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The Bermuda Solvency Capital Requirement 2009 Instruction Handbook

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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 (re)insurers domiciled in Bermuda.
- 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 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

- 4 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.
- 5 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.

Introduction to Bermuda Solvency Capital Requirement

Overview

- 6 Each of the following sections describes a different risk element contained in the BSCR model. Screenshots of each section of the BSCR model are provided immediately following the narrative, to aid in understanding the instructions.
- 7 These instructions contain the following sections:
 - Company Information
 - Summary
 - Fixed Income Investment Risk
 - Equity Investment Risk
 - Interest Rate / Liquidity Risk
 - Credit Risk
 - Premium Risk
 - Reserve Risk
 - Catastrophe Risk
 - Operational Risk
- 8 The filing guidance relating to Forms 1A, 2A, and 8 will be published in the Insurance Accounts Regulations 1980. The filing guidance relating to Schedules II, III, IV, and V will be published in the Insurance (Prudential Standards)(Class 4 Solvency Requirement) Order 2008 (including 2009 amendments). The electronic copy of Forms 1A, 2A, and 8, Schedules II, III, IV, and V, and operational risk have also been included in the BSCR model and have been appropriately linked to the BSCR model sections listed above. Model input instructions are included in the “basic worksheet instructions” in the appendix.
- 9 Also included is an appendix containing a section on system requirements, basic worksheet instructions, 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.

Introduction to Bermuda Solvency Capital Requirement

Changes to the BSCR Formula

- 10 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

- 11 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

- 12 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

- 13 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).

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.

Summary

1 BACKGROUND

The Summary Exhibit has seven key features: Required Capital and Surplus, Available Statutory Capital and Surplus, Minimum Margin of Solvency, ECR and Target Capital Level (“the TCL”), Ratios, Solvency Capital Distribution chart, and Regulatory Action Level chart. Each feature is described below. At the bottom of the page the BSCR formula for combining the various risk capital charges is displayed. The only financial data input into the Summary Exhibit is the BMA approved Capital Contribution of the company.

2 REQUIRED CAPITAL AND SURPLUS

The BSCR is determined according to the following formula:

$$BSCR = \sqrt{C_{fi}^2 + C_{eq}^2 + C_{int}^2 + C_{prem}^2 + \left(\frac{1}{2}C_{cred} + C_{rsvs}\right)^2 + \left(\frac{1}{2}C_{cred}\right)^2 + C_{cat}^2 + C_{op}^2}, \quad \text{where}$$

C_{fi} = capital charge in respect of fixed income investment risk;

C_{eq} = capital charge in respect of equity investment risk;

C_{int} = capital charge in respect of interest rate / liquidity risk;

C_{prem} = capital charge in respect of premium risk;

C_{rsvs} = capital charge in respect of reserve risk;

C_{cred} = capital charge in respect of credit risk;

C_{cat} = capital charge in respect of catastrophe risk; and

C_{op} = capital charge in respect of operational risk.

This formula utilizes the square root rule 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 credit risk and reserve risk are combined to reflect the assumption that part of credit risk is directly related to reserve risk. The end result is the BSCR (after covariance adjustment).

Summary

The operational risk capital charge is the operational risk charge multiplied by the BSCR (after covariance adjustment). The risk charge ranges from 1% to 10% based on each company's self-assessment of the Commercial Insurers Risk Assessment ("CIRA" or "the CIRA Framework") framework.

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 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.

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

3 AVAILABLE STATUTORY CAPITAL AND SURPLUS

Available Statutory Capital and Surplus is defined as the Total Statutory Capital and Surplus of the company including subsequent Capital Contribution less 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.

4 MINIMUM MARGIN OF SOLVENCY

The Minimum Margin of Solvency ("the MSM") is prescribed by the Insurance Returns and Solvency Regulations 1980.

5 ECR AND 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 Available Statutory Capital and Surplus to the BSCR.

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

Summary

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.

9 ITEMS

Available Statutory Capital and Surplus – The calculation of the Available Statutory Capital and Surplus is used for the purpose of determining the appropriate regulatory action level.

Line Item		Description
1	Total Statutory Capital and Surplus	Based on the current year statutory financial statements of the Company; as reported on Form 1A, Line (40).
2	Capital Contribution	Capital Contributions must be approved by the BMA. Note that a Capital Contribution increases 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.

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 1A 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 .

Fixed Income Investment Risk

3 ITEMS

(a) — Bonds by Rating Category - Total must reconcile to Form 1A, 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.

Fixed Income Investment Risk

(b) — Other Fixed Income Investments

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

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 input, 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 1A 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 1A.

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 1A, Line (2c) i.

Equity Investment Risk

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

(b) — Preferred Stocks

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

(c) — Other Equity Investments

Line Item		Description
1	Real Estate: Company-Occupied Less Encumbrances	Based on current year Form 1A, Line (7a).

Equity Investment Risk

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

Interest Rate / Liquidity Risk

1 BACKGROUND

The interest rate / liquidity risk charge is based on Form 1A amounts for quoted and unquoted other bonds and debentures, preferred stocks, and mortgage loans. It represents the risk that these assets may lose market value when interest rates are rising. The charge is calculated by applying the “shock” of a 1.2% increase in interest rates to the asset portfolio given the company’s effective asset and liability durations.

2. The interest rate / liquidity risk charge calculation can be summarized by the following formula:

$$C_{\text{int}} = \text{bonds} \times \text{duration} \times \text{marketdecline}, \quad \text{where}$$

bonds = quoted and unquoted value of other bonds and debentures, preferred stocks or mortgage loans;

duration = the higher of 1 or the company’s effective asset duration less the company’s effective liability duration or the company’s effective liability duration less the company’s effective asset duration; and

marketdecline = assumed interest rate shock supplied by BMA.

