BANK OF ENGLAND
**PRUDENTIAL REGULATION
AUTHORITY**

General Insurance Stress Test 2017

Scenario Specification, Guidelines and Instructions

11 April 2017

CONTENTS

INTRODUCTION

This document provides details of the stress tests to be evaluated by firms that are within the scope of the PRA's General Insurance Stress Test exercise in 2017 ('GIST 2017'). This document also provides notes and instructions as to how to complete the Excel workbook 'GIST 2017 Template.xls' which firms have been provided to record the results of each stress test.

Stress tests

Consistent with the 2015 exercise, the stress tests for 2017 have been developed to assess the potential impact of severe events at the market level for the UK general insurance (GI) sector and to identify which firms would be most impacted by these events.

This year the exercise has been separated into two sections:

Section 1: A defined set of scenarios

Part A: Natural catastrophe scenarios 1 to 4: This comprises a set of four severe natural catastrophe scenarios summarised below:
   a. Severe winter season with two severe windstorms across the South East of the United Kingdom and Northern Europe combined with two floods in the United Kingdom.
   b. An earthquake along the Cascadia subduction zone in the Pacific North West of magnitude 9 on the Richter Scale leading to a tsunami.
   c. An earthquake of magnitude 8 along the San Andreas fault in the region of Los Angeles followed by a second event of magnitude 7.
   d. A series of three US Hurricanes of category 3 and 4 across the Caribbean, Gulf of Mexico and making landfall in continental United States.

Firms are asked to consider the impacts of these scenarios over a one year time horizon, quantifying the gross & net losses and the impact on Own Funds.

Part B: Economic downturn scenario 5: This stress is based on an asset shock and economic downturn consistent with the Annual Cyclical Scenario of the banking stress test conducted by the Bank of England.[1] The stress also explicitly considers a reserving deterioration based on increased claims inflation. Firms are also asked to quantify the expected impact on underwriting losses associated with the economic downturn.

In addition to what was requested under GIST 2015, firms are asked to report the impact on their available capital at year end 2017, disclosing any likely management actions they may take.

Section 2: Captures the exposures of GI firms to sectors of the UK economy

This section aims at deepening the PRA's understanding of firm and sector exposures to the different sectors of the UK economy. It reflects the difficulty in defining a market-wide liability stress test that appropriately tests industry resilience to liability shock-events. Firms should note that the PRA is likely to use this information to assist in the development of a future market-wide liability stress test.

This section should be completed on a best endeavours basis and is only required for UK policyholders and UK risks.

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[1] Key elements of the 2017 stress test, March 2017, available at: www.bankofengland.co.uk/financialstability/Pages/fpc/stresstest.aspx.

PRA objectives

The PRA objectives reflect the fact that this exercise is designed to support our view of the insurance sector (macro supervision) and our supervision of individual firms (micro supervision):

Macro supervision

1) **Assessment of market resilience**: The stress test exercise allows the PRA to assess aggregate losses net of reinsurance protections across the UK GI sector from severe but conceivable scenarios.
2) **Preparedness and prioritisation**: GIST 2017 allows the PRA to rank UK general insurers by vulnerability following specified events. This should assist the PRA in adopting a more targeted response should events of a similar nature occur in the future.
3) **Dependencies on reinsurers and other jurisdictions**: Identify the level of interconnectedness of the insurance sector. For instance, the extent to which, under stressed scenarios, UK insurers are reliant on specific reinsurers, specific types of reinsurance collateral and other jurisdictions.
4) **Supporting sector resilience in the United Kingdom:** Develop a sectoral assessment of some hard to measure liability risks and assess the extent of reliance of the UK economy on the insurance sector in supporting resilience for specific UK sectors (eg technology, utilities, energy, and manufacturing)

Micro supervision

1) **A consistent view of stress testing**: Understand individual firms' resilience to the PRA's specified scenarios and how it is used in risk and business decisions.
2) **Internal model (IM) review**: Provide an additional perspective when reviewing an insurer's internal capital model. For instance, results from the PRA-specified stress can be compared against the output from the firm's IM.
3) **Exposure management of risks**: Develop the PRA's understanding of firms' exposure to specific industry sectors across the economy and the individual firm's level of concentration to specific sectors.
4) **Influencing firms**: Encourage firms to consider unmodelled exposures and raise awareness of some of the risks not necessarily considered in the IM.

Opening and closing balance sheet

Firms are required to provide their Solvency Capital Requirement (SCR) and available Own Funds to meet the SCR at the beginning of the year 2017. Firms are also required to project available Own Funds on a best estimate basis ('Base Case') together with their estimate of SCR at the end of 2017.

For each stress scenario, firms are then asked to quantify the impact on Own Funds at the end of 2017. Firms are not required to recalculate their SCR in the event of the stress scenario and may assume this is the same as for the Base Case.

Additional guidance for Lloyd's syndicates is provided in section 'Coverage' on page 6.

Standard formula vs internal model Solvency Capital Requirement

Firms with an approved IM need only provide the IM SCR view. For firms in IMAP and likely to make an IM application before year end 2017, the SCR should be provided on a standard formula and IM basis. For all other firms on the standard formula, including firms intending to make an IM application after 2017, the SCR should be based on the standard formula. In all cases, the SCR provided, and the breakdown, should be based on the one year view of risk.

Projected movement in Own Funds

To facilitate the understanding of changes in Own Funds, firms are asked to use the pro-forma reconciliation between opening and closing Own Funds which is included in the reporting pack, and which presents movements split between technical and non-technical accounts.

This is required for both the Base Case as well as the SCR scenario ie the projected movement in Own Funds during 2017 assuming that the 1-in-200 SCR scenario has occurred.

For each stress scenario, firms are then asked to provide any changes to the Projected Movement in Own Funds relative to the Base Case. This has been split between the direct impact of the stress scenario, the market adjustment and management actions, recognising that not all columns or cells will be relevant or required to be completed in every scenario.

Direct stress relates mainly to the underwriting or reserving impact, market adjustment relates mainly to changes in asset prices or reinsurance costs and management actions relates to the impact of actions such as changes made to the reinsurance programmes or changes made to the firm's premium rates. The separation between these columns is for presentation purposes to facilitate understanding of the impact of the stress scenario on Own Funds, with a degree of flexibility as to how the impact is allocated between the 'Direct stress', 'Market adjustment' and 'Management actions' columns.

For the purposes of the stress test, firms are not required to carry out detailed quarterly or half yearly modelling but may make reasonable assumptions, disclosing the main assumptions made. For instance, for the purposes of calculating the gross loss from the various specified natural catastrophes, firms may use in-force exposures adjusted for expected changes to the occurrence of the loss.

Emergence of risk for Section 1
For Part A (the natural catastrophe scenarios), the shock may be assumed to apply instantaneously and firms do not need to consider how the risk may emerge over time.

For Part B (the economic shock), the shock is assumed to emerge in 2017 and firms may make approximations for changes, if any, to the risk margin over the year relative to the base case movements.

The SCRs do not need to be recalculated in the event of the stress scenarios.

Additional information

For each stress scenario, firms are required to submit a number of outputs that are standard across scenarios, as well as additional information specific to each scenario that will allow the PRA to assess the calculation and impact of each stress in greater detail.

For each stress scenario, firms are required to provide an estimate of the gross loss arising from the event, the recoveries from their reinsurance or other risk mitigation arrangements and their net loss.

Return period guidance for Section 1: Parts A and B
For 2017, firms are asked to estimate both the return period of experiencing losses at least as large as the amount of gross loss to the firm from the scenario and their view of how likely such an event is at the market level (expressed as a return period).

For the return period of the loss to the firm in Part A, this should be with reference to the firm's distribution of all natural catastrophe losses in aggregate for the year for their entire portfolio. For Part B, this should be with reference to the firm's overall Profit/(Loss) for the year.

For a view of return period of the scenario from a market perspective, firms are not being asked to carry out an evaluation of industry losses but to provide their subjective view of the likelihood of

having similar type of market events (generating at least as large aggregate losses) expressed as a return period.

Where relevant for Part A, the PRA has provided AIR's, RMS' or JBA's view of the return period of the scenario and the PRA would like to understand how firms' views differ from the vendor models.

