



Hong Kong

6-9 May 2012



Thailand Flood: A Case Study

Verne Baker
Phillip Lui

Session Number: **MBR14**



Joint IACA, IAAHS and PBSS Colloquium in Hong Kong
www.actuaries.org/HongKong2012/

Agenda

Background

Actuarial considerations

Methodology

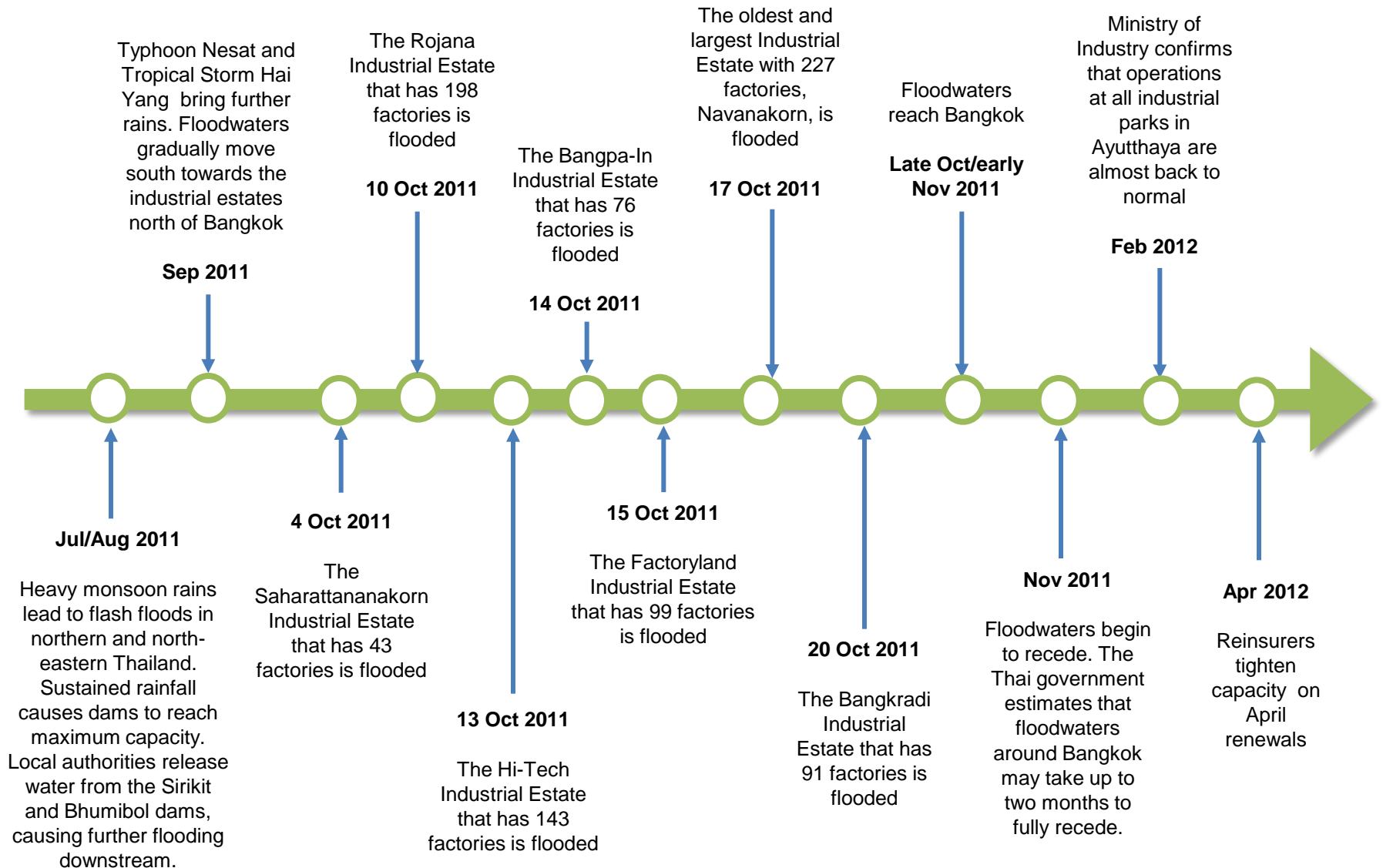
Some detailed matters

Reinsurance

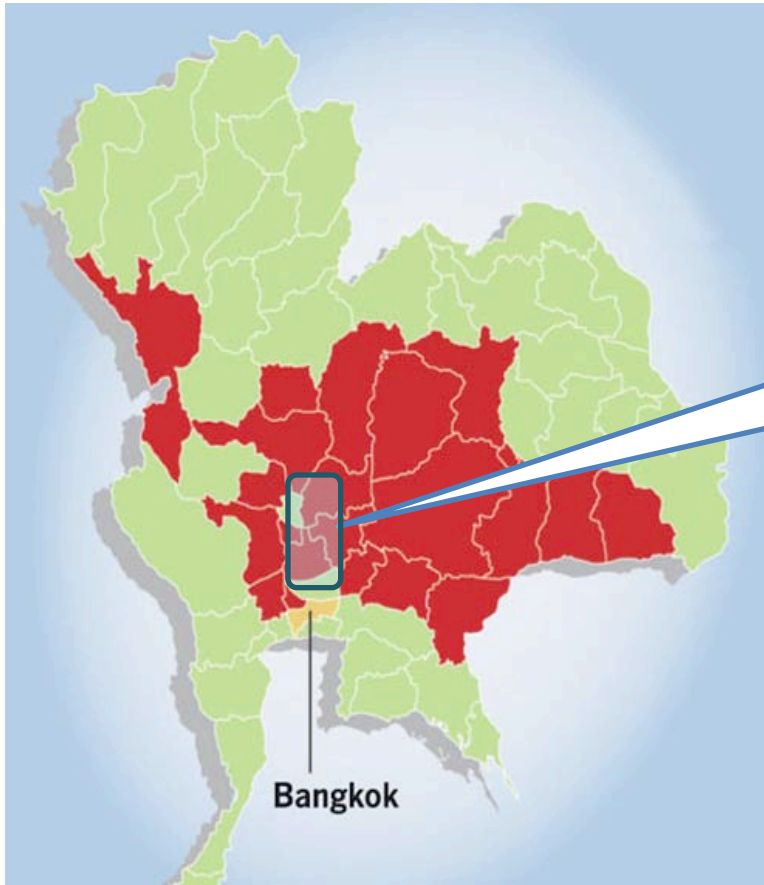
Current areas of uncertainty

Future Thai Flood Claims?

