



BMA House
43 Victoria Street
Hamilton HM 12 Bermuda
P.O. Box 2447
Hamilton HM JX Bermuda
tel: (441) 295 5278 fax: (441) 292 7471
email: info@bma.bm website: www.bma.bm

2009 STRESS/SCENARIO TESTS – CLASS 4 (RE)INSURERS

Below are stress/scenario tests to be performed by Class 4 (re)insurers. The results are to be submitted to the Authority with the 2009 Capital and Solvency Return.

The purpose of the tests is to assess the impact of the events on insurers' (legal entity's) statutory balance sheet (statutory admitted assets, admitted liabilities and capital and surplus) as determined by insurers' internal model and vendor model(s).

Please note that acquisition of a vendor package is not an obligation. If the company does not lease or otherwise use one of the three vendor packages mentioned below, please contact the Authority for further direction.

Furthermore, where a prescribed stress and/or scenario results in nil impact on the company's statutory balance sheet, a "not-applicable" response with an explanation is acceptable.

Vendor and Internal Model Descriptions

To assist the Authority with comparability, the company is to provide a description of the vendor model(s) used to perform the stress/scenario tests, identifying what model was used for each stress/scenario.

Where an internal model is utilized, the description should also include information on the internal model's methodology, parameters, and processes.

Impact and Effects

As noted above, the company is to provide the results of the expected impact and effects on: 1) aggregate admitted assets and/or a particular asset if one is specified; 2) admitted liabilities; and 3) statutory capital and surplus as reported at the 2009 year-end. The company is to use the GAAP / IFRS basis it ordinarily uses for statutory reporting so that the pre-stress/scenario valuations can be reconciled to the company's 2009 year-end statutory balance sheet.

The post-stress/scenario impact and effects to be reported are those that would be observed immediately upon the occurrence of the event (stress/scenario) as determined by the company's internal or vendor model(s) (both with and without the effect of reinsurance and/or other loss mitigation instruments).

NOTE: FOR EACH STRESS/SCENARIO, THE COMPANY IS TO PROVIDE BOTH PRE- AND POST-STRESS/SCENARIO POSITIONS OF THE BROAD CLASSES OF STATUTORY BALANCE SHEET ELEMENTS (I.E. AGGREGATE STATUTORY ADMITTED ASSETS, ADMITTED LIABILITIES, AND CAPITAL AND SURPLUS BALANCES).

A. Economic Scenarios

The company is to quantify the implications of an incidence of global volatility and/or a recession which results in the following separate and distinct impacts upon its statutory balance sheet:

<u>Stress Event</u>	<u>Interpretation</u>
R1. 40 percent decline in equity prices internationally	Decline should be across the board, i.e. there is no allowance for diversification across the markets. (It is assumed that all markets are correlated and the impact is on assets only).
R2. Widening of credit spreads from 40bp to 150bp	AAA widen by 40bp, AA widen by 125bp, A widen by 135bp, and BBB and below widen by 150bp.
R3. Combined R1 and R2	

B. Underwriting Loss Scenarios

The company is to run the Lloyd's developed realistic disaster scenarios (RDS') using aggregates in-force at January 1, 2010 unless otherwise specified.

Commercially available models do not currently exist for two (2) of the selected RDS'. As such, this document provides details on ultimate industry-wide settlement values and companies are expected to utilize their knowledge of market shares and other pertinent details to arrive at their expected losses.

Details of all assumptions and calculations utilized to arrive at final results must be presented and companies are encouraged to consult the Lloyd's "Realistic Disaster Scenarios – Guidance and Instructions" January 2010 Handbook for optional methods of approach.

1) Vendor Modelled RDS'

Provided the company has the package(s), it is to use one or more of the three vendor models (RMS, AIR, and/or EQE) to evaluate its expected losses emanating from the specified vendor events identified via the vendor IDs shown below.

All models are to run under the guidelines prescribed in the appendix (which mirror the Lloyd's 2010 instructions). All lines of business and exposures should be included in the final estimates and any deviations there-from should be noted.