Management Actions

Firms should disclose what management actions they anticipate taking for the various scenarios, including changes to their reinsurance programme and likely cost allowing for rate increases where relevant, expected changes to their underwriting strategy, changes to premium rates they would make and changes to their asset allocation. While some of these management actions will impact the year end 2017 Balance Sheet and Own Funds, the full impact may not be captured. Firms are asked to provide additional qualitative information in the free form box provided.

Where firms anticipate re-capitalisation plans, firms should provide this information, but should not assume new capital will be in place before year end 2017 unless existing contractual arrangements allow for this.

Materiality

Firms should complete all scenarios unless they can demonstrate that, given their specific risk coverage, the impact is immaterial. In this case immateriality is defined as less than 5% of total net written premium.

Firms should include a breakdown of all reinsurers where expected recoveries are more than 2% of the total recoverable.

Coverage for the stress test submission

Where firms have an approved IM or are submitting an IM application, the stress test submission should be aligned to that application. For the avoidance of doubt, for UK groups where the PRA has approved or is in the process of assessing a group IM, the submission should cover all group-wide operations including those outside the United Kingdom. This may be a consolidated view across multiple legal entities looking through to capturing the economic substance of the risk on the same basis as the group IM.

For firms operating across both Lloyd's and the company market, firms are asked to provide a consolidated view across both operations, including the firm's participations at Lloyd's and aligned to the corporate member. This may include multiple entities. To enable the PRA to delineate the Lloyd's and non-Lloyd's losses, separate submissions are also required for the firm's participations at Lloyd's and for the non-Lloyd's operations.

For those firms where the PRA is not the Group or EEA subgroup regulator, a separate submission may be provided for each relevant UK legal entity by prior agreement with their PRA supervisor.

Where firms are uncertain as to the scope required, firms should contact their PRA supervisor or email: **GIST2017@bankofengland.co.uk** to ensure the appropriate level of information is provided to enable the PRA to make its assessment.

Reporting and sign-off requirements

This exercise is to be carried out only by firms selected by the PRA. Firms that have not received a request are not required to complete the workbook.

All parts of the template are required to be completed.

On submission a senior executive is required to confirm they are satisfied with the completion of the template for each of the relevant stress tests.

Deadline for submission

Submission of the completed Excel template is required by **17:00 on Friday 14 July 2017**.

The Excel workbook should be saved ensuring that **Firm Name** and **FRN number** are contained within the file name and the subject of the email. Submissions should be sent to **GIST2017@bankofengland.co.uk**.

Resubmissions

Individual firm supervisors will be using the stress test submission as part of their ongoing supervisory reviews. Firms should ensure that the quantitative and qualitative information provided is clear and sufficient. Where this is not the case, the PRA may ask for a resubmission to enable it to make an assessment.

Queries

Any queries should be submitted to **GIST2017@bankofengland.co.uk**. Please ensure that the Firm Name and FRN number is included in the subject of the email.

Section 1A: Scenarios 1 to 4

1. EUROPEAN WINDSTORM AND FLOOD SET OF EVENTS

> Firms are encouraged to develop their own view of risk. This should include adjustments for the firm's view of any limitations of the vendor models used and include the firm's own view of those components not comprehensively captured by the vendor model such as storm surge for example.

1.1 EVENT DEFINITION

This stress test is for a severe winter season with a cluster of two severe windstorms across the south east of the United Kingdom and Northern Europe, combined with two severe UK flood events. At today's values, these events in aggregate cause approximately GBP 42-44 billion industry losses across Europe including approximately GBP 20 billion of losses in the United Kingdom.

Firms are to assume that the flood events occur between January and February 2017, and are sufficiently separated in time (more than 504 hours apart, or 21 days) to be considered separate events for the purposes of reinsurance recoveries. The windstorm events are assumed to occur between November and December 2017.

The return period for the set of windstorms combined is estimated to be approximately 200 years according to RMS, if events are assumed to be independent, and 145 years if clustered. The return period for the set of floods combined is estimated to be approximately 145 years according to RMS version 15, and 115 years according to RMS High Definition (HD) model. JBA estimate the loss return period of these two floods in a single year to be 127 years.

1.2 ASSUMPTIONS

Firms are asked to estimate the size of the loss per event and in aggregate using their natural catastrophe modelling capabilities. In estimating the gross loss, firms should provide their own view and allow explicitly for all material non-modelled risks (eg including for storm surge).

Firms should consider what management actions including changes to their reinsurance programmes they may take during and following the series of events. These should be described with the estimated associated costs, if any, disclosed and allowed for in the above calculations.

Firms should assume events fall under the same treaty year, that any changes made to the reinsurance programme do not incept before the first event occurred, and should include the impact of both inwards and outwards reinstatement premiums. Where additional reinstatements or back-up covers are purchased, firms should quantify the likely rate increases and should not factor in reduced attachment points without adequate justification.

For properties modelled as being impacted by more than one event, firms should disclose what assumptions, if any, they have made such as time for repairs or Additional Living Expenses.

1.2.1 First event: First windstorm

The first windstorm, with top wind speeds greater than 160 km/hr, causes industry losses of approximately GBP 20-22 billion across Europe, including GBP 6-7 billion in the United Kingdom (using an exchange rate of EUR:GBP of 1.1). The maps below illustrate footprints for the closest matching AIR and RMS events.
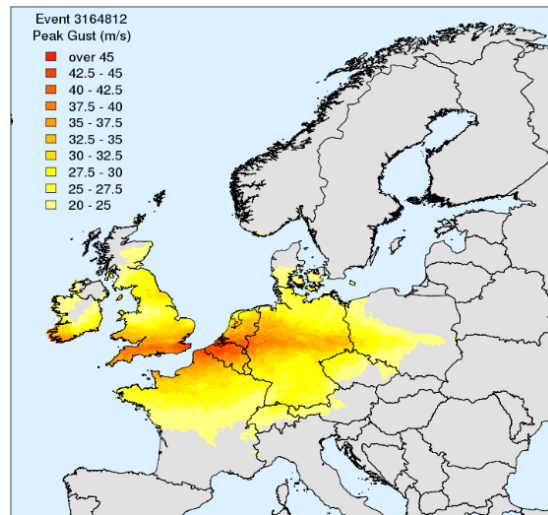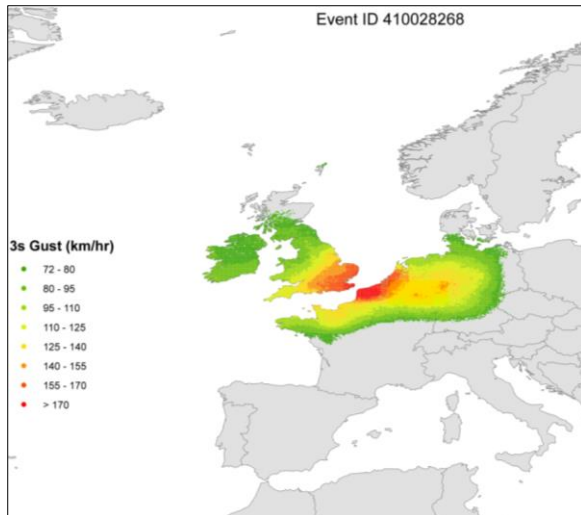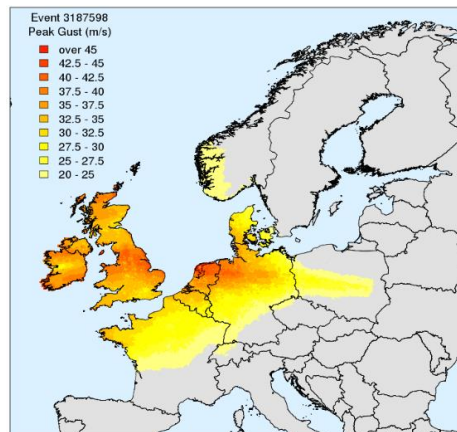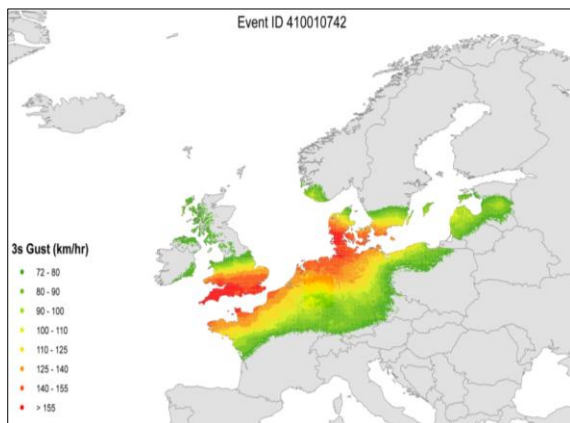
First event footprint, as modelled by AIR (left panel) and RMS (right panel). Cautionary note: Some visual differences between events are driven by the use of different map projections.

