Market Bulletin



FROM:	Head of Risk Management	EXTN:	5355
DATE:	13 April 2005	REF:	Y3539
SUBJECT:	APRIL 2005 REALISTIC DISASTER S	CENARIO	DS
SUBJECT AREA(S):			
ATTACHMENTS:	Yes		
ACTION POINTS:	Managing Agents to complete RDS process set out in the attached Guidance and Instructions		
DEADLINE(S):	Noon on Wednesday 8th June 2005		

Attached to this bulletin is the 'Guidance and Instruction' pack for the April 2005 Realistic Disaster Scenario (RDS) exercise. This pack has been produced as a result of the completion of the two year project to overhaul Lloyd's RDSs.

The principal aim of the overhaul process has been to improve the consistency of syndicates' submissions, to aid the comparison of syndicates' risk profiles and to enhance the modelling of Lloyd's overall exposure to major catastrophes.

Lloyd's has worked closely with the Lloyd's Market Association ('LMA') and a number of Market Experts Groups, that have met over the last year to work with Lloyd's in the development of an improved approach to the assessment of aggregate exposures.

A number of key decisions have been taken by Lloyd's during the overhaul process that affect the reporting requirements placed on syndicates. In making these decisions, Lloyd's has sought to arrive at the appropriate balance between costs and benefits, and has consulted with representatives from the market at each stage. Lloyd's will continue to enhance the RDSs and will be moving towards adopting a probabilistic approach to modelling natural catastrophe risks during the next 12 to 18 months.

The revised RDS Reporting Software will be issued on 15th April 2005 and a series of RDS workshops has been organised during April. The aim of these workshops is to provide guidance to syndicates on the RDS software and process, to present worked examples on different loss calculations and to provide a forum for the discussion of the many issues pertaining to modelling potential losses. Those wishing to attend these workshops should contact Brenda Wostear (020 7327 5819 or <u>brenda.m.wostear@lloyds.com</u>).

Managing agents should complete the RDS returns by noon on Wednesday, 8th June 2005.

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 advisors, corporate members, recognised accountants and market associations, for information.

Stephen Manning Head of Risk Management

REALISTIC DISASTER SCENARIOS



Guidance and Instructions

April 2005



CONTACT DETAILS

Head of Risk Management

Loss Modelling

Stephen Manning 020 7327 5355 steve.t.manning@lloyds.com

James Orr 020 7327 6402 james.orr@lloyds.com

James Boyce 020 7327 6534 james.boyce@lloyds.com

Junsang (Sean) Choi 020 7327 6496 junsang.choi@lloyds.com

Matthew Warren 020 7327 6679 matthew.warren@lloyds.com

Trevor Maynard 020 7327 6141 trevor.maynard@lloyds.com

IT Support

Ash Shah 020 7327 6858 ashish.shah@lloyds.com

Cash Flow and Funding

Paul Coyle 020 7327 6882 paul.coyle@lloyds.com

CONTENTS

Introduc	etion	4
Guidanc	e and Instructions	6
Α	Definitions	6
В	Reporting Requirements	8
С	RDS Reporting Software	12
D	Calculation Principles	12
Е	Recommended Best Practice	13
F	Segmentation	15
G	Modelling Principles and Worked Examples	17
Scenario	os Subject to De-Minimis Test	32
1	USA Windstorm	32
2	Marine Event	33
3	North Sea – Loss of Major Complex	35
4	Aviation Collision	35
5	Major Risk Loss	35
6	Satellite Risks	36
7	Liability Risks	37
8	Political Risks	41
9	Alternative RDS: A	44
10	Alternative RDS: B	44
Compuls	sory Scenarios	45
11	Second Event	45
12	Florida Windstorm	47
13	California Earthquake	55
14	New Madrid Earthquake	63
15	European Windstorm	68
16	Japanese Earthquake	84
17	Terrorism	89
18	Gulf of Mexico Windstorm	94
19	Japanese Typhoon	108

Introduction

Objective	The objective of Lloyd's Realistic Disaster Scenario ('RDS') exercise is for syndicates to estimate the losses they would incur from a variety of hypothetical disaster scenarios, using consistent and appropriate methods and assumptions.
	The RDS exercise should be viewed in the context of Lloyd's key Franchise objective 'to create and maintain a commercial environment at Lloyd's in which the long term return to all capital providers is maximised'. The principal aim of the exercise is to manage the security of Lloyd's for aggregating catastrophes and other large losses.
RDS Overhaul	This 'Guidance and Instructions' pack for the April 2005 RDS exercise marks the completion of a two year project to overhaul Lloyd's RDSs. The principal aim of the overhaul process has been to improve the consistency of syndicates' submissions, to aid the comparison of syndicates' risk profiles and to enhance the modelling of Lloyd's overall exposure to major catastrophes.
	Lloyd's has worked closely with the Lloyd's Market Association ('LMA') and a number of 'Market Experts Groups' in the development of an improved approach to the assessment of aggregate exposures. The assistance of the individuals involved and the support of their respective organisations has been invaluable and their contribution is greatly appreciated.
	A number of key decisions have been taken by Lloyd's during the overhaul process that will affect the reporting requirements placed on syndicates. In making these decisions, Lloyd's has sought to arrive at the appropriate balance between costs and benefits, and has consulted with representatives from the market at each stage. Lloyd's will continue to enhance the RDSs and will be moving towards adopting a probabilistic approach to modelling natural catastrophe risks during the next 12 to 18 months.
	A number of Lloyd's syndicates are already at the cutting edge of loss modelling within the insurance industry. The overhaul process has sought to capture the 'good practice' principles and methodologies used by these syndicates, and to raise loss modelling standards within the market as a whole, through the RDS recommendations and reporting requirements.
	The overhaul process has also highlighted the importance of working with consistent terminology. A set of definitions is included in section A of this document. The guidance also highlights the need for syndicates to obtain high quality data and to pay particular regard to sources of uncertainty when modelling their exposures.
Use of the Results	The loss estimates resulting from the RDS exercise provide a stress test of syndicates' exposures to aggregating catastrophes and large individual loss events, as well as information on the sources of anticipated reinsurance recoveries. These measurements are used as part of the Individual Capital Assessment process, in assessing compliance with the Franchise Guidelines and in identifying potential reliance on individual reinsurers. Through aggregating losses from particular events, the overall risk exposure of the market can also be assessed, which links into the capitalisation of Llovd's.

The analysis also extends to the consideration of cash flow and liquidity modelling, which are critical in the understanding of a syndicate's resilience to a major loss event.

RDS Workshops

A series of RDS workshops has been organised for 13, 14 and 15 April 2005. Specialist workshops for Offshore Energy Risks and Liability Risks have also been organised for 20 and 22 April 2005 respectively. The aim of these workshops is to provide guidance to syndicates on the revised RDS process, to present worked examples on different loss calculations and to provide a forum for the discussion of the many issues pertaining to modelling potential losses.

Details of these workshops have been publicised via the LMA and those wishing to attend should contact Brenda Wostear (020 7327 5819 or brenda.m.wostear@lloyds.com) to book a place.

Guidance and Instructions

A DEFINITIONS

Insured Value	The Insured Value is the total value of the underlying asset (or activity, for example, in the case of Business Interruption insurance) that is covered by the syndicate by way of insurance and/or reinsurance. This figure is determined before the application of policy or treaty limitations on cover, such as coinsurance, deductibles or limits. The Insured Value is also referred to as the Total Insured Value or 'TIV'.
Footprint	The Footprint refers to the geographical or physical extent of a RDS event. Only Insured Values inside the Footprint will be assumed to be affected for the purpose of the RDS calculations.
Aggregate (reported item)	The Aggregate is the sum of exposed Insured Values inside the Footprint, having taken the syndicate's participations and contract terms into consideration. This figure should correspond to the maximum Gross Loss that could be incurred in the situation where 100% of the Insured Values within the Footprint were destroyed.
	It should be noted that the Aggregate will vary according to the zones that are used to define the Footprint (i.e. a Footprint defined using zip-codes may give a different answer to one defined at County Level).
Ground-up Loss	In the context of physical property insurance, the Ground-up Loss is the expected value of the damage from the RDS event, expressed in terms of Insured Value, before the application of any policy or treaty limitations on cover, such as coinsurance, deductibles and limits.
Gross Loss (reported item)	The Gross Loss is the expected value of the loss arising from the damage to the Insured Value from the RDS event, after the application of syndicate participations and policy or treaty limitations on cover, such as coinsurance, deductibles and limits.
Net Loss	The Net Loss is the expected value of the loss from the RDS event after reinsurance recoveries, but before Reinstatement Premiums have been paid and received.
Inwards Reinstatement Premiums (reported item)	The Inwards Reinstatement Premiums are the premiums that would be expected to be received following the loss from the RDS event, in order to reinstate the cedant's reinsurance protections affected by the loss.
Outwards Reinstatement Premiums (reported item)	The Outwards Reinstatement Premiums are the premiums that would be expected to be paid following the loss from the RDS event, in order to reinstate the syndicate's reinsurance protections affected by the loss.
Final Net Loss	The Final Net Loss is the expected value of the loss from the RDS event after reinsurance recoveries have been received and Reinstatement Premiums have been paid and received.

Damage Ratio	The Damage Ratio is the average proportion of the Insured Value that is damaged in the RDS event. This might be determined as the ratio of the Ground-up Loss to the Insured Value.
Probable Maximum Loss ('PML')	The term 'PML' has a number of possible meanings and its application can be the source of confusion.
	In the assessment of losses from a possible property fire, reasonable judgements can be made as to the proportion of the total value that will be destroyed, with reference to fire protection and compartmentalisation provisions such as fire breaks and fire doors. In these circumstances, a 'PML' can be determined with reference to the number of compartments within a property that might be affected by a fire.
	However, for most scenarios, the assumption that there are physical limitations on the extent of damage is questionable. It is therefore recommended that the term 'PML' should only be used in limited circumstances, where there are physical constraints on the level of damage that may be incurred.
Industry Loss	The assumptions for some of the RDSs include the level of Insured Industry Loss that relates to an event. These figures provide guidance on the scale of event that should be considered and can be used in 'Market Share' loss estimation methodologies.
Insurable Industry Loss	The Insurable Industry Loss figure is defined as the total loss that would have been borne by the insurance industry if there had been a 100% take-up of insurance.
Insured Industry Loss	The Insured Industry Loss figure is defined as the total loss borne by the insurance industry having taken account of the actual Take-up Rate for insurance.
Take-up Rate	In assessing the total losses that will be borne by the insurance industry for a particular event, it is necessary to estimate the proportion of potential losses that are actually insured, and the Take-up Rate describes this relationship. For instance, residential insurance Take-up Rates for earthquake cover in California are known to be low, but are high for windstorm protection in Florida.

B REPORTING REQUIREMENTS

Date of Exercise	Loss calcula protections i reinsurance account in th	ations should be based on exposures and unutilised reinsurance in place at 1 April 2005. Any live exposures and any relevant remaining from prior years of account should be taken into the loss calculations.
Date of Board Approval	For each syr Board Appro page 12). Th managing ag RDS submis	ndicate, managing agents are required to complete the Date of oval field on the Main Screen in the RDS Reporting Software (see his should be the date on which the board of directors of the gent, or a sub-committee with delegated authority, approves the sion on behalf of the managed syndicate.
Reporting Deadline	All RDS retu	rns must be submitted by noon on Wednesday, 8 June 2005.
Compulsory RDSs	Nine of the r	nineteen RDSs must be completed by all syndicates. These are:
	Number	RDS
	11	Second Event (i.e. an 'Andrew' hurricane in the immediate aftermath of a 'Northridge' earthquake)
	12	Florida Windstorm (comprising two separate events)
	13	California Earthquake (comprising two separate events)
	14	New Madrid Earthquake (comprising an RDS and an 'Extreme Stress Scenario' ('ESS'))
	15	European Windstorm
	16	Japanese Earthquake
	17	Terrorism
	18	Gulf of Mexico Windstorm
	19	Japanese Typhoon
	There is no ' syndicate ha submit a 'nil	de-minimis' reporting level for the nine compulsory RDSs. If a as no exposure to a compulsory event its managing agent should ' return.
Minimum Number of RDSs	All syndicate nine compul scenarios do syndicates a page 44).	es must complete a minimum of eleven scenarios (including the sory RDSs described above). Where the suggested optional o not generate a loss above the 'de-minimis' reporting level, are recommended to use the Alternative A & B scenarios (see
'De-minimis' Reporting Level	Syndicates r Loss of less	need not include an optional scenario that results in both a Gross than 10% and a Net Loss of less than 3% of their 2005 capacity.
Syndicates in 'Run-off'	Syndicates t to the same	hat are no longer active, but still have live exposures, are subject reporting requirements as active syndicates.

Capacity Quoted Net of Qualifying Quota Shares	Capacity should be stated net of any Qualifying Quota Share ('QQS') facility.
Aggregate to include QQS	Aggregate exposure data should include exposures written under an insured QQS agreement.
Reporting QQS Recoveries	Recoveries relating to a QQS agreement should be shown on the 'Exposures' screen under a separate recovery class – 'Outwards R/I – Qualifying Quota Share'.
Breakdown of Reinsurance Recoveries	Syndicates are required to provide a breakdown, by reinsurer, of their anticipated reinsurance recoveries for each event. The figures should reconcile to at least 90% of the anticipated recoveries for both facultative and treaty (including stop loss) protections.
	The latest set of Lloyd's Outwards Reinsurance System (LORS) codes will be incorporated within the RDS Reporting Software prior to distribution. Should any security not appear on the listing, syndicates should first check the validity of the code with the LORS team or their broker, and then contact the Loss Modelling department (details are at the front of this document).
Reporting Stop Loss Protections	Syndicates should record their stop loss recoveries on the 'Exposures' screen, using the 'Stop Loss' option within the 'Placement Type' categories. The commentary facility should be used to explain the extent of any stop loss cover relied upon in the scenarios, including details such as limits and excess points.
	The 'Reinsurance' screen includes a separate 'Stop Loss' column, in addition to the 'Facultative' and 'Treaty' recoveries fields. The figures entered in the 'Treaty' field should exclude any 'Stop Loss' recoveries that are reported separately.
Related Parties	Managing agents are required to continue to detail the business assumed from and ceded to related companies as defined in the guidelines attached to market bulletin number Y3359 of 23 July 2004.
Reporting Cash Flow Profile Estimates	Syndicates should complete the 'Cash Flow' screen for each event. Syndicates should assume that year and quarter dates commence on the date of the loss, 1 April 2005. When completing cash flow details, percentages should be based on the largest cash deficit in a particular quarter.
Reporting Anticipated Sources of Funding	Syndicates should complete the 'Funding' screen for the event producing the largest cash deficit.
Overview of Returns	The following two diagrams describe the relationship between the different reported items and provide an outline of a syndicate's RDS return.

RELATIONSHIP BETWEEN REPORTED ITEMS



OUTLINE OF SYNDICATE RETURN



C RDS REPORTING SOFTWARE

Software Screens

Syndicates' returns should be submitted using the RDS Reporting Software. There are seven entry screens:

Screen	Description
Main Screen	to enter the syndicate number and confirm the date of Board sign-off
Scenarios / Events	to select scenarios and events that will be reported
Exposures	to enter loss details (specifically Aggregate, Gross Loss, Reinsurance Recoveries and Reinstatement Premiums) at 'Class of Business' and 'Placement Type' level
Reinsurance	to enter the breakdown of reinsurance recoveries by reinsurer
Cash Flow	to enter the expected cash flow profile for each event
Funding	to enter the anticipated sources of funding for the event that produces the largest cash deficit
Capacity + Notes	to enter capacity and comments on the syndicate's return

Software Release and Distribution

The software will be available to download from the Market Reporting website on 15 April 2005.

The download will also contain a manual for the software. Additional guidance on the use of the software will be given in the RDS workshops.

D CALCULATION PRINCIPLES

Reporting the Expected Value of Losses	There is a range of possible outcomes (i.e. loss levels) that might arise on the occurrence of an RDS event. The reported loss figure should correspond to the expected (average) value of this range of possible outcomes.
Following an Auditable Process	In producing loss estimates, syndicates should follow an auditable process that allows the reproduction of the results and that will stand up to review by Lloyd's or other parties.
Identification of Key Assumptions	Syndicates should identify the key assumptions in their calculations, particularly those based on subjective judgements. Where their impact is material, assumptions should be reported using the commentary facility in the RDS Reporting Software.

Considering All Lines Catastrophes have the potential to impact many different lines of business of **Business**

Use of Loss Modelling Software for RDS Returns and this should be recognised in considering the impact of an RDS event.

Syndicates may use catastrophe loss modelling software, as produced by AIR, EQECAT or RMS, to model their expected loss exposures. Lloyd's recognises results produced through the appropriate use of these packages for submission under the RDS exercise, provided that the reporting requirements within the RDS Reporting Software are met and that all relevant exposures and lines of business are included in the return.

'Best Estimate' Basis In estimating the expected value of the range of possible outcomes, syndicates should choose the most reasonable 'Best Estimate' value, which corresponds to neither an optimistic (low loss) nor a pessimistic (high loss) view.

RECOMMENDED BEST PRACTICE E

Segmenting Data	Where practical, exposure data should be organised into homogeneous groups that can be treated as having common characteristics and to which similar methodologies and assumptions might be applied. The 'Class of Business' and 'Placement Type' categories described in section F (see pages 15 and 16) provide a guide to the segmentation that might be applied.
Allocation of Exposures within Footprints	Not all data on Insured Values is sufficient to identify whether exposures lie within the Footprint of an RDS event. However, it is recommended that decisions should be taken as to which exposures lie within a Footprint before calculating the Aggregate for a particular RDS event. This might involve the application of average industry exposure figures (examples of which are included in the assumptions for the Aggregating Compulsory RDSs) or judgements about which key exposures lie within the Footprint.
	By following this practice, the Aggregate figures provided by managing agents will be determined on a more consistent basis. Syndicates are asked to pay particular regard to the definition of Aggregate in Section A (see page 6).
Appropriate Use of Conservative Assumptions	Where a component of the loss estimation process is subject to a great deal of uncertainty, say in the absence of any underlying exposure data, syndicates should adopt a conservative (i.e. pessimistic) approach to setting their assumptions and should record this using the commentary facility in the RDS Reporting Software.
Involving Underwriting and Other Experts	The estimation process should include input from underwriting, claims and other personnel. For instance, focused reviews of contract / treaty terms might be carried out on the largest components of the loss estimates. These reviews might identify that event sub-limits or occurrence limits will have a significant impact on the loss payable by the syndicate.

Allocation of Effort	It is recognised that an exhaustive analysis of every element of the RDS process is impossible. Nevertheless, syndicates should identify the most material components of their estimates, allocating effort accordingly and detailing their assumptions using the commentary facility in the RDS Reporting Software.
Consideration of Uncertainties	The loss modelling process will comprise a number of assumptions, choices of methodologies and subjective assessments (e.g. concerning the performance of reinsurance contracts). These decisions are often made in response to incomplete data concerning exposures or the events themselves. Syndicates should consider the potential sources of uncertainty in their calculations and satisfy themselves that the allocation of effort and the control of the calculation process are consistent with regard to these different sources of uncertainty.
Recognising Volatility in Calculating Expected Losses to Layers	Loss estimates will be based on the expected value of a range of possible outcomes for a given RDS event. It should be recognised, therefore, that Ground-up Losses can occur that are significantly in excess of their expected value. As a result, a given RDS event can generate losses to insurance and reinsurance layers set above the expected loss level (e.g. a contract with an expected Ground-up Loss of £5m, providing cover of £5m xs £5m, would have a non-zero expected loss).
	Recommended methodologies that can be used to assess the impact of the above volatility are illustrated in section G (see pages 17 to 29).
Using Alternative Methodologies	Alternative methodologies should be used to provide a check on loss estimates. These might include 'Market Share' or 'Maximum Line Size' methods, as described below.
'Market Share' Loss Estimation	In the absence of adequate exposure data, it may be necessary to estimate Gross Losses by considering the proportion of the total Industry Loss that will be borne by the syndicate. This proportion might be determined with reference to exposure estimates, historical loss experience or the share of total market premium income received. The usual method, especially for lines like workers compensation, is with reference to premium income.
'Maximum Line Size' Loss Estimation	An alternative approach to estimating losses, in the absence of adequate exposure data, might be to base loss estimates on the specific terms of the contract or treaty. Examples where this might be used include 'Per Risk Excess of Loss' and 'Liability' contracts.
	In using this approach, typical Gross Loss estimates will assume the total exhaustion of the relevant policy or treaty limits. Particular regard should be paid to occurrence and peril sub-limits in this context. Partial exhaustion of limits may be justified with reference to historical losses or market share data. Where material to the final result, the methodology and assumptions used should be described using the commentary facility in the RDS Reporting Software.