3 ITEMS

Bonds and Debentures - Based on current year Form 1A, 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 Stocks - Based on current year Form 1A, Lines 2(c) ii and 3(c) ii; total quoted and unquoted value of preferred stocks portfolio.

Mortgage Loans - Based on current year Form 1A, Line (5c); total amortized cost (outstanding principal amount less any provision made for doubtful collection) of mortgage loan portfolio.

Effective Duration of Assets – The effective duration calculation is based on the bonds and debentures (Form 1A, Lines (2a) ii and (3a) ii, preferred stocks (Form 1A, Lines (2c) ii and (3c) ii, and mortgage loans portfolios (Form 1A, Line (5c)).

Effective Duration of Liabilities – The effective duration calculation is based on the reserves (Form 1A, Lines 17 & 18).

Credit Risk

1 BACKGROUND

Credit risks are partitioned into four categories: accounts and premiums receivable, reinsurance receivables, all other receivables, and reinsurance recoverables. Where applicable, amounts should reconcile to the corresponding line(s) of the company's Form 1A.

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

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

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 reinsurers 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 1A, Line (10a).
2	Deferred - Not Yet Due	Based on current year Form 1A, Line (10b).

Credit Risk

Line Item		Description
3	Receivables from retrocessional contracts less: collateralized balances	Based on current year Form 1A, Line (10c) less collateralized balance as reported in Notes to Form 1A. Collateralized balances are all collaterals issued in favour of the company relating to accounts and premiums receivable. Assets accounted in Form 1A, 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 Reinsurers' 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 Form 1A, Line (11a).
2	Domestic Affiliates	Based on current year Form 1A, Line (11b).
3	Pools & Associations	Based on current year Form 1A, Line (11c).
4	All Other Insurers	Based on current year Form 1A, Line (11d).
5	Less: Letters of Credit	Based on current year Notes to Form 1A. 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 Form 1A, Line 14 should not be included here. Note that this item is to be entered as a positive number.

Credit Risk

Line Item		Description
6	Less: Funds Held under Reinsurance Contracts	Based on current year Form 1A, Line (34c). Note that this item is to be entered as a positive number.

(c) — All Other Receivables

Line Item		Description
1	Funds Held by Ceding Reinsurers	Based on current year Form 1A, Line (12c).
2	Accrued Investment Income	Based on current year Form 1A, Line (9).
3	Investments in and advances to affiliates	Based on current year Form 1A, Line (4c).

(d) — Reinsurance Recoverable Balance

Line Item		Description
1	Foreign Affiliates	Based on current year Form 1A, Line (17b) i.
2	Domestic Affiliates	Based on current year Form 1A, Line (17b) ii.

Credit Risk

Line Item		Description
3	Pools & Associations	Based on current year Form 1A, Line (17b) iii.
4	All Other Insurers	Based on current year Form 1A, Line (17b) iv.

Premium Risk

1 BACKGROUND

The premium risk charge is based on reported net premiums written for the latest calendar year by predefined statutory line of business. Note that although net premiums written for Property Catastrophe business are input to this section, they do not enter the calculation of the premium risk charge. All capital requirements pertaining to catastrophe exposures are explicitly calculated in the Catastrophe Risk section.

The first step of the calculation applies a statutory line of business specific premium risk capital factor to the respective net premiums written amounts. In the second step of the calculation, a concentration adjustment is determined to reflect the overall diversification of the premium risk. Finally, there is a further adjustment to reflect the fact that some of the lines of business premiums other than Property Catastrophe, include a loading for losses resulting from natural catastrophes. The appropriate risk charge for this portion of the premiums is calculated in the Catastrophe Risk section; the premium risk charge is reduced to avoid double counting.

The concentration adjustment factor is based on the ratio of the largest individual line of net premiums written to total net premiums written. If all net premiums written are allocated to a single line of business (other than Property Catastrophe), this ratio is equal to 100%. If net premiums written are evenly spread among 5 lines of business (other than Property Catastrophe), this ratio is equal to 20%. The concentration adjustment factor is obtained by multiplying this ratio by 40% and then adding 60%. So for a company with only one line of business the concentration adjustment factor is 100%, which means that no adjustment is made for diversification and the required premium risk charge is the same as that calculated in the first step. For a company with net premiums written that are evenly spread among 5 lines of business the concentration adjustment factor is 68%, leading to a required premium risk charge that is lower than the sum of all the individual lines of business premium risk charges calculated in the first step.

Premium Risk

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

$$C_{prem} = \left[\sum_{i>1} \alpha_i \times lineprem_i \right] \times \left[\max_{i>1} \left\{ \frac{lineprem_i}{totalprem} \right\} \times \mu + \mathcal{G} \right] - \left[avgpremcap \times \frac{avgannloss}{catlossratio} \right], \quad \text{where}$$

α_i = line of business i premium risk capital charge factor;

$totalprem$ = total premium measure over all lines of business (except Property Catastrophe), i.e. $\sum_{i>1} lineprem_i$;

$lineprem_i$ = premium measure for line of business i ;

μ = additional concentration adjustment factor equal to 40%;

\mathcal{G} = minimum concentration adjustment factor equal to 60%;

$avgpremcap$ = weighted average premium risk capital charge factor (after concentration adjustment);

$avgannloss$ = average annual loss estimated with catastrophe models; and

$catlossratio$ = expected industry average catastrophe loss ratio provided by BMA.

3 ITEMS

(a) — Lines of Business - As categorized by the twenty-three predefined statutory lines of business.

Line Item		Description
1	Net Premiums Written	Column (1): Current year net premiums written (after reinsurance) by predefined statutory line of business, as reported on Schedule IV, Lines (1) to (23). Total must tie to the Total Net Premiums Written of Form 2A, Line (3).

Premium Risk

Line Item		Description
2	Capital Factor	Column (2): Supplied by BMA; premium charge factors for individual lines of business.
3	Required Capital	Column (3): Calculated using Column (1) x Column (2); premium charge amounts for individual lines of business.