Timeline of Events

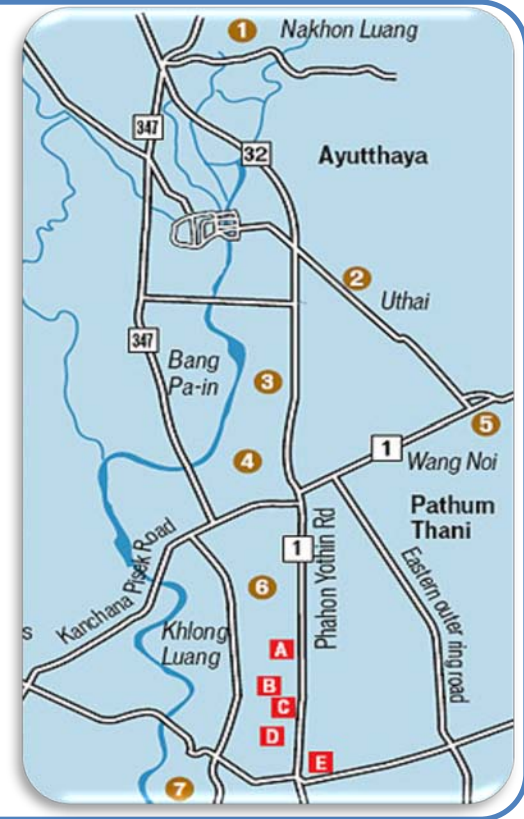


Affected Areas

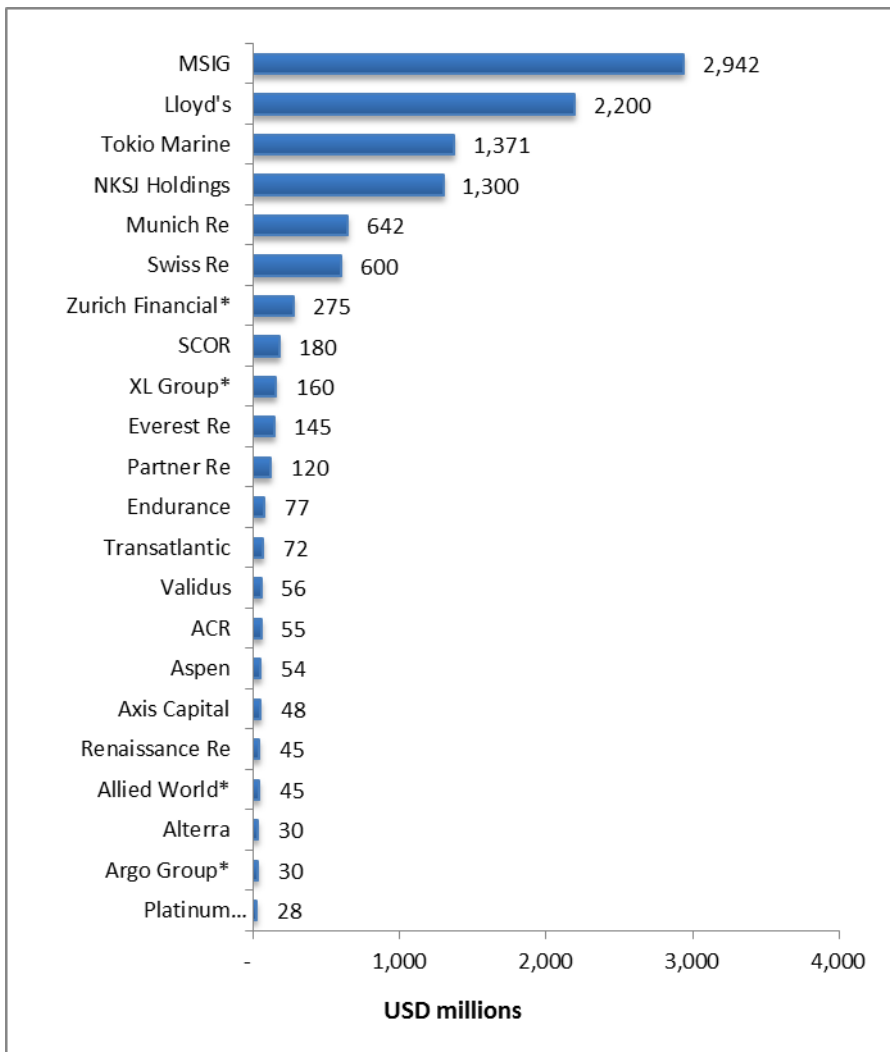


Industrial Estates

1. Saharattananakorn
2. Rojana
3. Hi-Tech
4. Bang Pa-In
5. Factoryland
6. Navanakorn
7. Bangkradi



Market Estimates



- The World Bank estimates overall economic losses from the Thailand floods to be USD45.7 billion, making it one of the top five most costly natural disasters in the past 31 years. As at February 2012, total insured losses to the industry are estimated at USD15 billion, a 50% increase from November 2011 (*Source: AM Best briefings*).
- Thailand is the world's second largest producer of computer hard disk drives and a key supplier to many global carmakers and digital/electrical goods manufacturers.
- 7 industrial estates have been inundated by the floods, comprising mainly Japanese-owned factories or suppliers to Japanese companies.
- The graph and table beside show published estimates for a sample of affected insurers and reinsurers. As can be seen, the losses borne by Japanese insurers are far higher than the rest.
- It should be noted that the Lloyd's estimate of USD2.2 billion may include losses for syndicates which are funded by insurers already on the list.