The company is to run all the events from each of the scenario groupings (US Windstorm, US Earthquake, Non-US Windstorm, Non-US Earthquake) below. It should use the underlying loss distribution for its Net Probable Maximum Loss (submitted in the Bermuda Solvency Capital

Requirement) to calculate the return period (eg: 1-in-50 year event, 1-in-100 year event, etc.) of each event. The return period should be submitted with each event from each scenario grouping.

a) US Windstorm

<u>Event</u>	<u>AIR ID</u>	<u>EQE ID</u>	<u>RMS ID</u>
UW1. Northeast Hurricane	25876(NT)*	45257	441305
UW2. Carolinas Hurricane	33468(NT)*	38353	440744
UW3. Miami-Dade Hurricane	23286(NT)*	29950	443334
UW4. Pinellas Hurricane	14532(NT)*	38151	450475
UW5. Gulf Windstorm (onshore)	14099(NT)*	7797	444103
UW6. Gulf Windstorm (offshore)	n/a	n/a	n/a

* Due to the upgrades to Vendor Modelled RDS each year, the following are updated event IDs:

<u>Event</u>	<u>AIR ID</u>
UW1. Northeast Hurricane	25859
UW2. Carolinas Hurricane	33433
UW3. Miami-Dade Hurricane	23267
UW4. Pinellas Hurricane	14522
UW5. Gulf Windstorm (onshore)	14090

b) US Earthquake

<u>Event</u>	<u>AIR ID</u>	<u>EQE ID</u>	<u>RMS ID</u>
UE1. Los Angeles Earthquake	110140873**	16	469918**
UE2. San Francisco Earthquake	110273434**	227	469639**
UE3. New Madrid (NM) RDS	110121294**	149229	953165**
UE4. NM Extreme Stress Scenario	110137787**	149227	952375**

** Due to the upgrades to Vendor Modelled RDS each year, the following are updated event IDs:

<u>Event</u>	<u>AIR ID</u>	<u>RMS ID</u>
UE1. Los Angeles Earthquake	18063	2007934
UE2. San Francisco Earthquake	36355	2006214
UE3. New Madrid (NM) RDS	05938	2081051
UE4. NM Extreme Stress Scenario	13130	2080786

c) Non-US Windstorm

<u>Event</u>	<u>AIR ID</u>	<u>EQE ID</u>	<u>RMS ID</u>
IW1. European Windstorm	41027345	18009	865781
IW2. Japanese Typhoon	62021377	10327	157359

d) Non-US Earthquake

<u>Event</u>	<u>AIR ID</u>	<u>EQE ID</u>	<u>RMS ID</u>
IE1. Japanese Earthquake	52370627***	75967	803094

*** Due to the upgrades to Vendor Modelled RDS each year, the following are updated event IDs:

<u>Event</u>	<u>AIR ID</u>
IE1. Japanese Earthquake	567766

The company is to include demand surge and storm surge for storm events, and demand surge and fire following for earthquakes, unless advised otherwise in the attached Appendix A.

2) **Unmodelled RDS'**

a) **A1. Aerospace/Aviation Event**

The company should assume a collision between two aircraft over a major city, anywhere in the world, using the company's two largest airline exposures.

The company should assume a total industry loss of up to US\$4b, comprising up to US\$2b per airline for hull and liability exposures and any balance up to US\$1b for either: a) a major product manufacturer's product liability cover and/or b) an air traffic control liability cover.

Consideration should be given to other exposures on the ground and all assumptions should be stated clearly.

The information should include:

- 1) The city over which the collision occurs
- 2) The airlines involved in the collision
- 3) Each airline's limits and attachment points for each impacted (re)insurance contract (policy).
- 4) The maximum hull value per aircraft
- 5) The maximum liability value per aircraft
- 6) The name of each applicable product manufacturer and applicable contract (policy) limits and attachment points (deductibles)
- 7) The name of each applicable traffic control authority and applicable contract (policy) limits and attachment points (deductibles)

In addition, the company is to use the underlying loss distribution for its Net Probable Maximum Loss (submitted in the Bermuda Solvency Capital Requirement) to calculate the return period (eg: 1-in-50 year event, 1-in-100 year event, etc.) of the loss.

b) Marine Event

The company is to select one scenario from below which would represent its largest expected loss. In addition, the company is to use the underlying loss distribution for its Net Probable Maximum Loss (submitted in the Bermuda Solvency Capital Requirement) to calculate the return period (eg: 1-in-50 year event, 1-in-100 year event, etc.) of the largest expected loss.

1. M1. Marine Collision in Prince William Sound

A fully laden tanker calling at Prince William Sound is involved in a collision with a cruise vessel carrying 500 passengers and 200 staff and crew. The incident involves the tanker spilling its cargo with loss of lives aboard both vessels.