(b) — Concentration Adjustment Calculation - Calculates a factor that determines how much credit is given for diversification of premium risk across lines of business other than Property Catastrophe.

Line Item		Description
1	Maximum Premium	Row (i): Calculated using Max [Column (1) of (a) excluding Property Catastrophe]; largest premium amount appearing in Column (1) of (a), excluding the premium amount for Property Catastrophe.
2	Total Premium	Row (ii): Calculated using Sum [Column (1) of (a) excluding Property Catastrophe]; total of premium amounts appearing in Column (1) of (a), excluding the premium amount for Property Catastrophe.
3	Maximum Premium / Total Premium	Row (iii): Calculated using Row (i) / Row (ii); ratio that measures the degree of concentration.
4	Maximum Adjustment	Row (iv): Supplied by BMA; parameter that limits the maximum credit that is given for diversification.
5	Minimum Adjustment Factor	Row (vi): Calculated using $1 - \text{Row (iv)}$; lower bound for the concentration adjustment factor. The formula ensures that no diversification credit will be give when all net premiums written other than Property Catastrophe are concentrated in a single line of business.

Premium Risk

Line Item		Description
6	Concentration Adjustment Factor	Calculated using [Row (iii) x Row (iv)] + Row (vi).

(c) — Required Capital Charge — Calculated using (Total of Column (3) of (a)) x (Concentration Adjustment Factor); premium risk capital charge, after concentration factor adjustment, but before adjustment for natural catastrophe exposure.

(d) — Catastrophe Premium Adjustment Calculation — Calculation reflects a reduction to the required premium risk capital for the "catastrophe-exposed" portion of the premium that is otherwise contemplated within the catastrophe risk capital charge. See Catastrophe Risk section for further information.

Line Item		Description
1	Average Annual Loss Excluding Property Catastrophe (AAL)	Row (i): Pulled from Catastrophe Risk section; the expected net natural catastrophe loss (after reinsurance), including reinstatement premiums, for annual aggregate exposure to all risks and perils other than those relating to the Property Catastrophe line of business. See Catastrophe Risk section for further information.
2	Industry Catastrophe Loss Ratio	Row (ii): Pulled from Catastrophe Risk section; used to calculate the embedded catastrophe premiums from lines of business other than Property Catastrophe. See Catastrophe Risk section for further information.
3	Average Capital Factor	Row (iii): Calculated using (c) / [Row (ii) of (b)]; ratio of required premium risk capital charge after concentration adjustment to total net premiums written excluding Property Catastrophe.
4	Catastrophe Premium Adjustment	Calculated using [Row (i) / Row (ii)] x Row (iii).

Premium Risk

(e) — Required Capital Charge Adjusted for Catastrophe Premium — Calculated using (c) - (d); premium risk capital charge (after concentration factor and catastrophe adjustment) carried to Summary section.

Reserve Risk

1 BACKGROUND

The reserve risk charge is based on the statutory net loss and loss expense provisions by predefined statutory line of business. The first step of the calculation applies a line of business specific reserve risk capital factor to the respective reserve amounts. In the second step of the calculation a concentration adjustment is determined to reflect the overall diversification of the reserve risk.

The concentration adjustment factor is based on the ratio of the largest individual line of business reserve to total reserves. If all reserves are allocated to a single line of business, this ratio is equal to 100%. If the reserves are evenly spread among 5 lines of business, this ratio is equal to 20%. The concentration adjustment factor is obtained by multiplying this ratio by 40% and then adding 60%. So for a company with only one line of business the concentration adjustment factor is 100%, which means that no adjustment is made for diversification and the required reserve risk charge is the same as that calculated in the first step. For a company with reserves that are evenly spread among 5 lines of business the concentration adjustment factor is 68%, leading to a required reserve risk charge that is lower than the sum of all the individual line of business reserve risk charges calculated in the first step.

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

$$C_{rsvs} = \left[\sum_i \beta_i \times lineRSVS_i \right] \times \left[\max_i \left\{ \frac{lineRSVS_i}{totalRSVS} \right\} \times \mu + \mathcal{G} \right], \quad \text{where}$$

β_i = individual line of business reserve risk charge factor;

$totalRSVS$ = total reserves over all lines of business, i.e. $\sum_i lineRSVS_i$;

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

μ = additional concentration adjustment factor equal to 40%; and

\mathcal{G} = minimum concentration adjustment factor equal to 60%.

Reserve Risk

3 ITEMS

(a) — Lines of Business - As categorized by the twenty-three predefined statutory lines of business.

Line Item		Description
1	Net Loss & Loss Expense Provisions	Column (1): net loss and loss expense provisions by predefined statutory line of business, as reported on Schedule III, Lines (1) to (23). Total must tie to the Loss and Loss Expense Provisions of the statutory financial statements (Form 1A, Line (17) d) and should be input on an undiscounted basis.
2	Capital Factor	Column (2): Supplied by BMA; reserve charge factors for individual lines of business.
3	Required Capital	Column (3): Calculated using Column (1) x Column (2); reserve charge amounts for individual lines of business.

(b) — Concentration Adjustment Calculation - Calculates a factor that determines how much credit is given for diversification of reserve risk across lines of business.

Line Item		Description
1	Maximum Reserve	Row (i): Calculated using Max [Column (1) of (a)]; largest reserve amount appearing in Column (1) of (a).
2	Total Reserve	Row (ii): Calculated using Sum [Column (1) of (a)]; total of reserve amounts appearing in Column (1) of (a).

Reserve Risk

Line Item		Description
3	Maximum Reserve / Total Reserve	Row (iii): Calculated using Row (i) / Row (ii); ratio that measures the degree of concentration.
4	Maximum Adjustment	Row (iv): Supplied by BMA; parameter that limits the maximum credit that is given for diversification.
5	Minimum Adjustment Factor	Row (vi): Calculated using $1 - \text{Row (iv)}$; lower bound for the concentration adjustment factor. The formula ensures that no diversification credit will be give when all net premiums written are concentrated in a single line of business.
6	Concentration Adjustment Factor	Calculated using $[\text{Row (iii)} \times \text{Row (iv)}] + \text{Row (vi)}$.

