based on the Dimension descriptor. The company is then to input an “X” in the grid corresponding to the stage in the matrix table under the relevant Operational Risk Area.

The company may provide comments in the space provided to support its responses.

Risk Monitoring & Reporting Processes:

Progression		Dimension	Operational Risk Areas							
Stage	Scoring		Fraud	HR	Outsourcing	Distribution Channel	Business Processes	Business Continuity	IT	Compliance
1	50	“ad hoc”								
2	100	Implemented but not standardized across the organization								
3	150	Implemented, well documented policies and procedures that are understood by relevant staff, and standardized across the entire organization								
4	200	In addition to Stage 3, processes are reviewed at least annually with the view to assessing effectiveness and introducing improvements								

(g) Operational Risk Charge Calculation

Subject to the BMA having a different opinion and reassessing the Charge through an onsite inspection, the “Total Operational Risk Capital Charge” is applied to the company’s BSCR (After Covariance Adjustment) sub-total for purposes of arriving at its ECR for the year-end filing.

(i) Overall CIRA Score – the aggregate of all the total scores from the Corporate Governance, Risk Management Function, Risk Identification, Risk Measurement, Risk Response, Risk Monitoring & Reporting assessment used to determine the Operational Risk Charge %.

(ii) CIRA Scoring Grid – the applicable Operational Risk Charge % that would be used to determine the company’s Total Operational Risk Capital Charge.

Overall Score	Applicable Operational Risk Charge % “BSCR (After Covariance Adjustment)”
<= 5200	10%
> 5200 <= 6000	9%
> 6000 <= 6650	8%
> 6650 <= 7250	7%
> 7250 <= 7650	6%
> 7650 <= 7850	5%
> 7850 <= 8050	4%
> 8050 <= 8250	3%
> 8250 <=8450	2%
> 8450	1%

(iii) Total Operational Risk Capital Charge – calculated using the Operational Risk Charge % x BSCR (After Covariance Adjustment)

2.10 Fixed Income Investment Risk

1 BACKGROUND

There are various categories of assets comprising of bonds, loans, and other miscellaneous investments that are used to determine the Fixed Income Investment Risk capital charge. The statutory financial statements and capital and solvency return value of all fixed income securities held by the company should be reported. Quoted and unquoted issues are combined. Bonds and mortgage-backed securities issued by any governmental authority (including non-US jurisdictions, government agencies, and government-sponsored enterprises) are to be reported as Government. The government agencies and/or government-sponsored enterprises include: Government National Mortgage Association (Ginnie Mae), the Federal National Mortgage Association (Fannie Mae), and the Federal Home Loan Mortgage Corporation (Freddie Mac), etc. All non-government bonds are to be segregated according to the latest available AM Best, S&P, Moody's, or Fitch ratings of the issuers with non-rated bonds assigned to Non-Rated. Where the ratings differ between agencies, companies are to segregate according to the most conservative rating. All other types of fixed income securities not included in Line 6 or 7 may be segregated as Lines 1 to 5 or 8 as appropriate. Where applicable the amounts must reconcile to the appropriate line(s) of the Company's Form 4 or Schedule II, as identified below.

2 The fixed income investment risk charge calculation can be summarized by the following formula:

$$C_{fi} = \sum_i \chi_i \times FIastclass_i, \quad \text{where}$$

i ranges over the classes set out below;

χ_i = BMA supplied asset class capital charge factor for type of fixed income asset class i ; and

$FIastclass_i$ = value of investment in fixed income asset class i .

3 ITEMS

(a) — Bonds by Rating Category - Total must reconcile to Form 4, Lines (2b) & (3b).

Line Item		Description
1	Government Bonds	All quoted and unquoted bonds or mortgage-backed securities issued by any government authority (including non-US jurisdiction, government agencies, and government-sponsored enterprises); as reported on Schedule II, Line (1) in the “Total” Column.
2	High Investment Grade Bonds (AAA & AA)	High Investment Grade (AAA & AA) — All quoted and unquoted non-government bonds rated AAA & AA by any of the rating agencies mentioned above or equivalent; as reported on Schedule II Line (2) in the “Total” Column.
3	Medium Investment Grade Bonds (A)	All quoted and unquoted non-government bonds rated A by rating agencies mentioned above or equivalent; as reported on Schedule II, Line (3) in the “Total” Column.
4	Low Investment Grade Bonds (BBB)	All quoted and unquoted non-government bonds rated BBB by rating agencies mentioned above or equivalent; as reported on Schedule II, Line (4) in the “Total” Column.
5	Non-Investment Grade Bonds	All quoted and unquoted non-government bonds rated as non-investment grade by rating agencies mentioned above or equivalent; as reported on Schedule II, Line (5) in the “Total” Column.
6	Mortgage-backed securities	All quoted and unquoted mortgage-backed securities not issued by any government agencies; as reported on Schedule II, Line (6) in the “Total” Column.
7	Mutual Funds	All quoted and unquoted mutual funds; as reported on Schedule II, Line (7) in the “Total” Column.
8	Non-Rated Bonds	All quoted and unquoted non-government bonds non-rated by rating agencies mentioned above or equivalent; as reported on Schedule II, Line (8) in the “Total” Column.

(b) — Other Fixed Income Investments

Line Item		Description
1	Mortgage Loans	Based on current year Form 4, Line (5).
2	Other Loans	Based on current year Form 4, Line (8).
3	Cash and Time deposits	Based on current year Form 4, Line (1).

2.11 Equity Investment Risk

1 BACKGROUND

There are various categories of equity investments comprising common stocks, preferred stocks, real estate, and other miscellaneous investments that are used to determine the Equity Investment Risk capital charge. All non-affiliated stocks held by the company should be accounted for, including both quoted and unquoted issues.

Stocks and real estate should be reported on a basis consistent with that used for purposes of statutory financial reporting. For example, if real estate was reported at market value on Form 4 of the latest statutory submission to the BMA, then the market value of real estate should be input to the BSCR. Where applicable, the amounts must reconcile to the appropriate line(s) of the company's Form 4.

2 The equity investment risk charge calculation can be summarized by the following formula:

$$C_{eq} = \sum_i \chi_i \times Eqastclass_i, \quad \text{where}$$

i = ranges over the classes set out below;

χ_i = BMA supplied asset class capital factor for type of equity class i ; and

$Eqastclass_i$ = value of investment in corresponding asset class i .

3 ITEMS

(a) — Common Stocks

Line Item		Description
1	Non-Affiliated (Quoted)	Based on current year Form 4, Line (2b) i.
2	Non-Affiliated (Unquoted)	Based on current year Form 4, Line (3b) i.
3	Mutual Funds (included in common stocks portfolio)	Based on current year Form 4, Lines (2b) iii and (3b) iii.

(b) — Preferred Stocks

Line Item		Description
1	Non-Affiliated (Quoted)	Based on current year Form 4, Line (2b) ii.
2	Non-Affiliated (Unquoted)	Based on current year Form 4, Line (3b) ii.

(c) — Other Equity Investments

Line Item		Description
1	Real Estate: Company-Occupied Less Encumbrances	Based on current year Form 4, Line (7a).
2	Real Estate: Investments Less Encumbrances	Based on current year Form 4, Line (7b).
3	Other Equity Investments	Based on current year Form 4, Lines (2d) and (3d).
4	Other Tangible Assets	Based on current year Form 4, Lines (13) and (14); all other equity-related assets, including derivatives, segregated accounts companies, deposit assets, other sundry assets, letters of credit, guarantees to affiliates, and other instruments.

2.12 Interest and Liquidity Risk

1 BACKGROUND

The interest rate and liquidity risk component is based on amounts entered into *Schedule II* of the BSCR model for quoted and unquoted other bonds and debentures, preferred stocks and mortgage loans. It represents the economic risk the insurer is subject to due to changes in interest rates. The charge is calculated by applying the “shock” of a 2% increase in interest rates to the portion of the fixed income assets (proportionate to the % of reserves) related to the duration difference.