F SEGMENTATION

Purpose	The 'Class of Business' and 'Placement Type' segmentation categories provide guidance to syndicates as to the approach that might be taken to identifying the similar (homogeneous) groupings of exposures that should be analysed in estimating losses. The segmentation may also help in structuring the auditable process that syndicates should follow.
Application	In completing the 'Exposure' screen in the RDS Reporting Software, syndicates should select the appropriate 'Class of Business' and 'Placement Type' for each reported segment of the RDS event loss. Where it is unclear which categories should be used, syndicates should select the best available combination and report this using the commentary facility in the RDS Reporting Software.
Level of Reporting	Many of the categories are subgroups of other categories (e.g. Specie / Fine Art is a subgroup of Property). Syndicates are asked to report at the finest, practical level of detail, without recourse to an arbitrary allocation of exposures and losses between lines of business. 'Specie / Fine Art' loss figures, for example, need only be reported separately if the analysis is actually carried out at that level. The highlighted 'Class of Business' categories overleaf represent the minimum level of detail that should be reported.
	It is recognised that some syndicates may only be able to make use of the higher level groupings. As for 2004, Lloyd's will not draw any conclusions about the total exposure in the market for the detailed classes, but would ask syndicates to provide this level of data wherever possible as it indicates where exposures may be concentrated.
	Lloyd's will continue to work with the market to improve the analysis of exposures at subgroup level.
2005 Reporting Categories	The reporting categories overleaf should be used for the April 2005 RDS exercise.

Classes of Business	Aviation	Property Physical Loss or Damage
	Aviation Hull	Agricultural Crop
	Aviation War	Business Interruption
	Aviation Liability	Commercial
	Aviation Premises Liability	Engineering
	Aviation Products Liability	Jewellers Block
	Energy Liability, inc. Pollution	Livestock/Bloodstock
	and ROW	Mortgage Impairment
	Energy Property Damage	Motor FTC
	Energy OEE/COW	Motor Physical Damage
	Energy Offshore	Nuclear Property Damage
	Energy Onshore	Residential
	General/Miscellaneous Liability	Specie/Fine Art
	Bankers	RI Outwards
	Contingency/Pecuniary Loss	RI Outwards – Qualifying Quota
	D&O	Share
	Extended Warranty	Reinstatement Premium
	Financial Guarantee	Protection
	PI/E&O	Third Party Legal Liability
	Non-Marine Liability	TRIA Recoveries
	Life/Personal Accident/Medical	Space
	Expenses	Space Launch
	Medical Malpractice	Space Operating
	Marine	Terrorism
	Marine Cargo	Workers Comp/Employers Liability
	Marine Hull	Commercial BITC
	Marine War	Personal Ston Loss
	Marine Liability	Political Risks
	Property Liability	Contract Frustration
	Motor Liability	Betrocession
	Nuclear Liability	Whole Account
		whole Account
Placement Types	Binders/Line Slip	Risk XS
	Cat XL	Stop Loss
	Direct & Facultative	General/Unspecified
	Proportional	
Modelling Types	Syndicates will also need to record the	approach taken to modelling the loss
	estimate for each segment, using the for	ollowing categories.
	Market Share	Modelled (EOECAT)
	Market Share	Modelled (RMS)
	Promium Dorivod	Modelled Internally
	Modelled (AIR)	modelled internally
	Where the 'Modelled Internally' categor	ry has been selected, the modelling
	basis (e.g. by applying Lloyd's published	ed Damage Factors) should be
	described using the commentary facilit	y in the RDS Reporting Software.

G MODELLING PRINCIPLES AND WORKED EXAMPLES

The calculation principles and recommended best practice set out in sections D and E should be followed in calculating loss estimates for all RDSs.

The following worked examples illustrate the different approaches that can be taken to estimate the losses from an RDS event. The examples are based on property insurance contracts, with assumptions similar to those prescribed for the Aggregating Compulsory RDSs, detailed on pages 47 to 112. The principles and practices described are, however, applicable to a wide range of business classes.

Syndicates that use loss modelling software supplied by AIR, EQECAT or RMS have the option to make use of results for identified events within the event catalogues of those companies. However, in doing this, they must be satisfied that they have captured all of the affected exposures and lines of business in their return.

WORKED EXAMPLES

Purpose

Example Insured Properties

	сомм	ERCIAL	RESIDE	ENTIAL
COUNTY	ID	TIV	ID	TIV
x	C1 C2 C3	100 80 60	R1 R2 R3 R4 R5 R6	50 40 30 20 10 5
Y	C4 C5 C6	100 60 60	R7 R8 R9 R10 R11 R12	20 10 10 5 2 2
z	C7 C8 C9	80 50 40	R13 R14 R15 R16 R17 R18	20 20 10 2 2 2

Worked examples have been provided to illustrate the approaches that syndicates might adopt in calculating their loss estimates.

The worked examples are based on a simplified event, affecting three counties: X, Y, and Z.

Loss estimates are calculated for several theoretical contracts that cover the insured properties in the table opposite.

The insured properties have been separated by county and occupancy type.

TIVs, or Total Insured Values, in these examples are assumed to comprise Building Value, Contents Value, and Business Interruption / Additional Living Expenses Values.

In these examples, only TIVs will be considered.

An example event has been devised and the event description can be seen in the following table :

Event Description

GROUND-UP DAMAGE F	COUNTRY			
		х	Y	z
	RESIDENTIAL	20%	10%	2%
	COMMERCIAL	10%	5%	1%

The worked examples deal with several methods that can be used in the calculation of loss estimates. Alternative methods to those demonstrated can be used.

The majority of the methods use the Expected Ground-up Loss as the basis for the calculation. This can be calculated as the product of the Insured Value and a damage factor :

TIV x DAMAGE = EXPECTED FACTOR = GROUND-UP LOSS

Once the Expected Ground-Up Loss has been calculated, there are several approaches that can be used to calculate an estimate for the loss to the contract. Essentially, these methods are concerned with assessing the proportion of the expected Ground-up Loss that will fall within the contract layer. To do this, assumptions are made as to the distribution of values that the actual loss might take. Alternatively, a 'first loss' curve can be used to estimate the effect of the deductible and limit.

MODELLED INTERNALLY METHODOLOGIES





Range of possible outcomes When one of the following methodologies is used by syndicates to calculate a loss estimate, they should report the result in the RDS Reporting Software using the 'Modelled Internally' modelling type.

The principle behind this method is to assume that all outcomes generate a loss equal to the expected loss (i.e. there is no spread of possible values).

This is the simplest method, where the Expected Ground-up Loss is determined, and then contract limits and deductibles are applied to that value, as illustrated.

The process to calculate the loss estimate is as follows :

Define the Expected Ground-up Loss as EGUL, and then

Calculate:

EGUL – DEDUCTIBLE

If this is less than zero then, the loss estimate is zero. If not, then this needs to be compared with the limit, and the loss estimate is the lesser of the two values.

By defining the deductible as D, and the limit as L, the estimate of loss to a contract is equal to :

MIN(MAX(EGUL-D,0),L)

For a typical contract, it is important to consider the potential maximum value that a syndicate could be exposed to.

If the TIV is below the deductible then no loss can arise to the contract. If the TIV is above the deductible then the potential loss is equal to the difference, subject to the limit for the contract, as expressed in the following equation :

EXPOSED VALUE = MIN(MAX(TIV-D,0),L)

Exposed Values





Range of possible outcomes





outcomes

The principle behind this method is to assume that a risk either experiences a total loss or zero loss, therefore the Expected Ground-up Loss (EGUL) is equal to :

EGUL = TIV x P(Total Loss) + 0 x P(Zero Loss)

From the equation above, the probability of a total loss is equal to :

P(Total Loss) = EGUL / TIV

If the Expected Ground-up Loss has been calculated as :

TIV x DAMAGE = EXPECTED FACTOR = GROUND-UP LOSS

The formula for the probability of total loss can then be determined to be :

P(Total Loss) = DAMAGE FACTOR

If the TIV is less than the deductible, the loss estimate is zero.

The loss estimate is the area of the rectangle defined by the exposed values and the probability of a total loss. This area is equal to :

EXPOSED VALUE x P(Total Loss)

Substituting this into the equation for the loss estimate gives the following expression for the loss estimate :

EXPOSED VALUE x DAMAGE FACTOR

In the previous method, loss was distributed between two values (zero loss or total loss). It is extremely unlikely that these are the only two loss values that could be observed. The Spike method assumes that the value of the loss could be any value between the Total Insured Value and zero.

Ideally, the distribution of the potential losses would be known, and a loss estimate could be calculated from this distribution. The actual distribution of potential loss values is difficult to ascertain and is simplified by a decreasing, linear distribution in the Spike method, as illustrated in the diagram opposite.

The loss estimate returned using this methodology is the area indicated in the diagram.

The area shaded in the diagram can be calculated to be the area of the triangle above the deductible less the area of the triangle above the deductible and limit.

Taking into consideration that the Insured Value may be less than the deductible and the limit, this area can be derived as :



Variation of Methods

The methods described above are all simple approximations of the actual distribution of loss around the Expected Ground-up Loss.

The methods used can be adapted to use different distributions.

For many risks, it is unrealistic for the maximum possible loss to be the Total Insured Value. In circumstances such as these, it is possible to replace the TIV in the formula with an estimate of the maximum possible loss.

By adapting the methods in this way, it is possible to adjust the calculation to reflect the characteristics of the contract. This can be seen below for the Spike method, where a lower maximum possible loss affects the magnitude of the loss estimate.



The possible reduction in the maximum possible loss has increased the area of the region bounded by the deductible and limit.

This reduction in the maximum possible loss would also have an affect on the 'Zero or Total' Loss method.

The principle of this method is to assume a distribution for the range of possible values with a mean equal to the Expected Ground-up Loss. This method samples values from that distribution which commonly has a standard deviation that is based on the mean, e.g. three times the mean.

Syndicates should first calculate the Expected Ground-up Loss. An appropriate distribution (producing non-negative values only) should then be selected and parameterised to have a mean equal to the Expected Ground-up Loss and an appropriate standard deviation. Possible distributions include the Beta, Gamma, Log Normal and the Truncated Normal (constrained to values above zero). A number of Ground-up Loss values should then be simulated.

Syndicates should then calculate the loss to the contract for each of the values sampled from the distribution. The loss estimate will then be the average of these.

OTHER MODELLING METHODS

Method 5 : 'Maximum Line' An alternative approach to estimating losses, in the absence of adequate exposure data, might be to base loss estimates on the specific terms of the contract or treaty. Examples where this might be used include 'Per Risk Excess of Loss' and 'Liability' contracts.

Method 4: Stochastic Sampling In using this approach, typical Gross Loss estimates will assume the total exhaustion of the relevant policy or treaty limits. Particular regard should be paid to occurrence and peril sub-limits in this context. Partial exhaustion of limits may be justified with reference to historical losses, market share data or Expected Ground-up Loss estimates. Where material to the final result, the methodology and assumptions used should be described using the commentary facility in the RDS Reporting Software.

Method 6 : 'Market Share' In the absence of adequate exposure data, it may be necessary to estimate Gross Losses by considering the proportion of the total industry loss that will be borne by the syndicate. This proportion might be determined with reference to historical loss experience or the share of total market premium income received.

This method is applicable where there is a wide distribution of homogeneous exposures, say from a direct residential or workers compensation book. Business accepted through a binder or proportional reinsurance treaty might also be assessed using this method.

EXAMPLE CONTRACTS The following sections apply the illustrated methods to a variety of contract types.

All calculations use the Damage Factors from the example event, shown in the table opposite.

Event Description

GROUND-UP DAMAGE FA	COUNTRY			
		х	Y	Z
Γ	RESIDENTIAL	20%	10%	2%
	COMMERCIAL	10%	5%	1%

DIRECT & FACULTATIVE EXAMPLE

D & F EXAMPLE CONTRAC	T:
INSURED PROPERTY	C1
COMMERCIAL	
TIV in X	100
TIV in Y	0
TIV in Z	0
TOTAL COMMERCIAL	100
RESIDENTIAL	
TIV in X	0
TIV in Y	0
TIV in Z	0
TOTAL RESIDENTIAL	0
TOTAL INSURED VALUE	100
DEDUCTIBLE LIMITS	20 30

The Direct & Facultative example contract (shown opposite) is a 30 xs 20 contract that covers property C1.

Property C1 is a commercial property located in county X with an Insured Value of 100.

The event description provides a damage factor for commercial property in county X of 10%.

The Expected Ground-up Loss can be determined as :

 $100 \times 10\% = 10$

Bathwater Estimate	The Expected Ground-up Loss can be seen to be less than the contract deductible, so there will be no loss to the contract if this method is used.
Zero or Total Loss Estimate	The Zero or Total Loss formula is :
	EXPOSED VALUE X DAMAGE FACTOR
	In this case the Insured Value is greater than the deductible and the limit, so the limit should be used in the Zero or Total Loss formula. Therefore, the loss estimate is equal to :
	30 x 10% = 3
Spike Method Estimate	In this example, the Insured Value is greater than the deductible and the sum of the deductible and limit.
	The Spike method formula is :
	EGUL x [((TIV-D)/TIV) ² – ((TIV-D-L)/TIV) ²]
	Inputting the values from the contract, the formula becomes :
	= 10 x [((100-20)/100) ² - ((100-20-30)/100) ²]
	= 3.9
Stochastic Sampling	The Expected Ground-up Loss estimate is 10. Sampling from a distribution with a mean and standard deviation based on the Expected Ground-up Loss could produce the following 20 values :
	6, 29, 5, 0, 7, 1, 0, 40, 0, 0, 61, 1, 0, 31, 46, 0, 0, 1, 1, 18
	Applying the contract terms on each value produces the following values :
	0, 9, 0, 0, 0, 0, 0, 20, 0, 0, 30, 0, 0, 11, 26, 0, 0, 0, 0, 0
	which have an average of : 4.8
	which is the loss estimate for this method.
Maximum Line	For this contract, there is adequate data available to calculate a loss estimate by other means; however, a maximum line estimate can still be calculated.
	The limit for this contract is 30, which is the initial estimate of the loss to the contract.
	The syndicate should then consider whether the implicit assumption of a Ground-up Loss of at least 50 is reasonable.
Market Share	This method should not be used for a single risk.

Summary

Summarised below is the range of possible outcomes in respect of this example :

EXPECTED GROUND-UP LOSS	10.0
LOSS ESTIMATES	
BATHWATER	0.0
ZERO OR TOTAL LOSS	3.0
SPIKE METHOD	3.9
STOCHASTIC SAMPLING	4.8

BINDING AUTHORITY EXAMPLE

CONTRACT	
INSURED PROPERTY	ALL RESIDENTIAL
COMMERCIAL	
TIV in X	0
TIV in Y	0
TIV in Z	0
TOTAL COMMERCIAL	0
RESIDENTIAL	
TIV in X	155
TIV in Y	49
TIV in Z	56
TOTAL RESIDENTIAL	260
TOTAL INSURED VALUE	260
DEDUCTIBLES PER RISK	1

BINDER EXAMPLE

The example Binding Authority ('Binder') contract is shown opposite, with a deductible of 1 per risk covered. There are no individual limits for each risk.

The binder covers residential property in counties X, Y, and Z.

The contract has deductibles that are applied to individual risks. Therefore, it is necessary to calculate the loss estimate for each risk in turn, then sum the results to produce a loss estimate for the contract.

The first step is to calculate the Expected Ground-up Loss for each risk. This is shown in the table below :

	ID	τιν		DAMAGE FACTOR		EXPECTED GROUND-UP LOSS
	R1	50	х	20%	=	10
	R2	40	х	20%	=	8
Х	R3	30	х	20%	=	6
	R4	20	х	20%	=	4
	R5	10	х	20%	=	2
	R6	5	х	20%	=	1
	R7	20	х	10%	=	2
	R8	10	х	10%	=	1
Y	R9	10	х	10%	=	1
	R10	5	х	10%	=	0.5
	R11	2	х	10%	=	0.2
	R12	2	х	10%	=	0.2
	R13	20	х	2%	=	0.4
	R14	20	х	2%	=	0.4
Z	R15	10	х	2%	=	0.02
	R16	2	х	2%	=	0.04
	R17	2	х	2%	=	0.04
	R18	2	х	2%	=	0.04

Summing the Expected Ground-up Loss column produces the Expected Ground-up Loss for the Binder of 37.

Bathwater Estimate

As the deductibles are per risk, the estimate needs to be calculated per risk as shown in the following table :

	ID	EXPECTED GROUND-UP LOSS	I	DEDUCTIBLE	E	LOSS ESTIMATE
	R1	10	_	1	=	9
	R2	8	_	1	=	7
Х	R3	6	_	1	=	5
	R4	4	—	1	=	3
	R5	2	—	1	=	1
	R6	1	-	1	=	0
	R7	2	_	1	=	1
	R8	1	_	1	=	0
Y	R9	1	_	1	=	0
	R10	0.5	—	1	=	0
	R11	0.2	—	1	=	0
	R12	0.2	—	1	=	0
	R13	0.4	_	1	=	0
	R14	0.4	—	1	=	0
Z	R15	0.2	—	1	=	0
	R16	0.04	-	1	=	0
	R17	0.04	_	1	=	0
	R18	0.04	-	1	=	0

Where the expression for the loss estimate produces a negative result, the loss estimate is zero.

Summing the Loss Estimate column produces a loss to the contract of 26.

Other MethodsOther methods such as the Zero or Total Loss and Spike methods might be
used, but their impact is unlikely to justify the additional effort, given the low
deductible and absence of a per risk limit.

Also, given the homogeneous nature of most Binders, particularly residential properties, a Market Share method may be appropriate.

Summarised below is the range of possible outcomes in respect of this example :

EXPECTED GROUND-UP LOSS	37.0
LOSS ESTIMATE	
BATHWATER	26.0

Summary

CATASTROPHIC EXCESS OF LOSS EXAMPLE

CAT XL EXAMPLE CONTRACT

	in the example insured properties.
ALL INSURED PROPERTY COMMERCIAL COMMERCIAL TIV in X 240 TIV in Y 200	The deductibles and limits apply to the contract as a whole, so the methodologies should be applied to the portfolio rather than to each individual risk.
TIV in Y 220 TIV in Z 170 TOTAL COMMERCIAL 630	The Expected Ground-up Loss can be calculated by applying county Damage Factors to the Insured Values of each county.
TIV in X 0 TIV in X 0 TIV in Y 0 TOTAL RESIDENTIAL 0 TOTAL INSURED VALUE 630 CONTRACT DEDUCTIBLE 250 CONTRACT LIMITS 250	 The Expected Ground-up Loss, EGUL, can be determined as : TIVS IN X × COUNTY X DAMAGE FACTOR TIVS IN Y × COUNTY Y DAMAGE FACTOR TIVS IN Z × COUNTY Z DAMAGE FACTOR = 240 × 10% + 220 × 5% + 170 × 1% = 36.7
Bathwater Estimate	EGUL = 36.7 The contract is a 250 xs 250, therefore the contract is not exposed under the Bathwater method
Zero or Total Loss Estimate	The Zero or Total Loss estimate formula is : <u>EGUL x MIN(TIV – D,L)</u> TIV
	The Insured Value is 630. This is larger than the sum of the deductible and the limit.
	Substituting the values into the formula gives :
	= 36.7 × 250 / 630
	= 14.6
	as the loss estimate.

