

FROM: Head of Risk Management
LOCATION: 86/5
EXTENSION: 5355
DATE: 3 April 2003
REFERENCE: Y3029
SUBJECT: **REALISTIC DISASTER SCENARIOS 2003**
ATTACHMENTS: Appendices I and II
ACTION POINTS: **Managing Agents to complete and return RDS data**
DEADLINE: **30 May 2003**

This bulletin details the 2003 Realistic Disaster Scenarios (“RDS”) which are attached at Appendix I.

A number of developments have been made and the resultant changes are discussed in this bulletin and Appendix II, ‘Guidance to the completion of the RDS Return’.

New Scenarios

Following market consultation a Specific Terrorism Scenario has been added, with the aim of obtaining a market-level loss figure from an extreme terrorist attack. The results from this scenario will not affect syndicates’ Risk Based Capital requirements. An additional business class, ‘Outwards R/I: TRIA Recoveries’ has been added to the software to assist in the completion of this new scenario.

Changes to Existing Scenarios

The Marine Event has been reduced from four possible scenarios to two. Syndicates should now choose between the Tanker/Cruiseship Collision and the Passenger Vessel Sunk/Damaged, selecting whichever gives the highest net loss.

Cash flow forecasts are still required for all completed scenarios. However, **the sources of funding need only be completed for the scenario producing the largest cash deficit to the syndicate**. Further details explaining how to complete this requirement are included in Appendix II. Please note that the software has been modified to allow positive and negative percentages to be entered. Any queries regarding cash flow and loss funding should be directed to Paul Coyle, Treasury Department, on extension 6882.

Completion of the Return

Completion of the six 'specific scenarios' (including the Specific Terrorism Scenario) and the Second Event scenario is mandatory for all syndicates. Syndicates with no exposure to any of these seven scenarios should use the nil return function.

A minimum of eight scenarios (including the six specific and Second Event scenarios) per syndicate must be returned. For additional scenarios, syndicates may apply a materiality test to their returns. Syndicates need not include a scenario that results in both a gross loss of less than 10% of stamp and a net loss of less than 3% of stamp. Syndicates that are no longer active, but still have live exposures, are subject to the same requirements as an active syndicate.

Capacity should be stated net of any Qualifying Quota Share ("QQS") facility, but aggregate data should include exposures written under a QQS agreement. Recoveries relating to a QQS agreement should be shown under a separate recovery class (business class 'RI: Whole Account QQS').

Syndicates should continue to record stop loss recoveries on the RDS data screen and also use the general notes page of the return to explain the extent of any stop loss cover relied upon in scenarios, including details such as limits and excess points.

Syndicates must enter aggregate figures in full, selecting the appropriate 'aggregate type', before taking account of the probable maximum loss ("PML"). Please note that the software has been modified to allow selection of a business class more than once, thus allowing entry of different aggregate types per class.

Syndicates should base the RDS submission on aggregates and unutilised reinsurance protections in place at 1 April 2003, i.e. any live exposures and any relevant reinsurance remaining from prior years of account should also be included.

The software package, together with a guide for users, will be distributed during April via the Market Reporting web-site. Any queries on the content of this bulletin should be addressed to the Loss Modelling Department by contacting Simon Sherriff on extension 6496, or James Orr on extension 6402. Syndicates needing IT assistance should contact Ash Shah on extension 6858. Queries regarding cash flow and loss funding should be directed to Paul Coyle, Treasury Department, on extension 6882.

Agents should note that the deadline for the submission of the completed RDS return is 12.00 noon on 30 May 2003. This return should be made via the Market Reporting web-site.

Future Developments

Minimal changes have been made to the RDS exercise this year to ensure consistency with previous years' results and minimise the inconvenience to syndicates. We are currently working with risk modelling experts within the market to develop a range of improvements to the framework and methodology for measuring catastrophic risk exposures at the syndicate and market level. These improvements will seek to achieve greater consistency between syndicates, provide more information on the range of potential losses at the market level, and raise best practice standards for the monitoring and management of aggregations within syndicates.