2 The interest rate capital requirement is the sum of A and B, where

For those assets (and liabilities) where the extent of the duration difference is known: A equals

- (i) Weighted average of the difference in asset duration and liability duration (minimum of 1 year) x
- (ii) Interest Rate Shock (2.0%) x
- (iii) Reserves with known difference in durations / Total reserves x
- (iv) Assets Value x
- (v) (100% – ALM Credit)

For those assets (and liabilities) where the extent of the duration difference is not known: B equals

- (i) Assumed difference in asset duration (2 years) x
- (ii) Interest Rate Shock (2.0%) x
- (iii) Reserves with unknown duration difference / Total Reserves x
- (iv) Assets Value

3 ITEMS

Weighted Average of the difference in asset duration and liability duration: Based on *Schedule III* of the BSCR model, line 14; calculate the absolute value of the difference in assets duration and liabilities duration. The minimum value of the duration difference is 1 year. For assets and liabilities where the extent of the duration difference is unknown, the assumed difference in duration is 2 years.

Interest Rate Shock: The assumed interest rate shock supplied by BMA is 2%.

Reserves with known difference in durations / Total reserves: Based on *Schedule III* of the BSCR model, line 15; Enter the proportion of the reported Bermuda Statutory reserves where the extent of the duration difference is known.

Reserves with unknown duration difference/ Total reserves: 1 minus *Schedule III* of the BSCR model, line 15.

Assets Value – includes:

Bonds and debentures: Based on current year Form 4, Lines 2(a) ii and 3(a) ii; total quoted and unquoted value of other bonds and debentures (excluding bonds and debentures held-to-maturity which are to be valued at amortised cost) portfolio.

Preferred stock: Based on current year Form 4, Lines 2(c) ii and 3(c) ii; total quoted and unquoted value of preferred stocks portfolio.

Mortgage Loans: Based on current year Form 4, Line (5); total amortized cost (outstanding principal amount less any provision made for doubtful collection) of mortgage loan portfolio

ALM Credit: Based on the answers to the Asset Liability Management questions in the Commercial Insurers Solvency Self Assessment (CISSA) an insurer can receive up to 50% credit towards the Interest and Liquidity Risk capital requirement.. This factor considers the sophistication and effectiveness of each insurers asset liability management practices. It rewards the company for having strong ALM practices in place.

The company answers the initial question: “Has the company implemented policies on Asset Liability Management, including tolerances for deviation?” If the answer is no, then the company does not have to complete the remaining five questions and no ALM credit is granted.

If the answer is yes, then the company’s answers to the next five questions determine the amount of credit available. Each positive answer to the ALM questions receive 10% credit on the interest rate risk factor.

2.13 Long Term Insurance Risk

1 BACKGROUND

The underwriting risks are divided into five sections: i) mortality, ii) morbidity, iii) longevity, iv) non-proportional covers, and v.) other product riders not included above.

i) Mortality

Products that are considered to be exposed to mortality risk include term assurance, whole life, universal life, and accidental death and dismemberment insurance. These risk factors exclude life policies with critical illness acceleration riders.

The mortality risk charge is calculated by applying a capital factor to the respective net amount at risk. The capital risk factors are applied on an additive basis (i.e. 3.97/1000 on first \$1 billion of business, plus 1.80/1000 on the next \$4 billion of business, etc.).

A 50% reduction is applied to adjustable products and accidental death products. Adjustable products are defined as any insurance contracts in which the insurance company has the ability to make a material adjustment to the premiums/cost of insurance charges/dividends, based on recent experience.

ii) Morbidity

Morbidity risks are separated by critical illness insurance products and health insurance products.

Critical Illness Insurance

For critical illness insurance and accelerated critical illness insurance products, a prescribed capital factor is applied to the net amount at risk. The capital risk factors are applied on an additive basis.

CI risk factors for adjustable products receive a 50% reduction compared to non-adjustable products.

Health Insurance

Health insurance products include disability income products, long term care insurance products, waiver of premium benefits and other accidental and sickness products.

For disability income products (including waiver of premium and long term care insurance) where claims are in payment, a factor is applied to the Bermuda statutory reserves. This component takes into account claims risk for incurred but unpaid claims from prior years.

For disability income products where lives are active (including waiver of premium and long term care insurance), the BMA supplied capital factors are applied to the net annual earned premiums based on the length of guarantee periods. This morbidity

risk component for active lives relates to claims arising from the current year's coverage, and includes risks of incidence and claims continuance.

For other accidental and sickness products where lives are active, a BMA supplied capital factor is applied to the respective net annual earned premiums.

iii) Longevity

Products that are considered to be exposed to longevity risks include, but not limited to, payout annuities and contingent annuities.

The longevity risk charge is equal to a BMA supplied factor of the Bermuda statutory reserves.

iv) Non-proportional covers

For non-proportional covers, a BMA supplied capital factor is applied to the respective net annual earned premiums.

v) Other product riders not mentioned

For any other product riders not mentioned, a BMA supplied capital factor is applied to the respective net annual earned premiums.

2.14 Long-Term Variable Annuity Guarantee Risk

1 BACKGROUND

Variable annuity benefits are partitioned into five categories: Guaranteed Minimum Accumulation Benefit (GMAB), Guaranteed Minimum Death Benefit (GMDB), Guaranteed Minimum Income Benefit (GMIB), Guaranteed Minimum Withdrawal Benefit (GMWB), and Guaranteed Enhanced Earnings Benefit (GEEB). Variable annuities contain various minimum guarantees that expose companies to risks of a particularly volatile nature.

- 2 The capital risk factors differentiate by volatility levels and are applied to the net amount at risk (NAR). Volatility is defined as the annual historic volatility of the fund. In the case where there is no, or limited, history of the fund, use the volatility of the benchmark. Where the guarantee value (GV) is less than the account value (AV), the minimum floor factors are applied to the account values.

The capital requirement for variable annuities is calculated to be:

$$C_{LTV A} = \left[\sum_i (TotalBS Re q_i - Res_i) \right], \text{ where}$$

$TotalBS Re q_i$ = Total balance sheet requirement for variable annuity benefit i ; and

Res_i = Net Bermuda statutory reserves

3 ITEMS

Line Item		Description
1	Account value: Volatility: (0%,10.0%]	Enter the account value for volatility that is less than or equal to 10%. If the portfolio contains amounts invested in equities and fixed income securities, then the proportion of the account value invested in low volatilities are reflected in this column accordingly.
2	Account value: Volatility >10%	Enter the account value for volatility that is greater than 10%. If the portfolio contains amounts invested in equities and fixed income securities, then the proportion of the account value invested in high volatilities are reflected in this column accordingly.

Line Item		Description
3	Net Amount at Risk (NAR)	The NAR amount is net of reinsurance. The values are taken from <i>Schedule IV</i>. See section <i>Schedule IV</i> for more details. GMAB: NAR is defined as total claim payable if all contracts mature immediately. That is, $NAR = GV - AV$ GMDB: NAR is defined as the total claim amount payable upon the immediate death of all policyholders. That is, $NAR = GV - AV$ GMIB: Total claim payable upon full and immediate annuitization of all policies using an 80% factor applied to the GV (the 80% represents the ratio between current market annuitization factors and the guaranteed annuitization factors). That is, $NAR = 80\% \times GV - AV$ GMWB: Total claim payable if 100% of the guaranteed withdrawal benefit base in excess of the current account value is withdrawn immediately. That is, $NAR = GV - AV$ GEEB: Total guaranteed enhanced payments upon immediate death of all policyholders. That is, $NAR = GV - AV$.
4	NAR factor: Volatility: (0%, 10.0%]	The NAR factors are separated by low volatility and high volatility. The NAR factors are applied to the respective NAR amounts for each variable annuity type.
5	NAR factor: Volatility >10%	The NAR factors are separated by low volatility and high volatility. The NAR factors are applied to the respective NAR amounts for each variable annuity type.
6	Minimum Floor Factor: Volatility (0%,10.0%]	The minimum floor factors are used to apply to the account value of the corresponding volatility if the guarantee value is less than the account value.