Spike Method Estimate The deductibles and the limits apply to the contract as a whole, which allows this method to be used.

> The Total Insured Value is greater than the sum of the deductible and limit, so the formula for the loss estimate is :

The example Catastrophic Excess of Loss ('Cat XL') contract is shown

opposite. It is a 250 xs 250 treaty for all the commercial properties that appear

EGUL x (((TIV-D)/TIV)² - ((TIV-D-L)/TIV)²)

Substituting the values into the formula gives :

 $= 36.7 \times (((630-250)/630))^2 - ((630-250-250)/630))^2)$

= 11.8

Stochastic Sampling	Once the Expected Ground-up Loss has been calculated, it is necessary to sample around the Expected Ground-up Loss, and then apply contract terms.		
Maximum Line	For this contract, there is adequate data available to calculate a loss estimate by other means; however, a maximum line estimate can still be calculated.		
	The limit for this contract is 250, which would imply a Ground-up Loss of 500, which is extremely unlikely, given the TIV and the event description.		
	Partial exhaustion of limits may therefore be justified with reference to historical losses, market share data, or Maximum Possible Loss estimates		
Market Share	A market share approach cannot generally be used for Cat XL.		
Summary	Summarised below is the range of possible outcomes in respect of this examp		
	EXPECTED GROUND-UP LOSS	36.7	
	LOSS ESTIMATES		
	BATHWATER	0.0	
	ZERO OR TOTAL LOSS	14.6	
	SPIKE METHOD	11.8	

RISK EXCESS OF LOSS EXAMPLE

RISK XS EXAMPLE CONTRACT

MIN	МАХ	AVERAGE	NUMBER OF RISKS		
0	10	5	200		
10	20	15	75		
20	30	25	30		
30	40	35	15		
40	50	45	3		
DEDUC	TIBLE PE	R RISK	10		
LIMIT P	ER RISK		10		
OCCUF	30				
ALL RISKS ARE COMMERCIAL					

The example Risk Excess of Loss ('Risk XS') contract is a 10 xs 10 with an occurrence limit of 30.

The first step is to allocate the risks geographically. This can often be done using the risk profile that is contained in the contract, shown opposite.

In this example, the risks are allocated using the following assumptions :

COUNTY	ALLOCATION
Х	30%
Y	20%
Z	10%
OTHER	40%

which can then be used to find the assumed number of risks in each property band, in each county, as shown below :

AVERAGE	Х	Y	z
5	60.00	40.00	20.00
15	22.50	15.00	7.50
25	9.00	6.00	3.00
35	4.50	3.00	1.50
45	0.90	0.60	0.30

As information regarding each risk is unavailable, it is necessary to deal with each band's average value.

It is necessary to find the Expected Ground-up Loss for each property band, for each county, calculated by multiplying the average value by the county damage factor.

In the following table, the entries are the Expected Ground-up Loss for each county, for each property band :

		COUNTY	
AVERAGE	Х	Y	Z
5	0.50	0.25	0.05
15	1.50	0.75	0.15
25	2.50	1.25	0.25
35	3.50	1.75	0.35
45	4.50	2.25	0.45

Multiplying this table by the assumed number of risks in each property band in each county and summing the results gives a total Expected Ground-up Loss of 145.

The Expected Ground-up Loss for each property band in each county is less than the deductible, so the loss estimate using this method is zero.

'Zero or Total' Loss Method

Bathwater Method

Using the formula :

EXPOSED VALUES × DAMAGE FACTOR

the following table can be produced :

	EXPOSED	PER RISK LOSS ESTIMATE			
AVERAGE	VALUES	Х	Y	Z	
5	0	0.00	0.00	0.00	
15	5	0.50	0.25	0.05	
25	10	1.00	0.50	0.10	
35	10	1.00	0.50	0.10	
45	10	1.00	0.50	0.10	

where the table entries are the calculated loss estimates for each property. The exposed values have been calculated by considering the average property value in each band, along with the deductible and limit.

Multiplying the loss estimate per risk, by the assumed number of risks in each county determines the loss estimate for the each band, in each county.

	BAND LOSS ESTIMATE			
AVERAGE	Х	Y	Z	
5	0.00	0.00	0.00	
15	11.25	3.75	0.38	
25	9.00	3.00	0.30	
25	4.50	1.50	0.15	
45	0.90	0.30	0.03	

Summing the table entries produces a loss estimate of 35.06. This is higher than the occurrence limit of 30.

The loss estimate is therefore 30.

It is necessary to apply the method to each property band, for each county.

Using the formula EGUL x (((TIV-D)/TIV)²-((TIV-D-L)/TIV)²) for every entry in the Expected Ground-up Loss table produces the following table :

	PER RISK LOSS ESTIMATE			
AVERAGE	Х	Y	Z	
5	0.00	0.00	0.00	
15	0.17	0.08	0.02	
25	0.80	0.40	0.08	
25	1.14	0.57	0.11	
45	1.33	0.67	0.13	

Multiplying this table with the geographical distribution of risks table produces a loss estimate for each band :

	BAND LOSS ESTIMA		
AVERAGE	Х	Y	Z
5	0.00	0.00	0.00
15	3.75	1.25	0.13
25	7.20	2.40	0.24
25	5.14	1.71	0.17
45	1.20	0.40	0.04

Summing all entries produces a loss estimate of 23.6, which is less than the occurrence limit of 30.

The loss estimate is therefore 23.6.

Stochastic Sampling

This method can be used, although it is important to remember to use this method to calculate a 'Per Risk Loss Estimate' for each county.

Spike Method

Maximum Line	For this contract, there is adequate data available to calculate a loss estimate by other means; however, a maximum line estimate can still be calculated.		
	The occurrence limit for this contract is 30 and total exhaustion of this limit would imply that at least three individual property Ground-up Losses of at least 20 had arisen, which does not appear unreasonable given the average levels of damage and number of higher-value properties.		
Summary	Summarised below are the range of possible outcomes in respect of this example :		
	EXPECTED GROUND-UP LOSS	145.0	
	LOSS ESTIMATES		
	BATHWATER	0.0	
	ZERO OR TOTAL LOSS	30.0	
	SPIKE METHOD	23.6	

30.0

MAXIMUM LINE

REALISTIC DISASTER SCENARIOS Scenarios and Events

Scenarios subject to De-Minimis Test

1 USA WINDSTORM

Assume a US\$60 billion insured loss arising from a windstorm in the United States.

Syndicates are recommended to consider either a windstorm that strikes the Caribbean before making landfall in the US or a tropical windstorm that transitions into a frontal system, which strikes the North-East of America, towards New York.

The methodology and assumptions used by the syndicate should be described using the commentary facility in the RDS Reporting Software.



2 MARINE EVENT

Scenarios (report both events and complete the questionnaire)

Marine Collision in Prince William Sound Syndicates should return a marine loss scenario for both of the following two incidents. In both scenarios, excess layers of liability, hull and cargo should be included based on maximum aggregate exposures. In addition to completing a return for both scenarios, syndicates should complete the Marine Questionnaire issued with this guidance, which requires syndicates to provide an analysis of how they calculated their loss estimates for the Marine Collision scenario (see below for further details).

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 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.
- Assume that the cost to the tanker and cruise vessel owners of the oil pollution is US\$2bn. This would lead to oil pollution recoveries on the International Group of P&I Associations' General Excess of Loss Reinsurance Programme (IG Reinsurance Programme) of US\$1bn from the tanker owner and US\$0.6bn from the cruise owner.
- Assume 125 fatalities, 125 persons with serious injuries and 250 persons with minor injuries: with average compensation of US\$1.5 million for each fatality, US\$2.5 million for each person with serious injuries and US\$0.5 million for each person with minor injuries.

The following diagram illustrates the structure of losses to the tanker and cruise vessel owners on the IG Reinsurance Programme. Shaded areas represent the losses to the Programme.



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. Claims to be heard in a Florida court.

 Assume 500 passenger fatalities and 1,500 injured persons with average compensation of US\$2 million for each fatality and US\$1 million for each injured person. In addition, assume an additional Protection and Indemnity loss of US\$500 million to cover costs such as removal of wreck, and loss of life and injury to the crew.



The following diagram illustrates the structure of losses on the IG Reinsurance Programme.

Marine Questionnaire

The 2004 Marine questionnaire gave Lloyd's an understanding of the processes that syndicates undertake in assessing marine exposures. For the 2005 RDS, syndicates are requested to return the questionnaire, which focuses on the policies and methodologies that syndicates adopt in completing the Marine Collision RDS. The questionnaire results will be used to support the RDS Review of Marine Business that will be carried out in the third quarter of 2005.

This questionnaire should be completed by all syndicates that submit a Marine RDS.

3 NORTH SEA - LOSS OF MAJOR COMPLEX

Assume a total loss to all platforms and bridge links of a major North Sea complex.

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

Syndicates should use the commentary facility in the RDS Reporting Software to name the complex and to provide details of modelling assumptions.

4 AVIATION COLLISION

Assume a collision between two aircraft over a major city, anywhere in the world, using the syndicate's two highest airline exposures.

Assume a total liability loss of up to US\$4 billion: comprising up to US\$2 billion per airline and any balance up to US\$1 billion from a major product manufacturer's product liability policy(ies) and/or an air traffic control liability policy(ies), where applicable.

Consideration should be given to other exposures on the ground. Assumptions should be stated clearly using the event commentary facility in the RDS Reporting Software.

Syndicates should include the following information in their return :

- the city over which the collision occurs;
- the airlines involved in the collision;
- the airline policy limits and syndicate's line and exposure per policy;
- maximum hull value per aircraft involved;
- maximum liability per aircraft involved;
- name of each product manufacturer and the applicable policy limits; and
- name of the air traffic control authority and the applicable policy limits.

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. Per Risk Excess of Loss).

The methodology and assumptions used by the syndicate should be described using the commentary facility in the RDS Reporting Software.
6 SATELLITE RISKS

Scenarios (report both events)

Proton Flare

Syndicates should return satellite loss information relating to both of the following events if either one of these events produces a loss in excess of the 'de-minimis' reporting level (see page 8).

A proton flare is a vast outpouring of protons that can result in permanent damage to semiconductor devices, particularly solar array cells. A large proton flare could result in a significant number of satellites losing some of their power generating capability.

Satellite orientation, age and make will also determine how a proton flare will affect a satellite. However, a single large proton flare (or a number of smaller flares in close succession) has the potential to affect all geostationary satellites and could result in a loss of power by all satellites.

For the purposes of this RDS, it should be assumed that either a single anomalous large proton flare or a number of flares in quick succession results in a loss to all satellites in geostationary orbit. All live exposures in this orbit will be affected by the proton flare. Syndicates should assume a 5% insurance loss to all affected policies.

The loss under this RDS will therefore be :

(Insured Satellites Value) x (Loss to Policy)

Therefore if a syndicate's share of an insured satellite is US\$10,000,000, the loss to the syndicate would be calculated as :

US\$10,000,000 x 5%

= US\$500,000

Syndicates should note that under this RDS, 'Total Loss Only' policies, component specific policies and policies not covering power losses will not be triggered.

An undetected generic defect in a number of operational satellites has the potential to cause significant losses to the space insurance market. During the time it takes for a generic defect to emerge, many more satellites of the same model/variant may have been launched.

For the 2005 RDS return, syndicates should report against those satellites that are in the following model / variant groups :

- A2100 all variants, including A2100, A2100A, A2100AX and A2100AX2
- Boeing-376 all variants, including BS-376HP, BS-376W
- Boeing-601 all variants, including BS-601, BS-601HP
- Boeing-702 all variants, including BS-702-M, BS-GEM
- Eurostar-2000 all variants, including E2000, E2000+
- Eurostar-3000 all variants, including E3000
- Express all variants, including Express-A, Express-AM

Generic Defect

- Insat all variants, including Insat-2, Insat-3, Insat-4
- LS-1300 all variants, including LS-1300, LS-1300 extended, LS-1300-GOES
- Spacebus-3000 all variants, including Spacebus-3000B2, Spacebus-3000B3
- Spacebus-4000 all variants, including Spacebus-4000, Spacebus-4100
- Starbus all variants, including Star-1, Star-2

For the purpose of this RDS, syndicates should assume the following damage levels when calculating their gross and net exposures for each model/variant group, for launches that have occurred in the last five years :

Period Remaining on Policy	Percentage of Satellites that Suffer a Total Loss	
Greater than 24 months	100%	
18 months – 24 months	80%	
12 months – 18 months	60%	
6 months – 12 months	40%	
Less than 6 months	20%	

The results should be calculated by taking the sum of the model / variant group exposures within each time period and multiplying them by the respective percentage (e.g. 20% of the total exposure for the Eurostar-2000 model / variant group that have less than 6 months left on their policy).

Syndicates should report full details (using the RDS Reporting Software) of their largest potential Net Loss due to a generic defect in a single model / variant, as listed above. Syndicates should also prepare details of the Aggregate Exposure, Gross Loss, Net Loss and the number of satellites for all three model / variant groups that have the highest exposure in order that Lloyd's can review these as part of the RDS reviews in the third quarter of 2005.

Syndicates should assume that all satellites affected are considered to suffer a constructive total loss.

7 LIABILITY RISKS

Scenarios (report up to three events)

Syndicates should return up to three liability loss scenarios based on the following types of scenario :

- a professional lines scenario, selected from the five defined scenarios on page 38, which provides the highest Net Loss to the syndicate;
- an internally modelled professional lines scenario based on peak exposures within the syndicate's portfolio as at 1 April 2005; and
- an internally modelled non-professional lines scenario based on peak exposures within the syndicate's portfolio as at 1 April 2005.

	All syndicates writing liability business would be expected to return internally modelled scenarios in excess of the 'de-minimis' reporting level. See pages 39 and 40 for additional guidance on internally modelled scenarios.
Development Process	The above scenarios have been developed in collaboration with the LMA International Liability Business Panel. Lloyd's will continue to work with this group and the wider market to improve the assessment of aggregate exposures arising from liability business.
Liability Risk Questionnaire	It is recognised that a standard and comprehensive approach to the management of aggregate exposures has not yet been developed for much of the Liability market. To help Lloyd's understand the nature of this challenge and identify possible approaches that might be taken, a liability risk questionnaire has been issued with this guidance. This questionnaire should be completed by all syndicates that submit a Liability Risk RDS.
RDS Review	To support the development of the Liability Risks RDSs and to assess the aggregation management capability of syndicates, RDS Review visits will be carried out in the third quarter of 2005. To support this process, syndicates should return the requested questionnaire and have available appropriate documentation to support the calculation of their loss estimates and the selection of their internally modelled scenarios.
Treatment of Back Year Deterioration	The above scenarios focus on losses arising from events occurring in 2005, and therefore do not attempt to quantify potential exposures from back year deterioration. The issue of reserving adequacy is subject to monitoring and review through other Franchise mechanisms.
Defined Professional Lines Scenarios	Syndicates should return a liability loss scenario based on one of the following, selecting whichever scenario produces the highest Net Loss to the syndicate:
US Laddering	A US 'laddering' scenario involving improper conduct by firms in connection with initial public offerings. This conduct results in a combined Securities Exchange Commission (SEC) class action, with the litigation involving the syndicate's five largest assureds to the full slip limits.
UK Pensions Mis-selling	A UK pensions mis-selling scenario, involving the syndicate's five largest assureds to the full slip limits.
Failure / Collapse of a Major Corporation	The failure/collapse of a major corporation, involving the syndicate's five largest assureds to the full slip limits.
Failure of a Merger	The failure of a merger, involving the syndicate's five largest assureds to the full slip limits.
Failure of a Construction Project	The failure of a construction project, involving the syndicate's five largest assureds (for example, architects, surveyors and engineers) to the full slip limits.

Calibration of Internally Modelled Scenarios

To assist syndicates in developing their internally modelled scenarios, the following discusses the extent to which more extreme (and less likely) scenarios should be identified by the syndicate.

The following chart illustrates Lloyd's present understanding of the likelihood levels of the different RDSs and shows the degree to which that assessment is based on structured probabilistic modelling or Lloyd's current beliefs and opinions.



The internally modelled scenarios should be more extreme than the existing, defined, Professional Lines scenarios, which are of a scale that could be experienced on a regular basis within a working lifetime. As a guide, syndicates are expected to identify scenarios that generate losses approaching the Franchise Guidelines of 75% of capacity for Gross Loss and 20% of capacity for Net Loss, and that might be experienced only rarely within a lifetime.

It is recognised that it is extremely difficult to model the likelihood for a particular level of loss, and this approach is intended to require syndicates to recognise peak potential exposures to their portfolios. Nonetheless, if syndicates were able to quantify the level of likelihood attaching to their internally modelled scenarios, it would need to be in the order of 1 in 200 to be consistent with the requirements of the ICA process.

Illustrated Example Scenarios The following example scenarios are provided to help guide syndicates in considering the type, scale and impact of their internally modelled scenarios.

Example I Industrial / Transport Incident	A syndicate may identify that it has a high potential exposure to industrial production and transport operators in the US, and determines that an extreme loss would arise from a release of chlorine from a train travelling through a major US city.
	The syndicate would develop a physical model of the incident, with assumptions for the area and populations affected, and the effects of the chlorine gas itself. Assumptions for the numbers of dead and injured would be determined from this model, and damage award assumptions would be used to arrive at a financial loss figure.
	It would be assumed that various organisations such as production, transport and maintenance companies would be held liable, along with other parties that the syndicate covers, such as joint venture partners and professional advisors.
Example II Multiple Public / Products Losses	A syndicate with multiple peak exposures may determine that it would be severely impacted by catastrophe losses affecting a multiple number of contracts. Such a scenario would capture the cumulative effect of a number of vertical spikes and the impact on the syndicate's reinsurance programme.
Example III Collapse of the UK Housing Market	A syndicate may identify that it is exposed to a dramatic fall in the housing market, associated with high negative equity, mortgage shortfalls and defaults. It could model its exposures by assuming that a large number of compensation claims would be brought against a number of groups, including:
	 Independent Financial Advisors (IFAs);
	Solicitors;
	• Surveyors;
	Lenders; Accountents and Actuarial Organizations; and
	Mortgage Indemnity contracts.
	This event could assume that there was a rising unemployment rate adding to further job insecurity.
Example IV Collapse Following the Merger of Two Major Corporations	A syndicate may identify that its Directors & Officers, Financial Institutions and Professional Indemnity exposures would be impacted by the collapse of one or more major corporations that were listed on the New York and London Stock Exchanges. To provide a more extreme loss scenario, the syndicate may decide to model the merger of two major corporations, which dramatically fails, increasing the total damages involved and the number of insureds that are affected.

Under this scenario, a large number of individual insureds would have substantial damage awards made against them.

8 POLITICAL RISKS

Scenarios (report up to three events)

Syndicates should return up to three Political Risks loss scenarios based on the following events:

- Losses triggered by an economic downturn in South-East Asia;
- Losses triggered by an economic crisis in South America;
- Losses triggered by a political crisis in the Middle East.

Syndicates should return those scenarios that generate losses above the 'deminimis' reporting level (see page 8).

Development Process

The above scenarios have been developed in collaboration with the LMA Political Risks and Financial Contingencies Committee.

South-East Asian Loss Event Following a severe economic collapse in a single market, public and private sector obligors are in default and a number of expropriation acts occur. In addition, the import of raw materials and the (re)export of partially finished / finished goods and services are materially affected. The impact on other closely connected / dependent economies should also be taken into account.

To establish syndicates' loss estimates on a consistent basis, managing agents are to apply the following PML ratios to all contract limits in force as at 1 April 2005.