The aim of this initiative is to improve our understanding of market risk and increase the value of our catastrophe monitoring process to individual syndicates. The deadline for initiating the move towards the improved framework and methodology is August 2003, although some changes may develop over a longer period, as they will rely upon improvements in data standards within the market.

This bulletin is being sent to all active underwriters and managing agents. A copy of this bulletin has also been sent to members' agents, Lloyd's advisers, corporate members, recognised accountants and market associations for information.

Stephen Manning
Head of Risk Management

REALISTIC DISASTER SCENARIOS

1 USA Windstorm

Assume a US \$50 billion insured loss arising from a windstorm hitting Florida and/or Gulf of Mexico.

2 Marine Event

Syndicates should return a marine loss scenario based on one of the following two incidents, selecting whichever scenario provides the highest net loss to the syndicate. In all scenarios, excess layers of liability, hull and cargo should be added based on maximum aggregate exposures.

- i) A fully laden tanker calling at Prince William Sound is involved in a collision with a cruise vessel carrying 500 passengers. The incident involves the tanker spilling its cargo and loss of lives aboard both vessels. Assume 70% tanker owner / 30% cruise vessel apportionment of negligence and that the collision occurs in US waters.
- ii) A U.S. owned passenger vessel, carrying a minimum of 3000 paying customers and a number of crew, is sunk or severely damaged with attendant loss of life, bodily injury, trauma, loss of possessions. Claims to be heard in an American court.

3 North Sea – Loss of major complex

Include property damage, removal of wreckage, liabilities, loss of production income, capping of well.

4 Aviation Collision

Assume a collision between 2 aircraft over a major US city, using the syndicate's two highest airline exposures. The names of the airlines must be disclosed. Assume a liability loss of US \$1.5 billion per airline and an involvement from a products liability policy. Consideration should be given to other exposures on the ground.

5 Major Risk loss

Assume a loss to the syndicate's largest single risk that results in the total exhaustion of policy limits, including a PML failure, together with any other potential interests which may arise from additional perils (business interruption or liabilities) or other methods of acquisition (e.g. risk excess).

6 Space Storm

Assume storm destroys six in-orbit satellites.

7 Liability

Syndicates should return a liability loss scenario based on one of the following, selecting whichever scenario provides the highest net loss to the syndicate.

- i) US ‘laddering’ scenario involving improper conduct by firms in connection with initial public offerings. This results in a combined SEC class action, with the litigation involving the syndicate’s 5 largest assureds to the full slip limits.
- ii) UK pensions mis-selling, involving the syndicate’s 5 largest assureds to the full slip limits.
- iii) A failure/collapse of a major corporation, involving the syndicate’s 5 largest assureds to the full slip limits.
- iv) A failure of a merger, involving the syndicate’s 5 largest assureds to the full slip limits.
- v) A failure of a construction project, involving the syndicate’s five largest assureds (for example, architects, surveyors, and engineers) to the full slip limits.

8 Political Risks

This exercise is designed to capture the effects of a series of attritional losses arising from unrelated causes. The aim of this exercise is to test the cumulative potential loss effect of a series of losses against the available horizontal reinsurance protection.

Where syndicates have already designed internal disaster scenarios on this basis, they should enter the data in the relevant screen. For syndicates that have not designed a tailor made scenario, the following methodology should be adopted when completing the return.

For your largest exposed country assume a deteriorating political and economic environment in the country in question causing losses to the top 10 individual risks as at 1 April 2003 from differing non-aggregating causes. The following classes of business should be specifically included: political risks, contract frustration, aircraft repossession/CEND, credit risks and financial guarantee exempted classes. Relevant exposures within the property and cargo classes should be included. All political risk specific reinsurances should be added, together with other specifics as may be applicable, being war and/or cargo. Whole account reinsurances should be included as applicable.

9 Second Event

Syndicates should model a US windstorm comparable to Hurricane Andrew occurring shortly after an earthquake comparable to the Northridge earthquake. Syndicates should assume that these events fall in the same reinsurance year and that there has not been sufficient time between events to purchase additional reinsurance.

10 Alternative RDS: A

The syndicate should state two further realistic events not listed above for scenarios numbered 10 and 11. For example, syndicates with substantial exposures to a San Francisco earthquake event, a UK flood, or terrorism outside of Chicago/Manhattan could use the Alternative scenarios to model these events.