Line Item		Description
7	Minimum Floor Factor Volatility > 10%	The minimum floor factors are used to apply to the account value of the corresponding volatility if the guarantee value is less than the account value.
8	Weighted average factor	The NAR factors from item (4) and (5) are weighted by the account value. The resulting factor is applied to the NAR to calculate the total balance sheet requirement.
9	Total Balance Sheet Requirement	The total balance sheet requirement is equal to the maximum of 2 values: i. Minimum floor factor_low volatility x Account value_low volatility + minimum floor factor_high volatility x account value_high volatility ii. Weighted average factor x NAR
10	Bermuda statutory reserves	The values are taken from <i>Schedule IV</i> of the BSCR model. See <i>Schedule IV</i> for details.
11	Capital Required	The capital required is the Total Balance Sheet Requirement <i>less</i> Bermuda statutory reserves.

4 NUMERICAL EXAMPLES

Example 1:

GMWB (Guaranteed Minimum Withdrawal Benefit)

Given:

Account value (AV) = 10,000
AV volatility $\geq 10\%$ = 4,000 (40%)
AV volatility $< 10\%$ = 6,000 (60%)
Guarantee value (GV) = 12,000
Bermuda statutory reserves = 800

Calculation:

NAR = GV – AV
= 12,000 – 10,000
= 2,000

Weighted average factor = Portion_of_account value_with_volatility_less_than_10% x
NAR_factor_for_volatility_less_than_10% +
Portion_of_account value_with_volatility_greater_than_10% x
NAR_factor_for_volatility_greater_than_10%
= 0.4 * 60% + 0.6 * 90%
= 0.78

Total balance sheet requirement = max (NAR * Weighted Average Factor, AV x Min. Floor Factor)

where:

NAR x Weighted Average Factor = 2000 x 0.78 = 1,560

*Account Value x Minimum Floor Factor = 4000 * 3.25% + 6000 * 5% = 430*

= max (1560, 430)
= 1,560

Capital required = Total Balance Sheet Requirement – Bermuda Statutory Reserves
= 1,560 - 800
= 760

Example 2:GMIB (Guaranteed Minimum Income Benefit)*Given:*

Account value (AV)	=	10,000	
AV volatility $\geq 10\%$	=	4,000	(40%)
AV volatility $< 10\%$	=	6,000	(60%)
Guarantee value (GV)	=	12,000	
Bermuda statutory reserves	=	450	

Calculation:

$$\begin{aligned}
 \text{NAR} &= 0.8 \times \text{GV} - \text{AV} \\
 &= 0.8 \times 12,000 - 10,000 \\
 &= 9,600 - 10,000 \\
 &= -400
 \end{aligned}$$

Since $\text{NAR} < 0$, the AV minimum factors will determine the balance sheet requirement.

$$\begin{aligned}
 \text{Weighted average factor} &= \frac{\text{Portion_of_account value_with_volatility_less_than_10\%} \times \text{NAR_factor_for_volatility_less_than_10\%} + \text{Portion_of_account value_with_volatility_greater_than_10\%} \times \text{NAR_factor_for_volatility_greater_than_10\%}}{\text{NAR_factor_for_volatility_greater_than_10\%}} \\
 &= \frac{0.4 \times 100\% + 0.6 \times 160\%}{1.36} \\
 &= 1.36
 \end{aligned}$$

$$\text{Total balance sheet requirement} = \max(\text{NAR} \times \text{Weighted Average Factor}, \text{AV} \times \text{Min. Floor Factor})$$

where:

$$\text{NAR} \times \text{Weighted Average Factor} = -400 \times 1.36 = -544$$

$$\text{Account Value} \times \text{Minimum Floor Factor} = 4000 \times 5\% + 6000 \times 8\% = 680$$

$$= \max(-544, 680)$$

$$= 680$$

$$\text{Capital required} = \text{Total Balance Sheet Requirement} - \text{Bermuda Statutory Reserves}$$

$$= 680 - 450$$

$$= 230$$

2.15 Long Term Other Insurance Risks

1 BACKGROUND

The Long Term Other Insurance risks capture other risks related to policyholder behaviour, expenses and guarantees. The calculation applies a line of business specific reserve risk capital factor to the respective net reported Bermuda Reserves.

The long term reserve risk charge calculation can be summarized by the following formula:

$$C_{LToth} = \left[\sum_i \beta_i \times lineRSVS_i \right], \text{ where}$$

β_i = individual line of business reserve risk charge factor;

$lineRSVS_i$ = Bermuda Statutory reserves for individual line of business i ;

2 ITEMS

(a) Line of Business: As categorized into four different lines of business.

Column Item		Description
1	Bermuda statutory reserve	Based on Bermuda Statutory Reserves on the <i>Schedule III</i> worksheet
2	Capital Factor	Supplied by BMA; reserve charge factors for individual lines of business
3	Capital Required	Calculated as Bermuda Statutory Reserve x capital factor

2.16 Credit Risk

1 BACKGROUND

Credit risks are partitioned into four categories: i) accounts and premiums receivable, ii) reinsurance receivables, iii) all other receivables, and iv) reinsurance recoverables. Where applicable, amounts should reconcile to the corresponding line(s) of the company's Form 4.

2 The credit risk charge calculation can be summarized by the following formula:

$$C_{LTcred} = \sum_i \delta_i \times creditor_i, \quad \text{where}$$

δ_i = BMA supplied credit risk capital charge factor for type of creditor i ; and

$creditor_i$ = receivable amount from creditor i .

3 ITEMS

(a) — Accounts and Premiums Receivable - (i) amounts receivable on account of policies of insurance from any person, whether an affiliate or not, should be included; (ii) amounts due from reinsurers and funds held by ceding companies should not be included; (iii) all uncollectible amounts, as determined by the company, should be deducted.

Line Item		Description
1	In Course of Collection	Based on current year Form 4, Line (10a).
2	Deferred - Not Yet Due	Based on current year Form 4, Line (10b).
3	Receivables from retrocessional contracts less: collateralized balances	Based on current year Form 4, Line (10c) less collateralized balance as reported in Notes to Form 4. Collateralized balances are all collaterals issued in favour of the company relating to accounts and premiums receivable. Assets accounted in Form 4, Line 34 should not be included here.

(b) — Reinsurance Balances Receivable - (i) amounts receivable on account of policies of reinsurance from any person, whether an affiliate or not, should be included; (ii) any amount included in ‘Accounts and Premiums Receivable’ and ‘Funds Held by Ceding Companies’ should not be included; (iii) all uncollectible amounts, as determined by the company, should be deducted.

Line Item		Description
1	Foreign Affiliates	Based on current year <i>Form 4</i> , Line (11a).
2	Domestic Affiliates	Based on current year <i>Form 4</i> , Line (11b).
3	Pools & Associations	Based on current year <i>Form 4</i> , Line (11c).
4	All Other Insurers	Based on current year <i>Form 4</i> , Line (11d).
5	Less: Letters of Credit	Based on current year notes to <i>Form 4</i> . Letters of credit are the amount of the letters of credit issued in favour of the company relating to reinsurance receivable. Assets accounted for in <i>Form 4</i> , Line 14 should not be included here. Note that this item is to be entered as a positive number.
6	Less: Funds Held under Reinsurance Contracts	Based on current year <i>Form 4</i> , Line (34). Note that this item is to be entered as a positive number.

(c) — All Other Receivables

Line Item		Description
1	Funds Held by Ceding Companies (AAA, AA rating)	Based on current year <i>Schedule III</i> , line (16a).
2	Funds Held by Ceding Companies (A rating)	Based on current year <i>Schedule III</i> , line (16b).
3	Funds Held by Ceding Companies (Below A rating)	Based on current year <i>Schedule III</i> , line (16c).
4	Accrued Investment Income	Based on current year <i>Form 4</i> , Line (9).
5	Investments in and advances to affiliates	Based on current year <i>Form 4</i> , Line (4).