	Main Affected Economy	Connected/Dependent Economy
Class of Business		
AW Confiscation	N/A	N/A
CEND	20%	12.5%
CEND (CDE)	50%	30%
CF	30%	20%
CR	50%	35%
Repossession	10%	5%
RSCC	5%	5%
Unfair Calling	10%	7.5%

South America Economic Event

Following an exogenous shock, regional economic slow down or internal crisis, there is a sudden economic crisis in South America. In this 'most pessimistic' hypothetical scenario, three major South American countries are particularly affected. External commitments to bonds and other financial instruments are severely affected, with public and private sector defaults and the introduction of currency controls.

In order to estimate the aggregation of exposures due to cross-border contagion, PML ratios have been specified for the affected economies. To establish syndicates' loss estimates on a consistent basis, managing agents are to apply the following PML ratios to all contract limits in force as at 1 April 2005.

	Economic Crisis	Contagion	Contagion
Class of Business	Economy 1	Economy 2	Economy 3
AW Confiscation	N/A	N/A	N/A
CEND	20%	5%	5%
CEND (CDE)	50%	20%	10%
CF	25%	10%	10%
CR	40%	17.5%	15%
Repossession	15%	7.5%	5%
RSCC	5%	2.5%	2.5%
Unfair Calling	10%	7.5%	5%

Middle East Political Event

As a result of political and social unrest in the Middle Eastern Gulf States, multilateral agencies and private insurers receive an influx of claims affecting many business lines within the Political Risks arena.

To establish syndicates' loss estimates on a consistent basis, managing agents are to apply the following PML ratios to all contract limits in force as at 1 April 2005.

	Political Crisis	Contagion	Contagion	Contagion
Class of Business	Country 1	Country 2	Country 3	Country 4
AW Confiscation	10%	N/A	N/A	N/A
CEND	40%	10%	10%	10%
CEND (CDE)	N/A	N/A	N/A	N/A
CF	40%	20%	20%	20%
CR	55%	20%	20%	20%
Repossession	10%	N/A	N/A	N/A
RSCC	10%	5%	5%	5%
Unfair Calling	25%	5%	5%	5%

Calculation Methodology

Definitions

- The percentage figures in the above matrices are to be applied to the maximum possible exposure remaining under each policy for each risk type.
- All figures are to be converted into US dollars, where applicable, at the prevailing Lloyd's premium income monitoring rate.
- Where one policy covers more than one peril / risk code with varying limits of liability, the highest combined single limit shall be applied.
- Syndicates' Gross return figure should be before all reinsurances.
- Syndicates' figures should be before any transactional recoveries such as those arising from subrogation.
- To avoid double-counting, the amounts declared by syndicates should be net of amounts already paid or reserved in respect of any current policy.

To ensure consistency, and for reference purposes, please use the following definitions :

AW Confiscation refers to confiscation coverage provided under an airline Aviation War policy. For the purposes of this RDS exercise, only exposures to airlines in the prescribed scenario countries should be utilised (but excluding aircraft registered in that country where confiscation by the government of registry is excluded under the relevant Aviation War policy).

CEND refers to actions that result in an act or a series of acts whether characterised as expropriation, confiscation, nationalisation, requisition, deprivation or sequestration by law, order or administrative action taken by the host government, which has the effect of depriving the insured of its fundamental rights and benefits. It should be assumed for this exercise that the applicable waiting period has been exhausted and the loss is now payable.

CEND (CDE) refers to contractually dependent expropriation.

CF refers to coverage of counterparties' non-performance, non-payment or non-fulfilment where caused by a Political Risk peril or government default. Political Risks can typically include the import / export restrictions, embargo or frustration as a result of War, Civil War, Revolution, Rebellion, Insurrection or Civil Strife. For a precise definition, please refer to Lloyd's Bulletin Y2406 dated 7 November 2000.

CR refers to Trade Credit and all business ceded under risk code 'CR'.

Repossession means an action taken by, or refusal or failure by, the Foreign Government preventing a lessor or mortgagee of commercial aircraft or vessels from repossessing their assets. Such actions can include outright confiscation or frustration of contractual repossession rights. It should be assumed for this exercise that the applicable waiting period has been exhausted and the loss is now payable.

RSCC refers to bespoke Riots, Strikes and Civil Commotions coverage not afforded under Non-Marine Property contracts.

Unfair Calling refers to Tender, Bid and Performance Bonds that are drawn down arbitrarily by public obligors or where the draw down is due to Political Risks perils (public or private obligors).

9 ALTERNATIVE RDS: A

Syndicates should list two further realistic events not listed above for scenarios numbered 9 and 10.

For example, syndicates with substantial exposures to :

- earthquakes outside of California, New Madrid and Japan;
- a major flood incident;
- development of long-tail liabilities; or
- terrorism outside of Manhattan,

could use the 'Alternative' scenarios to report these.

10 ALTERNATIVE RDS: B

A further alternative scenario, as described above.

Compulsory Scenarios

11 SECOND EVENT

Syndicates should model on an 'as if' basis the occurrence of Hurricane Andrew in the immediate aftermath of a Northridge earthquake.

Both events should approximate to a US\$20 billion Insured Industry Loss.

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 protection.

COMMENTS ON AGGREGATING COMPULSORY RDSS

Changes for 2005

For the April 2005 RDS exercise, the following changes have been made to the Aggregating Compulsory RDSs (i.e. all Compulsory RDSs other than the 'Second Event' RDS) :

- **Florida Windstorm** no longer includes a specified loss level from Workers Compensation, following feedback from the market;
- California Earthquake assumes that minimal Aviation Hull losses will arise, following research commissioned by Lloyd's;
- New Madrid Earthquake includes county level Damage Factors, plus the introduction of an 'Extreme Stress Scenario' to look at the potential exposure to Lloyd's from a much larger earthquake event;
- **European Windstorm** is based on a new event, with Damage Factors defined at a more detailed level for each country;
- Japanese Earthquake includes CRESTA and prefecture level Damage Factors;
- **Terrorism** has been retained, as a conventional bomb attack on the Empire State Building, following consultation with the market;
- **Gulf of Mexico Windstorm** is a new event, targeting the same US\$60 billion loss level as the USA Windstorm, assuming offshore energy and onshore property losses. Damage Factors have been defined for licence blocks within the damage path of the storm and at county level; and
- Japanese Typhoon is a new event, with Damage Factors defined at CRESTA and prefecture levels.

Development of New Events The new RDSs have been developed by Lloyd's with assistance from AIR, EQECAT and RMS. The prescribed assumptions for the events within these scenarios have been arrived at following a detailed review of data provided by each of these companies.

Events Defined byThe Natural Catastrophe RDSs have been defined with reference to the
expected Ground-up Industry Loss that they will generate for commercial and
residential property insurance, after allowance for the take-up of relevant
insurance cover. These assumptions have been determined after consultation
with the market and catastrophe loss modelling companies.

	It should be noted that divergent views exist between the three modelling companies as to the return periods that should be attached to different Industry Loss levels. In view of these divergent opinions, the continuing development of catastrophe loss modelling technology and the infrequent occurrence of major catastrophic events that can be used to calibrate the models for higher return periods, the new RDS events have been described with reference to the level of Industry Loss that they will generate.
	Approximate return periods for the RDSs are indicated in the chart on page 39 of this document.
Defined Event 'Footprint'	The Footprint for each event has been defined with reference to those counties, CRESTA areas and prefectures that are subject to a damage factor greater than zero, as detailed in the 'Aggregate Footprint' column of the Event Damage Factor Tables. By using this specified Footprint, a consistent assessment of potential exposures can be undertaken.
Use of Modelling Software	Syndicates may use catastrophe loss modelling software, as produced by AIR, EQECAT or RMS, to model their expected loss exposures. Lloyd's recognises results produced through the appropriate use of these packages for submission under the RDS exercise, provided that the reporting requirements within the RDS Reporting Software are met, and that all relevant exposures and lines of business are included in the return.
	Event IDs can be obtained from AIR, EQECAT and RMS for the events within their event catalogues that correspond to the assumptions prescribed by Lloyd's.

12 FLORIDA WINDSTORM

Distribution of Florida Property Values The map below illustrates Lloyd's assumptions for the distribution of property values within Florida, which are also detailed in the Event Damage Factor Tables.



Major Ports

The table below lists the main ports in Florida, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the events.

Port	County
Jacksonville	Duval
Miami	Miami-Dade
Palm Beach	Palm Beach
Panama City	Вау
Port Canaveral	Brevard
Port Everglades	Broward
Port Manatee	Manatee
Pensacola	Escambia
Tampa	Hillsborough

Major Airports

The table below lists the main international airports in Florida, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller airports that fall within the Footprint of the events.

Airport	County
Fort Lauderdale/Hollywood (FLL)	Broward
Miami (MIA)	Miami-Dade
Orlando (MCO)	Orange
Tampa (TPA)	Hillsborough

FLORIDA WINDSTORM - EVENT ONE

Miami-Dade Hurricane Event

A US\$70 billion Ground-up property Industry Loss from a Florida Hurricane landing in Miami-Dade County.

Event Footprint

The map below illustrates the Footprint and damage levels for the Miami-Dade Hurricane Event, which are also detailed in the Event Damage Factor Table on page 50.



Insured Industry Loss Levels

Syndicates should assume the following components of the loss.

Residential Property	US\$47,000,000,000
Commercial Property	US\$23,000,000,000
Auto	US\$ 2,000,000,000
Marine	US\$ 1,000,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

Specie/Fine Art

Personal Accident

Aviation

Liability

Exclusion of Contingent Business Interruption Losses Lloyd's recognises the difficulties involved in modelling losses from Contingent Business Interruption (CBI) covers. Syndicates should therefore exclude CBI losses from this event. Future development work is planned to address this issue.

Miami-Dade Hurricane Event Damage Factor Table

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAMAGE FACTORS RESIDENTIAL COMMERCIAL	
Alachua	001	1.2%			
Baker	003	0.1%			
Bay	005	0.9%			
Bradford	007	0.1%			
Brevard	009	2.6%	100%	0.01%	
Broward	011	11.0%	100%	12.70%	7.30%
Calhoun	013				
Charlotte	015	0.7%	100%	0.83%	0.36%
Citrus	017	0.7%			
Clay	019	0.6%			
Collier	021	2.0%	100%	1.33%	0.96%
Columbia	023	0.2%			
Desoto	027	0.1%	100%	0.37%	0.10%
Dixie	029				
Duval	031	5.5%			
Escambia	033	1.6%			
Flagler	035	0.2%			
Franklin	037				
Gadsden	039	0.2%			
Gilchrist	041				
Glades	043		100%	1.20%	0.40%
Gulf	045	0.1%			
Hamilton	047				
Hardee	049	0.1%	100%	0.08%	0.02%
Hendry	051	0.1%	100%	1.82%	0.83%
Hernando	053	0.6%			
Highlands	055	0.4%	100%	0.11%	0.03%
Hillsborough	057	7.0%	100%	0.02%	0.01%
Holmes	059	0.1%	10001		
Indian River	061	0.8%	100%	0.07%	0.02%
Jackson	063	0.2%			
Jefferson	065				
Latayette	067	0.001			
Lake	069	0.9%	1000/	1.000/	0.700/
Lee	0/1	2.8%	100%	1.30%	0.70%
Leon	073	1.3%			
Levy	075	0.1%			
Liberty	077	0.10/			
Manataa	079	0.1%	100%	0.109/	0.049/
wanatee	081	1.5%	100%	0.12%	0.04%

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAMAGE FACTORS RESIDENTIAL COMMERCIAL	
Marion	083	1.3%			
Martin	085	1.1%	100%	0.36%	0.19%
Miami-Dade	086	14.0%	100%	22.20%	15.10%
Monroe	087	0.8%	100%	0.66%	0.34%
Nassau	089	0.3%			
Okaloosa	091	0.9%			
Okeechobee	093	0.1%	100%	0.18%	0.04%
Orange	095	6.5%			
Osceola	097	0.7%	100%	0.01%	
Palm Beach	099	10.0%	100%	1.89%	1.28%
Pasco	101	1.5%	100%	0.01%	
Pinellas	103	6.0%	100%	0.03%	0.01%
Polk	105	2.4%	100%	0.02%	
Putnam	107	0.3%			
Santa Rosa	113	0.5%			
Sarasota	115	2.6%	100%	0.01%	0.01%
Seminole	117	2.4%	100%	0.06%	0.01%
St. Johns	109	0.8%			
St. Lucie	111	0.9%	100%	0.81%	0.28%
Sumter	119	0.1%			
Suwannee	121	0.1%			
Taylor	123	0.1%			
Union	125				
Volusia	127	2.4%			
Wakula	129	0.1%			
vvalton	131	0.2%			
vvasnington	133	0.1%			

FLORIDA WINDSTORM - EVENT TWO

Pinellas Hurricane Event

A US\$70 billion Ground-up property Industry Loss from a Florida Hurricane landing in Pinellas County.

Event Footprint

The map below illustrates the Footprint and damage levels for the Pinellas Hurricane Event, which are also detailed in the Event Damage Factor Table on page 54.



Insured Industry Loss Levels

Syndicates should assume the following components of the loss.

Residential Property	US\$45,000,000,000
Commercial Property	US\$25,000,000,000
Auto	US\$ 2,000,000,000
Marine	US\$ 1,000,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

Specie/Fine Art
Personal Accident
Aviation
Liability
's recognises the difficulties

Exclusion of Contingent Business Interruption Losses Lloyd's recognises the difficulties involved in modelling losses from Contingent Business Interruption (CBI) covers. Syndicates should therefore exclude CBI losses from this event. Future development work is planned to address this issue.

Pinellas Hurricane Event Damage Factor Table

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAI RESIDENTIAL	MAGE FACTORS COMMERCIAL
Alachua	001	1.2%	100%	0.21%	0.16%
Baker	003	0.1%	100%	0.03%	0.02%
Вау	005	0.9%			
Bradford	007	0.1%	100%	0.15%	0.09%
Brevard	009	2.6%	100%	0.59%	0.49%
Broward	011	11.0%			
Calhoun	013	0.7%	100%	2.40%	1 05%
Citrus	015	0.7%	100%	5.40% 2.14%	1.05%
Clav	019	0.6%	100%	0.25%	0.18%
Collier	021	2.0%	100%	0.17%	0.13%
Columbia	023	0.2%	100%	0.01%	
Desoto	027	0.1%	100%	1.69%	0.82%
Dixie	029		100%	0.04%	0.01%
Duval	031	5.5%	100%	0.14%	0.10%
Escambia	033	1.6%	100%	0.70%	0 459/
Franklin	035	0.2%	100%	0.72%	0.45%
Gadsden	039	0.2%			
Gilchrist	041		100%	0.05%	0.03%
Glades	043		100%	0.40%	0.27%
Gulf	045	0.1%			
Hamilton	047				
Hardee	049	0.1%	100%	3.14%	1.40%
Hendry	051	0.1%	100%	0.13%	0.08%
Highlands	055	0.0%	100%	1.27%	0.72%
Hillsborough	057	7.0%	100%	16.30%	13.40%
Holmes	059	0.1%			
Indian River	061	0.8%	100%	0.12%	0.08%
Jackson	063	0.2%			
Jefferson	065				
Latayette	067	0.09/	100%	4.009/	0.000/
	071	2.8%	100%	4.00%	2.00%
Leon	073	1.3%	10076	0.0070	0.0070
Levy	075	0.1%	100%	0.75%	0.34%
Liberty	077				
Madison	079	0.1%			
Manatee	081	1.5%	100%	32.80%	22.00%
Martin	083	1.3%	100%	1.43%	0.89%
Miami-Dade	086	14.0%	100 /6	0.02 /8	0.0178
Monroe	087	0.8%			
Nassau	089	0.3%	100%	0.04%	0.02%
Okaloosa	091	0.9%			
Okeechobee	093	0.1%	100%	0.37%	0.26%
Orange	095	6.5%	100%	3.38%	2.46%
Palm Beach	097	10.0%	100%	4.40%	3.40%
Pasco	101	1.5%	100%	9.60%	6.70%
Pinellas	103	6.0%	100%	27.20%	19.30%
Polk	105	2.4%	100%	12.50%	9.20%
Putnam	107	0.3%	100%	0.98%	0.50%
Santa Rosa	113	0.5%	100%	1.35%	0.09%
Seminole	115	2.0%	100%	1.87%	1.63%
St. Johns	109	0.8%	100%	0.03%	0.01%
St. Lucie	111	0.9%	100%	2.84%	1.45%
Sumter	119	0.1%	100%	3.60%	2.04%
Suwannee	121	0.1%			
Taylor	123	0.1%	10051	0.000	0.0007
Union	125	0.49/	100%	0.06%	0.03%
Wakulla	12/ 120	∠.4% 0.1%	100%	1.30%	0.01%
Walton	131	0.2%			
Washington	133	0.1%			

13 CALIFORNIA EARTHQUAKE

Distribution of Property Values in California The map below illustrates Lloyd's assumptions for the distribution of property values within California, which are also detailed in the Event Damage Factor Tables.



Major Ports

The table below lists the main ports in California, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the events.

Port	County
Long Beach	Orange
Los Angeles	Los Angeles
Oakland	Alameda
Port Hueneme	Ventura
Richmond	Contra Costa
San Diego	San Diego
San Francisco	San Francisco
Stockton	San Joaquin

Major Airports

The table below lists the main international airports in California, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the events.

Airport	County
Los Angeles (LAX)	Los Angeles
San Diego-Lindbergh (SAN)	San Diego
San Francisco (SFO)	San Francisco
San Jose (SJC)	San Jose

CALIFORNIA EARTHQUAKE - EVENT ONE

Los Angeles Earthquake Event

A US\$54 billion Ground-up property (shake and fire-following), Industry Loss from an earthquake originating from the Elsinore Fault in Los Angeles.

Event Footprint

The map below illustrates the Footprint and damage levels for the Los Angeles Earthquake Event, which are also detailed in the Event Damage Factor Table on page 59.



Insured Industry Loss Levels

Syndicates should assume the following components of the loss.

Residential Property	US\$24,000,000,000
Commercial Property	US\$30,000,000,000
Workers Compensation	US\$ 5,000,000,000
Marine	US\$ 2,000,000,000
Personal Accident	US\$ 1,000,000,000
Auto	US\$ 1,000,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

Specie/Fine Art

Aviation

Liability

PA and WCA losses It should be assumed that there will be 2,000 deaths and 20,000 injuries as a result of the earthquake. Syndicates should assume that 50% of those injured will have PA cover.

Exclusion of ContingentLloyd's recognises the difficulties involved in modelling losses from ContingentBusiness InterruptionBusiness Interruption (CBI) covers. Syndicates should therefore exclude CBILossesIosses from this event. Future development work is planned to address this
issue.

Estimation of AviationLloyd's has commissioned research which indicates that minimal Aviation HullHull Losseslosses would be expected to arise from an earthquake. Syndicates should
take account of these findings in calculating their loss estimates.