The closest matching AIR Event ID would be 410028268. The closest matching RMS Event ID would be 3164812 (Version 15). The PRA is aware that event footprints, associated parameters and industry loss estimates vary between AIR and RMS.

1.2.2 Second event: Second windstorm

The second windstorm, with top wind speeds greater than 160 km/hr, causes industry losses of approximately GBP 15-16 billion across Europe, including GBP 6-7 billion in the U.K. (using an exchange rate of EUR:GBP of 1.1). The maps below illustrate footprints for the closest matching AIR and RMS events.
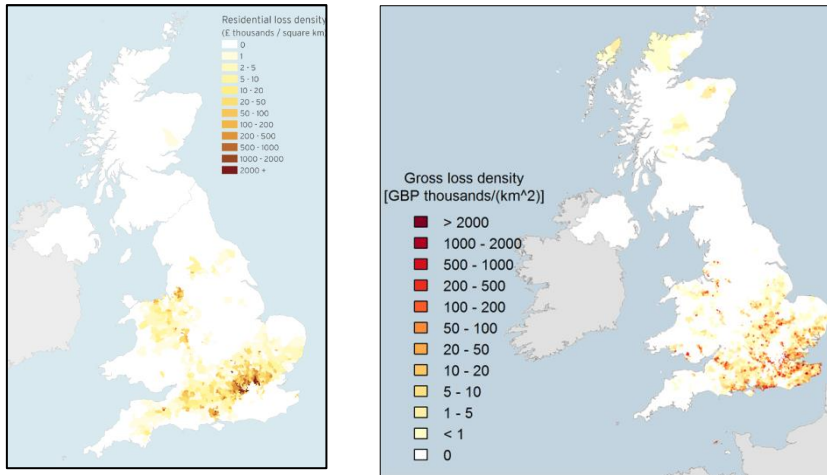

Second event footprint, as modelled by AIR (left panel) and RMS (right panel). Cautionary note: Some visual differences between events are driven by the use of different map projections.

The closest matching AIR Event ID would be 410010742. The closest matching RMS Event ID would be 3187598 (Version 15). The PRA is aware that the footprint, event parameters and industry loss estimates vary between the different vendor models.

1.2.3 Third event: UK flood (South England)

For the third event, firms are to assume precipitation induced flooding in the south of England. The map below illustrates the area impacted by flooding for the third event.
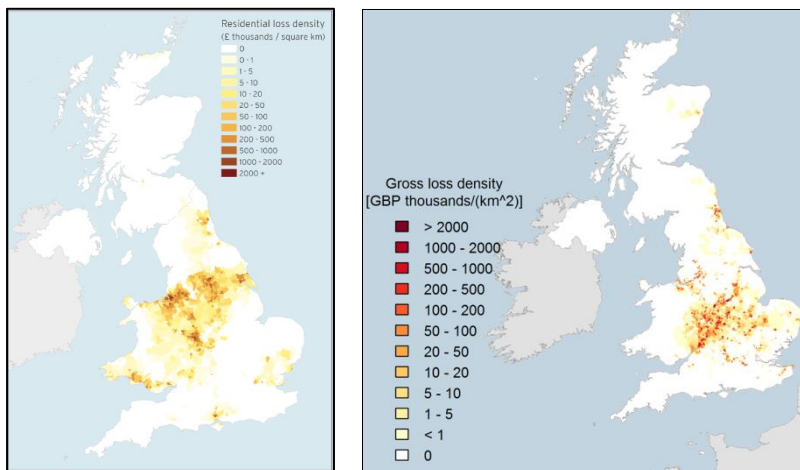
Third event area impacted by flooding, as modelled by JBA (left panel) and RMS (HD model, right panel). Cautionary note: Some visual differences between events are driven by the use of different map projections.

The flood event is assumed to result in severe flooding with the event lasting 144 hours across the south of England.

The closest JBA Event ID from their stochastic Flood model is E67419. The closest matching RMS Event ID would be 1920865 (Version 15) or 4323349 (HD model) from their stochastic event set. The closest matching AIR Event ID would be 920047668. At today's values, this event is estimated to cause approximately GBP 3.7-4 billion industry losses, according to RMS and AIR. The PRA is aware that the footprint, event parameters and industry loss estimates vary between the different vendor models.

1.2.4   Fourth event: UK flood (Midlands)

For the fourth event, firms are to assume precipitation induced flooding in the Midlands. The map below illustrates the area impacted by flooding for the fourth event.

Fourth event area impacted by flooding, as modelled by JBA (left panel) and RMS (HD model, right panel). Cautionary note: Some visual differences between events are driven by the use of different map projections.

The flood event is assumed to result in severe flooding with the event lasting 144 hours across the Midlands.

The closest JBA Event ID from their stochastic Flood model is E43480. The closest matching RMS Event ID would be 1916360 (Version 15) or 4075912 (HD model) from their stochastic event set. The

closest matching AIR Event ID would be 920039783. At today's values, this event is estimated to cause approximately GBP 3.5-3.7 billion industry losses, according to AIR and RMS respectively. The PRA is aware that the footprint and event parameters vary between the different vendor models.

1.3 REPORTING

Data assumptions and adjustments made to the vendor model estimates to reflect firms' own view of risk should be disclosed, including for example:

- the allowance made for uncaptured exposures or data limitations (eg locations not geocoded); and
- the allowance made for non-modelled secondary perils (eg storm-surge), non-modelled coverages (eg contingent business interruption) and non-modelled lines of business (eg energy).

Firms are also asked to disclose their estimates of post loss amplification (and their expected reliance on external claims adjusters), their estimates of the secondary uncertainty (if any) around their loss estimates, the vendor model and version used, as well as any other assumptions made in the loss estimation.

The gross loss estimate should break down the loss between lines of business and coverage (eg residential property damage, commercial property damage, business interruption, contingent business interruption, motor, marine and energy, and liability)

The gross loss estimate should also break down the loss between types of peril (eg wind, storm-surge, river flood)

Firms should provide details of the exposures that have been modelled (modelled number of risks and modelled sums insured), their impacted exposures under the storm track or flood footprint (impacted number of risks and impacted sums insured) and give details of the firm's expected number of claims and average cost per claim. Firms may make reasonable assumptions to derive their estimates and should exclude immaterial claims if using vendor models.

2. PACIFIC NORTH WEST EARTHQUAKE AND ASSOCIATED TSUNAMI (US – CANADA)

> This Pacific North West earthquake scenario tests firms' resilience to a potential market turning event. Scientists view a Cascadia subduction zone earthquake as conceivable within our lifetime, especially when time dependency is factored in, as the probability increases with the stress build-up. With the energy released proportional to the length of the fault, such an earthquake has the potential to generate magnitude 9 earthquakes, impacting a large zone from Canada to California. Firms are asked to evaluate the impact of tsunamis not currently captured by the vendor models.

2.1 EVENT DEFINITION

This stress test is for a severe subduction earthquake followed by a tsunami in the North West of the United States and in Canada. The scenario has been based on a plausible Magnitude 9 event along the Cascadia subduction zone. The recurrence interval of major events along the subduction is known to range between 400 to 600 years approximately, with the last major event occurring in 1700. At today's values, the earthquake is estimated to cause approximately USD 174 and 186 billion industry losses across the US and Canada according to RMS and AIR respectively. Firms are to assume that the earthquake and tsunami occur in December 2017.

2.2 ASSUMPTIONS

In estimating the gross loss, **firms are asked to allow for demand surge** (post loss amplification), using their natural catastrophe modelling capabilities.

Firms should estimate both the aggregate losses and the breakdown between ground-shaking, and tsunami losses. Breakdown between physical damage and contingent business interruption is also requested. Should the firm not have access to suitable modelling capabilities, they are requested to estimate the non-modelled components (eg tsunami or contingent business interruption) using an alternative approach of their choice. The approach should be clearly disclosed, along with assumptions and expert judgements made to estimate the non-modelled components.