Appendix A: Basic Worksheet Instructions

SUPPORTED OPERATING SYSTEM

Windows XP Professional (Service Pack 2)

SOFTWARE REQUIRED

Microsoft Office Excel 2003 (Service Pack 2)

INSTALLATION

Save the file to the directory of your choice. Right-click on the filename "BSCR Model - Blank.xls" and select *Rename*. Type "BSCR Model - [Company Name].xls" where [Company Name] is the legal name of the appropriate company. For example: "BSCR Model - ABC Insurance Company.xls".

ACCESSING THE FILE

Double-click on the filename.

When the Security Warning pop-up window appears, select the option: *Enable Macros*.

NAVIGATING THE FILE

The various tabs can be accessed by normal means; left-clicking on a specific worksheet will take the user to that worksheet.

A navigation worksheet and navigation buttons have also been provided. A navigation button for each worksheet can be found on the "Index" worksheet. Note that "Crosscheck" worksheet cannot be accessed from the "Index" worksheet. Each worksheet features a navigation button that will return the user to the "Index" worksheet. The "Crosscheck" worksheet is for the Bermuda Monetary Authority's use only, and hence has been deliberately removed from the navigation options.

ENTERING DATA

Form 4 and 8, Eligible Capital, Schedules II, III, and IV, and operational risk have been included in the BSCR model worksheets. Enter values into every cell with a white background in Forms 4, and 8, Eligible Capital, Schedules II, III, and IV, and operational risk.

All manually entered values will be in a blue font. The user should not leave any cell blank; a zero should be entered where appropriate. The cells in Forms 4, 8, Eligible Capital, Schedules II, III, and IV, and operational risk are linked to the applicable BSCR model worksheets. Note that due to cell protections, the user will only be allowed to edit the cells described above.

PRINTING

Printing can be accomplished by normal means; select the *P*rint... option the *F*ile menu.

SAVING

Saving can be accomplished by normal means; select the *S*ave option the *F*ile menu.

EXITING

Exiting can be accomplished by normal means; select the *E*xit option the *F*ile menu.

Appendix B: Long-Term Insurance BSCR Template Screen Shots

FORM 4

STATUTORY BALANCE SHEET

Sample Company

As at **December 31, 2010**

Expressed in ['000s] (see Regulation 10(2))

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Form 4

STMT.

LINE No.

20XX
('000)

20XX
('000)

1. CASH AND TIME DEPOSITS

2. QUOTED INVESTMENTS:

(a) Bonds and Debentures

(b) Equities

i. Common stocks

ii. Preferred stocks

iii. Mutual Funds

(c) Total equity investments

(d) Other quoted investments

(e) Total quoted investments

3. UNQUOTED INVESTMENTS:

(a) Bonds and Debentures

(b) Equities

i. Common stocks

ii. Preferred stocks

iii. Mutual Funds

(c) Total equity investments

(d) Other unquoted investments

(e) Total unquoted investments

4. INVESTMENTS IN AND ADVANCES TO AFFILIATES

5. INVESTMENTS IN MORTGAGE LOANS ON REAL ESTATE:

6. POLICY LOANS

FORM 4 CONTINUED

7.	REAL ESTATE:		
(a)	Occupied by the company (less encumbrances)		
(b)	Other properties (less encumbrances)		
(c)	Total real estate	-	-
8.	COLLATERAL LOANS		
9.	INVESTMENT INCOME DUE AND ACCRUED		
10.	ACCOUNTS AND PREMIUMS RECEIVABLE		
(a)	In course of collection		
(b)	Deferred - not yet due		
(c)	Receivables from retrocessional contracts		
(d)	Total accounts and premiums receivable	-	-
11.	REINSURANCE BALANCES RECEIVABLE		
(a)	Foreign affiliates		
(b)	Domestic affiliates		
(c)	Pools & associations		
(d)	All other insurers		
(e)	Total reinsurance balances receivable	-	-
12.	FUNDS HELD BY CEDING COMPANIES		
13.	SUNDRY ASSETS:		
(a)	Derivative instruments		
(b)	Segregated accounts companies		
(c)	Deposit assets		
(d)			
(e)	Total sundry assets	-	-
14.	LETTERS OF CREDIT, GUARANTEES AND OTHER INSTRUMENTS		
(a)	Letters of credit		
(b)	Guarantees		
(c)	Other instruments		
(d)	Total letters of credit, guarantees and other instruments	-	-
15.	TOTAL	-	-

FORM 4 CONTINUED

LONG-TERM BUSINESS INSURANCE RESERVES, OTHER LIABILITIES AND STATUTORY CAPITAL AND SURPLUS			
INSURANCE RESERVES			
20.	RESERVES FOR REPORTED CLAIMS		
21.	RESERVES FOR UNREPORTED CLAIMS		
22.	POLICY RESERVES LIFE		
23.	POLICY RESERVES ACCIDENT AND HEALTH		
24.	POLICYHOLDER'S FUNDS ON DEPOSIT		
25.	LIABILITY FOR FUTURE POLICYHOLDER DIVIDENDS		
26.	OTHER INSURANCE RESERVES - LONG-TERM		
27.	TOTAL LONG-TERM BUSINESS - INSURANCE RESERVES	-	-
OTHER LIABILITIES			
28.	INSURANCE AND REINSURANCE BALANCES PAYABLE		
29.	COMMISSIONS, EXPENSES, FEES AND TAXES PAYABLE		
30.	LOANS AND NOTES PAYABLE		
31.	(a) INCOME TAXES PAYABLE		
	(b) DEFERRED INCOME TAXES		
32.	AMOUNTS DUE TO AFFILIATES		
33.	ACCOUNTS PAYABLE AND ACCRUED LIABILITIES		
34.	FUNDS HELD UNDER REINSURANCE CONTRACTS		
35.	DIVIDENDS PAYABLE		
36.	SUNDRY LIABILITIES:		
(a)	Derivative instruments		
(b)	Segregated accounts companies		
(c)	Deposit liabilities		
(d)			
(e)	Total sundry liabilities	-	-
37.	LETTERS OF CREDIT, GUARANTEES AND OTHER INSTRUMENTS		
(a)	Letters of credit		
(b)	Guarantees		
(c)	Other instruments		
(d)	Total letters of credit, guarantees and other instruments	-	-
38.	TOTAL OTHER LIABILITIES	-	-
39.	TOTAL LONG-TERM BUSINESS INSURANCE RESERVES AND OTHER LIABILITIES	-	-
STATUTORY CAPITAL AND SURPLUS			
40.	TOTAL STATUTORY CAPITAL AND SURPLUS	-	-
41.	TOTAL	-	-
		TRUE	TRUE
Notes to Form 4			
Line 10	Collateralized balances		
Line 11	Letters of credit		

FORM 8

STATUTORY STATEMENT OF CAPITAL AND SURPLUS

Sample Company

For the year ending
Expressed in

December 31, 2010

['000s] (see Regulation 10(2))

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Form 8

STMT.

LINE No.

1.

STATUTORY CAPITAL

(a) Capital stock

authorized
value

shares of par
each issued and

fully paid

shares

(b) Contributed surplus

(c) Any other fixed capital

(d) Total Statutory Capital

20XX
('000)

20XX
('000)

2.

STATUTORY SURPLUS:

(a) Statutory Surplus - Beginning of Year

(b) Add: Income for Year

(c) Less: Dividends paid and payable

(d) Add (Deduct) change in unrealized appreciation (depreciation) of investments

(e) Add (Deduct) change in non-admitted assets

(f) Add (Deduct) change in appraisal of real estate

(g) Add (Deduct) change in any other statutory capital

(h) Statutory Surplus - End of Year

3.