*Denotes mid-point of estimated range

Sources: Reuters, AM Best, company websites



Some Possible Consequences of the Thai Floods

Recapitalisation of reinsurers

- In January 2012 Fairfax Financial Holdings announced its acquisition of a 25% stake in Thai Re for approximately USD70 million
- Hardy Underwriting (part of the Lloyd's of London group) is acquired by CNA Financial for USD227 million in March 2012, after putting itself up for sale following losses of USD40 million from the Thailand Floods

Industry movements

- Singapore-based Lloyd's Syndicate 1965 stopped writing new business due to heavy losses from catastrophes including the floods
- Withdrawal of French reinsurer CCR from the Thailand market following the floods
- Entry of Berkshire Hathaway via its insurance arm, National Indemnity into the Thailand market

Establishment of a National Disaster Fund by the Thai government

- Estimated size of THB50 billion by pooling together resources of the 67 market players.
- Aims to provide funding to purchase reinsurance premiums at competitive rates.
- Will have capacity to cover losses of approximately THB500 billion.
- Expected to operate for a minimum of three years until reinsurance capacity returns to normal levels
- The fund will provide coverage up to THB50m for SMEs, in return for premiums of 1% of the sum insured.
- For sum insured amounts exceeding THB50m, coverage is provided up to 30% of the sum insured amounts, in return for premiums of 1.25% of the sum insured.

Key Actuarial Considerations

Lengthy period before loss reports came in

- Some sites were under water for 2 months
- Power lost left many factories in complete darkness
- Logistical problems in assessing damage
- Logistical problems in collating information

Claims reported information at 31 December not a reliable basis for reserve estimates

- Proportion of loss advices calculated by desktop evaluation
- Preliminary loss advice reports
- Few cases where second reports were available
- Possibly information on more serious claims in first

No precedents in Thailand

- Previous floods were flash floods – no extended period of exposure to water and corrosion

Different damage ratios according to the types of asset insured the business operations and their location

- Claim severity patterns for Machinery, Buildings, Stock etc. differed
- Geographic location important
- Presence in industrial estates vs. other locations
- Specialist businesses (e.g. clean rooms) generally more
- Many contracts were close to total loss