Firms should consider what management actions including changes to their reinsurance programmes they may take following the events. These should be described with the estimated associated costs, if any, disclosed and allowed for post event in the above calculations.

2.2.1 Earthquake source

The map below illustrates the footprint for the ground-shaking event. For firms not using any vendor model, the length of the fault rupture is estimated to be about 1,000 kilometres (620 miles) from Vancouver Island (British Columbia) to northern California, with an average slip of 20 meters (66 feet). The epicentre should be located at 48.407 latitude and -123.330 longitude, near the town of Victoria. The tsunami produced by this Cascadia event could reach run-up heights (ie how far the wave surges inland above sea level) of approximately 30m (100 feet), and travel as far as 10 km inland (6 miles). For comparison, the maximum run-up height observed during the Magnitude 9.2 Tohoku earthquake (2011, Japan) was 39m.
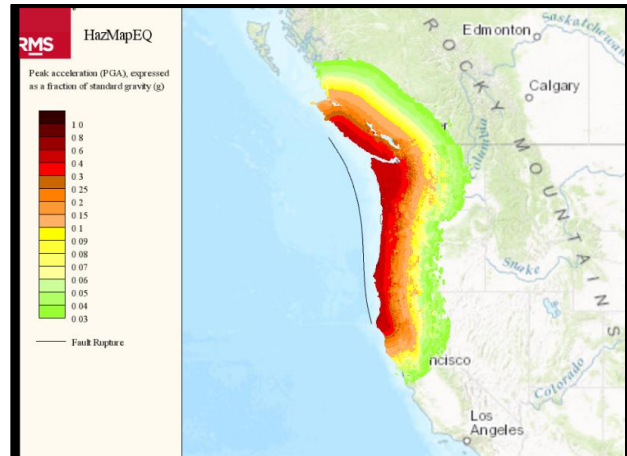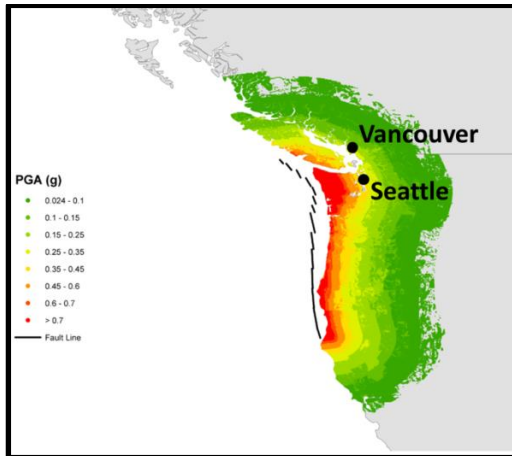
Left panel: Cascadia event footprint as modelled by AIR Worldwide; Right panel: Cascadia event footprint as modelled by RMS.

The closest matching AIR Event ID would be 110108488. The closest matching RMS Event ID would be 2013538 (Version 15). The PRA is aware that event footprints, associated parameters and industry losses between AIR and RMS differ.

Parameters for firms not relying on vendor models	
Earthquake magnitude (Mw)	9.0
Rupture length (km)	1000
Average co-seismic slip (m)	20
Epicentre latitude (°)	48.407
Epicentre longitude (°)	-123.330
Tsunami run-up (m)	30
Tsunami maximum inland inundation (km)	10

Parameters to consider for firms not using any vendor model (Cautionary note: event footprints from vendors correspond to closest matching events, and we are aware that parameters between vendors and those indicated in the table may differ).

2.3 REPORTING

Data assumptions and adjustments made to the vendor model estimates to reflect firms' own view of risk should be disclosed, including for example:

- the allowance made for uncaptured exposures or data limitations (eg locations not geocoded); and
- the allowance made for non-modelled secondary perils (eg tsunami), non-modelled coverages (eg contingent business interruption) and non-modelled lines of business (eg energy).

Firms are also asked to disclose their estimates of post loss amplification, their estimates of the secondary uncertainty (if any) around their loss estimates, the vendor model and version used, as well as any other assumptions made in the loss estimation.

The gross loss estimate should break down the loss between lines of business and coverage (eg, residential property damage, commercial property damage, business interruption, contingent business interruption, motor, marine and energy, liability)

The gross loss estimate should also break down the loss between types of peril (eg ground-shaking, tsunami, fire following).

Firms should provide details of the exposures that have been modelled (modelled number of risks and modelled sums insured), their exposures impacted by the earthquake and tsunami (impacted number

of risks and impacted sums insured), and give details of the firm's expected number of claims and average cost per claim. Firms may make reasonable assumptions to derive their estimates and should exclude immaterial claims if using vendor models

3. CALIFORNIA EARTHQUAKES

> This California earthquake scenario tests firm's resilience to several shocks, from both a severe earthquake and a subsequent event, analogously to what is observed during earthquake sequences (eg the 2010-2011 New Zealand series of events; the 20th century sequence in Turkey; the 1811-1812 New Madrid sequence, United States of America).

3.1 EVENT DEFINITION

This stress test is for a severe earthquake in central and southern California, followed by a severe second event. The scenario has been based on a plausible Magnitude ~8 main shock along the San Andreas Fault, and a magnitude ~7 second event in the region of Los Angeles. At today's values, the earthquakes are estimated to cause a total industry loss of USD 51 and 71 billion approximately according to AIR and RMS respectively. The recurrence interval of major earthquakes along the central and southern sections of San Andreas Fault is known to range between 50 and 200 years approximately, with the last major event occurring in 1857 near Fort Tejon (magnitude 7.9). Firms are to assume that both events occur between September and December 2017, and are sufficiently separated in time to be considered two separate events for the purposes of reinsurance recoveries. In the PRA's view, these events could plausibly occur in our lifetime, especially when time-dependency effects are considered. Also multiple events scenarios are plausible considering earthquake interactions processes (eg stress transfer).

3.2 ASSUMPTIONS

In estimating the gross loss, **firms are asked to allow for demand surge** (post loss amplification), using their natural catastrophe modelling capabilities.

Firms should estimate both the aggregate losses and the breakdown between the two earthquakes. Breakdown between physical damage and contingent business interruption is also requested. Should the firm not have access to suitable modelling capabilities, they are requested to estimate the non-modelled components (eg contingent business interruption) using an alternative approach of their choice. The approach should be clearly disclosed, along with assumptions and expert judgements made, to estimate the non-modelled components.

Firms should consider what management actions including changes to their reinsurance programmes they may take during and following the series of events. These should be described with the estimated associated costs, if any, disclosed and allowed for post event in the above calculations.

Firms should assume events fall under the same treaty year, that any changes made to the reinsurance programme do not incept before the first event occurred, and should include the impact of both inwards and outwards reinstatement premiums. Where additional reinstatements or back-up covers are purchased, firms should quantify the likely rate increases and should not factor in reduced attachment points without adequate justification.

For properties modelled as being impacted by more than one event, firms should disclose what assumptions, if any, they have made such as time for repairs or Additional Living Expenses.

3.2.1 Earthquake sources

The map below illustrates the footprint for the first event, which is assumed to match the characteristics of a Magnitude ~8 event. For firms not using any vendor model, the length of the fault rupture is estimated to be approximately 400 kilometres (250 miles) from the region of Soledad to the region of San Bernardino, with an average slip of 10 meters (33 feet). The epicentre should be located at 34.580 latitude and -118.117 longitude on the San Andreas Fault near the town of Palmdale. Firms are requested to simulate the second event (magnitude 7.0) with an epicentre located at 34.121 latitude and -118.107 longitude ie on the Raymond Fault near San Marino (county