TOTAL STATUTORY CAPITAL AND SURPLUS

SCHEDULE II (Long-term business)

SCHEDULE OF FIXED INCOME INVESTMENTS BY RATING CATEGORY

Sample Company

As atDecember 31, 2010

Expressed in[‘000s] (see Regulation 10(2))

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Schedule II

	QUOTED INVESTMENTS Bonds and Debentures [Form 4 Line 2(a)]		UNQUOTED INVESTMENTS Bonds and Debentures [Form 4 Line 3(a)]		TOTAL [Form 4 Lines 2(a) & 3(a)]	
Schedule Line no.	20XX (‘000)	20XX (‘000)	20XX (‘000)	20XX (‘000)	20XX (‘000)	20XX (‘000)
1 Government					-	-
2 High Investment Grade (AAA & AA)					-	-
3 Medium Investment Grade (A)					-	-
4 Low Investment Grade (BBB)					-	-
5 Non Investment Grade					-	-
6 Mortgaged-backed Securities					-	-
7 Mutual Funds					-	-
8 Non Rated					-	-
9 Total	-	-	-	-	-	-
	TRUE	TRUE	TRUE	TRUE		

SCHEDULE III (Long-term business)

Sample Company
Schedule III (\$'000)
For the Year Ending December 31, 2010

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Schedule III

SCHEDULE OF THE LONG-TERM INSURANCE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Bermuda Statutory Reserve	Reported DAC (if any)	Best Estimate Reserve	Best Estimate Reserve (Subject to zero floor)	Net Amount at Risk		
	('000)	('000)	('000)	('000)	Adjustable product/ treaty	Non-adjustable product/ treaty	Total
	('000)	('000)	('000)	('000)	('000)	('000)	('000)
1. Mortality (term assurance, whole life, universal life)				-			-
2. Critical Illness (including accelerated CI products)				-			-
3. Longevity (payout annuities, contingent annuities, pension blocks)				-			-
4. Deferred annuities (including index linked products with no guarantees)				-			-
5. Disability Income: active lives - incl. waiver of premium and LTC					Net Annual Premium		
Length of Premium Guarantee					Benefit Period	Benefit period	Total
(a) <= 1 year					<= 2 years	>2 years	
(b) 1-5 years							-
(c) >5 years							-
Total				-			-
6. Disability income: active lives - other accident and sickness				-			-
7. Disability income: claims in payment - incl. waiver of premium and LTC				-			-
8. Disability income: claims in payment - other accident and sickness				-			-
9. Group Life				-			-
10. Group Disability				-			-
11. Group Health				-			-
12. Non-proportional covers				-			-
13. Other product riders not included above				-			-
Total (excluding variable annuities)	-	-	-	-			
14. Weighted average of the difference between assets duration and liabilities duration (weighted by reported reserves)	Duration (yrs)						
15. Reserves with known difference in duration / Total Reserves	% Reserves						
16. FUNDS HELD BY CEDING COMPANIES	Amount Held ('000)						
(a) in which the ceding company has a AAA, AA rating							
(b) in which the ceding company has a A rating							
(c) in which the ceding company has a rating lower than A							
Total funds held by ceding companies							
17. Long-Term License Class	Class E						

SCHEDULE IV (Long-term business)

Sample Company
Schedule IV (\$'000)
For the Year Ending December 31, 2010

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[Schedule IV](#)

SCHEDULE OF THE LONG TERM VARIABLE ANNUITY GUARANTEES

	(1) <i>Bermuda Statutory Reserve</i>	(2) <i>Account Value ⁴ Volatility (0%,10.0%]</i>	(3) <i>Volatility >10.0%</i>	(4) <i>Net Amount at Risk ^{1, 3}</i>
	('000)	('000)	('000)	('000)
1 Guaranteed Minimum Accumulation Benefit: <5 years to maturity				
2 Guaranteed Minimum Accumulation Benefit: >=5 years to maturity				
3 Guaranteed Minimum Death Benefit: Return of Premium, Ratchet and Reset ² .				
4 Guaranteed Minimum Death Benefit: Enhanced Benefits (Roll up) ² .				
5 Guaranteed Minimum Income Benefit				
6 Guaranteed Minimum Withdrawal Benefit				
7 Guaranteed Enhanced Earnings Benefit				
Total (Variable Annuities)	-	-	-	-

Notes

- Factors should be applied to Net Amount at Risk (NAR) defined as:
 - GMAB Total claim payable if all contracts mature immediately
 - GMDB Total claim amount payable upon immediate death of all policyholders
 - GMIB Total claim payable upon full and immediate annuitization of all policies using an 80% factor applied to the GV (the 80% represents the ratio between current market annuitization factors and the guaranteed annuitization factors)
 - GMWB Total claim payable if 100% of the guaranteed withdrawal benefit base in excess of the current account value is withdrawn immediately
 - GEEB Total guaranteed enhanced payments upon immediate death of all policyholders
- Where ratchets, resets and roll-ups exist, please use the roll-up category.
- NAR is net of reinsurance.
- The proportion used for the account value under reinsurance is the proportion used for NAR.
- Volatility is defined as the annual volatility of the fund. In the case where there is no, or limited, history of the fund, use the volatility of the benchmark.

SUMMARY

Sample Company

Bermuda Solvency Capital Requirement - Long Term Business (BSCR_{LT})

For the Year Ending December 31, 2010

(\$'000)

REQUIRED CAPITAL AND SURPLUS		
C_{FI}	Fixed Income Investment Risk	0
C_{Eq}	Equity Investment Risk	0
C_{LTint}	Long Term Interest and Liquidity Risk	0
C_{LTmort}	Long Term Insurance Risk - mortality	0
C_{LTnp}	Long Term Insurance Risk - non-proportional	0
C_{Ltr}	Long Term Insurance Risk - riders	0
C_{LTmorb}	Long Term Insurance Risk - morbidity and disability	0
C_{LTlong}	Long Term Insurance Risk - longevity	0
C_{LTVa}	Long Term Variable Annuity Guarantee Risk	0
C_{LToth}	Long Term Other Insurance Risk	0
C_{Lcred}	Credit Risk	0

BSCR _{L,T} (Prior to Covariance Adjustment and prior to C _{op})	0
BSCR _{L,T} (After Covariance Adjustment and prior to C _{op})	0
Operational risk charge (%)	10%
C _{op} Operational risk capital charge (\$)	0
Reserve adjustment	0
Capital add-on / reduction (BMA assessment)	
Final BSCR _{L,T}	0

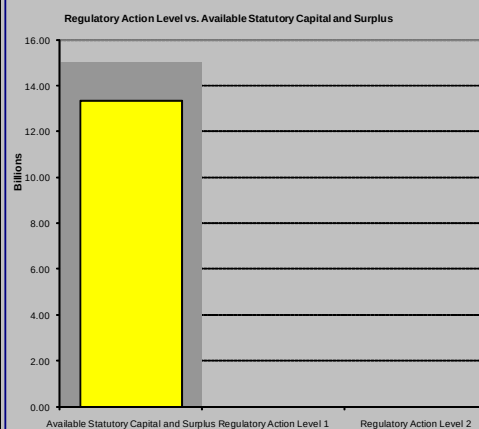
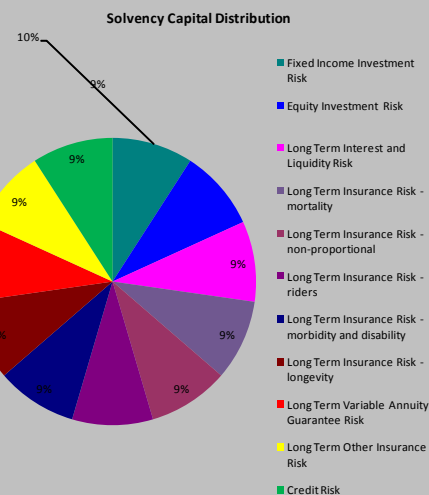
AVAILABLE STATUTORY CAPITAL AND SURPLUS	
Total eligible capital and surplus	0
Capital contribution	
Pre-adjustment available statutory capital and surplus	0
Capital add-on / reduction (BMA Assessment)	0