Los Angeles Earthquake Event Damage Factor Table

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP SHAKE RESIDENTIAL	DAMAGE FACTORS COMMERCIAL	GROUND-UP FIRE D	AMAGE FACTORS COMMERCIAL
Alameda Alpine Amador Butte Calaveras	001 003 005 007 009	5.0% 0.1% 0.4% 0.1%					
Colusa Contra Costa Del Norte El Dorado Fresno	011 013 015 017 019	3.2% 0.4% 1.5%					
Glenn Humboldt Imperial Inyo Kern	021 023 025 027 029	0.1% 0.3% 0.2%	100%	1.83%	0.45%		
Kings Lake Lassen Los Angeles Madera	031 033 035 037 039	0.2% 0.1% 30.0%	100%	9.60%	12.40%	0.16%	0.10%
Marin Mariposa Mendocino Merced Modoc	041 043 045 047 049	0.2% 0.3%					
Mono Monterey Napa Nevada Orange	051 053 055 057 059	0.1% 1.0% 0.4% 0.3% 10.0%	100%	15.60%	17.50%	0.20%	0.14%
Placer Plumas Riverside Sacramento San Benito	061 063 065 067 069	0.7% 0.1% 3.4% 3.0% 0.1%	100%	10.40%	11.10%	0.12%	0.05%
San Bernardino San Diego San Francisco San Joaquin San Luis Obispo	071 073 075 077 079	3.8% 8.0% 3.6% 1.1% 0.8%	100% 100%	7.35% 2.24%	8.70% 2.34%	0.04% 0.01%	0.02%
San Mateo Santa Barbara Santa Clara Santa Cruz Shasta	081 083 085 087 089	3.0% 1.3% 6.5% 0.8% 0.3%	100%	0.04%	0.29%		
Sierra Siskiyou Solano Sonoma Stanislaus	091 093 095 097 099	0.1% 0.8% 1.3% 0.9%					
Sutter Tehama Trinity Tulare Tuolumne	101 103 105 107 109	0.1% 0.1% 0.6% 0.1%					
Ventura Yolo Yuba	111 113 115	2.4% 0.4% 0.1%	100%	1.04%	1.67%		

CALIFORNIA EARTHQUAKE - EVENT TWO

San Francisco Earthquake Event A US\$54 billion Ground-up property (shake and fire-following) Industry Loss from an earthquake originating from the San Andreas Fault (North) near San Francisco.

Event Footprint

The map below illustrates the Footprint and damage levels for the San Francisco Earthquake Event, which are detailed in the Event Damage Factor Table on page 62.



Insured Industry Loss Levels

Syndicates should assume the following components of the loss.

Residential Property	US\$27,000,000,000
Commercial Property	US\$27,000,000,000
Workers Compensation	US\$ 5,000,000,000
Marine	US\$ 2,000,000,000
Personal Accident	US\$ 1,000,000,000
Auto	US\$ 1,000,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

Specie/Fine Art

Aviation

Liability

PA and WCA lossesIt should be assumed that there will be 2,000 deaths and 20,000 injuries as a
result of the earthquake. Syndicates should assume that 50% of those injured
will have PA cover.

Exclusion of ContingentLloyd's recognises the difficulties involved in modelling losses from ContingentBusiness InterruptionBusiness Interruption (CBI) covers. Syndicates should therefore exclude CBILossesIosses from this event. Future development work is planned to address this issue.

Estimation of AviationLloyd's has commissioned research which indicates that minimal Aviation HullHull Losseslosses would be expected to arise from an earthquake. Syndicates should
take account of these findings in calculating their loss estimates.

San Francisco Earthquake Event Damage Factor Table

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP SHAKE RESIDENTIAL	DAMAGE FACTORS COMMERCIAL	GROUND-UP FIRE D RESIDENTIAL	AMAGE FACTORS COMMERCIAL
Alameda	001	5.0%	100%	10.70%	12.80%	0.39%	0.25%
Alpine	003						
Amador	005	0.1%	100%	0.04%	0.09%		
Butte	007	0.4%	100%	0.01%	0.03%		
Calaveras	009	0.1%	100%	0.03%	0.11%		
Colusa	011		100%	0.30%	0.79%		
Contra Costa	013	3.2%	100%	5.20%	5.60%	0.15%	0.14%
Del Norte	015						
El Dorado	017	0.4%	100%		0.01%		
Fresno	019	1.5%	100%	0.32%	0.86%		
Glenn	021	0.1%	100%	0.07%	0.30%		
Humboldt	023	0.3%					
Imperial	025	0.2%					
Inyo	027						
Kern	029	1.3%	1000/	0.400/	0.000/		
Kings	031	0.2%	100%	0.18%	0.62%		
Lake	035	0.1%	100%	0.30%	0.02%		
	035	20.0%					
LOS Aligeles Madora	030	0.0%	100%	0.20%	0.99%		
Marin	041	1.2%	100%	11 30%	13.60%	0.44%	0.28%
Marinosa	043	1.270	100%	11.00 /0	0.09%	0.4470	0.2070
Mendocino	045	0.2%	100%	0.06%	0.00%		
Merced	043	0.2%	100%	1 20%	1.64%	0.01%	
Modoc	049	010 / 0				010170	
Mono	051	0.1%					
Monterey	053	1.0%	100%	6.25%	7.40%	0.28%	0.21%
Napa	055	0.4%	100%	1.75%	2.20%	0.07%	0.06%
Nevada	057	0.3%					
Orange	059	10.0%					
Placer	061	0.7%	100%	0.09%	0.17%		
Plumas	063	0.1%					
Riverside	065	3.4%					
Sacramento	067	3.0%	100%	0.37%	0.89%		
San Benito	069	0.1%	100%	19.50%	21.20%	0.84%	0.20%
San Bernardino	0/1	3.8%					
San Diego	073	8.0%	1000/	04.000/	00.000/	4.040/	0.040/
San Francisco	075	3.0%	100%	24.80%	28.20%	4.24%	2.24%
San Luis Obieno	077	0.9%	100%	0.08%	0.24%	0.01%	
San Mateo	079	3.0%	100%	31.80%	46.40%	3 1/%	1 7/%
Santa Barbara	083	1.3%	10070	01.0070	40.4070	0.1470	1.7 4 /0
Santa Clara	085	6.5%	100%	19.90%	19.90%	0.90%	0.50%
Santa Cruz	087	0.8%	100%	18.40%	19.80%	0.91%	0.37%
Shasta	089	0.3%					
Sierra	091						
Siskiyou	093	0.1%					
Solano	095	0.8%	100%	2.78%	3.14%	0.08%	0.04%
Sonoma	097	1.3%	100%	1.90%	2.72%	0.07%	0.06%
Stanislaus	099	0.9%	100%	1.10%	1.65%		
Sutter	101	0.1%	100%	0.22%	0.55%		
Tehama	103	0.1%					
Trinity	105		10551				
Tulare	107	0.6%	100%	0.11%	0.39%		
Iuolumne	109	0.1%	100%	0.01%	0.06%		
Ventura	112	2.4%	100%	0.70%	1 599/		
Vuba	115	0.4%	100%	0.10%	0.37%		
Tuba	115	0.1%	100%	0.10%	0.57%		

14 NEW MADRID EARTHQUAKE

Specification of Two Loss Events

Due to the uncertainty surrounding the frequency and potential cost of a New Madrid earthquake, Lloyd's requires syndicates to provide loss estimates against two hypothetical events: the original RDS specified in previous years and a new 'Extreme Stress Scenario' (or 'ESS') in order to determine the market's exposure to a more extreme occurrence. The ESS has been based upon the latest scientific research.

Distribution of Property Values in the New Madrid Seismic Zone

The map below illustrates Lloyd's assumptions for the distribution of property values within the New Madrid Seismic Zone ('NMSZ'), which are also detailed in the Event Damage Factor Tables.



Major Ports

The table below lists the main ports in the NMSZ, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the events.

Port	County / Parish
Pascagoula	Jackson
Gulfport	Harrison
South Louisiana	St John the Baptist
Baton Rouge	West Baton Rouge
Mobile	Mobile
Memphis	Shelby
St. Louis	St Louis

The table below lists the main domestic and international airports in the NMSZ, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the events.

Airport	County / Parish
Jonesboro Municipal	Craighead
Cape Girardeau Regional	Scott
Barkley Regional	McCracken
McKellar-Sipes Regional	Madison
Memphis International	Shelby
Louis Armstrong New Orleans International/Moisant Field	Jefferson Parish
Alexandria International	Rapides Parish
Jackson International	Rankin
Birmingham International	Jefferson
Huntsville International- Carl T. Jones Field Nashville International	Madison Davidson
Lambert-St. Louis International	Saint Louis
Terre Haute International- Hulman Field	Vigo

Major Airports

NEW MADRID EARTHQUAKE - RDS EVENT

New Madrid Earthquake RDS Event

A US\$35 billion Ground-up property (shake and fire-following) Industry Loss.

Event Footprint

The map below illustrates the Footprint and county / parish damage levels for this event, which are also detailed in the Event Damage Factor Tables.



Insured Industry Loss Levels

Syndicates should assume the following components of the loss.

Residential Property	US\$20,000,000,000
Commercial/Industrial Property	US\$15,000,000,000
Marine	US\$ 1,500,000,000
Personal Accident	US\$ 500,000,000
Workers Compensation	US\$ 2,500,000,000
Auto	US\$ 500,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

- **PA and WCA** It should be assumed that there will be 1,000 deaths and 10,000 injuries as a result of this earthquake. Syndicates should assume that 50% of those injured will have PA cover.
- Aviation Lloyd's has commissioned research which indicates that minimal Aviation Hull losses would be expected to arise from an earthquake. Syndicates should take account of these findings in calculating their loss estimates.
- **Business Interruption** Overland transport systems are severely damaged and Businesses Impacted, leading to significant business interruption exposure for a period of 30 days. This is restricted to the inner zone of maximum earthquake intensities (highlighted on Event Footprint).

New Madrid Earthquake RDS Event Damage Factor Table Due to the large number of counties / parishes involved, it is not practical to include a full list of the Event Damage Factors for the New Madrid Earthquake events. The full tables have been provided in electronic form, along with this document.

NEW MADRID EARTHQUAKE – EXTREME STRESS SCENARIO (ESS) EVENT

New Madrid Earthquake ESS Event

A US\$70 billion Ground-up property (shake and fire following) Industry Loss from an earthquake originating within the NMSZ near Mississippi county.

Event Footprint

The map below illustrates the Footprint and county / parish damage levels for this event, which are also detailed in the Event Damage Factor Tables.



Insured Industry Loss Levels

Syndicates should assume the following components of the loss.

Residential Property	US\$41,000,000,000
Commercial/Industrial Property	US\$29,000,000,000
Marine	US\$ 3,000,000,000
Personal Accident	US\$ 1,000,000,000
Workers Compensation	US\$ 5,000,000,000
Auto	US\$ 1,000,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

- **PA and WCA** It should be assumed that there will be 2,000 deaths and 20,000 injuries as a result of this earthquake. Syndicates should assume that 50% of those injured will have PA cover.
- Aviation Lloyd's has commissioned research which indicates that minimal Aviation Hull losses would be expected to arise from an earthquake. Syndicates should take account of these findings in calculating their loss estimates.
- **Business Interruption** Overland transport systems are severely damaged and businesses impacted, leading to significant Business Interruption exposure for a period of 60 days. This is restricted to the inner zone of maximum earthquake intensities (highlighted on Event Footprint).

New Madrid Earthquake RDS Event Damage Factor Table Due to the large number of counties / parishes involved, it is not practical to include a full list of the Event Damage Factors for the New Madrid Earthquake events. The full tables have been provided in electronic form, along with this document.

15 EUROPEAN WINDSTORM

European Windstorm Central Track	This event is based upon a low pressure track originating in the North Atlantic basin resulting in an intense windstorm with maximum / peak gust wind speeds in excess of 50 metres per second (112 mph or 97 knots). The strongest winds occur to the south of the storm track resulting in a broad swath of damage across southern England, France, Belgium, Netherlands, Luxembourg, Germany and Denmark.
This event The map b	This event results in an estimated Industry Loss of US\$30 billion or €23 billion. The map below illustrates the windstorm track and affected regions.
Insured Industry Loss Assumptions	This windstorm track would be expected to generate a Ground-up, Industry Loss of US\$ 30 billion or €23 billion.



Syndicates should assume the following components of the loss:

Residential Property	US\$20,000,000,000
Commercial/Industrial Property	US\$ 8,000,000,000
Agricultural	US\$ 2,000,000,000
Marine	US\$ 1,000,000,000
Auto	US\$ 500,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

Specie/Fine Art Personal Accident Aviation Liability

COUNTRY MAPPING OF PROPERTY VALUE DISTRIBUTIONS AND DAMAGE FACTORS

Distribution of Property Values in the UK and Ireland

The map below illustrates Lloyd's assumptions for the distribution of property values within the UK and Ireland, which are also detailed in the Event Damage Factor Tables. Please note that the scale is different for the two countries.



Event Footprint

The map below illustrates the Footprint and damage levels within the UK and Ireland, which are also detailed in the Event Damage Factor Tables on pages 78 to 83. Please note that the scale is different for the two countries.


Distribution of Property Values in France and Germany

The map below illustrates Lloyd's assumptions for the distribution of property values within France and Germany, which are also detailed in the Event Damage Factor Tables. Please note that the scale is different for the two countries.



Event Footprint

The map below illustrates the Footprint and damage levels in France and Germany, which are also detailed in the Event Damage Factor Tables on pages 78 to 83. Please note that the scale is different for the two countries.



Distribution of Property Values in Belgium and The Netherlands The map below illustrates Lloyd's assumptions for the distribution of property values in Belgium and The Netherlands, which are also detailed in the Event Damage Factor Tables. Please note that the scale is different for the two countries.



Event Footprint

The map below illustrates the Footprint and damage levels in Belgium and the Netherlands, which are also detailed in the Event Damage Factor Tables on pages 78 to 83. Please note that the scale is different for the two countries.



in Denmark

Distribution of Property Values The map below illustrates Lloyd's assumptions for the distribution of property values within Denmark, which are also detailed in the Event Damage Factor Tables.



Event Footprint

The map below illustrates the Footprint and damage levels in Denmark, which are also detailed in the Event Damage Factor Tables on pages 78 to 83.



European Country Level Exposure Guidance A spreadsheet detailing the damage factor assumptions at CRESTA level for Belgium, Denmark, France, Germany, Ireland, Luxembourg, Netherlands and the UK will be available from the MSU website.

BELGIUM

COUNTRY	PROVINCE	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DA RESIDENTIAL	MAGE FACTORS COMMERCIAL
BELGIUM	BRUXELLES	20.51%	100%	0.24%	0.15%
BELGIUM	ANVERS, MECHELEN	16.92%	100%	0.25%	0.13%
BELGIUM	LOUVAIN / TIENEN / HASSELT	11.14%	100%	0.25%	0.12%
BELGIUM	LIEGE	9.95%	100%	0.19%	0.09%
BELGIUM	NAMUR	3.85%	100%	0.23%	0.12%
BELGIUM	CHARLEROI / LIBRAMONT	5.81%	100%	0.19%	0.09%
BELGIUM	TOURNAI / ATH / MONS	6.78%	100%	0.33%	0.18%
BELGIUM	OOSTENDE / BRUGGE / KORTRIJK	12.16%	100%	0.37%	0.20%
BELGIUM	GENT	12.87%	100%	0.34%	0.18%

DENMARK

COUNTRY	AMT (COUNTY)	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DA RESIDENTIAL	MAGE FACTORS COMMERCIAL
DENMARK	Aarhus	11.38%	100%	0.04%	0.01%
DENMARK	Bornholm	1.17%	100%	0.12%	0.03%
DENMARK	Frederiksborg	6.01%	100%	0.06%	0.01%
DENMARK	Fyn	9.55%	100%	0.17%	0.06%
DENMARK	Kobenhavn og Frederiksberg	9.04%	100%	0.10%	0.04%
DENMARK	Kobenhavns	9.20%	100%	0.09%	0.03%
DENMARK	Nordjylland	10.69%	100%	0.02%	0.01%
DENMARK	Ribe	4.68%	100%	0.10%	0.03%
DENMARK	Ringkobing	5.99%	100%	0.03%	0.01%
DENMARK	Roskilde	3.71%	100%	0.08%	0.02%
DENMARK	Sonderjylland	5.24%	100%	0.16%	0.05%
DENMARK	Storstrom	5.34%	100%	0.23%	0.08%
DENMARK	Vejle	6.61%	100%	0.05%	0.01%
DENMARK	Vestsjaelland	6.37%	100%	0.15%	0.05%
DENMARK	Viborg	5.01%	100%	0.02%	0.00%

FRANCE

COUNTRY	DÉPARTEMENT	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAI RESIDENTIAL	MAGE FACTORS COMMERCIAL
FRANCE	Ain	0.89%	100%	0.01%	0.00%
FRANCE	Aisne	0.64%	100%	0.16%	0.09%
FRANCE	Allier	0.58%	100%	0.15%	0.05%
FRANCE	Alpes-de-Haute-Provence	0.34%	100%	0.05%	0.02%
FRANCE	Alpes-Maritimes	2.53%			
FRANCE	Ardeche	0.55%			
FRANCE	Ardennes	0.36%	100%	0.15%	0.09%
FRANCE	Ariège	0.30%	100%	0.16%	0.07%
FRANCE	Aube	0.44%	100%	0.01%	0.00%
FRANCE	Aude	0.65%	100%	0.05%	0.02%
FRANCE	Aveyron	0.54%			
FRANCE	Bas Rhin	1.61%			
FRANCE	Bouches-du-Rhone	3.41%	100%	0.05%	0.01%
FRANCE	Calvados	0.96%	100%	0.07%	0.04%

FRANCE (continued)

COUNTRY	DÉPARTEMENT	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAN RESIDENTIAL	MAGE FACTORS COMMERCIAL
FRANCE	Cantal	0.30%	100%	0.80%	0.44%
FRANCE	Charente	0.59%	100%	0.01%	0.00%
FRANCE	Charente-Maritime	1.08%	100%	0.01%	0.01%
FRANCE	Cher	0.50%	100%	0.18%	0.09%
FRANCE	Correze	0.44%	100%	0.04%	0.02%
FRANCE	Corse-du-Sud	0.30%	100%	0.04%	0.01%
FRANCE	Cote-d'Or	0.84%			
FRANCE	Cotes-d'Armor	0.78%	100%	0.02%	0.01%
FRANCE	Creuse	0.24%	100%	0.56%	0.33%
FRANCE	Deux-Sevres	0.53%	100%	0.03%	0.01%
FRANCE	Dordogne	0.75%	100%	0.04%	0.01%
FRANCE	Doubs	0.77%	100%	0.01%	0.00%
FRANCE	Drome	0.96%	100%	0.06%	0.02%
FRANCE	Esonne	1.72%	100%	0.03%	0.01%
FRANCE	Eure	0.71%	100%	0.16%	0.10%
FRANCE	Eure-et-Loire	0.53%	100%	0.09%	0.04%
FRANCE	Finistere	1.23%	100%	0.02%	0.01%
FRANCE	Gard	1.09%	100%	0.19%	0.06%
FRANCE	Gers	0.33%			
FRANCE	Gironde Haut Phin	2.38%	100%	0.05%	0.00%
		0.24%	100%	0.05%	0.02%
FRANCE	Haute-Garonne	1.85%	100 /8	0.1070	0.05 %
FRANCE	Haute-Caroline Haute-Loire	0.42%			
FRANCE	Haute-Marne	0.42 %	100%	0.02%	0.01%
FRANCE	Hautes-Alnes	0.32%	100%	0.05%	0.02%
FRANCE	Haute-Savoie	1.28%	10070	0.000,0	0.0270
FRANCE	Hautes-Pyrenees	0.43%	100%	0.08%	0.04%
FRANCE	Haute-Vienne	0.56%			
FRANCE	Haut-Saone	0.37%	100%	0.04%	0.01%
FRANCE	Hauts-de-Seine	3.47%	100%	0.04%	0.02%
FRANCE	Herault	1.87%	100%	0.06%	0.07%
FRANCE	Ille-et-Vilaine	1.33%	100%	0.01%	0.00%
FRANCE	Indre	0.40%	100%	0.33%	0.13%
FRANCE	Indre-et-Loire	0.81%	100%	0.03%	0.01%
FRANCE	Isere	1.85%	100%	0.02%	0.01%
FRANCE	Jura	0.48%	100%	0.07%	0.04%
FRANCE	Landes	0.63%	100%	0.03%	0.02%
FRANCE		1.30%	100%	0.01%	0.00%
FRANCE	Loire-Allanuque	1.87%	100%	0.08%	0.049/
	Loir et Cher	0.90%	100%	0.00%	0.04%
FRANCE	Lot	0.49%	100%	0.13%	0.05%
FRANCE	Lot-et-Garonne	0.56%	100 /6	0.1076	0.0378
FRANCE	Lozere	0.17%	100%	0.02%	0.01%
FRANCE	Maine-et-Loire	1.12%	10070	0.0270	0.0170
FRANCE	Manche	0.65%	100%	0.09%	0.05%
FRANCE	Marne	0.89%	100%	0.16%	0.08%
FRANCE	Mayenne	0.37%	100%	0.08%	0.04%
FRANCE	Meurthe-et-Moselle	0.86%	100%	0.04%	0.02%
FRANCE	Meuse	0.26%	100%	0.16%	0.07%
FRANCE	Morbihan	0.91%	100%	0.01%	0.01%
FRANCE	Moselle	1.26%	100%	0.07%	0.04%
FRANCE	Nievre	0.39%	100%	0.27%	0.10%
FRANCE	Nord	3.21%	100%	0.40%	0.27%
FRANCE	Oise	0.93%	100%	0.54%	0.27%
FRANCE	Orne	0.40%	100%	0.14%	0.07%
FRANCE	Paris	6.78%	100%	0.03%	0.03%
FRANCE	Pas-de-Calais	1.63%	100%	0.48%	0.37%
FRANCE	Puy-de-Dome	1.01%	100%	0.00%	0.23%
FRANCE	r yrenees-Allanlique Pyronoos-Oriontal	1.21%	100%	0.02%	0.01%
FRANCE	Rhone	2 94%			
		2.37/0			