of Los Angeles). For comparison, the magnitude 7.1 Darfield earthquake (Sept. 2010, New Zealand) was followed in February 2011 by a Magnitude 6.2 aftershock beneath the city of Christchurch.
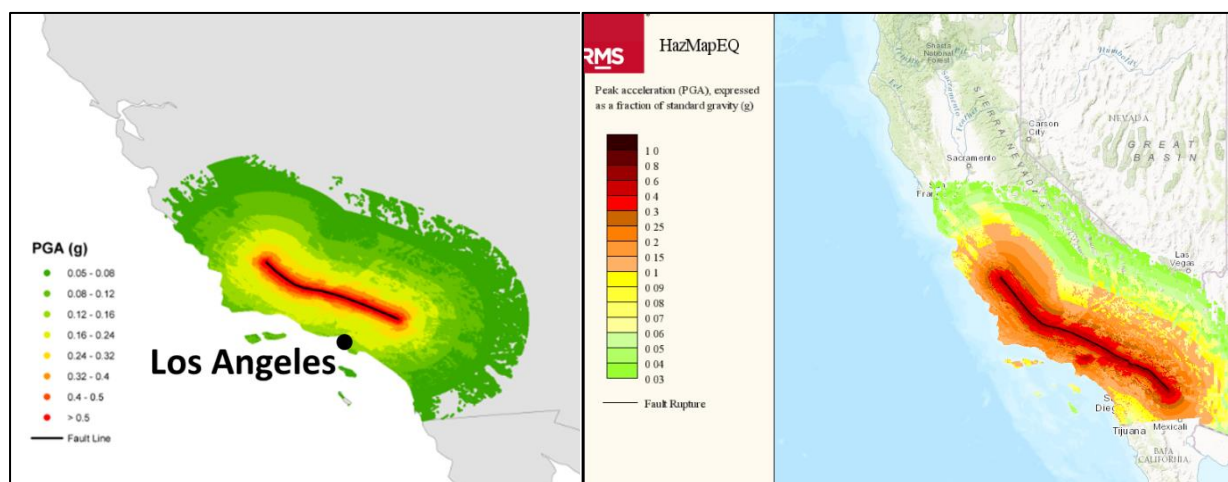
Left panel: First event footprint as modelled by AIR Worldwide; Right panel: First event footprint as modelled by RMS.

For the first event, the closest matching AIR Event ID would be 110009827. The closest matching RMS Event ID would be 2006845 (Version 15). At today's values, the first earthquake is estimated to cause approximately USD 30-38 billion industry losses, according to AIR and RMS.

For the second event, the closest matching AIR Event ID would be 110000189. The closest matching RMS Event ID would be 2007867 (Version 15). At today's values, the first earthquake is estimated to cause approximately USD 21-33 billion industry losses, according to AIR and RMS.

The PRA is aware that event footprints, associated parameters and industry losses between AIR and RMS differ.

Parameters for firms not relying on vendor models	First earthquake	Second earthquake
Fault name	San Andreas	Raymond
Earthquake magnitude (Mw)	8.0	7.0
Rupture length (km)	400	40
Average co-seismic slip (m)	10	2
Epicentre latitude (°)	34.580	34.121
Epicentre longitude (°)	-118.117	-118.107

Parameters to consider for firms not using any vendor model (Cautionary note: event footprints from vendors correspond to closest matching events, and we are aware that parameters between vendors and those indicated in the table may differ)

3.3 REPORTING

Data assumptions and adjustments made to the vendor model estimates to reflect firms' own view of risk should be disclosed, including for example:

- the allowance made for uncaptured exposures or data limitations (eg locations not geocoded); and

- the allowance made for non-modelled secondary perils (eg fire following), non-modelled coverages (eg contingent business interruption) and non-modelled lines of business (eg energy).

Firms are also asked to disclose their estimates of post loss amplification, their estimates of the secondary uncertainty (if any) around their loss estimates, the vendor model and version used, as well as any other assumptions made in the loss estimation.

The gross loss estimate should break down the loss between lines of business and coverage (eg, residential property damage, commercial property damage, business interruption, contingent business interruption, motor, marine and energy, liability).

The gross loss estimate should also break down the loss between types of peril (eg ground-shaking, fire following).

Firms should provide details of the exposures that have been modelled (modelled number of risks and modelled sums insured), their exposures impacted by the earthquake and the aftershock (impacted number of risks and impacted sums insured), and give details of the firm's expected number of claims and average cost per claim. Firms may make reasonable assumptions to derive their estimates and should exclude immaterial claims if using vendor models.

4. US HURRICANE SET OF EVENTS

> To the extent possible, the PRA has kept the scenario of a US hurricane series of events broadly consistent with the 2015 exercise with a view to understanding changes over time to firms' exposures and protections including from alternative markets.

4.1 EVENT DEFINITION

This stress scenario is for a Katrina, Rita and Wilma (2005) type of scenario where a series of three major US hurricanes occur in the same year. At today's values, the three hurricanes are estimated to cause a total industry loss of USD 96 and 142 billion approximately, according to RMS and AIR respectively. Firms are to assume that the events occur between July and September 2017, and are sufficiently separated in time to be considered three separate events for the purposes of reinsurance recoveries.

4.2 ASSUMPTIONS

As for the European scenario, firms are expected to carry out their own modelling to estimate the impact of the losses. In estimating the gross loss, firms should allow for storm surge and demand surge or post loss amplification. Firms are asked to provide their own view of demand surge or post loss amplification.

Firms should consider what management actions including changes to their reinsurance programmes they may take during and following the series of events. These should be described with the estimated associated costs, if any, disclosed and allowed for post event in the above calculations.

Firms should assume events fall under the same treaty year, that any changes made to the reinsurance programme do not incept before the first event occurred, and should include the impact of both inwards and outwards reinstatement premiums. Where additional reinstatements or back-up covers are purchased, firms should quantify the likely rate increases and should not factor in reduced attachment points without adequate justification.

4.2.1   First hurricane through Florida before making landfall in Texas

The map below illustrates the track of the first hurricane of category 3 on the Saffir-Simpson scale making landfall in Palm Beach, Florida. The hurricane is assumed to cause losses across the Gulf of Mexico before making landfall again as a Category 4 hurricane in Texas. It will also create some losses across the Caribbean. The table provides details of the hurricane's US landfalls.

	US Landfall 1	US Landfall 2
Saffir-Simpson Category	3	4
Central Pressure (mbar)	952.2	929.6
Maximum Windspeed (mph)	119.5	139.5
Maximum Radius (miles)	25	23
Speed (mph)	6.5	5.7
Angle (degrees)	-35.4	-16.3
Longitude (degrees)	-80.089	-94.200
Latitude (degrees)	26.382	29.579
State	Florida	Texas
County	Palm Beach	Chambers

Hurricane track as modelled by AIR.

The resulting industry loss is assumed to be approximately USD 46 and 61 billion according to RMS and AIR respectively, with the closest matching RMS ID being 2864983 and the AIR Event ID being 270133233.

The PRA is aware that the event footprint, associated parameters and industry loss between AIR and RMS differ.

4.2.2   Second hurricane hitting the US North East

The map below illustrates the track for the second category 3 hurricane making landfall in New Jersey, and causing losses across the north-eastern US states of New York, Connecticut, Pennsylvania and Delaware. Details of the hurricane's landfall are provided in the table.

	US Landfall 1
Saffir-Simpson Category	3
Central Pressure (mbar)	956.3
Maximum Windspeed (mph)	111.1
Maximum Radius (miles)	38.1
Speed (mph)	33
Angle (degrees)	-49.2
Longitude (degrees)	-74.456
Latitude (degrees)	39.397
State	New Jersey
County	Atlantic

Hurricane track as modelled by AIR

The resulting industry loss is assumed to be approximately USD 17 and 35 billion according to RMS and AIR respectively, with the closest matching RMS Event ID being 2851343 and the AIR Event ID being 270093160.

The PRA is aware that the event footprint, associated parameters and industry loss between AIR and RMS differ.

4.2.3 Third hurricane going through Florida before drifting north

The map below illustrates the track for the third category 4 hurricane making landfall in Lee, Florida before making landfall again as a category 3 hurricane in South Carolina. Details of the hurricane's landfalls are provided in the table.

	Landfall 1	Landfall 2
Saffir-Simpson Category	4	3
Central Pressure (mbar)	941.8	953.6
Maximum Windspeed (mph)	133.7	121.4
Maximum Radius (miles)	25.6	18.3
Speed (mph)	14.1	12.1
Angle (degrees)	48.7	22.9
Longitude (degrees)	-82.244	-78.709
Latitude (degrees)	26.626	33.797
State	Florida	South Carolina
County	Lee	Horry

Hurricane track as modelled by AIR.

The resulting industry loss is assumed to be approximately USD 33 and 45 billion according to RMS and AIR respectively, with the closest matching RMS Event ID being 2850375 and the AIR Event ID being 270163397.