Available statutory capital and surplus	0
---	---

MINIMUM MARGIN OF SOLVENCY	
Minimum Margin of Solvency	10,000,000
Eligible Capital and Surplus for Minimum Margin of Solvency	0

ENHANCED CAPITAL REQUIREMENT & TARGET CAPITAL LEVEL	
Enhanced Capital Requirement	10,000,000
Target Capital Level	12,000,000

RATIOS	
Bermuda Solvency Capital Requirement Ratio	n/a
Enhanced Capital Requirement Ratio	0%



$$\text{BSCR}_{\text{LT}} = \sqrt{\{C_{fi}^2 + C_{eq}^2 + C_{LTint}^2 + (C_{LTmort} + C_{LTnp} + C_{LTtr})^2 + C_{LTmorb}^2 + C_{LTlong}^2 + C_{LTVa}^2 + C_{LToth}^2 + C_{LTcred}^2\} + C_{op}}$$

OPERATIONAL RISK

Risk Management Function

OPERATIONAL RISK: RISK MANAGEMENT FUNCTION

[Return to Index](#)

Sample Company

December 31, 2010

The insurer is to review the following statements below. The insurer is to place an “X” in the column “Implemented” where the Risk Management function meets the criteria (150 points for each fulfilled criteria). The worksheet will automatically aggregate all scores.

The Risk Management Function:

Description	Implemented	Score
Is independent of other operational units and has direct access to the Board of Directors		0
Is entrenched in strategic planning, decision making and budgeting process		0
Ensures that the risk management procedures and policies are well documented and approved by the Board of Directors		0
Ensures the risk management policies and procedures are communicated throughout the organisation.		0
Reviews operational risk management processes and procedures at least annually		0
Ensures that loss events arising from operational risks are documented and loss event data is integrated into enterprise risk management		0
Documents its risk management recommendations for operational units, ensures that deficiencies have remedial plans and progress on the execution of such plans are reported to the Board of Directors at least annually		0
		0

Comments (optionally, the insurer may provide comments in the box below to support its responses above):

--

Risk Identification

OPERATIONAL RISK: RISK IDENTIFICATION

Sample Company

December 31, 2010

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The insurer is to answer the following question. If the answer to the question is "No" then the insurer does not have to complete the matrix/grid. If the answer to the question is "Yes" then the insurer is to identify the stage of progression of each Operational Risk Area based upon the Dimension descriptor. The insurer is then to input an "X" in the grid corresponding to the stage in the matrix table under the relevant Operational Risk Area.

Has your company taken steps to identify material risks arising from the Operational Risk Areas identified below? (Y/N)

If "Y", identify the stage of each Operational Risk Area and input an "X" in the appropriate grid under each area.

Risk Identification Processes are:

Progression		Dimension	Operational Risk Areas								
Stage	Scoring		Fraud	Human Resources	Outsourcing	Distribution Channels	Business Processes	Business Continuity	Information Systems	Compliance	Total (Si)
1	50	"ad hoc"									
2	100	Implemented but not standardized across the organization									
3	150	Implemented, well documented policies and procedures that are understood by relevant staff, and standardized across the entire organization									
4	200	In addition to Stage 3, processes are reviewed at least annually with the view to assessing effectiveness and introducing improvements									
			0	0	0	0	0	0	0	0	0

OK

Comments (optionally, the insurer may provide comments in the box below to support its responses above):

Risk Measurement

OPERATIONAL RISK: RISK MEASUREMENT

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Sample Company

December 31, 2010

The insurer is to answer the following question. If the answer to the question is "No" then the insurer does not have to complete the matrix/grid. If the answer to the question is "Yes" then the insurer is to identify the stage of progression of each Operational Risk Area based upon the Dimension descriptor. The insurer is then to input an "X" in the grid corresponding to the stage in the matrix table under the relevant Operational Risk Area.

Has your company taken steps to measure material risks arising from the Operational Risk Areas identified below? (Y/N)

If "Y", identify the stage of each Operational Risk Area and input an "X" in the appropriate grid under each area.

Risk Identification Processes are:

Progression		Dimension	Operational Risk Areas								Total (Si)
Stage	Scoring		Fraud	Human Resources	Outsourcing	Distribution Channels	Business Processes	Business Continuity	Information Systems	Compliance	
1	50	"ad hoc"									
2	100	Implemented but not standardized across the organization									
3	150	Implemented, well documented policies and procedures that are understood by relevant staff, and standardized across the entire organization									
4	200	In addition to Stage 3, processes are reviewed at least annually with the view to assessing effectiveness and introducing improvements									
			0	0	0	0	0	0	0	0	0

OK

Comments (optionally, the insurer may provide comments in the box below to support its responses above):

Risk Response

OPERATIONAL RISK: RISK RESPONSE

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Sample Company

December 31, 2010

The insurer is to answer the following question. If the answer to the question is "No" then the insurer does not have to complete the matrix/grid. If the answer to the question is "Yes" then the insurer is to identify the stage of progression of each Operational Risk Area based upon the Dimension descriptor. The insurer is then to input an "X" in the grid corresponding to the stage in the matrix table under the relevant Operational Risk Area.

Has your company taken steps to control and/or mitigate material risks arising from the Operational Risk Areas identified below? (Y/N)

If "Y", identify the stage of each Operational Risk Area and input an "X" in the appropriate grid under each area.

Risk Response processes are:

Progression		Dimension	Operational Risk Areas								
Stage	Scoring		Fraud	Human Resources	Outsourcing	Distribution Channels	Business Processes	Business Continuity	Information Systems	Compliance	Total (Si)
1	50	"ad hoc"									
2	100	Implemented but not standardized across the organization									
3	150	Implemented, well documented policies and procedures that are understood by relevant staff, and standardized across the entire organization									
4	200	In addition to Stage 3, processes are reviewed at least annually with the view to assessing effectiveness and introducing improvements									
			0	0	0	0	0	0	0	0	0

OK

Comments (optionally, the insurer may provide comments in the box below to support its responses above):

Risk Monitoring & Reporting

OPERATIONAL RISK: RISK MONITORING & REPORTING

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Sample Company

December 31,2010

The insurer is to answer the following question. If the answer to the question is "No" then the insurer does not have to complete the matrix/grid. If the answer to the question is "Yes" then the insurer is to identify the stage of progression of each Operational Risk Area based upon the Dimension descriptor. The insurer is then to input an "X" in the grid corresponding to the stage in the matrix table under the relevant Operational Risk Area.

Has your company taken steps to monitor and report material risks arising from the Operational Risk Areas identified below? (Y/N)

If "Y", identify the stage of each Operational Risk Area and input an "X" in the appropriate grid under each area.

Risk Monitoring & Reporting processes are:

Progression		Dimension	Operational Risk Areas								
Stage	Scoring		Fraud	Human Resources	Outsourcing	Distribution Channels	Business Processes	Business Continuity	Information Systems	Compliance	Total (Si)
1	50	"ad hoc"									
2	100	Implemented but not standardized across the organization									
3	150	Implemented, well documented policies and procedures that are understood by relevant staff, and standardized across the entire organization									
4	200	In addition to Stage 3, processes are reviewed at least annually with the view to assessing effectiveness and introducing improvements									
			0	0	0	0	0	0	0	0	0

OK

Comments (optionally, the insurer may provide comments in the box below to support its responses above):

Operational Risk Charge

OPERATIONAL RISK: OPERATIONAL RISK CHARGE CALCULATION INSTRUCTIONS

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Subject to the Authority applying a re-assessment upon onsite inspection, the "Total Operational Risk Capital Charge" below will be applied to the insurer's BSCR (After Covariance Adjustment) sub-total in the BSCR model for purposes of arriving at its Enhanced Capital Requirement for the year-end filing.