11 Alternative RDS: B

Further alternative scenario, as above.

12 Specific Event Based Scenarios – Florida Windstorm

Landfall: Florida (East coast)
Saffir Simpson¹ on landfall: Category 5

State	County	Direction	Saffir Simpson	Mean wind speed (mph)	Major towns
Florida	Dade	West	Category 4	147	Miami, Kendall
Florida	Monroe	West	Category 3	119	-
Florida	Broward	West	Category 3	111	Coral Springs, Fort Lauderdale
Florida	Collier	West	Category 2	100	East Naples
Florida	Palm Beach	West	Category 1	91	West Palm Beach, Belle Glade
Florida	All others		< Category 1	< 73	-

13 Specific Event Based Scenarios – Los Angeles Earthquake

Fault name: Santa Monica
Richter Magnitude¹: 7.5

State	County	Modified Mercalli Intensity ¹ (MMI)	Major towns
California	Los Angeles	8 - 9	Los Angeles, Long Beach, Pasadena, Burbank, Lancaster
California	Ventura	8 - 9	Ventura
California	Orange	6 - 7	Orange, Anaheim, Santa Ana, Costa Mesa
California	San Bernardino	6 - 7	San Bernardino, Barstow
California	Riverside	5 - 6	Riverside, Palm Springs, Hemet, Indio
California	San Diego	5 - 6	San Diego, Oceanside
California	Kern	5 - 6	Bakersfield
California	San Luis Obispo	5 - 6	San Luis Obispo
California	Santa Barbara	5 - 6	Santa Barbara, Santa Maria
California	All others	1 - 5	-

¹ Additional information on the specific events, along with an explanation of the Saffir Simpson, Richter, Moment Magnitude, and MMI scale, is available from Loss Modelling on x6496.

14 Specific Event Based Scenarios – New Madrid Earthquake

Seismic Zone: New Madrid
 Moment Magnitude²: 7.4

State	Counties	Modified Mercalli Intensity (MMI) ²
Arkansas	Craighead, Cross, Jackson, Mississippi, Poinsett	9 - 10
Arkansas	Clay, Crittenden, Greene, Lawrence, Lee, Monroe, St. Francis, Woodruff	8 - 9
Arkansas	Arkansas County, Independence, Lonoke, Phillips, Prairie, Randolph, White	7 - 8
Arkansas	Cleburne, Desha, Jefferson, Lincoln, Sharp	6 - 7
Arkansas	Baxter, Chicot, Cleveland, Conway, Drew, Faulkner, Fulton, Grant, Izard, Pulaski, Saline, Stone, Van Buren	5 - 6
Illinois	Alexander	6 - 7
Illinois	Massac, Pulaski	5 - 6
Kentucky	Carlisle, Fulton, Hickman	6 - 7
Kentucky	Ballard, Calloway, Graves, McCracken	5 - 6
Missouri	Dunklin, New Madrid, Pemiscot	8 - 9
Missouri	Butler, Mississippi, Ripley, Stoddard	7 - 8
Missouri	Scott	6 - 7
Missouri	Bollinger, Cape Girardeau, Carter, Howell, Oregon, Shannon, Wayne	5 - 6
Mississippi	Coahoma, De Soto, Quitman, Tate, Tunica	7 - 8
Mississippi	Benton, Bolivar, Marshall, Panola, Tallahatchie	6 - 7
Mississippi	Alcorn, Calhoun, Grenada, Humphreys, Lafayette, Leflore, Pontotoc, Sunflower, Tippah, Union, Washington, Yalobusha	5 - 6
Tennessee	Dyer, Lake, Lauderdale, Tipton	8 - 9
Tennessee	Crockett, Fayette, Gibson, Haywood, Obion, Shelby	7 - 8
Tennessee	Hardeman, Madison, Weakley	6 - 7
Tennessee	Carroll, Chester, Henderson, Henry, McNairy	5 - 6

The MMIs in this scenario are average values for the counties and have been grouped in steps of 1. The information is sorted by State, then by MMI group, followed by County.