The PRA is aware that the event footprint, associated parameters and industry loss between AIR and RMS differ.

4.3 REPORTING

Data assumptions and adjustments made to the vendor model estimates to reflect firms' own view of risk should be disclosed, including for example:

- the allowance made for uncaptured exposures or data limitations (eg locations not geocoded); and
- the allowance made for non-modelled secondary perils (eg storm-surge), non-modelled coverages (eg contingent business interruption) and non-modelled lines of business (eg energy).

Firms are also asked to disclose their estimates of post loss amplification, their estimates of the secondary uncertainty (if any) around their loss estimates, the vendor model and version used, as well as any other assumptions made in the loss estimation.

The gross loss estimate should break down the loss between lines of business and coverage (eg residential property damage, commercial property damage, business interruption, contingent business interruption, motor, marine and energy, liability).

The gross loss estimate should also break down the loss between types of peril (eg wind, storm-surge, river flood).

Firms should provide details of the exposures that have been modelled (modelled number of risks and modelled sums insured), their exposures impacted by the different hurricanes (impacted number of risks and impacted sums insured), and give details of the firm's expected number of claims and average cost per claim. Firms may make reasonable assumptions to derive their estimates and should exclude immaterial claims if using vendor models.

Section 1B

5. ECONOMIC SCENARIO

> In 2015, the economic downturn was the scenario leading to the worst loss (net of the benefit of reinsurance) to GI firms. Given the PRA's current concerns[1] on reserving, there is the potential for significant GI stress were there to be an economic downturn at a time when reserves are also deteriorating. Firms are asked to consider in greater detail than in 2015 the underwriting losses which may arise during a downturn.

5.1 EVENT DEFINITION

The economic shock scenario is consistent with the 2017 Annual Cyclical Scenario (ACS) of the Bank of England's Stress Test of the UK Banking system, published on March 27, 2017.[2]

Firms are asked to estimate the impact on the asset side and to estimate the associated underwriting losses with the economic downturn combined with the reserving shock, as specified below.

5.1.1   Asset Shock

The asset shock is consistent with the Traded Risk Scenario of the ACS (12 months horizon). Firms should assume that the asset shock occurs instantaneously at the end of December 2017. For the purposes of calculating the loss, firms may assume the same allocation to assets as at the beginning of the year, unless they have made changes or plan changes to their asset allocation. Firms should provide information as to how they expect their investment strategy and asset allocation to change following the shock but are not required to recalculate the expected investment income for 2017. Firms may assume that the widening of credit spreads at different durations is the same in percentage terms.

5.1.2   Associated Underwriting Losses

When estimating the underwriting losses associated with the economic downturn as specified by the Banking Stress Test, consideration should be given to lines of business such as credit insurance that are directly related to economic conditions, but firms should also consider other lines of business that could be indirectly impacted by the wider economic climate described above.

Firms are asked, at the very minimum, to consider and quantify:

  i.   deterioration in fraud and theft losses;
  ii.   an increase in the frequency and severity of D&O claims from distressed financial markets; and
  iii. an increase in the frequency or severity PI or E&O claims from the deteriorating housing and financial markets, for surveyors, accountants and lawyers.

5.1.3   Reserving Shock

For the reserving shock, firms are asked to estimate the impact on the technical provisions, both premium and claims, at year end 2017 assuming claims inflation rate is 4% per annum (pa) greater than what is currently assumed in their reserving or business planning assumptions (whether implicitly or explicitly), for all classes of business, for the next five years before reverting to what had previously been assumed.

The PRA is aware that expressing the reserving shock as this superimposed increase in claims inflation may be inconsistent with the economic downturn scenario. However this calculation has been

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[1] The PRA's concerns were set out in our 18 July 2016 Dear CEO letter following the results of our analysis of the 2016 Premium rate movements: www.bankofengland.co.uk/pra/Documents/solvency2/cmoulderletter180716.pdf.
[2] Available at: www.bankofengland.co.uk/financialstability/Pages/fpc/stresstest.aspx.

chosen in the interests of simplicity, to minimise the calculation burden on firms, and to be consistently applied across firms.

Firms may not assume a matching increase in investment yields.

5.2 EVENT DESCRIPTION

A brief outline of the economic scenario in the Banking Stress Test is provided below. If insurers require additional detail around the scenario then refer to the Bank of England Banking Stress Test 2017.[1]

5.2.1   Global stress

Vulnerabilities across financial markets and the global economy crystallise. The stress scenario incorporates a synchronised global downturn in output growth. Relative to the baseline scenario, growth in China, Hong Kong and Singapore is particularly adversely affected.

Investors' risk appetite diminishes and financial market participants attempt to de-risk their portfolios, generating modest safe-haven capital flows and substantial increases in risk premia in financial and property markets. There is volatility in financial markets with emerging market currencies depreciating against the US dollar. The prices of other assets, including property, fall sharply. Falls in Chinese and Hong Kong property prices are particularly pronounced. Interest rates facing households and businesses increase in the early part of the stress, partly reflecting increases in bank funding costs. Although policymakers pursue additional monetary stimulus, which starts to reduce market interest rates, the overall cost of credit rises in the short term.

5.2.2   Domestic stress

Alongside the crystallisation of vulnerabilities in the global economy, which also impacts the United Kingdom, there is a UK-specific risk premium shock, which is associated with a large depreciation of sterling. Monetary policy responds, as higher import prices feed through to inflation and inflation expectations rise. Long-term gilt yields also rise as a consequence. Related to these rises in interest rates, banks face material increases in their wholesale and retail funding costs.

A sharp fall in UK residential property prices is particularly concentrated in regions which have recently experienced more rapid price increases. Likewise a fall in UK Commercial Real Estate (CRE) prices is concentrated in the prime sector of the market, where — 2016 aside — prices have risen robustly since the financial crisis.

The combined impact of increases in the cost of credit, the contraction in world demand, falls in asset prices and heightened uncertainty have a pronounced impact on domestic growth and unemployment. UK productivity growth remains weak, limiting the recovery in UK activity through the latter part of the stress horizon.

5.2.3   Further Information

Insurers are not expected to implement the full banking stress test which considers a five year horizon, nor apply the full economic and asset stress factors required by banks and building societies. Instead, we provide the factors that insurers may need to apply in section 5.3 below

Please note it is inevitable that these factors will not capture the breadth of all firms' assets, geographies or products. Where this is the case, we expect insurers to consider suitable factors and make their own judgments/assessment that are appropriate and within the spirit of the wider economic stress illustrated above.

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[1] Available at: http://www.bankofengland.co.uk/publications/Pages/news/2017/270317.aspx.

When applying expert judgment in relation to the asset shocks, we would expect insurers to consider the worst market moves observed in the historical periods per region detailed in the table below.

Geographical region of positions Historical period
- Asia and Emerging Markets 2008 H2
- Europe and the United States 2011 H2 and 2012 H1

The economic assumptions firms should apply under stress are set out in section 5.3. Definitions are available in the spreadsheet used to collect the scenario feedback. Firms should assess the extent to which this would impact their insurance operations as well as the impact on their investments.

When considering changes in Pension Scheme commitments, for firms with defined benefit schemes, we expect insurers to assess the impact of the instantaneous asset shock on their pension scheme investments and report the extent to which this results in a surplus or deficit. We acknowledge that firms have a number of options in which to manage funding pension schemes under stress and this will be considered when evaluating the scenario outcome. Further notes as to how firms should apply the economic scenario to pensions projections are provided in the Annex.

5.3 ASSUMPTIONS

5.3.1 Assumptions for Asset Shock (12 Months Traded Risk Scenario)

The table below shows the movements to be applied to the values of the variables as at the date of the shock.