(c) — Required Capital Charge — Calculated using (Total of Column (3) of (a)) x (Concentration Adjustment Factor); reserve capital charge (after concentration factor adjustment) carried to Summary section.

Catastrophe Risk

1 BACKGROUND

The catastrophe risk charge is based on company specific catastrophe risk modelling output. All exposures and premiums used in the Probable Maximum Loss (PML) and AAL calculations should include amounts for second, third, and subsequent events or losses following the initial loss event. Modeled losses should include demand surge, storm surge, fire following earthquakes and secondary uncertainty.

The calculated catastrophe risk charge has two components. The first component is the average premium shortfall for the top 1% worst case scenarios (i.e. at the 99.0% TVar level). The second component is a credit risk charge for reinsurance recoverables under the 1% worst case scenarios. Since the PML calculations use annual aggregate exposure for all risks the formula uses an imputed Total Catastrophe Premium in its calculation of the premium shortfall component. In addition to actual Property Catastrophe Premiums, this imputed Total Catastrophe Premium is based on the AAL divided by the industry catastrophe loss ratio as determined by the BMA.

2 The catastrophe risk charge calculation can be summarized by the following formulae:

$$C_{cat} = NetPML - Netcatprem + CR_{PML}, \quad \text{where}$$

$Netcatprem$ = Property catastrophe premium + (modeled AAL) / (estimated industry catastrophe loss ratio); and

CR_{PML} = Credit risk charge associated with reinsurance recoveries of ceded catastrophe losses.

3 ITEMS

(a) — Gross Probable Maximum Loss — Based on the company's CAT models; probable maximum gross natural catastrophe loss (prior to reinsurance) at the 99.0% TVar level for annual aggregate exposure to all related risks and perils, including reinstatement premiums, for the year following the "relevant year" as reported on Schedule V.

(b) — Net Probable Maximum Loss — Based on the company's CAT models; probable maximum net natural catastrophe loss (after reinsurance) at the 99.0% TVar level for annual aggregate exposure to all related risks and perils, including reinstatement premiums, for the year following the "relevant year" as reported on Schedule V.

Catastrophe Risk

(c) — Average Annual Loss Excluding Property Catastrophe (AAL) — Based on Company CAT models; the expected net natural catastrophe loss (after reinsurance), including reinstatement premiums, for annual aggregate exposure to all related risks and perils other than those relating to the Property Catastrophe line of business for the year following the “relevant year” as reported on Schedule V. The AAL should be calculated from the same underlying loss distribution used to determine the Gross PML and Net PML (excluding the property catastrophe component).

(d) — Industry Catastrophe Loss Ratio — Supplied by BMA; used to calculate the embedded catastrophe premiums from lines of business other than Property Catastrophe.

(e) — Property Catastrophe Premium — Copied from Premium Risk section; current year net premiums written amount for Property Catastrophe line of business as reported on Schedule IV. Line

(f) — Total Catastrophe Premium — is calculated using $(c) / (d) + (e)$; used to calculate the embedded catastrophe premiums from lines of business other than Property Catastrophe.

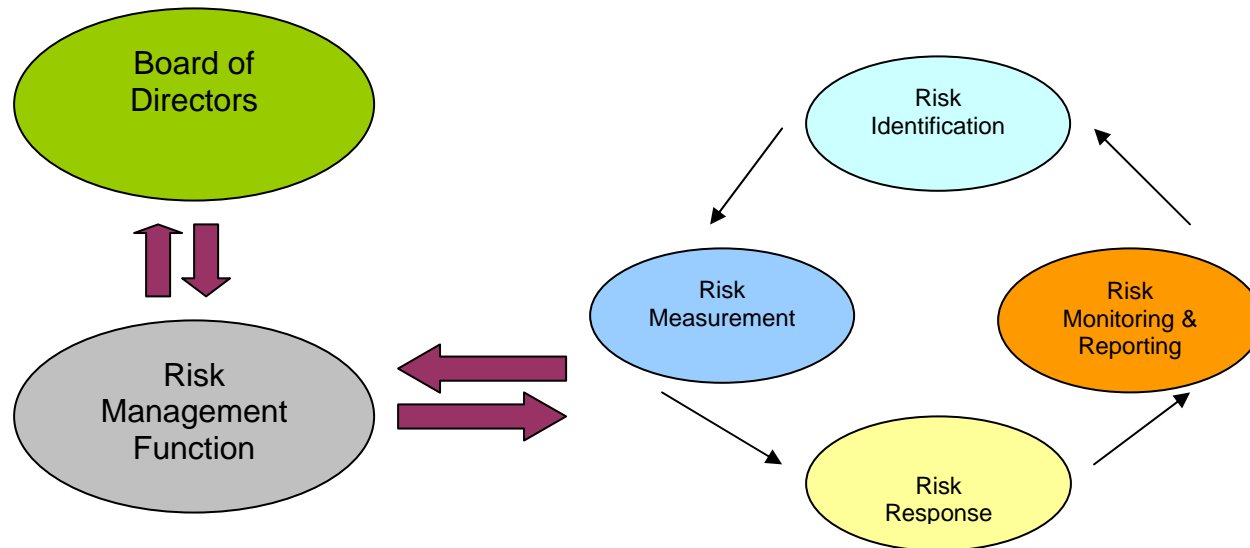
(g) — Credit Risk Capital Factor — Supplied by BMA; credit risk factor applied to ceded catastrophe losses at the 99.0% TVar level.

(h) — Credit Risk Charge — Calculated using $[(a) - (b)] \times (g)$; ceded catastrophe losses times the catastrophe credit risk capital factor.