Overall CIRA Score

CIRA Scoring Grid

OVERALL SCORE	APPLICABLE OPERATIONAL RISK CHARGE % OF "BSCR AFTER COVARIANCE ADJUSTMENT"
<= 5200	10%
> 5200 <= 6000	9%
> 6000 <= 6650	8%
> 6650 <= 7250	7%
> 7250 <= 7650	6%
> 7650 <= 7850	5%
> 7850 <= 8050	4%
> 8050 <= 8250	3%
> 8250 <= 8450	2%
> 8450	1%

BSCR After Covariance Adjustment:

Operational Risk Charge % (Decimals):

Total Operational Risk Capital Charge:

Operational Risk Charge Continued

Signatory:	
Print Name:	 Resident Director
Date:	
Signatory:	
Print Name:	 Director
Date:	
Insurer Name:	Sample Company
Year-end:	December 31, 2010
Insurer Registration No.	

FIXED INCOME INVESTMENTS

Sample Company

Fixed Income Investment Risk (\$'000)

December 31, 2010

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		(1)	(2)	(3)
TYPE OF FIXED INCOME INVESTMENTS	STATEMENT SOURCE	ASSET VALUE	CAPITAL FACTOR	REQUIRED CAPITAL
(a) Bonds By Rating Category				(1) x (2)
Government	Schedule II, Line (1)	-	0.30%	-
High Investment Grade (AAA & AA)	Schedule II, Line (2)	-	0.80%	-
Medium Investment Grade (A)	Schedule II, Line (3)	-	3.20%	-
Low Investment Grade (BBB)	Schedule II, Line (4)	-	5.00%	-
Non Investment Grade	Schedule II, Line (5)	-	26.30%	-
Mortgage-Backed Securities	Schedule II, Line (6)	-	10.00%	-
Mutual Funds	Schedule II, Line (7)	-	15.00%	-
Non Rated Bonds	Schedule II, Line (8)	-	50.00%	-
(a) SUBTOTAL - BONDS		-		-
(b) Other Fixed Income Investments				
Mortgage Loans	Form 4, Line (5)	-	5.0%	-
Other Loans	Form 4, Line (8)	-	5.0%	-
Cash and Time deposits	Form 4, Line (1)	-	0.3%	-
(b) SUBTOTAL - OTHER FIXED INCOME INVESTMENTS		-		-
(c) TOTAL FIXED INCOME INVESTMENTS [(a) + (b)]		-		-

EQUITY INVESTMENTS

Sample Company
Equity Investment Risk (\$'000)
December 31, 2010

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		(1)	(2)	(3)
TYPE OF EQUITY INVESTMENTS	STATEMENT SOURCE	ASSET VALUE	CAPITAL FACTOR	REQUIRED CAPITAL
(a) Common Stocks				(1) x (2)
Non-Affiliated (Quoted)	Form 4, Line (2b)-i	-	14.4%	-
Non-Affiliated (Unquoted)	Form 4, Line (3b)-i	-	14.4%	-
Mutual Funds	Form 4, Lines (2b)-iii, (3b)-iii	-	14.4%	-
(a) SUBTOTAL - COMMON STOCKS		-		-
(b) Preferred Stocks				
Non-Affiliated (Quoted)	Form 4, Line (2b)-ii	-	14.4%	-
Non-Affiliated (Unquoted)	Form 4, Line (3b)-ii	-	14.4%	-
(b) SUBTOTAL - PREFERRED STOCKS		-		-
(c) Other Equity Investments				
Real Estate				
Company-Occupied Less Encumbrances	Form 4, Line (7a)	-	10.0%	-
Investments Less Encumbrances	Form 4, Line (7b)	-	20.0%	-
Other Equity Investments	Form 4, Lines (2d), (3d)	-	20.0%	-
Other Tangible Assets	Form 4, Lines (13), (14)	-	20.0%	-
(c) SUBTOTAL - OTHER EQUITY INVESTMENTS		-		-
(d) TOTAL EQUITY INVESTMENTS [(a) + (b) + (c)]		-		-

INTEREST AND LIQUIDITY RISK

Sample Company Interest Rate and Liquidity Risk (\$'000) December 31, 2010								Return to Index
	(1)	(2)		(3)	(5)	(6)	(7)	(8)
INTEREST RATE AND LIQUIDITY RISK CHARGE	INTEREST RATE SHOCK	WEIGHTED AVERAGE DIFFERENCE IN ASSET DURATION AND LIABILITY DURATION (MINIMUM OF 1 YEAR)	STATEMENT SOURCE	RESERVES WITH KNOWN DIFFERENCE IN DURATIONS / TOTAL RESERVES	ASSET VALUE	ALM CREDIT	CAPITAL FACTOR	REQUIRED CAPITAL
(a) For assets (and liabilities) where the extent of the duration mismatch is known:	2%	1	Schedule III, Line (14)	0%	-	0.00%	0.0%	-
(b) For assets (and liabilities) where the extent of the duration mismatch is unknown:	2%	2		N/A	-	N/A	4.0%	-
TOTAL INTEREST RATE AND LIQUIDITY RISK CHARGE								-

ALM CREDIT	DISCOUNT FACTOR
Has the company implemented policies on Asset Liability Management, including tolerances for deviation?	Yes/No No
Question 1: Have clear roles and responsibilities for the execution of the Asset Liability Management program been assigned?	Yes/No Yes 0.00%
Question 2: Are Asset Liability Management positions / tolerances communicated to the investment function, senior management and the board on a timely basis?	Yes/No Yes 0.00%
Question 3: Have systems and procedures been established to identify, report and promptly address asset liability management deficiencies?	Yes/No Yes 0.00%
Question 4: Are the Asset Liability Management policies and procedures reviewed and reapproved or revised at least annually?	Yes/No Yes 0.00%
Question 5: Is the company's current Asset Liability Management position in compliance with the company's policies?	Yes/No Yes 0.00%
Total discount factor to apply to Investment capital requirement:	Total 0.00%

LT INSURANCE RISK

[illegible]

LT VARIABLE ANNUITY GUARANTEE RISK

Sample Company
Long Term Business Variable Annuity Guarantee Risk ('\$000)
December 31, 2010

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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
TYPE OF RISK										
ACCOUNT VALUE			NAR FACTOR		MINIMUM FLOOR FACTOR		WEIGHTED AVERAGE FACTOR	TOTAL BALANCE SHEET REQUIREMENT	BERMUDA STATUTORY RESERVES	CAPITAL REQUIRED
Volatility (0%,10.0%]	Volatility >10.0%	NET AMOUNT AT RISK (NAR)	Volatility (0%,10.0%]	Volatility >10.0%	Volatility (0%,10.0%]	Volatility >10.0%				
Variable Annuity Guarantee Risk								Max [((6) x (1) + (7) x (2)), (8) x (3)]		(9) - (10)
Guaranteed Minimum Accumulation Benefit (GMAB): <5 years to maturity								See notes		
-	-	-	65%	125%	4.00%	7.00%	0.00%	-	-	-
Guaranteed Minimum Accumulation Benefit (GMAB): >=5 years to maturity										
-	-	-	20%	70%	1.50%	4.00%	0.00%	-	-	-
Guaranteed Minimum Death Benefit: Return of Premium, Ratchet and Reset										
-	-	-	4%	13%	0.25%	0.75%	0.00%	-	-	-
Guaranteed Minimum Death Benefit: Enhanced Benefits (Roll up)										
-	-	-	12%	21%	0.75%	1.25%	0.00%	-	-	-
Guaranteed Minimum Income Benefit (GMIB)										
-	-	-	100%	160%	5.00%	8.00%	0.00%	-	-	-
Guaranteed Minimum Withdrawal Benefit (GMWB)										
-	-	-	60%	90%	3.25%	5.00%	0.00%	-	-	-
Guaranteed Enhanced Earnings Benefit (GEEB)										
-	-	-	1%	17%	0.00%	1.00%	0.00%	-	-	-
Total										
-	-	-						-	-	-
SUBTOTAL - VARIABLE ANNUITY GUARANTEE RISK										
								-	-	-

Notes

- Factors should be applied to Net Amount at Risk (NAR) defined as:

GMAB	Total claim payable if all contracts mature immediately
GMDB	Total claim amount payable upon immediate death of all policyholders
GMIB	Total claim payable upon full and immediate annuitization of all policies using an 80% factor applied to the Guaranteed Value (the 80% represents the ratio between current market annuitization factors and the guaranteed annuitization factors)
GMWB	Total claim payable if 100% of the guaranteed withdrawal benefit base in excess of the current account value is withdrawn immediately
GEEB	Total guaranteed enhanced payments upon immediate death of all policyholders
- Where ratchets, resets and roll-ups exist, please use the roll-up category.
- NAR is net of reinsurance.
- The proportion used for the account value under reinsurance is the proportion used for NAR.
- Need minimum amount when Guaranteed Value (GV) < Account Value (AV), the minimum floor factor is applied to AV.