Asset Class	Region	Risk Factor	Time horizon 1 y	
Credit (absolute spread change, in basis points)	Asia	ITRAXX EX JAPAN IG	580	These are absolute basis point shifts to the 5yr credit spread. For example if the iTraxx IG is at 68bps a 15bps shock takes the index to 68 + 15 = 83bps.
		ITRAXX JAPAN	310	
	Europe	ITRAXX EUR IG	135	
		ITRAXX XOVER	855	
	US	CDX IG	215	
		CDX HY	1,130	
	Bank Funding	ITRAXX SNR FIN	200	
Rates (absolute rate change, in basis points)	Asia	INDIA GOV 1Y	50	These are absolute basis points shifts to the annual interest rate. For example, if the 1-year CN government yield is 477bps, a 20 bps shock would take the rate to 477 + 20 = 497bps.
		INDIA GOV 5Y	50	
		SG GOV 1Y	200	
		SG GOV 3Y	170	
		HK GOV 1Y	275	
		HK GOV 3Y	125	
		CN GOV 1Y	50	
		CN GOV 3Y	50	

		SG SW 1Y	250
		SG SW 3Y	250
		HK SW 1Y	325
		HK SW 3Y	150
		CN SW 1Y	50
		CN SW 3Y	50
	Europe	GER GOV 1Y	-25
		GER GOV 5Y	50
		GER GOV 10Y	75
		GER GOV 20Y	110
		EUR SW 1Y	25
		EUR SW 5Y	60
		EUR SW 10Y	95
		EUR SW 20Y	120
		TRY GOV 1Y	250
		TRY GOV 3Y	250
		TRY SW 1Y	200
		TRY SW 3Y	200
	UK	GBP SW 1Y	450
		GBP SW 5Y	515
		GBP SW 10Y	550
		GBP SW 20Y	560
		GBP GOV 1Y	395
		GBP GOV 5Y	500
		GBP GOV 10Y	525
		GBP GOV 20Y	540
	US	USD GOV 1Y	-55
		USD GOV 5Y	-5
		USD GOV 10Y	100
		USD GOV 20Y	165
		USD SW 1Y	-15
		USD SW 5Y	35
		USD SW 10Y	115
		USD SW 20Y	165

	Other	ZAR GOV 1Y	190	
		ZAR GOV 3Y	210	
		BRL GOV 1Y	500	
		BRL GOV 3Y	500	
Equities **(percentage change)**	**Asia**	NIKKEI225	-50%	These are relative percentage shifts. If the FTSE100 index is 7164, an -11% shock will take the index value to 7164 x (1 - 11%) = 6376.
		HANG SENG INDEX	-55%	
		SENSEX	-55%	
		KOSPI	-55%	
	Europe	EUROSTOXX50	-45%	
	UK	FTSE100 INDEX	-45%	
	US	S&P 500	-46%	
FX **(percentage change)**	**Asia**	USDKRW	12%	
		USDMYR	7%	
		USDIDR	14%	
		USDTWD	17%	
		USDSGD	12%	
		AUDUSD	-8%	
		USDCNH	11%	The convention of 'Ccy1Ccy2' represents the number of Ccy2 per Ccy1. These are relative percentage shifts. For example, if USDJPY spot rate is 113, a 3% shock will take the spot rate to 113 x (1 + 3%) = 116.
		USDJPY	10%	
		USDCNY	11%	
		USDINR	8%	
		USDHKD	0%	
	Europe	EURUSD	-8%	
		USDRUB	25%	
		USDCHF	-5%	
		USDTRY	15%	
	UK	GBPUSD	-32%	
	Other	USDBRL	13%	
		USDZAR	15%	

A copy of these assumptions is provided in the Annex of the GIST 2017 Template Excel workbook.

5.3.2 Assumptions for Economic Downturn (First Year of ACS)

Area	Variable	2016	2017	Change	
UK	UK real GDP[1]	1,878,659	1,843,351	(1.9)%	
	UK nominal GDP	1,944,857	1,946,181	0.1%	
	UK CPI	101.5	105.3	3.7%	
	UK unemployment rate	4.80	8.60	3.80	%
	UK corporate profits	909,809	903,046	(0.7)%	
	UK household income	1,339,597	1,335,357	(0.3)%	
	UK residential property price index	100.0	88.9	(11.1)%	
	UK commercial real estate price index - aggregate	100.0	80.9	(19.1)%	
	UK commercial real estate price index - prime	100.0	78.1	(21.9)%	
	UK commercial real estate price index - secondary	100.0	83.8	(16.2)%	
	UK equity prices	100.0	55.2	(44.8)%	
	Bank Rate	0.3	4.0	3.70	%
	Sterling IG corporate bond spread	151.3	431.0	279.70	bps
	Sterling HY corporate bond spread	469.4	2072.8	1,603.40	bps
	Secured lending to UK individuals	3.1	0.9	-2.2	%
	Consumer credit to UK individuals	10.6	0.3	-10.3	%
	Lending to UK PNFCs	3.2	-6.8	-10.0	%
World	PPP-weighted World real GDP	100.0	97.6	(2.4)%	
	Oil price	50.1	24.0	(52.1)%	
	Volatility index	14.0	35.4	152.9%	
	GBP-EUR exchange rate index	100.0	74.3	(25.7)%	
	GBP-USD exchange rate index	100.0	68.3	(31.7)%	
Euro	Euro area real GDP	100.0	96.4	(3.6)%	
	France real GDP	100.0	97.2	(2.8)%	
	Germany real GDP	100.0	96.1	(3.9)%	
	Ireland real GDP	100.0	95.7	(4.3)%	
	Euro area consumer price index	100.0	99.7	(0.3)%	
	Euro area unemployment rate	9.7	13.2	3.5	%
	ECB policy rate	-0.4	-0.4	0.0	%
	Euro area residential property price index	100.0	94.3	(5.7)%	
	Euro area commercial real estate price index	100.0	87.8	(12.2)%	

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[1] The GDP numbers provided in the above table relate to the 2016 and 2017 calendar years. In the annual cyclical scenario (ACS) spanning a five-year period to the end of 2021, the peak-to-trough contraction in UK GDP is 4.7%, the fall in UK residential property prices is 33%, and the fall in UK commercial real estate is 40% over that longer time frame.

US	US real GDP	100.0	96.5	(3.5)%	
	US unemployment rate	4.7	7.8	3.1	%
	US equity prices	100.0	54.4	(45.6)%	
	US policy rate	0.5	0.3	-0.2	%
	US residential real estate price index	100.0	91.4	(8.6)%	
	US commercial real estate price index	100.0	82.1	(17.9)%	
	US dollar IG corporate bond spread	135.0	515.0	380.00	bps
	US dollar HY corporate bond spread	463.4	1613.0	1,149.60	bps
Asia	China real GDP	100.0	98.8	(1.2)%	
	China household income growth	7.8	1.5	-6.3	%
	China residential property price index	100.0	72.6	(27.4)%	
	Hong Kong real GDP	100.0	92.1	(7.9)%	
	Hong Kong unemployment rate	3.3	6.6	3.3	%
	Hong Kong residential property price index	100.0	69.4	(30.6)%	
	Hong Kong commercial real estate price index	100.0	65.4	(34.6)%	
	India real GDP	100.0	102.2	2.2%	
	Singapore real GDP	100.0	92.8	(7.2)%	
	South Africa real GDP	100.0	96.2	(3.8)%	

A copy of these assumptions, together with definitions, is provided in the Annex of the GIST 2017 Template Excel workbook.

5.3.3   Assumptions for reserving deterioration

Additional superimposed claims inflation relative to pricing or reserving basis	+4% over 5 years

5.4 REPORTING

Firms should assess the impact on both the asset and liability side of their projected Solvency II Balance Sheet as at year end 2017. Firms should disclose any changes they plan to make to their asset allocation.

Note: Within the template for this particular stress test Gross and Net aggregate loss should reflect the total loss arising from both investment and underwriting activities.

Section 2

6. EXPOSURE GATHERING FOR UK RISKS BY SECTOR

Given the limitations of specifying a liability scenario, this section of the GIST 2017 aims at capturing exposures and providing the PRA with a map of where firms' and industry exposures lie across both property and liability. This will provide the PRA with an understanding of sectoral accumulations, assist the PRA's preparedness in the event of a significant loss, and is likely to be used to develop future market-wide liability stress tests.

6.1 DEFINITION

The intention of this section of GIST 2017 is to capture the exposures of UK general insurers to various sectors of the economy. It is not a scenario but it will allow the PRA to build a map of exposures for individual firms and across the GI sector with the potential to use this information for assessing the impact of future loss events.

For 2017, the information collected would enable the PRA to better tailor its supervisory activities post any liability catastrophe scenario by prioritising those firms with the largest exposures to the impacted sectors.