² Additional information on the specific events, along with an explanation of the Saffir Simpson, Richter, Moment Magnitude, and MMI scale, is available from Loss Modelling on x6496.

15 Specific Event Based Scenarios – European Windstorm

Region: Northern Europe
 Peak Wind speed ³: 54 metres per second

Country	Area	Max Windspeed (m/s)
Belgium	All except Brussels	40-50
Belgium	Brussels	30-40
Denmark	All	30-40
France	Nord, Pas-de-Calais	40-50
France	Brittany, Loire, Ile-de-France, Central France	30-40
France	Rest of France	<30
Germany	Mecklenburg-Vorpommern, Niedersachsen, Schleswig-Holstein	40-50
Germany	Baden-Wurttemberg, Brandenburg, Bremen, Hamburg, Hessen, Nordheim-Westfalen, Rheinland-Pfalz, Saarland	30-40
Germany	Bayern, Berlin, Sachsen, Sachsen-Anhalt, Thuringen	20-30
Ireland	All	30-40
Luxembourg	All	30-40
Netherlands	Delta, Northern Netherlands	40-50
Netherlands	Central & Southern Netherlands	30-40
Norway	Atlantic & Southern Norway	20-30
Sweden	Southern Sweden	30-40
Sweden	Rest of Sweden	<30
UK	SW England	>50
UK	Rest of England, and Wales	40-50
UK	Scotland	30-40
UK	Northern Ireland	20-30

16 Specific Event Based Scenarios – Japanese Earthquake

Description: Based on Great Kanto event of 1923
 Moment Magnitude ³: 7.9

Prefecture	Modified Mercalli Intensity ³ (MMI)
Chiba, Kanagawa, Shizuoka	9 - 10
Saitama, Tokyo, Yamanashi	8 - 9
Gumma, Ibaraki, Nagano, Tochigi	7 - 8
Aichi, Gifu, Niigata	6 - 7
Fukui, Fukushima, Ishikawa, Mie, Shiga, Toyama	5 - 6

³ Additional information on the specific events, along with an explanation of the Saffir Simpson, Richter, Moment Magnitude, and MMI scale, is available from Loss Modelling on x6496.

17 Specific Event Based Scenarios - Terrorism

Assume both of the following terrorist events occur on the same day:

- i. An aircraft is hijacked after take-off, notwithstanding that all appropriate procedures and security checks were properly undertaken. It is flown into the Empire State Building in Manhattan, New York during mid-morning causing substantial collapse and thereby total loss of the main building, as well as damage to surrounding properties.
- ii. An aircraft is hijacked after take-off, notwithstanding that all appropriate procedures and security checks were properly undertaken. It is flown into the Sears Tower, Chicago, Illinois during mid-morning causing substantial collapse and thereby total loss of the main building, as well as damage to surrounding properties.

Syndicates should assume the following:

- The terrorist attacks fall within the definition of an “act of terrorism” as set out in TRIA, thus TRIA recoveries should be calculated, and entered under the new “Outwards R/I: TRIA Recoveries” business class of the RDS software. It is appreciated that, due to ambiguity in the terrorism act wording, some syndicates may have difficulty calculating their group deductible where affiliates are involved. Syndicates are therefore requested to outline their assumptions in the ‘Comments’ section of the software.
- The attack is classed as two occurrences.
- 1,000 blue/white collar worker deaths per building, as well as 250 passenger and 12 crew deaths per airline.
- Overland/underground transport systems are partially damaged, thus significant business interruption exposure for a period of 1 month.
- Property within 250m of the target is 25% damaged, and within 500m of the target is 10% damaged.⁴
- Amounts should be included for risks where US exposure is included to state or county level but without specific location or zip code information.
- There is no Nuclear, Biological or Chemical hazard exposure.
- Consideration should be given to other possible business classes affected, such as Contingent Business Interruption, and Specie/Fine Art.

⁴ Additional information on the specific events, including maps and zip codes affected, is available from Loss Modelling on x6496.