FRANCE (continued)

COUNTRY	DÉPARTEMENT	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAI RESIDENTIAL	MAGE FACTORS COMMERCIAL
FRANCE	Saone-et-Loire	0.87%	100%	0.01%	0.01%
FRANCE	Sarthe	0.59%	100%	0.01%	0.01%
FRANCE	Savoie	0.82%	100%	0.09%	0.04%
FRANCE	Seine-et-Marne	1.82%	100%	0.04%	0.02%
FRANCE	Seine-Maritime	1.85%	100%	0.32%	0.20%
FRANCE	Seine-Saint-Denis	1.95%	100%	0.11%	0.04%
FRANCE	Somme	0.82%	100%	0.51%	0.37%
FRANCE	Tarn	0.65%	100%	0.16%	0.05%
FRANCE	Tarn-et-Garonne	0.34%			
FRANCE	Territoire de Belfort	0.19%			
FRANCE	Val-de-Marne	1.85%	100%	0.04%	0.03%
FRANCE	Val-d'Oise	1.42%	100%	0.13%	0.07%
FRANCE	Var	2.11%	100%	0.05%	0.02%
FRANCE	Vaucluse	1.04%			
FRANCE	Vendee	1.01%			
FRANCE	Vienne	0.59%	100%	0.15%	0.06%
FRANCE	Vosges	0.64%	100%	0.05%	0.02%
FRANCE	Yonne	0.57%	100%	0.07%	0.03%
FRANCE	Yvelines	1.98%	100%	0.06%	0.03%

GERMANY

COUNTRY	BUNDESLAND	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAI RESIDENTIAL	MAGE FACTORS COMMERCIAL
GERMANY	Baden-Wuerttemberg	8.90%	100%	0.01%	0.00%
GERMANY	Bayern	11.10%	100%	0.01%	0.01%
GERMANY	Berlin	5.01%	100%	0.01%	0.01%
GERMANY	Brandenburg	3.14%	100%	0.01%	0.01%
GERMANY	Bremen	1.07%	100%	0.07%	0.02%
GERMANY	Hamburg	2.97%	100%	0.02%	0.01%
GERMANY	Hessen	10.10%	100%	0.03%	0.02%
GERMANY	Niedersachsen	5.55%	100%	0.33%	0.07%
GERMANY	Mecklenburg-Vorpommern	6.08%	100%	0.00%	0.00%
GERMANY	Nordrhein-Westfalen	23.20%	100%	0.09%	0.07%
GERMANY	Rheinland-Pfalz	5.73%	100%	0.03%	0.02%
GERMANY	Saarland	1.43%	100%	0.03%	0.01%
GERMANY	Sachsen	5.73%	100%	0.01%	0.01%
GERMANY	Sachsen-Anhalt	3.93%	100%	0.02%	0.02%
GERMANY	Schleswig-Holstein	3.42%	100%	0.04%	0.01%
GERMANY	Thueringen	2.71%	100%	0.04%	0.03%

IRELAND

COUNTRY	COUNTY	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DA	MAGE FACTORS COMMERCIAL
IRELAND	Carlow	1.06%	100%	0.70%	0.56%
IRELAND	Cavan	1.33%			
IRELAND	Clare	2.19%	100%	0.06%	0.02%
IRELAND	Cork	10.48%	100%	0.16%	0.07%
IRELAND	Donegal	3.05%			
IRELAND	Dublin	36.43%	100%	0.03%	0.01%
IRELAND	Galway	4.31%	100%	0.01%	
IRELAND	Kerry	3.01%	100%	0.13%	0.06%
IRELAND	Kildare	3.21%	100%	0.05%	0.02%
IRELAND	Kilkenny	1.88%	100%	0.17%	0.08%
IRELAND	Laois	1.23%	100%	0.06%	0.02%

IRELAND (continued)

COUNTRY	COUNTY	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAM RESIDENTIAL	AGE FACTORS COMMERCIAL
IRELAND	Leitrim	0.67%			
IRELAND	Limerick	3.87%	100%	0.09%	0.03%
IRELAND	Longford	0.78%			
IRELAND	Louth	2.63%	100%	0.01%	
IRELAND	Мауо	2.75%			
IRELAND	Meath	2.86%	100%	0.01%	
IRELAND	Monaghan	1.38%			
IRELAND	Offaly	1.47%	100%	0.03%	0.01%
IRELAND	Roscommon	1.29%			
IRELAND	Sligo	1.37%			
IRELAND	Tipperary	3.32%	100%	0.09%	0.04%
IRELAND	Waterford	2.49%	100%	0.21%	0.11%
IRELAND	Westmeath	1.53%			
IRELAND	Wexford	2.64%	100%	0.25%	0.14%
IRELAND	Wicklow	2.75%	100%	0.08%	0.03%

LUXEMBOURG

COUNTRY	COUNTY	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAI RESIDENTIAL	MAGE FACTORS COMMERCIAL
LUXEMBOURG	N/A	100.00%	100%	0.09%	0.06%

NETHERLANDS

COUNTRY	PROVINCE	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAN RESIDENTIAL	AGE FACTORS
NETHERLANDS	Drenthe	2.53%	100%	0.13%	0.05%
NETHERLANDS	Flevoland	1.62%	100%	0.17%	0.08%
NETHERLANDS NETHERLANDS	Friesland Gelderland Groningen	3.28% 13.15% 3.18%	100% 100% 100%	0.22% 0.19% 0.15%	0.11% 0.08% 0.07%
NETHERLANDS	Limburg	6.68%	100%	0.25%	0.09%
NETHERLANDS	Noord-Brabant	14.74%	100%	0.31%	0.12%
NETHERLANDS	Noord-Holland	18.16%	100%	0.24%	0.16%
NETHERLANDS	Overijssel	5.49%	100%	0.14%	0.06%
NETHERLANDS	Utrecht	6.70%	100%	0.15%	0.07%
NETHERLANDS	Zeeland	2.17%	100%	0.51%	0.22%
NETHERLANDS	Zuid-Holland	22.30%	100%	0.25%	0.15%

UK

COUNTRY	POSTAL AREA	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DA RESIDENTIAL	MAGE FACTORS COMMERCIAL
UK	В	3.09%	100%	0.09%	0.05%
UK	BT	2.04%			
UK	G	1.40%			
UK	S	1.79%	100%	0.06%	0.03%
UK	L	1.56%	100%	0.11%	0.08%
UK	M	1.85%	100%	0.07%	0.03%
UK	NG	1.57%	100%	0.12%	0.06%
UK	EH	1.30%			
UK	BN	1.77%	100%	0.86%	0.59%

UK

COUNTRY	POSTAL AREA	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAI RESIDENTIAL	MAGE FACTORS COMMERCIAL
UK	SW	2.14%	100%	0.19%	0.14%
UK	NE	1.13%	100%	0.02%	0.01%
UK	BS	1.34%	100%	0.17%	0.11%
UK	PO	1.94%	100%	0.65%	0.47%
UK	SE	1.99%	100%	0.26%	0.18%
UK	CF	1.08%	100%	0.15%	0.09%
UK	TN	1.59%	100%	0.82%	0.52%
UK	GU	1.48%	100%	0.36%	0.23%
UK	LE	1.33%	100%	0.13%	0.06%
UK	PE	1.19%	100%	0.25%	0.13%
UK	N	1.64%	100%	0.23%	0.16%
UK	CH	0.67%	100%	0.09%	0.05%
UK	RG	1.47%	100%	0.24%	0.16%
UK	SA	0.89%	100%	0.19%	0.11%
UK	NR	1.26%	100%	0.31%	0.17%
UK	LS	1.10%	100%	0.04%	0.02%
UK	CM	0.99%	100%	0.45%	0.27%
UK	SU	1.42%	100%	0.37%	0.25%
UK		1.16%	100%	0.11%	0.05%
UK	E	2.35%	100%	0.28%	0.18%
		0.92%	100%	0.14%	0.08%
		0.85%	100%	0.12%	0.06%
	SK	0.93%	100%	0.08%	0.04%
		1.02%	100%	0.29%	0.20%
	OY OX	0.92%	100%	0.09%	0.04%
		0.00%	100%	0.10%	0.11%
UK	II- \\\/	1.66%	100%	0.37%	0.21%
UK	NW	1 35%	100%	0.20%	0.15%
UK	BH	1 16%	100%	0.49%	0.31%
UK	WA	0.74%	100%	0.07%	0.04%
UK	ST	0.87%	100%	0.09%	0.05%
UK	YO	0.79%	100%	0.05%	0.03%
UK	ME	1.21%	100%	0.65%	0.38%
UK	СТ	1.10%	100%	0.97%	0.59%
UK	SS	0.78%	100%	0.55%	0.32%
UK	BH	0.75%	100%	0.38%	0.25%
UK	NN	0.86%	100%	0.15%	0.08%
UK	LL	0.65%	100%	0.11%	0.05%
UK	PL	0.76%	100%	0.29%	0.19%
UK	EX	0.75%	100%	0.17%	0.10%
UK	HP	0.96%	100%	0.21%	0.12%
		0.64%	100%	0.03%	0.01%
		0.8/%	1009/	0.070/	0.000/
		0.74%	100%	0.07%	0.03%
	TW	0.74%	100%	0.02%	0.01%
UK OK	NP	0.00%	100%	0.20%	0.10%
UK	CO	0.03%	100%	0.52%	0.29%
UK	BB	0.88%	100%	0.04%	0.01%
UK	MK	0.60%	100%	0.17%	0.11%
UK	RM	0.82%	100%	0.37%	0.26%
UK	ВА	0.62%	100%	0.17%	0.09%
UK	SL	0.84%	100%	0.19%	0.11%
UK	WF	0.63%	100%	0.06%	0.02%
UK	CR	0.77%	100%	0.34%	0.25%
UK	SG	0.59%	100%	0.27%	0.16%
UK	SN	0.54%	100%	0.19%	0.12%
UK	HA	0.75%	100%	0.20%	0.13%
UK	DA	0.70%	100%	0.36%	0.25%
UK	OL	0.74%	100%	0.05%	0.02%
UK	CB	0.53%	100%	0.31%	0.19%
UK	KA	0.56%			

UK (continued)

COUNTRY	POSTAL AREA	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAI RESIDENTIAL	MAGE FACTORS COMMERCIAL
UK	BR	0.59%	100%	0.34%	0.24%
UK	WS	0.57%	100%	0.07%	0.03%
UK	DY	0.62%	100%	0.10%	0.04%
UK	KY	0.37%			
UK	LA	0.54%	100%	0.01%	0.01%
UK	HU	0.48%	100%	0.12%	0.08%
UK	WV	0.55%	100%	0.09%	0.04%
UK	BL	0.53%	100%	0.06%	0.03%
UK	ML	0.65%			
UK	CA	0.45%	100%	0.01%	0.01%
UK	DL	0.40%	100%	0.01%	0.01%
UK	SY	0.41%	100%	0.09%	0.05%
	PA	0.31%	1000/	0.000/	0.000/
		0.38%	100%	0.32%	0.22%
	TO	0.43%	100%	0.25%	0.15%
UK	CW	0.38%	100%	0.09%	0.05%
UK	ТА	0.44%	100%	0.16%	0.09%
UK	IG	0.53%	100%	0.30%	0.20%
UK	FY	0.39%	100%	0.09%	0.05%
UK	UB	0.62%	100%	0.23%	0.15%
UK	AL	0.35%	100%	0.26%	0.18%
UK	WD	0.35%	100%	0.21%	0.15%
UK	DD	0.42%			
UK	TR	0.41%	100%	0.37%	0.25%
UK	FK	0.51%			
UK	WR	0.43%	100%	0.12%	0.06%
UK	LN	0.36%	100%	0.16%	0.08%
UK	WN	0.35%	100%	0.07%	0.03%
		0.32%	100%	0.02%	0.01%
	SM	0.37%	100%	0.04 %	0.01%
	IV	0.34%	10070	0.2070	0.2170
UK	SP	0.30%	100%	0.28%	0.18%
UK	DT	0.35%	100%	0.37%	0.20%
UK	SR	0.27%	100%	0.03%	0.01%
UK	HR	0.27%	100%	0.11%	0.05%
UK	PH	0.49%			
UK	DG	0.26%			
UK	TF	0.24%	100%	0.09%	0.04%
UK	HG	0.18%	100%	0.03%	0.01%
UK	HX	0.26%	100%	0.03%	0.01%
UK	ID	0.16%	100%	0.01%	0.400/
		0.15%	100%	0.49%	0.43%
		0.13%	100%	0.03%	0.47%
UK	K/M/	0.10%	100 %	0.03%	0.01%
UK	ID	0.08%	100%	0.12%	0.06%
UK	WC	0.38%	100%	0.15%	0.14%
UK	EC	1.08%	100%	0.16%	0.14%

16 JAPANESE EARTHQUAKE

Japanese Earthquake Event

Insured Industry Loss from this event of US\$50 billion.

Distribution of Property Values in Japan The map below illustrates Lloyd's assumptions for the distribution of property values within Japan, which are also detailed in the Event Damage Factor Tables.

This event is based on the Great Kanto earthquake of 1923, with an estimated



Major Ports

The table below lists the main ports in the Great Kanto Footprint, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the event.

Port	City
Akita	Akita
Kinuura	Handa
Kobe	Nada-Ku Kobe-Shi
Nagoya	Minato-Ku Nagoya-Shi
Osaka	Suminoe-Ku Osaka-Shi
Sakaide	Sakaide-Shi
Yokkaichi	Yokkaichi-Shi
Sakata	Sakata-Shi
Hachinohe	Hachinohe-Shi
Maizuru	Maizuru-Shi

Major Airports

The table below lists the main international and domestic airports potentially impacted by the Great Kanto earthquake event, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the event.

Airport	City
Matsumoto	Matsumoto
Miyake Jima	Miyake Jima
Nagoya Komaki	Nagoya
Niigata	Niigata
Oshima	Oshima
Yokohama	Yokohama

Great Kanto Event Footprint

The map below illustrates the Footprint and damage levels for Japan, which are also detailed in the Event Damage Factor Tables on pages 87 and 88.



Insured Industry Loss Levels

Is Syndicates should assume the following components of the loss.

Residential Property	US\$15,000,000,000
Commercial/Industrial Property	US\$35,000,000,000
Marine	US\$ 1,500,000,000
Personal Accident	US\$ 500,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

PA – It should be assumed that 2,000 deaths and 20,000 injuries will arise as a result of this major earthquake. Assume that 50% of those injured will have PA cover.

Liability Business - Liability exposures should also be considered.

Aviation – Following research undertaken by Lloyd's, syndicates should assume that minimal Aviation Hull losses will arise from an earthquake of this magnitude.

Business Interruption – Overland transport systems are severely damaged and businesses impacted, leading to significant Business Interruption exposure for a period of 60 days. This is restricted to the inner zone of maximum earthquake intensities (highlighted on Event Footprint).

Japanese Earthquake Event - Prefecture Level Damage Factor Table

PREFECTURE		AGGREGATE	DAMAGE FACTORS SHAKE ONLY FIRE FOLLOWING ON RESIDENTIAL COMMERCIAL RESIDENTIAL COMM			
NAME	DISTRIBUTION	FOOTFRINT	RESIDENTIAL	COMMERCIAL	RESIDENTIAL	COMMERCIAL
AICHI	5.32%	100.00%	0.02%	0.11%		
AKITA	0.52%		0.00%			
AOMORI	0.72%		0.00%			
CHIBA	6.57%	100.00%	1.81%	3.70%	0.35%	1.43%
EHIME	0.75%		0.00%			
FUKUI	0.52%		0.00%			
FUKUOKA	3.21%		0.00%			
FUKUSHIMA	0.76%	100.00%	0.00%	0.01%		
GIFU	1.38%	100.00%	0.01%	0.04%		
GUNMA	1.18%	100.00%	0.15%	0.88%		0.02%
HIROSHIMA	2.14%		0.00%			
HOKKAIDO	4.16%		0.00%			
HYOGO	3.21%		0.00%			
IBARAKI	2.22%	100.00%	0.21%	0.96%	0.02%	0.09%
ISHIKAWA	0.77%		0.00%			
IWATE	0.50%		0.00%			
KAGAWA	0.64%		0.00%			
KAGOSHIMA	1.42%		0.00%			
KANAGAWA	10.01%	100.00%	3.86%	6.30%	0.78%	3.42%
KOCHI	0.59%		0.00%			
KUMAMOTO	1.15%		0.00%			
KYOTO	1.81%		0.00%			
MIE	0.78%	100.00%	0.00%	0.01%		
MIYAGI	1.57%		0.00%			
MIYAZAKI	0.83%		0.00%			
NAGANO	0.58%	100.00%	0.04%	0.29%		
NAGASAKI	0.43%		0.00%			
NARA	0.83%		0.00%			
NIIGATA	1.07%	100.00%	0.01%	0.04%		
OITA	0.60%		0.00%			
OKAYAMA	0.81%		0.00%			
OKINAWA	0.30%		0.00%			
OSAKA	7.99%		0.00%			
SAGA	0.20%		0.00%			
SAITAMA	6.85%	100.00%	1.13%	2.44%	0.26%	1.17%
SHIGA	0.54%		0.00%			
SHIMANE	0.26%		0.00%			
SHIZUOKA	3.86%	100.00%	1.32%	2.34%	0.18%	0.40%

PREFECTURE NAME	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	SHAKE	DAMAGE E ONLY COMMERCIAL	FACTORS FIRE FOLLO RESIDENTIAL	DWING ONLY COMMERCIAL
TOCHIGI TOKUSHIMA TOKYO TOTTORI TOYAMA	0.93% 0.44% 18.45% 0.36% 0.34%	100.00% 100.00% 100.00%	0.08% 0.00% 2.32% 0.00% 0.01%	0.45% 4.68% 0.02%	0.48%	1.56%
WAKAYAMA YAMAGATA YAMAGUCHI YAMANASHI	0.60% 0.43% 0.67% 0.76%	100.00%	0.00% 0.00% 0.00% 0.63%	1.39%	0.19%	0.16%

Japanese Earthquake Event - Prefecture Level Damage Factor Table (continued)

Japanese Earthquake Event - CRESTA Zone Damage Factor Table

			DAMAGE FACTORS			
CRESTA ZONE	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	SHAKE	E ONLY COMMERCIAL	FIRE FOLLO	OWING ONLY COMMERCIAL
1	4.16%					
2	2.00%	100.00%	0.01%	0.04%		
3	1.84%	100.00%		0.01%		
4	11.70%	100.00%	0.72%	2.26%	0.16%	0.48%
5	36.00%	100.00%	2.58%	5.40%	0.51%	1.37%
6	13.50%	100.00%	0.37%	0.80%	0.08%	0.21%
7	1.03%	100.00%	0.01%	0.02%		
8	14.95%					
9	4.23%					
10	2.41%					
11	7.83%					

17 TERRORISM

TRIA Event (covered by Terrorism Risk Insurance Act 2002) Syndicates should complete both of the following hypothetical terrorist attack scenarios :

The Midtown Manhattan area, New York, at 11:00am on 1 April 2005 suffers a 2-tonne bomb blast attack causing :

Zone	Impact Description	Damage Zones	Property Damage	Fire Loss
1	Collapse and fire following	Inner zone, radius 200m	100%	10%
2	Massive debris damage to surrounding properties	400m radius	25%	2.5%
3	Light debris damage to surrounding properties	500m radius	10%	1%

Radii measurements are taken from the Empire State Building as a reference point.