The PRA acknowledges the limitations arising from only partial coverage of exposures, from capturing only one year's worth of exposures, from likely inaccuracies in mapping to industry sectors, and from differences in policy coverage and wording, attachment point, reinstatement provisions and exclusions, among other considerations.

Nonetheless the PRA believes analysing historical events is limited as a guide to evaluating future potential liability catastrophes and that an analysis of exposure information could supplement useful information at both firm (micro) and sector (macro) level. This is especially so at a time of the insurance cycle when many insurers are expanding their liability business.

The PRA acknowledges that some firms are developing their ability to capture liability exposure information. This part of GIST 2017, while recognising the good progress made to date by some firms, leverages emerging best practice in the industry for the benefit of broader oversight of liability accumulations. The PRA will feed back to the industry our summary of the exposures by high-level sector classification.

6.2 INFORMATION REQUESTED

Firms are requested to provide the number of policies, gross written premiums and total limits exposed through their different products offered by each sector of the economy. The sectors of the economy are delineated by using the traditional Standard Industrial Classification (SIC) grouping. Each policy is to be allocated to one SIC code based on the most relevant SIC code for the policyholder.

For 2017 and after taking on board firms' feedback, the PRA is only requesting this information for SIC codes at 2 digit level of granularity except for some Sections (D, G, J and K) where the information is being asked at 3 digit level. Firms should not assume that, were the PRA to repeat a similar exercise, the information would not be requested at a greater level of granularity or for other territories.

Many firms will already have a sectoral allocation that can be used or mapped to our requested codes. If need be, a description of the various sectors and codes is provided by the ONS.[1]

A mapping of all UK companies active as at 3 October 2016 with their matching SIC code, as reported by the company to the Companies House, is also provided.[2]

The information requested in this section is to be provided for all in-force policies as at 1 January 2017 and is only being requested for direct commercial business. Personal lines and treaty reinsurance business are specifically excluded. Firms are requested to provide the information split by coverage provided ie: Property; Motor; Employers' Liability; General Liability or Public Liability; Errors & Omissions or Professional Indemnity; Directors & Officers; Trade Credit; and all other classes. For commercial motor where liability is unlimited, total limits exposed is not requested.

Where there are multiple policyholders under a policy, it will suffice to use the holding company or the largest UK company under the policy. Where there are multiple layers to a policy or policies, the PRA prefers firms to consider these as one policy. Where there are multiple reinstatements or an aggregate limit, the PRA prefers firms to provide the aggregate limit provided. Where the number of reinstatements is unlimited, firms should estimate a reasonable aggregate limit using a sensible or rule of thumb approach, disclosing the assumption made.

For policies which have been written through delegated authorities or schemes or facilities, where firms receive information through bordereaux, firms should allocate individual policies or risks under these contracts to the relevant SIC codes. Firms may do this on the basis of known bordereaux or expiring risks adjusted for the estimated premium income for 2017.

6.3 Scope: UK Policyholders and UK risks

The PRA has restricted the scope of this section to be in respect of UK policyholders and for UK risks only. Where these risks have been underwritten by branches abroad, these are included. Multinational policies with a main overseas policyholder but which also contain UK risks are excluded.

Where the insurance policy covers risks outside the United Kingdom, firms are asked to allocate the premium for each policy between the portion reflective of UK risks and the remaining portion for non-UK risks. Firms are not being requested to split the premium for each policy between different SIC codes where the policyholder operates across different economic sectors.

It is acceptable for firms to use a range of allocation methodologies. Firms are free to use the allocation methodology they consider appropriate and can use pragmatic methods provided these yield sensible aggregate results. Where the limits can be fully exhausted by UK risks, these do not need to be allocated. If the limit of the policy cannot be fully exhausted by UK risks, only the maximum amount of loss that can be caused by UK risks is to be counted.

Although this information is only being requested in respect of UK policyholders and for UK risks only, firms may provide the information for the totality of their commercial book if this would be easier.

For the avoidance of doubt, this information will be held by the Bank and will not be disclosed at a firm level to any third parties. However, the PRA may release aggregate sector information where there are a sufficiently large number of risks to avoid individual firm identification.

6.4 REPORTING

A standardised template is provided in the GIST 2017 Template.xls workbook capturing the number of policies, gross written premiums and total limits exposed for each SIC code for the various product lines. Exposures underwritten at Lloyd's and non-Lloyd's exposures are to be provided separately.

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[1] Available at:
www.ons.gov.uk/methodology/classificationsandstandards/ukstandardindustrialclassificationofeconomicactivities/uksic2007.

[2] Available at: http://download.companieshouse.gov.uk/en_output.html.

6.5 Feedback

The PRA will use the information collated to develop our view of the aggregate exposures to various sectors of the UK sector and the PRA will feed back aggregate results to the industry.

At the request of firms, the PRA will share with the firm our assessment of their exposures relative to the market.

Annex

NOTES FOR FIRMS WITH DEFINED PENSION SCHEMES

(only applicable to Scenario 5)

Pensions Projections in the 2017 Stress Test may require additional variables that are not in the published stress scenario. In order to help firms assess proportionality, we are here making available the assumptions used in the PRA model for 2017.

a. **Discount Rate Changes:** We decompose the starting discount rate into 'risk free' and 'credit spread' components. We assume the 'risk free' curve is the gilt curve in the scenario (available up to 20 years). For many firms, the 20-year point is suitable; for slightly longer terms, we will extrapolate using an estimate of the forward rate at 20 years.

   For the 'credit spread' component, we use the methodology described below.

b. **Real Yields:** Below we provide real rates for 10 year UK government bonds. In the ACS there is a larger wedge initially between real and nominal rates, as inflation expectations rise above target over that part of the horizon.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Base	-1.96	-1.77	-1.44	-1.16	-0.94	-0.70	-0.52	-0.40
ACS	-1.96	2.44	1.17	0.96	1.22	0.72	n/a	n/a

c. **CPI vs RPI:** We assume a constant wedge between CPI and RPI inflation throughout the scenario horizon.

d. **UK and US Credit Spreads:** Spreads are provided for Investment Grade and Non-Investment Grade Bonds. We assume the spreads on corporate bonds (including the IAS discount rate) increase *pro rata*[1] – ie by $I(t) / I(0)$ where $I(t)$ is the spread Index at time t. We assume that the change in credit spreads applies across the yield curve for that rating category of bond. When valuing corporate bond assets we ignore the impact of default and downgrades – ie the change in value can be based on the changing risk-free rate and credit spread only. We do not value bonds individually and we expect firms to use representative bonds in each of the rating buckets.

e. **Funding Projections and Recovery Plans:** For UK schemes we project the funding basis on the assumption of regular triennial valuations. Recovery plans are assumed to start between 9 and 15 months after the valuation date (for convenience in aligning with calendar years) and be *no weaker* than the existing plan. By 'no weaker' we mean:

   • If the position is 'behind' previous recovery plan path, no reduction in contributions, no additional allowance for outperformance, no extension beyond a further 3 years, no additional 'back-end loading'.

   • If the position is 'ahead' of previous recovery plan path, a bringing forward of the end date rather than a reduction in contributions.

f. **UK and US Equity assets:** Equity assets are assumed to move with the equity returns provided in the scenario, ignoring basis risk between specific stocks and the relevant index. The index supplied is an equity price index only, ie does not include dividends. The gross dividend yield at time zero on the relevant index is assumed to remain constant throughout the projection period.

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[1] The starting credit spread plus the starting risk free rate used in bullet point (a) should add up to the discount rate at 31 December 2015.

g. **Euro, Asian and other overseas assets:** For material holdings, movements in equity prices or credit spreads can be estimated using a combination of:

- UK and US equity paths

- A comparison of the overseas GDP paths in the scenario with UK / US GDP paths.

- The one-year stresses provided in the "Traded Risk Scenario" document.

Where there is no appropriate GDP index, or the holding is not material, the remaining assets are assumed to be invested in the relevant UK index and to be denominated in sterling.

h. **Property assets:** The property index is assumed not to include rental income. A rental yield of 5% is assumed to be applicable throughout the projection.

i. **Alternative Assets:** Hedge funds, private equity and other alternative assets without an index are assumed to be invested in equities.

We understand that firms may have their own methodology in place and firms may use their own consistent assumptions in line with Solvency II. In order to help our analysis, we expect any material differences between firms' methodologies and the assumptions outlined above to be explained and justified in the unstructured data request.

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