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:



Operational Risk

- 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.

Operational Risk

- 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

Operational Risk

Dimension	Implemented	Score
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
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

Operational Risk

Dimension	Implemented	Score
Ensures that loss events arising from operational risks are documented and loss event data is integrated into enterprise risk management		150
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								

Operational Risk

Progression		Dimension	Operational Risk Areas							
Stage	Scoring		Fraud	HR	Outsourcing	Distribution Channel	Business Processes	Business Continuity	IT	Compliance
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

Operational Risk

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.

Operational Risk

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								

Operational Risk

(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								

Operational Risk

(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)

Appendix A - 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

Forms 1A, 2A, and 8, Schedules II, III, IV, and V, and operational risk have been included in the BSCR model worksheets. Enter values into every cell with a **white** background in Forms 1A, 2A, and 8, Schedules II, III, IV, and V, 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 1A, 2A, 8, Schedules II, III, IV, and V, 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.

Appendix A - Worksheet Instructions

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 – Screen Shots

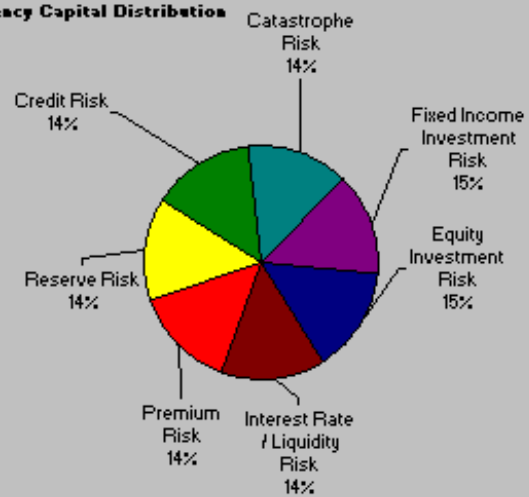
SUMMARY

Sample Company

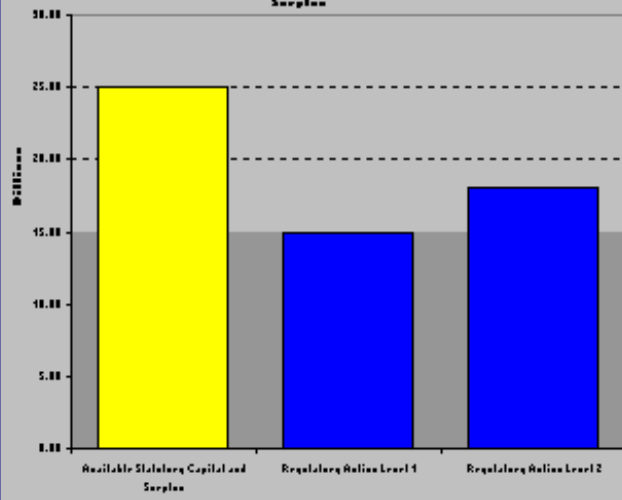
Bermuda Solvency Capital Requirement (BSCR)
(\$'000)

REQUIRED CAPITAL AND SURPLUS		20XX
C _{FI}	Fixed Income Investment Risk	0
C _{EQ}	Equity Investment Risk	0
C _{IRL}	Interest Rate / Liquidity Risk	0
C _{PRM}	Premium Risk	0
C _{RES}	Reserve Risk	0
C _{CR}	Credit Risk	0
C _{CAT}	Catastrophe Risk	0
BSCR (Prior to Covariance Adjustment)		0
BSCR (After Covariance Adjustment)		0
Operational risk charge (Z)		10%
Operational risk capital charge (\$)		0
Capital add-on (BMA assessment)		
BSCR		0
AVAILABLE STATUTORY CAPITAL AND SURPLUS		20XX
Total statutory capital and surr Form 1A, Line (40)		0
Capital Contribution		0
Pre-adjustment available statutory capital and surplus		0
Capital reduction (BMA Assessment)		0
Available statutory capital and surplus		0
MINIMUM MARGIN OF SOLVENCY		20XX
Minimum Margin of Solvency		100,000
ENHANCED CAPITAL REQUIREMENT & TARGET CAPITAL L		20XX
Enhanced Capital Requirement		100,000
Target Capital Level		120,000
RATIOS		20XX
Bermuda Solvency Capital Requirement Ratio		n/a
Enhanced Capital Requirement Ratio		n/a

Solvency Capital Distribution



Regulatory Ratio Level vs. Available Statutory Capital and Surplus



Appendix B – Screen Shots

FIXED INCOME INVESTMENT RISK

Sample Company		December 31, 20XX		Return to Index	
Fixed Income Investment Risk (\$000)		(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	0.3%	0	
High Investment Grade (AAA & AA)	Schedule II, Line (2)	0	0.8%	0	
Medium Investment Grade (A)	Schedule II, Line (3)	0	3.2%	0	
Low Investment Grade (BBB)	Schedule II, Line (4)	0	5.0%	0	
Non Investment Grade	Schedule II, Line (5)	0	26.3%	0	
Mortgage-Backed Securities	Schedule II, Line (6)	0	10.0%	0	
Mutual Funds	Schedule II, Line (7)	0	15.0%	0	
Non Rated	Schedule II, Line (8)	0	50.0%	0	
(a) SUBTOTAL - BONDS		0		0	
(b) Other Fixed Income Investments					
Mortgage Loans	Form 1A, Line (5c)	0	5.0%	0	
Other Loans	Form 1A, Line (8)	0	5.0%	0	
Cash and time deposit	Form 1A, Line (1)	0	0.3%	0	
(b) SUBTOTAL - OTHER FIXED INCOME INVESTMENTS		0		0	
(c) TOTAL FIXED INCOME INVESTMENTS [(a) + (b)]		0		0	