The perpetrator is a foreign terrorist group and the terrorist attack falls within the definition of an 'Act of Terrorism' as set out in TRIA.

Non-TRIA Event

The same scenario as above, but the perpetrator is a domestic terrorist group and the event is not covered by TRIA.

PRESCRIBED ASSUMPTIONS

Number of Deaths and Injuries 1,000 blue / white-collar worker deaths in total and 2,500 injuries in total; syndicates to determine a worst case split across lines of business (WCA, PA, Group PA, etc.) and document assumptions using the commentary facility in the RDS Reporting Software. The following percentage split should be used for non-fatal injuries:

14% life threatening

- 35% moderate
- 51% minor

Business Interruption

Overland / underground transport systems are partially damaged, leading to significant Business Interruption exposure for a period of three months.

Affected Classes of Business	All possible affected business classes should be included in the calculations, such as Contingent Business Interruption and Specie / Fine Art.
TRIA Recoveries	The business class, 'Outwards R/I: TRIA Recoveries' is included within the 'Exposure' screen to assist in the completion of the return. LORS Code N1631 has been assigned to the 'Reinsurance' screen to facilitate entry of this information.
	It is appreciated that, due to the wording of TRIA, some managing agents may have difficulty in calculating their group deductible where affiliates are involved. Managing agents are therefore asked to outline their assumptions using the commentary facility in the RDS Reporting Software.
Fire Following	Taking 'Fire Following' into consideration, syndicates should assume the same damage zones with the appropriate fire loss percentage applied (see table on page 89). Syndicates should assume that all property policies are impacted given the New York state ruling that property policies cannot exclude fire. Any assumptions concerning Fire Following Terrorism are to be documented using the commentary facility in the RDS Reporting Software.
Number of Events	The TRIA event and the non-TRIA event should each be assumed to be a single occurrence.
'CBRN' Status	It should be assumed that there is no Chemical, Biological, Radiological or Nuclear hazard exposure arising from these events.

CALCULATION METHODOLOGY

Address Level DataThose syndicates that hold risks at address level should apply the appropriate
mean damage ratio for each damage zone as detailed in the table on page
89. The 'Fire Loss' percentages represent the proportion of the total damage
that can be allocated to fire-following covers.

Zip code dataThose syndicates that record their exposures on a 5 or 9-digit zip code basis
will not be in a position to locate exposures accurately within each zone. An
allocation of aggregate exposures should therefore be applied. Syndicates that
record their exposures on a 5-digit basis should use the table below, which
summarises the proportion of each zip code that lies within each damage zone.

Zip Code	0m – 200m	200m – 400m	400m – 500m
10001	6%	7%	4%
10016	3%	10%	8%
10018	2%	9%	7%

For syndicates that record their exposures on a 9-digit zip code basis, an electronic version of this file, which provides data on a more detailed basis, can be obtained from Loss Modelling on request.

Best Estimate Basis	Syndicates should report losses on a Best Estimate basis to allow the meaningful aggregation of the results at market level. The loss should be reported after selecting the relevant event on the 'Scenarios / Events' screen, entering loss details using the 'Exposures' screen.
Pessimistic Estimate Basis	To highlight the importance of data quality, and to enable Lloyd's to gain a greater understanding of the uncertainty arising from imprecise data, all syndicates should also report losses on a Pessimistic Estimate basis. This figure should be based on the assumption that all data within a relevant zip code, that is not identified at the street address level should be assumed to lie within the damage zone with the highest damage factor. It should be noted that, where a syndicate holds all data at the street address level, its Best Estimate and Pessimistic Estimate figures will be the same.
	Pessimistic losses should be reported using the commentary facility for both the TRIA and non-TRIA events. Those syndicates that do not hold risk data at address level should use the following criteria:
Zip Code Level	Assume that all of the syndicate's exposure within the zip code lies in the highest damage zone within the zip code.
Above Zip Code Level	Apportion all county, state and country exposures to zip code level using appropriate assumptions, such as 'market share' or 'industry database proportions', and detail these using the commentary facility in the RDS Reporting Software. Syndicates should then assume that all of their exposure in the zip code lies in the highest damage zone within the zip code.



'Point' Zip Code Data

These are zip codes that do not have a geographic boundary and are generally zip codes that are assigned to specific buildings. Please use the table below to allocate exposures to the appropriate damage zone.

Zip Code	0m – 200m	200m – 400m	400m – 500m
10060 (Point)	0%	0%	100%
10095 (Point)	0%	100%	0%
10098 (Point)	0%	100%	0%
10099 (Point)	0%	0%	100%
10118 (Point)	100%	0%	0%
10120 (Point)	0%	100%	0%
10123 (Point)	0%	0%	100%
10138 (Point)	0%	100%	0%
10157 (Point)	0%	100%	0%

TERRORISM WORKED EXAMPLE

	Below is a worked example using the Terrorism event. The diagram on page 92 illustrates the concentric damage zones that are affected by the scenarios.						
Best Estimate for Zip Code 10001	For this example, only assumed to have a To	/ exposures otal Insured	s in zip Value o	code 10001 are of 100.	consi	dered, which are	
	Taking account of the zones, it has been es Insured Value of 6, th Insured Value of 7, ar an Insured Value of 4	proportion timated tha e zone with nd the zone	of the e t the inr a radiu with a	exposure that lie her zone with a r is between 200n radius between	s with adius n and 400m	in each of the of 200m has an 400m has an and 500m has	
Calculating the Aggregate	The aggregate exposure can be calculated by applying a 100% damage factor to each zone as illustrated below :						
	AGGREGATE CALCULATION						
	INSU	RED VALUE IN 2	ZONE x	DAMAGE FACTOR	=	EXPECTED DAMAGE	
	Inner Zone, radius 200m	6.0	Х	100%	=	6.0	
	400m radius	7.0	Х	100%	=	7.0	
	500m radius	4.0	Х	100%	= _	4.0	
					_	17.0	

Given the maximum level of Ground-up Loss, syndicates will then calculate the expected loss to the affected contracts by applying the methods outlined in section G (see page 17).

Expected Ground-up Loss Calculation

Pessimistic Estimate for

Zip Code 10001

The Expected Ground-up Loss can be calculated by applying the zone Damage Factors, detailed on page 89, to each zone as illustrated below :

EXPECTED GROUND-UP LOSS CALCULATION

	NSURED VALUE IN ZON	IE x	DAMAGE FACTOR	=	EXPECTED DAMAGE
Inner zone, radius 200m	6.0	Х	100%	=	6.0
400m radius	7.0	Х	25%	=	1.8
500m radius	4.0	Х	10%	=	0.4
	8.2				

Once the Expected Ground-up Loss has been determined, syndicates can then calculate the expected loss to the affected contracts by applying the methods outlined in section G (see page 17).

The Pessimistic Estimate can be calculated by allocating the Insured Value for the entire zip code to the zone with the largest damage factor.

PESSIMISTIC GROUND-UP LOSS CALCULATION

	INSURED VALUE IN ZONE	х	DAMAGE FACTOR	=	EXPECTED DAMAGE
Inner zone, radius 200m	100	х	100%	=	100
400m radius	0	х	25%	=	0
500m radius	0	Х	10%	=	0
		TOTAL GROUND-UP LOSS			100

Once the Pessimistic Estimate has been determined, syndicates can then calculate the expected loss to the affected contracts by applying the methods outlined in section G (see page 17).

18 GULF OF MEXICO WINDSTORM

Gulf of Mexico Windstorm Event A US\$60 billion Ground-up, Industry Loss from a Gulf of Mexico Hurricane resulting in offshore energy losses of approximately US\$10 billion and mainland property losses of US\$50 billion.

Distribution of Property Values in the affected mainland areas and of Platforms in the Gulf of Mexico The map below illustrates Lloyd's assumptions for the distribution of property within the affected mainland areas, which are also detailed in the Event Damage Factor Tables. Inset is the distribution of offshore energy platforms in the Gulf of Mexico.







Licence Blocks

A list of the affected Licence Blocks in the Gulf of Mexico will be issued with the RDS Reporting Software. The blocks are grouped within three bands depending on their proximity to the centre of the damage track. The bands are:

- Below 10 miles (Band 10)
- From 10 to 25 miles (Band 25)
- From 25 to 50 miles (Band 50)

An example of the data that has been provided for each Licence Block is shown below :

BAND (miles)	AREA_NAME	AREA_CODE	AREA_BLOCK		BLOCK	GEOCODE
50	East Cameron	EC	East Cameron	61	61	GOM EC 61
50	West Cameron	WC	West Cameron	162	162	GOM_WC_162
50	East Cameron	EC	East Cameron	62	62	GOM EC 62
50	East Cameron	EC	East Cameron	63	63	GOM EC 63
50	West Cameron	WC	West Cameron	161	161	GOM_WC_161
50	East Cameron	EC	East Cameron	64	64	GOM_EC_64
25	West Cameron	WC	West Cameron	160	160	GOM_WC_160
10	Galveston	GA	Galveston	101	101	GOM_GA_101
10	Galveston	GA	Galveston	100	100	GOM_GA_100
10	Galveston	GA	Galveston	99	99	GOM_GA_99
10	High Island	HI	High Island	98	98	GOM_HI_98
10	High Island	HI	High Island	97	97	GOM_HI_97
10	High Island	HI	High Island	96	96	GOM_HI_96
25	High Island	HI	High Island	95	95	GOM_HI_95
25	High Island	HI	High Island	94	94	GOM_HI_94
25	High Island	HI	High Island	93	93	GOM_HI_93
25	High Island	HI	High Island	92	92	GOM_HI_92
25	High Island	HI	High Island	91	91	GOM_HI_91
25	High Island	HI	High Island	90	90	GOM_HI_90
25	High Island	HI	High Island	89	89	GOM_HI_89
25	High Island	HI	High Island	88	88	GOM_HI_88
50	West Cameron	WC	West Cameron	177	177	GOM_WC_177
50	West Cameron	WC	West Cameron	178	178	GOM_WC_178
50	West Cameron	WC	West Cameron	179	179	GOM_WC_179
25	High Island	HI	High Island	87	87	GOM_HI_87
50	Vermilion	VR	Vermilion	60	60	GOM_VR_60
50	Vermilion	VR	Vermilion	61	61	GOM_VR_61
50	West Cameron	WC	West Cameron	180	180	GOM_WC_180
50	West Cameron	WC	West Cameron	181	181	GOM_WC_181
50	West Cameron	WC	West Cameron	182	182	GOM_WC_182
25	High Island	HI	High Island	86	86	GOM_HI_86
50	West Cameron	WC	West Cameron	183	183	GOM_WC_183
50	West Cameron	WC	West Cameron	184	184	GOM_WC_184
25	High Island	HI	High Island	85	85	GOM_HI_85
50	West Cameron	WC	West Cameron	185	185	GOM_WC_185
50	West Cameron	WC	West Cameron	186	186	GOM_WC_186
50	West Cameron	WC	West Cameron	187	187	GOM_WC_187
25	High Island	HI	High Island	84	84	GOM_HI_84
50	East Cameron	EC	East Cameron	73	73	GOM_EC_73
50	East Cameron	EC	East Cameron	72	72	GOM_EC_72
50	West Cameron	WC	West Cameron	291	291	GOM_WC_291
50	East Cameron	EC	East Cameron	71	71	GOM_EC_71

CALCULATION METHODOLOGY

Offshore Component Loss Factors

The following loss factors should be used by syndicates to calculate their losses at a Licence Block level for each of the listed classes of business. When calculating their gross exposures, syndicates should use the following loss factors at Licence Block level for each of the classes of business listed below :

	PD [1]	ROD [2]	Pipeline [3]	Mobile [4]	OEE [5]	BI	CBI [6]
Assumptions for calculating block aggregate (100)% exposure	Sum of block platform PD values	25% of sum of block platform PD values	Sum of block pipeline values OR 20% of sum of block platform PD values	Sum of Insured Value of mobiles advised by Lloyd's	Sum of applicable policy limits OR US\$50m (100%) for each platform in block where no 100% limits expressed within policy	365 x sum block per day Bl values OR Annualised block value	As for BI
Loss Factor Blocks < 10 miles	25%	10%	5%	33%	20%	50%	25%
Loss Factor Blocks 10 – 25 miles	10%	0%	0%	10%	5%	25%	12.5%
Loss Factor Blocks 25 – 50 miles	5%	0%	0%	0%	0%	12.5%	6.25%

Note	Details
1	The physical damage (PD) loss factors represent the proportion of asset value lost in the block as a result of the event. For Licence Blocks within 10 miles of the centre of the damage track, assume that the 25% loss is split 10% total losses and 15% partial losses. It is assumed that there will be no total losses within the other two bands.
2	The assumed block aggregate exposure for ROD is 25% of platform PD values. The removal of debris (ROD) loss factors represent the proportion of asset value lost in the block as a result of assets that are a total loss.
3	Underwriters are requested to record pipeline exposures at block level by assigning actual values per block or assigning values pro- rata according to the number of blocks they pass through. Should syndicates not be able to calculate their block aggregate in this way, they should use the alternative calculation method of assigning 20% of the sum of their block PD values.
4	Lloyd's will provide a full listing of mobile drilling rigs on the Market Reporting website by Friday 15 April 2005.
5	Policy Limits should be used for calculating operators' extra expenses (OEE) block aggregate exposure where held. Where these are not available, each platform within a Licence Block should be assumed to generate a loss of US\$50m.
6	Contingent business interruption (CBI) losses, where applicable, should be calculated in addition to business interruption (BI) losses.

Calculation Methodology for Third Party Liabilities (TPL)

Syndicates should calculate their TPL losses by assuming a US\$250 million Lloyd's market loss and applying their syndicate EG/EH market share.

Calculation Process using Loss Factors

- 1. Calculate aggregate exposure in each block, for each interest.
- 2. Calculate aggregate exposure in respect of Mobile Drilling Rigs according to loss assumptions supplied by Lloyd's.
- 3. Calculate best estimate event loss in each block, for each interest, by applying the prescribed loss factors.

- 4. Calculate TPL loss by assuming a US\$250m Lloyd's market loss and applying syndicate EG/EH market share.
- 5. Apply policy terms (limits, excesses, fac RI, etc.) to arrive at estimate of insured loss.

Offshore Component Worked Example

Below is an illustration of how syndicates should calculate their losses for each class of business using example Licence Block aggregates and the loss factors as prescribed in the previous tables.

	PD	ROD	Pipeline	Mobile	OEE	BI	СВІ	TOTAL
Assumptions for calculating block aggregate (100)% exposure	Sum of block platform PD values	25% of sum of block platform PD values	Sum of block pipeline values OR 20% of sum of block platform PD values	Sum of Insured Value of mobiles advised by Lloyd's	Sum of applicable policy limits OR US\$50m (100%) for each platform in block where no 100% limits expressed within policy	365 x sum block per day Bl values OR Annualised block value	As for BI	
Example Block Aggregates	US\$10m	US\$2.5m	US\$2m	US\$3m	US\$10m	US\$4m per year	US\$4m per year	US\$35.5m
Loss Estimate Blocks < 10 miles	US\$2.5m	US\$0.25m	US\$0.1m	US\$1m	US\$2m	US\$2m	US\$1m	US\$8.85m
Loss Estimate Blocks 10 – 25 miles	US\$1m	US\$0m	US\$0m	US\$0.3m	US\$0.5m	US\$1m	US\$0.5m	US\$3.3m
Loss Estimate Blocks 25 – 50 miles	US\$0.5m	US\$0m	US\$0m	US\$0m	US\$0m	US\$0.5m	US\$0.25m	US\$1.25m

Third Party Liabilities Example A syndicate with a 5% share of the Lloyd's EG/EH market should assume a loss of US\$250 million x 5% = US\$12.5 million.

Onshore Event Footprint

The map below illustrates the Footprint and damage levels for the onshore component of the affected counties and parishes. These damage levels are also detailed in the Event Damage Factor Tables on pages 102 to 107.



Copyright @ 2003 Microsoft Corp. and/or its suppliers. All rights reserved.

Insured Industry Loss Levels Syndicates should assume the following components for the loss :

Residential Property	US\$30,000,000,000
Commercial/Industrial Property	US\$20,000,000,000
Offshore Energy	US\$10,000,000,000
Marine	US\$ 1,000,000,000

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

Specie/Fine Art

Personal Accident

Aviation

Liability

Major Ports

The table below lists the main ports that would be affected by the windstorm, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the event.

Port	County / Parish
Beaumont	Jefferson (TX)
Brownsville	Cameron (TX)
Corpus Christi	Nueces (TX)
Freeport	Brazoria (TX)
Galveston	Galveston (TX)
Houston	Harris (TX)
Lake Charles	Calcasieu (LA)
Matagorda Ship Channel	Calhoun (TX)
Orange	Orange (TX)
Port Arthur	Jefferson (TX)
Port of Plaquemine / Sulphur	Plaquemines (LA)
Texas City	Galveston (TX)
Victoria	Victoria (TX)

Major Airports

The table below lists the main airports in Texas and Louisiana that would be affected by the windstorm, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller airports that fall within the Footprint of the event.

Airport	County / Parish
Allen Parish	Allen (LA)
Austin-Bergstrom International	Travis (TX)
Brazoria County	Brazoria (TX)
Clover Field	Brazoria (TX)
David Wayne Hooks Memorial	Harris (TX)
Easterwood Field	Brazos (TX)
Ellington Field	Harris (TX)
George Bush Intercontinental	Harris (TX)
Gregg County	Gregg (TX)
Killeen Municipal	Bell (TX)
Lake Charles Regional	Calcasieu (LA)
Robert Gray Army Air Field	Bell (TX)
Salaika Aviation	Brazoria (TX)
Scholes International	Galveston (TX)
Southeast Texas Regional	Jefferson (TX)
Sugar Land Municipal	Fort Bend (TX)
Tyler Pounds Field	Smith County (TX)
Victoria Regional	Victoria (TX)
Waco Regional	Mclennan (TX)
William P. Hobby	Harris (TX)

Exclusion of Contingent Business Interruption Losses

Lloyd's recognises the difficulties involved in modelling losses from Contingent Business Interruption (CBI) covers. Syndicates should therefore exclude CBI losses (except offshore energy CBI) from this event. Future development work is planned to address this issue.

The following tables show the Lloyd's Property Value Distribution for each parish in Louisiana and county in Texas (totalling 100% over both states combined). The table also shows the Lloyd's damage factors by county / parish.