Assume 70% tanker owner and 30% cruise vessel apportionment of negligence and that the collision occurs in US waters.

Assume that the cost of the oil pollution to the tanker and cruise vessel owners is US\$2b.

Assume: 1) 125 fatalities with average compensation of \$1.5m, 2) 125 persons with serious injuries and average compensation of \$2.5m and 3) 250 persons with minor injuries with an average compensation level of \$0.5m each.

2. M2. Major Cruise Vessel Incident

A US owned cruise vessel is sunk or severely damaged with attendant loss of life, bodily injury, trauma and loss of possessions. The claims were heard in a Florida court.

Assume 500 passenger fatalities with average compensation of US\$2m and 1,500 injured persons with average compensation of \$1m. Further, assume an additional Protection and Indemnity loss of US\$500m to cover costs such as removal of wreck and loss of life and injury to crew.

C. Company Specific Scenario

The company is to submit detailed qualitative disclosure of the impact upon both its statutory statement of income and liquidity positions of a ratings downgrade of its Bermuda legal entity or group by 2 notches. The disclosure should cover and provide an indication of the relative impact/severity of collateral requirements, loss payment triggers on in force policy contracts, clawbacks, and/or other adverse financial and liquidity implications of the downgrade.

Upon reviewing the disclosure, the Authority may request additional information of a more quantitative nature relating to the liquidity impact and potential losses.

D. Worst-Case Annual Aggregate Loss Scenario

The company is to submit the following:

1. Company specific scenario

The company is to submit a description of its worst-case annual aggregate loss scenario and the underlying assumptions; **and**

2. Either Series of loss simulations or Economic scenario (R3) and three largest underwriting scenarios

a). Series of loss simulations

In the event that the company chooses this option, the company is to run a series of loss simulations that include all in-force policies for Jan 1, 2010. The company is also to submit its underlying assumptions, inter alia, risk measure, return period, and time horizon.

The underlying assumptions are to include, but not limited to, assumptions relating to reinstatement premiums and/or vendor model(s). Where vendor model(s) are used for, as well as those models serving as inputs to, the simulation, the model(s) specifications (e.g. AIR, RMS, EQECAT, proprietary, etc.) and assumptions (such as the inclusion or exclusion of demand surge, standard versus near-term, etc.) are also to be disclosed.

b). Economic scenario (R3) and three largest underwriting scenarios

In the event that the company chooses this option, the company is to combine the impacts of: 1) an economic scenario which would result simultaneously in the occurrence of R1. and R2. above, and 2) an aggregation of the three largest underwriting losses from the above series of UW (US Windstorm), UE (US Earthquake), IW (International Windstorm), IE (International Earthquake), A (Aviation), and M (Marine) loss events.

The underwriting loss events follow in quick succession and there is the inability to engage in capital or other fund raising activities. In addition, an assumption should be made that there is no geographic correlation between these non-economic events. The company is to disclose its assumptions, including any magnified demand surge, if applicable, from the multiple events.

E. Reverse Stress Test Questionnaire

A reverse stress test defines a stressed outcome (i.e. insolvency, illiquidity, etc.) then identifies events that could lead to the defined stressed outcome.

1. Does the company conduct reverse stress tests? Yes / No
2. If Yes, how frequent?
3. How is the information used?

Appendix A - Vendor Modelled RDS' – Modelling Instructions

Northeast Hurricane:

AIR: Do not include demand surge

Carolinas Hurricane:

AIR: Do not include demand surge. Include losses contributed from North Carolina.

RMS: Include losses contributed from North Carolina.

Miami-Dade Hurricane:

AIR: Report losses applicable to Florida only

RMS: Report losses applicable to Florida only

Pinellas Hurricane:

AIR: Report losses applicable to Florida only

RMS: Report losses applicable to Florida only

New Madrid RDS:

AIR: Do not include demand surge

New Madrid (ESS) Extreme Stress Scenario:

AIR: Do not include demand surge. Exclude Fire Following. Report Quake Only Loss Element.

RMS: Exclude Fire Following. Report Quake Only Loss Element

European Windstorm:

RMS: Exclude UK Storm Surge

Japanese Earthquake:

RMS: Do not reflect Loss Amplification

Gulf of Mexico Windstorm (onshore):

AIR: Do not include demand surge

Japanese Typhoon:

RMS: Do not reflect Loss Amplification