Appendix B – Screen Shots

EQUITY INVESTMENTS

Sample Company Equity Investments (\$000)		December 31, 20XX	(1)	(2)	(3)
					Return to Index
TYPE OF EQUITY INVESTMENTS	STATEMENT SOURCE	ASSET VALUE	CAPITAL FACTOR	REQUIRED CAPITAL	
(a) Common Stocks					(1) x (2)
Non-Affiliated (Quoted)	Form 1A, Line (2c)-i	0	14.4%	0	
Non-Affiliated (Unquoted)	Form 1A, Line (3c)-i	0	14.4%	0	
Mutual Funds	Form 1A, Lines (2c)-iii, (3c)-iii	0	14.4%	0	
(a) SUBTOTAL - COMMON STOCKS		0			0
(b) Preferred Stocks					
Non-Affiliated (Quoted)	Form 1A, Line (2c)-ii	0	14.4%	0	
Non-Affiliated (Unquoted)	Form 1A, Line (3c)-ii	0	14.4%	0	
(b) SUBTOTAL - PREFERRED STOCKS		0			0
(c) Other Equity Investments					
<u>Real Estate</u>					
Company-Occupied Less Encumbrances	Form 1A, Line (7a)	0	10.0%	0	
Investments Less Encumbrances	Form 1A, Line (7b)	0	20.0%	0	
Other Equity Investments	Form 1A, Lines (2e), (3e)	0	20.0%	0	
Other Tangible Assets	Form 1A, Lines (13e), (14d)	0	20.0%	0	
(c) SUBTOTAL - OTHER EQUITY INVESTMENTS		0			0
(d) TOTAL EQUITY INVESTMENTS [(a) + (b) + (c)]		0			0

Appendix B – Screen Shots

INTEREST RATE / LIQUIDITY RISK

Sample Company		December 31, 20XX		Return to Index	
Interest Rate / Liquidity Risk (\$000)		(1)	(2)	(3)	(4)
TYPE OF SECURITY	STATEMENT SOURCE	MARKET VALUES	ESTIMATED EFFECTIVE DURATION	'20 BASIS POINT INTEREST RATE INCREASE	REQUIRED CAPITAL
					(1) x (2) x (3)
Bonds and Debentures	Form 1A, Lines (2a)-ii and (3a)-ii	0	1.0	1.2%	0
Preferred Stocks	Form 1A, Lines (2c)-ii and (3c)-ii	0	1.0	1.2%	0
Mortgage Loans	Form 1A, Line (5c)	0	1.0	1.2%	0
TOTAL INTEREST RATE / LIQUIDITY RISK		0			0

Appendix B – Screen Shots

CREDIT RISK

Sample Company Credit Risk (\$000)		December 31, 20XX		Return to Index	
		(1)	(2)	(3)	
<i>TYPE OF CREDITOR</i>	<i>STATEMENT SOURCE</i>	<i>RECEIVABLES/ RECOVERABLES</i>	<i>CAPITAL FACTOR</i>	<i>REQUIRED CAPITAL</i>	
(a) Accounts and Premiums Receivable				(1) x (2)	
In Course of Collection	Form 1A, Line (10a)	0	5.0%	0	
Deferred - Not Yet Due	Form 1A, Line (10b)	0	5.0%	0	
Receivables from retrocessional contracts					
Less: Collateralized Balances	Form 1A, Line (10c), Notes to Form 1A	0	10.0%	0	
(a) SUBTOTAL - ACCOUNTS AND PREMIUMS RECEIVABLE		0		0	
(b) Reinsurance Balances Receivable					
Foreign Affiliates	Form 1A, Line (11a)	0	10.0%	0	
Domestic Affiliates	Form 1A, Line (11b)	0	0.0%	0	
Pools & Associations	Form 1A, Line (11c)	0	10.0%	0	
All Other Insurers	Form 1A, Line (11d)	0	9.4%	0	
Less: Letters of Credit	Notes to Form 1A	0	9.0%	0	
Less: Funds held by Company	Form 1A, Line 34(c)	0	9.7%	0	
(b) SUBTOTAL - REINSURANCE BALANCES RECEIVABLE		0		0	
(c) All Other Receivables					
Funds Held by Ceding Reinsurers	Form 1A, Line (12c)	0	5.0%	0	
Accrued Investment Income	Form 1A, Line (9)	0	2.5%	0	
Investments in and Advances to Affiliates	Form 1A, Line (4c)	0	5.0%	0	
(c) SUBTOTAL - ALL OTHER RECEIVABLES		0		0	
(d) Reinsurance Recoverable Balance					
Foreign Affiliates	Form 1A, Line (17b)-i	0	10.0%	0	
Domestic Affiliates	Form 1A, Line (17b)-ii	0	0.0%	0	
Pools & Associations	Form 1A, Line (17b)-iii	0	10.0%	0	
All Other Insurers	Form 1A, Line (17b)-iv	0	9.4%	0	
(d) SUBTOTAL - REINSURANCE RECOVERABLE BALANCE		0		0	
(e) TOTAL CREDIT RISK [(a) + (b) + (c) + (d)]		0		0	