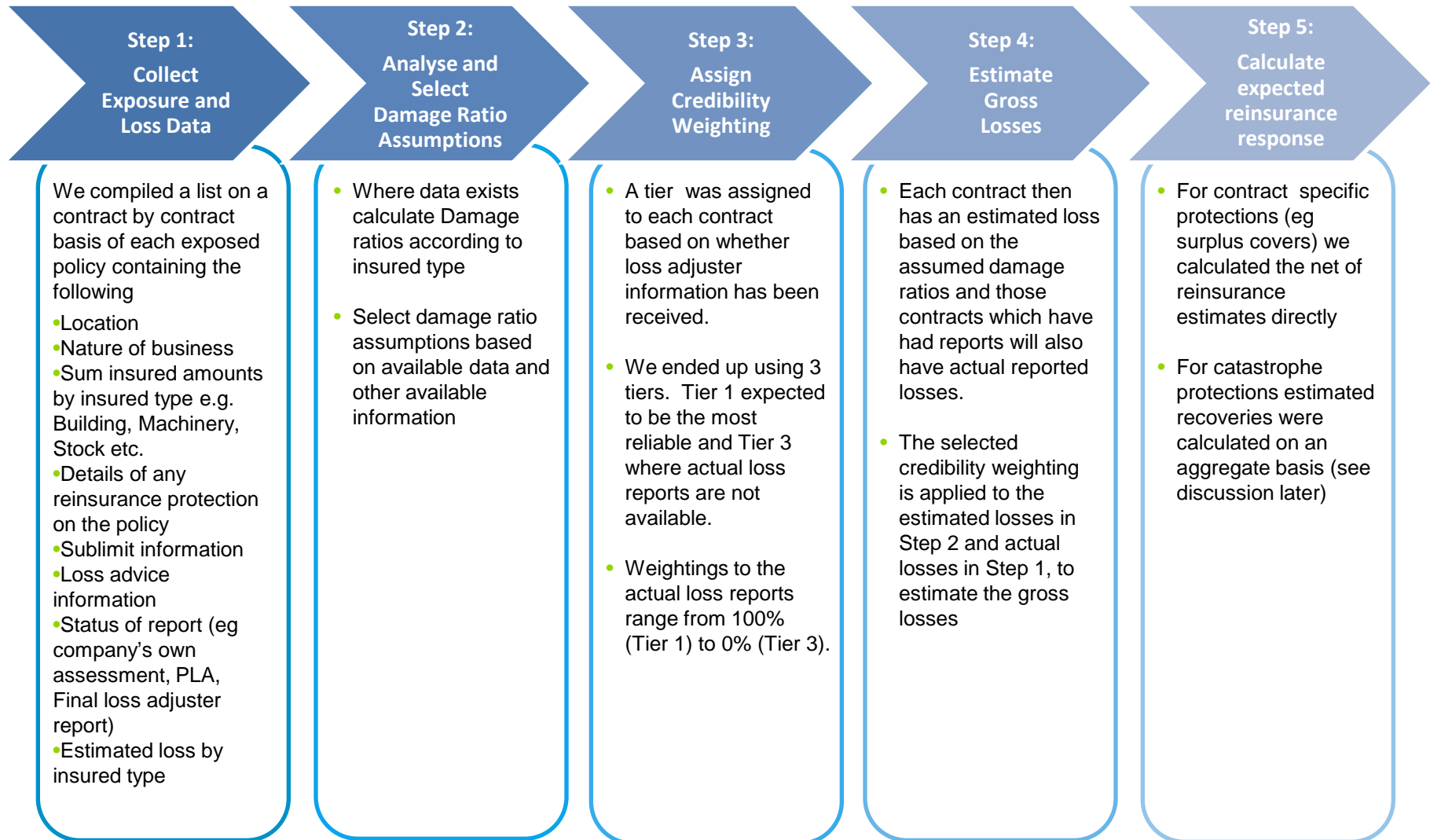
Numbers were very significant

- Unexpected accumulations
- Damage ratios far exceeded EML
- Reinsurance and retrocession protections inadequate

The above factors led us to use an exposure based estimation process