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAM RESIDENTIAL	AGE FACTORS COMMERCIAL
LOUISIANA PARISHES					
Acadia	001	0.2%	100%	0.59%	0.49%
Allen	003	0.1%	100%	0.29%	0.25%
Ascension	005	0.2%	100%	0.32%	0.28%
Assumption	007	0.1%	100%	1.05%	0.77%
Avoyelles	009	0.1%	100%	0.15%	0.12%
Beauregard	011	0.1%	100%	0.31%	0.28%
Bienville	013	0.1%	100%	0.01%	
Bossier	015	0.4%	100%	0.09%	0.03%
Caddo	017	1.3%	100%	0.10%	0.03%
Calcasieu	019	0.7%	100%	0.79%	0.56%
Caldwell	021	0.0%			
Cameron	023	0.0%	100%	13.70%	8.75%
Catahoula	025	0.0%	100%	0.02%	0.01%
Claiborne	027	0.1%	100%	0.02%	
Concordia	029	0.1%	100%	0.02%	0.01%
De Soto	031	0.1%	100%	0.08%	0.02%
East Baton Rouge	033	1.7%	100%	0.19%	0.17%
East Carroll	035	0.0%			
East Feliciana	037	0.0%	100%	0.05%	0.03%
Evangeline	039	0.1%	100%	0.30%	0.26%
Franklin	041	0.1%			
Grant	043	0.0%	100%	0.02%	0.01%
Iberia	045	0.3%	100%	1.36%	0.97%
Iberville	047	0.1%	100%	0.86%	0.75%
Jackson	049	0.1%	1000/		0.500/
Jefferson	051	1.9%	100%	0.59%	0.56%
Jefferson Davis	053	0.1%	100%	0.91%	0.72%
Latayette	055	0.6%	100%	0.80%	0.68%
	057	0.3%	100%	1.83%	1.32%
Lincoln	059	0.4%	100%	0.01%	0.01%
Lincolli	067	0.2%	100%	0.22%	0.21%
Madison	065	0.2/8	100 /6	0.23 /0	0.21/0
Morehouse	067	0.1%			
Natchitoches	069	0.1%	100%	0.02%	0.01%
Orleans	071	2.2%	100%	0.02%	0.64%
Quachita	073	0.7%	10070	0.1170	0.0170
Plaguemines	075	0.1%	100%	1.40%	0.99%
Pointe Coupee	077	0.1%	100%	0.51%	0.47%
Rapides	079	0.5%	100%	0.08%	0.06%
Red River	081	0.0%	100%	0.03%	0.01%
Richland	083	0.1%	100%	0.11%	0.11%
Sabine	085	0.1%	100%	0.04%	0.02%
St. Bernard	087	0.2%	100%	0.48%	0.45%
St. Charles	089	0.2%	100%	0.54%	0.44%
St. Helena	091	0.0%	100%	0.10%	0.08%
St. James	093	0.1%	100%	0.54%	0.44%
St. John the Baptist	095	0.1%	100%	0.45%	0.42%
St. Landry	097	0.2%	100%	0.31%	0.25%
St. Martin	099	0.2%	100%	1.15%	0.91%
St. Mary	101	0.2%	100%	2.52%	1.75%
St. Tammany	103	0.7%	100%	0.15%	0.13%
Tangipahoa	105	0.3%	100%	0.14%	0.13%
Iensas	107	0.0%	100%	0.01%	

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAM RESIDENTIAL	IAGE FACTORS COMMERCIAL			
LOUISIANA PARISHES (Cont.)								
Terrebonne	109	0.3%	100%	3.44%	2.70%			
Union	111	0.1%						
Vermilion	113	0.2%	100%	2.06%	1.59%			
Vernon	115	0.1%	100%	0.11%	0.09%			
Washington	117	0.1%	100%	0.07%	0.06%			
Webster	119	0.1%	100%	0.04%	0.01%			
West Baton Rouge	121	0.1%	100%	0.35%	0.33%			
West Carroll	123	0.0%						
West Feliciana	125	0.0%	100%	0.18%	0.18%			
Winn	127	0.0%	100%	0.01%				

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DA	MAGE FACTORS COMMERCIAL
TEXAS COUNTIES					
Anderson	001	0.1%	100%	0.10%	0.03%
Andrews	003	0.0%			
Angelina	005	0.3%	100%	0.38%	0.18%
Aransas	007	0.1%	100%	0.01%	
Archer	009	0.0%			
Armstrong	011	0.0%			
Atascosa	013	0.1%			
Austin	015	0.1%	100%	2.10%	1.56%
Bailey	017	0.0%			
Bandera	019	0.1%			
Bastrop	021	0.2%			
Baylor	023	0.0%			
Bee	025	0.1%	100%	0.01%	
Bell	027	0.8%	100%	0.05%	0.05%
Bexar	029	5.5%			
Blanco	031	0.0%			
Borden	033	0.0%			
Bosque	035	0.1%	100%	0.04%	0.03%
Bowie	037	0.4%			
Brazoria	039	0.8%	100%	11.80%	8.80%
Brazos	041	0.5%	100%	0.77%	0.61%
Brewster	043	0.1%			
Briscoe	045	0.0%			
Brooks	047	0.0%			
Brown	049	0.1%	1000/	1.000/	0.010/
Burleson	051	0.0%	100%	1.09%	0.81%
Burnet	053	0.1%			
Caldwell	055	0.1%	1000/	0.100/	0.07%
Callaban	057	0.1%	100%	0.13%	0.07%
Callanan	059	1.2%			
Camp	067	0.0%			
Carson	065	0.0%			
Carson	067	0.1%	100%	0.02%	
Castro	069	0.0%	100 /8	0.02 /0	
Chambers	071	0.0%	100%	17 00%	10 30%
Cherokee	073	0.1%	100%	0.14%	0.04%
Childress	075	0.0%	100 /0	0.1470	0.0470
Clay	073	0.0%			
Cochran	079	0.0%			
Coke	081	0.0%			
		0.070			

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAMAGE FACTORS RESIDENTIAL COMMERCIAL	
TEXAS COUNTIES (Cont.)					
Coleman	083	0.0%			
Collin	085	3.0%			
Collingsworth	087	0.0%	10001	0 = 444	0.5.00
Colorado	089	0.1%	100%	0.74%	0.54%
Comanche	091	0.3%	100%	0.01%	0.01%
Concho	095	0.0%			
Cooke	097	0.1%			
Coryell	099	0.1%	100%	0.04%	0.03%
Cottle	101	0.0%			
Crane	103	0.0%			
Crockett	105	0.0%			
Crosby	107	0.0%			
Dallam	109	0.0%			
Dallas	113	11.0%			
Dawson	115	0.0%			
De Witt	123	0.1%			
Deaf Smith	117	0.1%			
Delta	119	0.0%			
Denton	121	1.7%			
Dimmit	127	0.0%			
Donley	129	0.0%			
Eastland	133	0.0%			
Ector	135	0.1%			
Edwards	137	0.0%			
El Paso	141	2.6%			
Ellis	139	0.4%	100%	0.01%	
Erath	143	0.1%			
Falls	145	0.1%	100%	0.14%	0.11%
Fannin	147	0.1%	1000/	0.000/	0.000/
Fayette	149	0.1%	100%	0.08%	0.06%
Floyd	153	0.0%			
Foard	155	0.0%			
Fort Bend	157	1.1%	100%	5.60%	3.70%
Franklin	159	0.0%			
Freestone	161	0.1%	100%	0.05%	0.02%
Frio	163	0.0%			
Gaines	165	0.0%	1000/	07 000/	00.000/
Garza	167	1.0%	100%	37.20%	26.60%
Gillesnie	171	0.0%			
Glasscock	173	0.0%			
Goliad	175	0.0%	100%	0.02%	0.01%
Gonzales	177	0.1%			
Gray	179	0.1%			
Grayson	181	0.4%	10001	0.054/	0.0404
Gregg	183	0.5%	100%	0.05%	0.01%
Guadalupe	100	0.1%	100%	1.05% 0.01%	0.01%
Hale	189	0.1%	100 /0	0.01/0	0.01/0
Hall	191	0.0%			
Hamilton	193	0.0%	100%	0.01%	0.01%
Hansford	195	0.0%			
Hardeman	197	0.0%			
Hardin	199	0.1%	100%	0.94%	0.66%
Harris	201	15.0%	100%	7.55%	4.76%
Harrison	203	0.2%	100%	0.06%	0.01%
Haskell	205 207	0.0%			
i luolloli	201	0.070			

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAMAGE FACTORS RESIDENTIAL COMMERCIAL	
TEXAS COUNTIES (Cont.)					
Hays	209	0.4%			
Hemphill	211	0.0%			
Henderson	213	0.2%	100%	0.02%	0.01%
Hidaigo	215	0.1%	100%	0.01%	0.01%
Hockley	217	0.1%	100 /8	0.0176	0.0178
Hood	221	0.1%			
Hopkins	223	0.1%			
Houston	225	0.1%	100%	0.38%	0.20%
Howard	227	0.1%			
Hudspeth	229	0.0%			
Hutchinson	233	0.3%			
Irion	235	0.0%			
Jack	237	0.0%			
Jackson	239	0.1%	100%	0.27%	0.21%
Jasper	241	0.1%	100%	0.34%	0.21%
Jeff Davis	243	0.0%	100%	2 06%	0.000/
Jim Hogg	245	0.0%	100 %	3.90%	2.02%
Jim Wells	249	0.1%			
Johnson	251	0.4%			
Jones	253	0.0%			
Karnes	255	0.0%	100%	0.01%	0.01%
Kaufman	257	0.2%			
Kendali	259	0.1%			
Kent	263	0.0%			
Kerr	265	0.2%			
Kimble	267	0.0%			
Kinney	271	0.0%			
Kleberg	273	0.1%			
Knox	2/5	0.0%			
La Salle	203	0.0%			
Lamb	279	0.1%			
Lampasas	281	0.1%	100%	0.03%	0.02%
Lavaca	285	0.1%	100%	0.18%	0.14%
Lee	287	0.1%	100%	0.10%	0.08%
Leon	289	0.1%	100%	0.21%	0.11%
Liberty	291	0.2%	100%	0.15%	2.42%
Lipscomb	295	0.0%	100 /0	0.1070	0.1076
Live Oak	297	0.0%			
Llano	299	0.1%			
Loving	301	0.0%			
Lubbock	303	1.2%			
Lynn Madison	305	0.0%	100%	0.63%	0.45%
Marion	315	0.0%	100%	0.04%	0.01%
Martin	317	0.0%			
Mason	319	0.0%			
Matagorda	321	0.1%	100%	1.10%	0.78%
Maverick	323	0.1%			
Mclennan	307	0.0%	100%	0 12%	0 11%
McLennan	309	0.8%	100%	0.12%	0.11%
McMullen	311	0.0%			
Medina	325	0.1%			
Menard	327	0.0%			
Midand	329	0.6%	100%	0.000/	0.000/
wiialii	331	U.1%	100%	0.32%	0.30%

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAM RESIDENTIAL	IAGE FACTORS COMMERCIAL
TEXAS COUNTIES (Cont.)					
Mills	333	0.0%	100%	0.01%	
Mitchell	335	0.0%			
Montague	337	0.1%			
Montgomery	339	0.9%	100%	2.66%	1.76%
Moore	341	0.1%			
Morris	343	0.1%			
Motiey	345	0.0%	1000/	0.070/	0.100/
Navarro	347	0.2%	100%	0.27%	0.12%
Newton	349	0.1%	100%	0.01%	0.01%
Nolan	353	0.0%	10078	0.0078	0.2078
Nueces	355	1.3%			
Ochiltree	357	0.0%			
Oldham	359	0.0%			
Orange	361	0.3%	100%	1.90%	1.41%
Palo Pinto	363	0.1%			
Panola	365	0.1%	100%	0.11%	0.04%
Parker	367	0.3%			
Parmer	369	0.0%			
Pecos	371	0.0%			
Polk	373	0.1%	100%	0.82%	0.44%
Potter	375	0.6%			
Presidio	377	0.0%			
Rains	379	0.0%			
Reagan	383	0.0%			
Beal	385	0.0%			
Red River	387	0.0%			
Reeves	389	0.0%			
Refugio	391	0.0%	100%	0.01%	
Roberts	393	0.0%			
Robertson	395	0.1%	100%	0.59%	0.51%
Rockwall	397	0.2%			
Runnels	399	0.0%			
Rusk	401	0.2%	100%	0.10%	0.03%
Sabine	403	0.0%	100%	0.10%	0.04%
San Augustine	405	0.0%	100%	0.13%	0.05%
San Datricio	407	0.1%	100%	1.07%	1.04%
San Saha	409	0.2%	100%	0.01%	
Schleicher	413	0.0%	10070	0.0170	
Scurry	415	0.1%			
Shackelford	417	0.0%			
Shelby	419	0.1%	100%	0.15%	0.05%
Sherman	421	0.0%			
Smith	423	0.8%	100%	0.02%	0.01%
Somervell	425	0.0%			
Starr	427	0.1%			
Stephens	429	0.0%			
Sterling	431	0.0%			
Sutton	400	0.0%			
Swisher	437	0.0%			
Tarrant	439	6.0%			
Taylor	441	0.5%			
Terrell	443	0.0%			
Terry	445	0.0%			
Throckmorton	447	0.0%			
Titus	449	0.1%			
Tom Green	451	0.4%			
Travis	453	4.0%	100%	0.04%	0.03%
Trinity	455	0.0%	100%	0.71%	0.36%
lyier	457	0.1%	100%	0.35%	0.21%

COUNTY NAME	COUNTY NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAMAGE FACTORS RESIDENTIAL COMMERCIAL	
TEXAS COUNTIES (Cont.)					
Upshur	459	0.1%	100%	0.01%	
Upton	461	0.0%			
Uvalde	463	0.1%			
Val Verde	465	0.1%			
Van Zandt	467	0.1%			
Victoria	469	0.3%	100%	0.06%	0.03%
Walker	471	0.2%	100%	1.21%	0.85%
Waller	473	0.1%	100%	3.50%	2.26%
Ward	475	0.0%			
Washington	477	0.1%	100%	1.47%	1.13%
Webb	479	0.6%			
Wharton	481	0.1%	100%	1.59%	1.12%
Wheeler	483	0.0%			
Wichita	485	0.5%			
Wilbarger	487	0.0%			
Willacy	489	0.1%			
Williamson	491	0.7%	100%	0.04%	0.03%
Wilson	493	0.1%	100%	0.01%	0.01%
Winkler	495	0.0%			
Wise	497	0.1%			
Wood	499	0.1%			
Yoakum	501	0.0%			
Young	503	0.1%			
Zapata	505	0.0%			
Zavala	507	0.0%			
19 JAPANESE TYPHOON

Japanese Typhoon Event

Property Value Distribution Map This event is based on the Isewan ('Vera') typhoon event of 1959. As a guide, the estimated Industry Loss from this event would be US\$14 billion.

The map below illustrates Lloyd's assumptions for the distribution of property values at prefecture level, which are also detailed in the Event Damage Factor Tables.



Major Ports

The table below lists the main ports in the Typhoon Isewan (Vera) Footprint, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the event.

Port	City
Akita	Akita
Kinuura	Handa
Kobe	Nada-Ku Kobe-Shi
Nagoya	Minato-Ku Nagoya-Shi
Osaka	Suminoe-Ku Osaka-Shi
Sakaide	Sakaide-Shi
Yokkaichi	Yokkaichi-Shi
Sakata	Sakata-Shi
Hachinohe	Hachinohe-Shi
Maizuru	Maizuru-Shi

Major Airports

The table below lists the main international and domestic airports potentially impacted by the Typhoon, which syndicates should consider in assessing their potential exposures. They should also have regard to exposures in smaller ports that fall within the Footprint of the event.

Airport	City
Matsumoto	Matsumoto
Miyake Jima	Miyake Jima
Nagoya Komaki	Nagoya
Niigata	Niigata
Oshima	Oshima
Yokohama	Yokohama

Typhoon Isewan Event Footprint

The map below illustrates the Footprint and damage levels for Japan, which are also detailed in the Event Damage Factor Tables on pages 111 and 112.



Insured Industry Loss Levels

Syndicates should assume the following components of the loss.

Residential Property	US\$6	6,000,000,000	
Commercial/Industrial Property	US\$8,000,000,000		
Marine	US\$	500,000,000	

Syndicates should consider all other lines of business that would be affected by the event. Particular consideration should be given to losses arising from :

Specie/Fine Art

Personal Accident

Aviation

Liability

Marine

Japanese Typhoon Event - Prefecture Level Damage Factor Table

PREFECTURE NAME	PERFECTURE NUMBER	PROPERTY VALUE DISTRIBUTION	AGGREGATE "FOOTPRINT"	GROUND-UP DAMAGE FACTORS RESIDENTIAL COMMERCIAL	
Aichi	043	6.1%	100%	0.88%	0.82%
Akita	010	0.7%	100%	0.13%	0.09%
Aomori	002	0.8%	100%	0.06%	0.04%
Chiba	024	3.3%	100 /0	0.0070	0.0170
Ehime	074	1.0%	100%	0.02%	0.02%
Eukui	033	0.7%	100%	0.35%	0.28%
Fukuoka	081	3.3%	10070	0.0076	0.2070
Fukushima	012	1.6%	100%	0.01%	0.01%
Gifu	041	1.8%	100%	0.66%	0.60%
Gumma	022	1.0%	100%	0.00%	0.00%
Hiroshima	070	2.3%	100%	0.01%	0.03%
Hokkaido	001	2.0%	100%	0.02%	0.02%
Hyogo	001	1 2%	100%	0.02 /8	0.02 /0
Iboroki	039	4.5 %	100%	0.21%	0.10%
Ibalaki	020	2.1%	100%	0.01%	0.01%
Isilikawa	002	0.99/	100%	0.27%	0.22%
Iwate	003	0.8%	100%	0.10%	0.01%
Kagawa	073	0.8%	100%	0.16%	0.13%
Kagosnima	092	1.4%	1000/	0.010/	0.010/
Kanagawa	026	5.2%	100%	0.01%	0.01%
Kochi	080	0.5%	100%	0.10%	0.08%
Kumamoto	084	1.2%	10001	0.000/	
Kyoto	057	2.5%	100%	0.29%	0.21%
Mie	044	1.5%	100%	1.54%	1.37%
Miyagi	004	1.5%	100%	0.01%	0.01%
Miyazaki	091	0.8%			
Nagano	040	1.8%	100%	0.20%	0.14%
Nagasaki	083	1.0%			
Nara	060	1.0%	100%	0.52%	0.52%
Niigata	030	1.8%	100%	0.26%	0.18%
Oita	090	0.8%			
Okayama	064	1.6%	100%	0.03%	0.03%
Okinawa	093	0.7%			
Osaka	058	8.8%	100%	0.42%	0.36%
Saga	082	0.6%			
Saitama	023	5.0%	100%	0.01%	0.01%
Shiga	050	1.0%	100%	0.55%	0.50%
Shimane	063	0.6%			
Shizuoka	042	3.3%	100%	0.04%	0.03%
Tochigi	021	1.8%	100%	0.03%	0.02%
Tokushima	072	0.6%	100%	0.44%	0.40%
Tokyo	025	13.9%	100%		0.01%
Tottori	062	0.5%	100%		0.01%
Toyama	031	0.9%	100%	0.49%	0.40%
Wakayama	061	0.8%	100%	1.19%	1.01%
Yamagata	011	0.8%	100%	0.05%	0.04%
Yamaguchi	071	1.1%			
Yamanashi	034	0.8%	100%	0.02%	0.02%

CRESTA	PROPERTY VALUE	AGGREGATE	GROUND-UP DAMAGE FACTORS		
ZONE	DISTRIBUTION	"FOOTPRINT"	RESIDENTIAL	COMMERCIAL	
1	3.7%	100%	0.02%	0.02%	
2	4.1%	100%	0.15%	0.12%	
3	3.7%	100%	0.01%	0.01%	
4	10.4%	100%	0.02%	0.02%	
5	23.9%	100%		0.01%	
6	14.9%	100%	0.63%	0.58%	
7	2.6%	100%	0.37%	0.30%	
8	18.1%	100%	0.40%	0.35%	
9	5.9%	100%	0.01%	0.01%	
10	2.8%	100%	0.15%	0.14%	
11	9.0%				
12	0.7%				

Japanese Typhoon Event - CRESTA Zone Damage Factor Table

One Lime Street London EC3 7HA www.lloyds.com