LT OTHER INSURANCE RISK

Sample Company

Long Term Other Insurance Risk (\$'000)

December 31, 2010

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	(1)	(2)	(3)
OTHER INSURANCE RISK	BERMUDA STATUTORY RESERVE	STATEMENT SOURCE	CAPITAL FACTOR
(covering insurance risks such as policyholder behaviour, expenses, and product guarantees)			CAPITAL REQUIRED
			Max [0, (1) x (2)]
<u>Line of Business</u>			
Pay out annuities, deferred annuities	-	Schedule III, Lines 3 & 4	0.50%
Group business (life, health, disability)	-	Schedule III, Lines 9,10 & 11	0.50%
Disability claims in payment	-	Schedule III, Lines 7 & 8	0.50%
All other products (excluding Variable Annuity Guarantees)	-	Schedule III, Lines 1,2,5,6,12 & 13	2.00%
Total	-		-
SUBTOTAL - RESERVE RISK	-		-

CREDIT RISK

Sample Company
Credit Risk (\$'000)
December 31, 2010

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		(1)	(2)	(3)
TYPE OF CREDITOR	STATEMENT SOURCE	RECEIVABLES/ RECOVERABLES	CAPITAL FACTOR	REQUIRED CAPITAL
(a) Accounts and Premiums Receivable				(1) x (2)
In Course of Collection	Form 4, Line (10a)	-	5.0%	-
Deferred - Not Yet Due	Form 4, Line (10b)	-	5.0%	-
Receivables from retrocessional contracts				
Less: Collateralized Balances	Form 4, Line (10c), Notes to Form 4	-	10.0%	-
(a) SUBTOTAL - ACCOUNTS AND PREMIUMS RECEIVABLE		-		-
(b) Reinsurance Balances Receivable				
Foreign Affiliates	Form 4, Line (11a)	-	10.0%	-
Domestic Affiliates	Form 4, Line (11b)	-	0.0%	-
Pools & Associations	Form 4, Line (11c)	-	10.0%	-
All Other Insurers	Form 4, Line (11d)	-	9.4%	-
Less: Letters of Credit	Notes to Form 4	-	9.0%	-
Less: Funds Held Under Reinsurance Contracts	Form 4, Line 34	-	9.7%	-
(b) SUBTOTAL - REINSURANCE BALANCES RECEIVABLE		-		-
(c) All Other Receivables				
Funds Held by Ceding Companies (AAA, AA rating)	Schedule III, Line (16a)	-	0.8%	-
Funds Held by Ceding Companies (A rating)	Schedule III, Line (16b)	-	3.2%	-
Funds Held by Ceding Companies (Below A rating)	Schedule III, Line (16c)	-	5.0%	-
Accrued Investment Income	Form 4, Line (9)	-	2.5%	-
Investments in and Advances to Affiliates	Form 4, Line (4)	-	5.0%	-
(c) SUBTOTAL - ALL OTHER RECEIVABLES		-		-
(d) TOTAL CREDIT RISK [(a) + (b) + (c)]		-		-

Appendix C: Glossary

Available Statutory Capital and Surplus – Available Statutory Capital and Surplus is defined as Total Statutory Capital and Surplus including subsequent Capital Contributions. All capital contributions are to be approved by the BMA, and all adjustments are determined at the discretion of the BMA.

Bermuda Solvency Capital Requirement (BSCR) - Establishes a measure of solvency capital that is used by the BMA to monitor the capital adequacy of Class IV (re)insurers for the general business and Class E (re)insurers for the long-term business domiciled in Bermuda. The BSCR is determined by combining the calculated capital for each risk category (excluding operational risk) and applying a covariance adjustment with the square root rule, which is further adjusted to include company-specific operational risk and capital add-on.

Bermuda Monetary Authority (BMA) - The BMA is responsible for the licensing, supervision and regulation of financial institutions including those conducting deposit-taking, insurance, investment and trust business in Bermuda. It is also the issuing authority for Bermuda's bank notes and coinage, as well as providing a range of services and advice to Government on company incorporations and on banking and other financial and monetary matters.

BSCR Ratio - The BSCR Ratio is the ratio of the Available Statutory Capital and Surplus to the BSCR (after covariance adjustment).

Commercial Insurer Risk Assessment (CIRA or CIRA Framework) - The CIRA Framework assesses the quality of the company's risk management function surrounding its operational risk exposures.

Enhanced Capital Requirement (ECR) – Establishes a measure of solvency capital that is used by the BMA to monitor the capital adequacy of (re)insurers domiciled in Bermuda. It is equal to the higher of a (re)insurer's approved internal capital model/BSCR or MSM.

ECR Ratio – The ECR Ratio is the ratio of Available Statutory Capital and Surplus to the ECR.

Form 4 – Statutory balance sheet for long-term business as defined by the BMA.

Form 8 - Statutory statement of capital and surplus as defined by the BMA.

Non-Rated Bonds – Bonds that have not been rated by AM Best, Standard & Poor's, Moody's, Fitch or equivalent agencies.

Quoted – Assets that are carried at fair value quoted on an exchange or a determinable market.

Rated Bonds - Bonds rated with respect to the latest available AM Best, Standard & Poor's, Moody's, Fitch or equivalent agencies.

Regulatory Action Level - Defined by BMA's regulatory action guidelines.

Retrocessional contracts – Reinsurance contract whereby one reinsurer transfers all or part of the reinsurance risk that it has assumed or will assume to another reinsurer.

Schedule II – Schedule of fixed income investments by rating category as defined by the BMA.

Schedule III (Long-term business) – Schedule of reserves, net amount at risk, premiums, durations, and funds held by ceding companies.

Schedule IV (Long-term business) – Schedule of variable annuity guaranteed information.

Square Root Rule - The square root rule is an approximation of the covariance effect of the risk categories.

Statutory Financial Statements - System of financial reporting as defined by the BMA.

Target Capital Level (TCL) - Establishes a measure of solvency capital that is used by the BMA to monitor the capital adequacy of Class IV (re)insurers domiciled in Bermuda. It is equal to a Class IV (re)insurer's ECR * 120%.

Tail Value At Risk (TVar) – Risk measure that is defined as the conditional average given that the outcome exceeds a given percentile threshold. A 99.0% TVar level therefore corresponds to the average of the largest 1% of outcomes. If the tail distribution (in this example the conditional distribution given that the outcome equal to or above the 99.0%-ile) is positively skewed, then the 99.0% TVar is greater than the 99.0% Var (see *Value At Risk*).

Unquoted - Assets that are not traded on an exchange, which are carried at fair values determined in good faith.

Value-At-Risk (Var) – Risk measure that is defined as the value of the outcome that corresponds to a given percentile threshold. The 99.5% Var therefore corresponds to the threshold that defines the 0.5% largest outcomes. Often this quantity is also referred to as the 1-in-200 event, because one would expect the outcome to hit or exceed this value once every 200 trials.