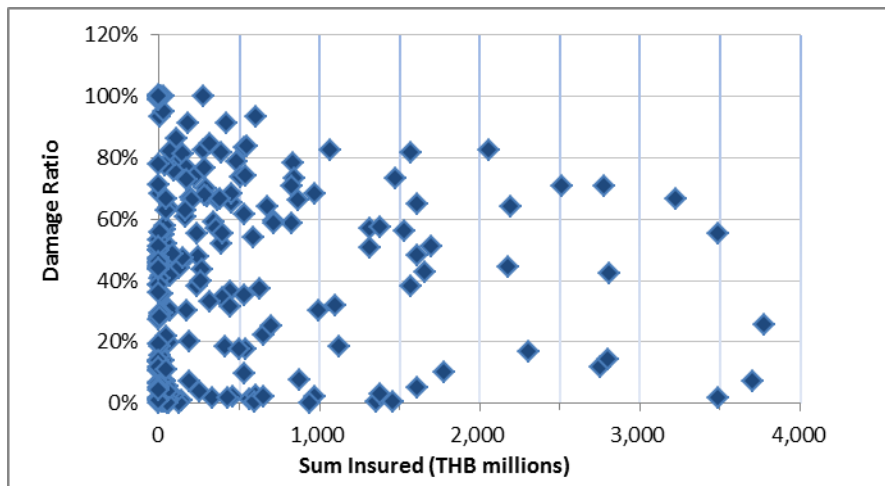


Description of Approach



Total Damage Ratios

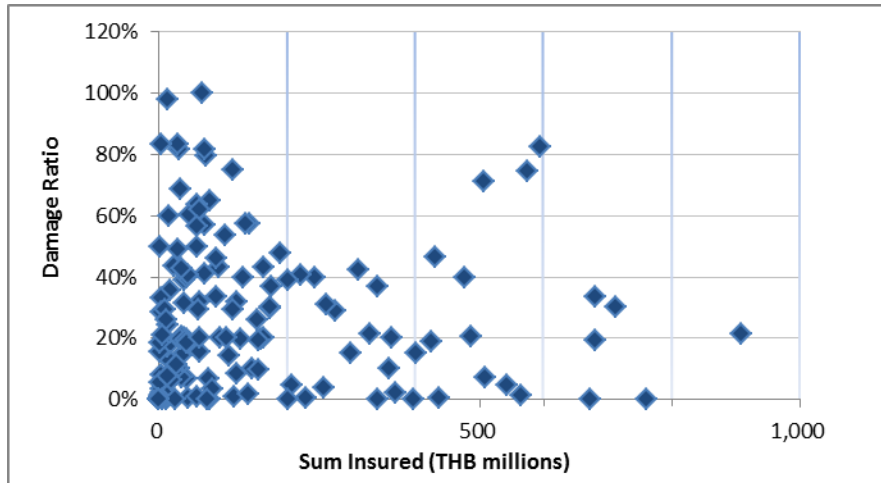
Damage Ratios by Share of Sum Insured (excluding outliers)