Appendix B – Screen Shots

PREMIUM RISK

Sample Company		December 31, 20XX		Return to Index	
Premium Risk (\$'000)		(1)	(2)	(3)	
(a) LINE OF BUSINESS	STATEMENT SOURC	NET PREMIUMS WRITTEN	CAPITAL FACTOR	REQUIRED CAPITAL	(1) x (2)
Property Catastrophe	Schedule IV, Line (1)	0	0.0%	0	
Property	Schedule IV, Line (2)	0	49.7%	0	
Property Non-Proportional	Schedule IV, Line (3)	0	51.6%	0	
Personal Accident	Schedule IV, Line (4)	0	34.1%	0	
Personal Accident Non-Proportional	Schedule IV, Line (5)	0	41.2%	0	
Aviation	Schedule IV, Line (6)	0	48.2%	0	
Aviation Non-Proportional	Schedule IV, Line (7)	0	48.2%	0	
Credit / Surety	Schedule IV, Line (8)	0	39.8%	0	
Credit / Surety Non-Proportional	Schedule IV, Line (9)	0	45.4%	0	
Energy Offshore / Marine	Schedule IV, Line (10)	0	42.1%	0	
Energy Offshore / Marine Non-Proportional	Schedule IV, Line (11)	0	47.0%	0	
US Casualty	Schedule IV, Line (12)	0	50.3%	0	
US Casualty Non-Proportional	Schedule IV, Line (13)	0	55.6%	0	
US Professional	Schedule IV, Line (14)	0	51.2%	0	
US Professional Non-Proportional	Schedule IV, Line (15)	0	53.8%	0	
US Specialty	Schedule IV, Line (16)	0	51.4%	0	
US Specialty Non-Proportional	Schedule IV, Line (17)	0	52.7%	0	
International Motor	Schedule IV, Line (18)	0	42.2%	0	
International Motor Non-Proportional	Schedule IV, Line (19)	0	48.2%	0	
International Casualty Non-Motor	Schedule IV, Line (20)	0	50.0%	0	
International Casualty Non-Motor Non-Proportional	Schedule IV, Line (21)	0	53.6%	0	
Retro Property	Schedule IV, Line (22)	0	50.8%	0	
Structured / Finite Reinsurance	Schedule IV, Line (23)	0	27.2%	0	
(a) TOTAL		0		0	
(b) CONCENTRATION ADJUSTMENT CALCULATION					
	(i) Maximum Premium [Maximum (1a) excl Prop CAT]			0	
	(ii) Total Premium [Total (1a) excl Prop CAT]			0	
	(iii) Maximum Premium / Total Premium [(i) / (ii)]			#DIV/0!	
	(iv) Maximum Adjustment			40.0%	
	(v) [(iii) x (iv)]			#DIV/0!	
	(vi) Minimum Adjustment Factor			60.0%	
(b) CONCENTRATION ADJUSTMENT FACTOR [(v) + (vi)]				#DIV/0!	
(c) REQUIRED CAPITAL CHARGE [TOTAL (a) x (b)]					0
(d) CATASTROPHE PREMIUM ADJUSTMENT CALCULATION					
	(i) Average Annual Loss (AAL) Excluding Property Catastrophe			0	
	(ii) Industry Catastrophe Loss Ratio			40.0%	
	(iii) Avg Capital Factor [Total (3c) / (Total (1a) excl Prop CAT)]			0.0%	
(d) CATASTROPHE PREMIUM ADJUSTMENT [(i) / (ii) x (iii)]					0
(e) REQUIRED CAPITAL CHARGE ADJUSTED FOR CATASTROPHE PREMIUM [(c) - (d)]					0

Appendix B – Screen Shots

RESERVE RISK

Sample Company Reserve Risk (\$'000)		December 31, 20XX		Return to Index	
		(1)	(2)	(3)	
<i>LINE OF BUSINESS</i>	<i>STATEMENT SOURCES</i>	<i>NET LOSS & LOSS EXPENSES PROVISIONS</i>	<i>CAPITAL FACTOR</i>	<i>REQUIRED CAPITAL</i>	
				(1) x (2)	
Property Catastrophe	Schedule III, Line (1)	0	46.2%	0	
Property	Schedule III, Line (2)	0	43.8%	0	
Property Non-Proportional	Schedule III, Line (3)	0	49.7%	0	
Personal Accident	Schedule III, Line (4)	0	29.7%	0	
Personal Accident Non-Proportional	Schedule III, Line (5)	0	34.9%	0	
Aviation	Schedule III, Line (6)	0	46.0%	0	
Aviation Non-Proportional	Schedule III, Line (7)	0	48.3%	0	
Credit / Surety	Schedule III, Line (8)	0	38.4%	0	
Credit / Surety Non-Proportional	Schedule III, Line (9)	0	43.5%	0	
Energy Offshore / Marine	Schedule III, Line (10)	0	39.5%	0	
Energy Offshore / Marine Non-Proportional	Schedule III, Line (11)	0	43.9%	0	
US Casualty	Schedule III, Line (12)	0	43.0%	0	
US Casualty Non-Proportional	Schedule III, Line (13)	0	48.8%	0	
US Professional	Schedule III, Line (14)	0	46.3%	0	
US Professional Non-Proportional	Schedule III, Line (15)	0	51.5%	0	
US Specialty	Schedule III, Line (16)	0	46.5%	0	
US Specialty Non-Proportional	Schedule III, Line (17)	0	48.3%	0	
International Motor	Schedule III, Line (18)	0	37.1%	0	
International Motor Non-Proportional	Schedule III, Line (19)	0	43.5%	0	
International Casualty Non-Motor	Schedule III, Line (20)	0	43.7%	0	
International Casualty Non-Motor Non-Proportional	Schedule III, Line (21)	0	49.4%	0	
Retro Property	Schedule III, Line (22)	0	47.8%	0	
Structured / Finite Reinsurance	Schedule III, Line (23)	0	24.1%	0	
(a) TOTAL		0		0	
(b) CONCENTRATION ADJUSTMENT CALCULATION					
	(i) Maximum Reserve [Maximum (1a)]			0	
	(ii) Total Reserve [Total (1a)]			0	
	(iii) Maximum Reserve / Total Reserve [(i) / (ii)]			0.0%	
	(iv) Maximum Adjustment			40.0%	
	(v) [(iii) x (iv)]			0.0%	
	(vi) Minimum Adjustment Factor			60.0%	
(b) CONCENTRATION ADJUSTMENT FACTOR [(v) + (vi)]				60.0%	
(c) REQUIRED CAPITAL CHARGE [Total (a) x (b)]				0	