Guidance to completion of the RDS return

- a) A Specific Terrorism Scenario has been added. It is expected that syndicates will utilise the specific event information (e.g. zip code damage ratios) when producing their estimates. The results should be on a 'best-estimate' basis to allow the meaningful aggregation of the results at market level. For some syndicates or types of business (e.g. direct and retrocessional) this may be difficult and broad assumptions may be necessary. Maps and tables showing the zip codes affected are available from Loss Modelling on extension 6496.
- b) The Marine Scenario has been amended. Syndicates should select one scenario from the reduced list of two that would result in the highest net loss to the syndicate.
- c) For the five specific natural catastrophe events it is expected that syndicates will utilise the specific event information (e.g. location, path, intensity) when producing their estimates. The results should be on a 'best-estimate' basis to allow the meaningful aggregation of the results at market-level. For some syndicates or types of business (e.g. direct and retrocessional) this may be difficult and broad assumptions may be necessary.

For each peril, the location and magnitude of the event are given in Appendix I. Maps showing the path/location and the intensity of the specific catastrophes are available from Loss Modelling on extension 6496. Syndicates using catastrophe models should contact the respective modelling agency in the first instance. Letters were sent to all modelling agencies on 11 February 2003, providing the parameters necessary to model these events.

Syndicates should note the six aggregate types (numbered 7 to 12) which should be used for the specific events. These will enable Loss Modelling to gain an understanding of whether the losses have been calculated using modelling techniques, or by using a market share approach. If a syndicate's approach does not fall into either of these categories, then one of the generic aggregate types (numbered 1 to 6) should be used.

- d) Other than for the required minimum eight scenarios, syndicates are entitled to apply a materiality test to the returns. Where a prescribed scenario results in both a gross loss that is less than 10% and a net loss of less than 3% of stamp, then no return is required. A syndicate must satisfy both criteria so that in instances where a loss is less than 10% gross but more than 3% net, a return must still be made. The minimum eight scenarios should include the six specific scenarios and Second Event scenario - a 'nil return' facility is included within the software for the mandatory scenarios to simplify this process for those syndicates with no exposure.
- e) Syndicates should use the notes feature to discuss any material changes in methodology used to complete the RDS return. The software allows for notes at both scenario and a general level.
- f) Syndicates should continue to record stop loss recoveries on the RDS data screen and also use the general notes page of the return to explain the extent of any stop loss cover relied upon in scenarios, including details such as limits and the excess points. Syndicates should also indicate, using the reinsurer screen of the software, which reinsurers and related recoveries are stop loss recoveries. This may result in multiple entries for some reinsurers.

- g) Syndicates should complete the cash flow and funding screens, which can be accessed via each scenario screen. The cash flow screen should be completed for each scenario and syndicates should assume that year and quarter dates commence on the date of the loss. The funding screen should be completed for the scenario producing the largest cash deficit to the syndicate. When completing the funding details, percentages should be based on the largest cash deficit in a particular quarter.
- h) For the political risks scenario, syndicates should select the exposed country from a drop-down list. Alternatively, if syndicates are returning a scenario involving exposures in more than one country, then the 'other e.g. cross-border' option should be selected and details of the scenario should be provided in the notes section.
- i) Reinsurance recoveries should be broken down by reinsurer across each scenario submitted. To avoid reconciling recoveries to the last cent, syndicates are required to break down recoveries to at least 90% of the total reinsurance for each scenario.
- j) The latest set of LORS codes will be incorporated in the software prior to distribution. Should any security not appear on the listing, syndicates should first check the validity of their code with the LORS team or the broker, and then contact Loss Modelling on extension 6496.
- k) Syndicates are requested to complete the 'Date of Board Approval' field on the main form. This should be the date on which either the Board, or a sub-committee with delegated authority, approves the RDS return.
- l) In order to facilitate monitoring of the Related Parties regime set out under Regulatory Bulletin 081/99 dated 20 September 1999, syndicates are required to detail the business assumed from and ceded to related companies (as defined by the Lloyd's Act 1982). In previous versions of the software, syndicates were required to show related company business assumed as additional entries to any non-related class of business entries. This secondary entry is no longer required, as a 'related party %' field has been included on the class of business line of data. A related company indicator is still included on the reinsurance outwards detail section.
- m) A number of validation procedures are included within the software and will automatically run when syndicates begin to extract the data. Details of these checks can be found in the RDS software manual.