- Graphs show the damage ratios for the sample of exposures we have observed, excluding the largest exposures
- There is no obvious trend in the damage ratios. Broadly speaking there is slight clustering in the region of 40% to 70%
- There are several very large exposures that might skew the overall damage ratio
- The overall damage ratios before and after exclusion of large exposures are similar in this case as the largest exposure had a damage ratio of 40%
- Some policies have flood sub-limits and we have excluded these in the selection of the damage ratio to apply
- Bangkok losses are expected to incur a lower damage ratio

Buildings

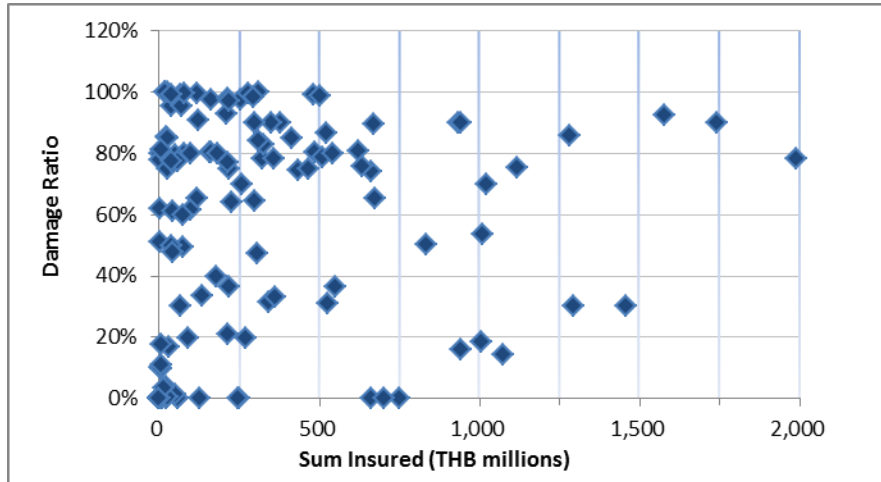
Damage Ratios by Share of Sum Insured (excluding outliers)



- The bulk of the damage ratios are below 40%
- We have in general noted increased loss adjuster estimates in February and March 2012, compared to the initial estimate in December 2011 of below 20%

Machinery

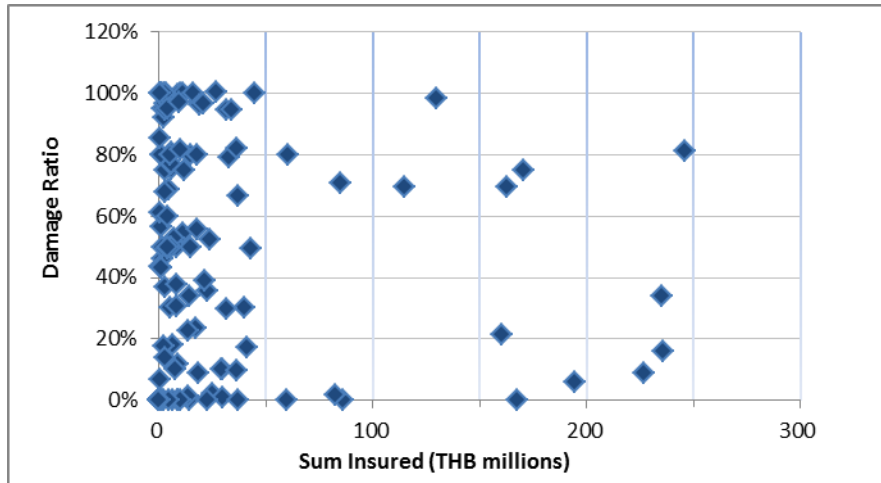
Damage Ratios by Share of Sum Insured (excluding outliers)



- Based on discussions with other industry players, we understand that machinery is likely to have been submerged in water for extended periods of time, thus leading to corrosion
- Therefore the machines are likely to be replaced rather than repaired, and losses are expected to be high
- This is in line with the actual loss estimates, where damage ratios appear to be generally above 60%