Appendix B – Screen Shots

CATASTROPHE RISK

Sample Company
Catastrophe Risk (\$000)

December 31, 20XX

[Return to Index](#)

DESCRIPTION	STATEMENT SOURCE	VALUE
(a) Gross Probable Maximum Loss	Schedule V, Line (b)	<input type="text" value="0"/>
(b) Net Probable Maximum Loss	Schedule V, Line (c)	<input type="text" value="0"/>
(c) Average Annual Loss (AAL) Excluding Property Catastrophe	Schedule V, Line (d)	<input type="text" value="0"/>
(d) Industry Catastrophe Loss Ratio		40.0%
(e) Property Catastrophe Premium	Schedule IV, Line (1)	0
(f) Total Catastrophe Premium [(c) / (d) + (e)]		0
(g) Credit Risk Capital Factor		12.2%
(h) Credit Risk Charge [((a) - (b)) x (g)]		0
(i) CATASTROPHE CAPITAL CHARGE [(b) - (f) + (h)]		0

Appendix B – Screen Shots

OPERATIONAL RISK

Corporate Governance

CORPORATE GOVERNANCE [Return to Index](#)

Sample Company
December 31, 20XX

The insurer is to review the following statements below. The insurer is to place an “X” in the column “Implemented” where the Corporate Governance function meets the criteria (200 points for each fulfilled criteria). The worksheet will automatically aggregate all scores.

The Board of Directors:

Description	Implement	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		0
Monitors adherence to operational risk tolerance limits more regularly than		0
Receives, at least annually, reports on the effectiveness of material operational risk internal controls as well as management’s plans to address related weaknesses		0
Ensures that systems and/or procedures are in place to identify, report and promptly address internal control deficiencies related to operational risks		0
Promotes full, open and timely disclosure from senior management on all significant issues related to operational risk		0
Ensures that periodic independent reviews of the risk management function are performed and receives the findings of the review		0
		0

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

Appendix B – Screen Shots

Risk Management Function

RISK MANAGEMENT FUNCTION Return to Index

Sample Company
December 31, 20XX

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	<input type="checkbox"/>	0
Is entrenched in strategic planning, decision making and budgeting process	<input type="checkbox"/>	0
Ensures that the risk management procedures and policies are well documented and approved by the Board of Directors	<input type="checkbox"/>	0
Ensures the risk management policies and procedures are communicated throughout the organization.	<input type="checkbox"/>	0
Reviews operational risk management processes and procedures at least annually	<input type="checkbox"/>	0
Ensures that loss events arising from operational risks are documented and loss event data is integrated into enterprise risk management	<input type="checkbox"/>	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	<input type="checkbox"/>	0
		0

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

Appendix B – Screen Shots

Risk Identification

RISK IDENTIFICATION

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Sample Company

December 31, 20XX

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							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									
			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):

Appendix B – Screen Shots

Risk Measurement

RISK MEASUREMENT

[Return to Index](#)

Sample Company

December 31, 20XX

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 Measurement processes are:

Progression		Dimension	Operational Risk Areas							Total (\$)	
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									
			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):

Appendix B – Screen Shots

Risk Response

RISK RESPONSE

[Return to Index](#)

Sample Company
December 31, 20XX

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							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									
			0	0	0	0	0	0	0	0	0

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

Appendix B – Screen Shots

Risk Monitoring & Reporting

RISK MONITORING & REPORTING

[Return to Index](#)

Sample Company
December 31, 20XX

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									
			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):

Appendix B – Screen Shots

Operational Risk Charge

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 0

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): 10%

Total Operational Risk Capital Charge: -

Appendix B – Screen Shots

Signatory:	<input type="text"/>
Print Name:	<input type="text"/>
	Resident Director
Date:	<input type="text"/>
Signatory:	<input type="text"/>
Print Name:	<input type="text"/>
	Director
Date:	<input type="text"/>
Insurer Name:	<u>Sample Company</u>
Year-end:	<u>December 31, 20XX</u>
Insurer Registration No.	<input type="text"/>

Appendix C - Glossary

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

Average Annual Loss (AAL) - Based on Company CAT models; mean expected net natural catastrophe loss (after reinsurance), including reinstatement premiums, for annual aggregate exposure to all related risks and perils other than those relating to the Property Catastrophe line of business for the year following the “relevant year” as reported on Schedule V. The AAL should be calculated from the same underlying loss distribution used to determine the Gross PML and Net PML (excluding the property catastrophe component).

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 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).

CAT - Abbreviation of the word catastrophe.

Class IV (Re)insurers - A body corporate is registrable as a Class IV (re)insurer if at the time of its application for registration it has a total statutory capital and surplus of not less than \$100,000,000 and intends to carry on insurance business including excess liability business or property catastrophe reinsurance business.

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.

Concentration Adjustment Factor - The concentration adjustment factor is used in relation to the premium risk and the reserve risk. It is based on the ratio of the largest individual line of business amount to total amount. The Factor will decrease as the number of lines of business increases to a minimum value of 60%.

Enhanced Capital Requirement (ECR) – 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 the higher of a Class IV (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.

Appendix C - Glossary

Form 1A - Statutory balance sheet as defined by the BMA.

Form 2A - Statutory statement of income 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.

PML - See *Probable Maximum Loss* definition.

Probable Maximum Loss (PML) - Based on Company CAT models; probable maximum loss is the anticipated maximum loss that can occur with a certain level of probability. The BSCR utilizes a probable maximum natural catastrophe loss at a 99.0% TVar level for annual aggregate exposure to all related risks and all perils, including reinstatement premiums.

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.

Required Capital and Surplus – see Enhanced Capital Requirement.

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 – Schedule of loss and loss expense provisions by line of business as defined by the BMA.

Schedule IV – Schedule of premium written by line of business as defined by the BMA.

Schedule V – Schedule of risk management as defined by the BMA.

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*).

Appendix C - Glossary

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.

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