Furniture, Fixture and Fittings

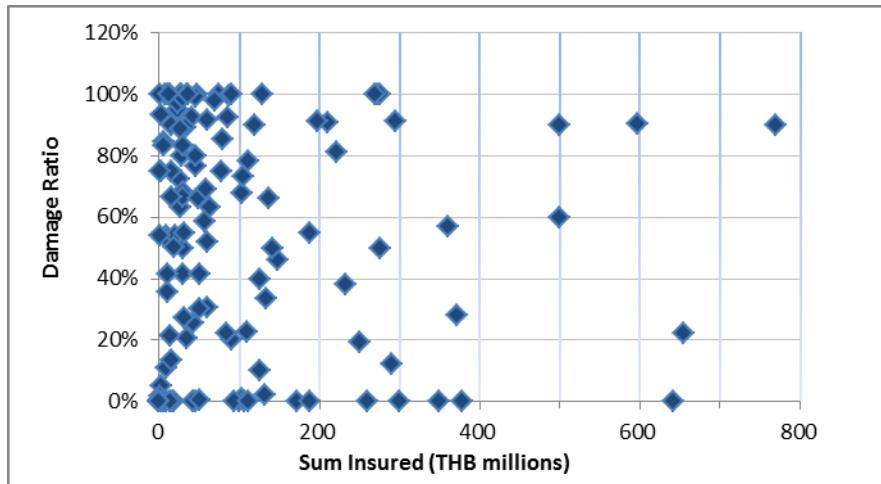
Damage Ratios by Share of Sum Insured (excluding outliers)



- Damage ratios appear to be varied with no apparent trend.
- There are a number of contracts with low damage ratios, as well as a number of total losses.
- The loss ratios are generally below 60%

Stock

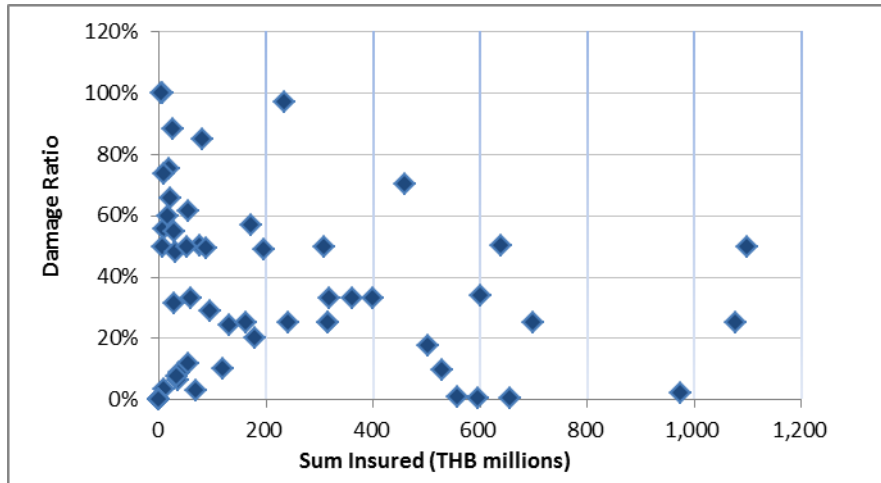
Damage Ratios by Share of Sum Insured (excluding outliers)



- Damage ratios appear varied however many total losses have been observed
- Food manufacturers in particular have had to register a total loss for hygiene reasons

Business Interruption

Damage Ratios by Share of Sum Insured (excluding outliers)



- In most cases, the indemnity period covered by the contracts is 12 months and the loss adjusters have estimated losses of 6 to 9 months.
- There is high uncertainty associated with the Contingent Business Interruption claims, which are difficult to estimate and will take time

Some Detailed Matters

Provision for Adverse Deviation

- In accordance with local regulatory requirements, we were required to add a provision for adverse deviation which is intended to provide a 75% probability of adequacy in our reserve estimates.
- We were able to calculate empirical PAD factors for the damage ratios for each insured type based on the loss information available
- These factors were directly applied in cases where there was no credible loss information available
- We judgmentally reduced the factor by 75% in cases where a loss adjuster report had been received on the file
- We further limited PAD if the inclusion of PAD was to cause a breach in the policy limits

Claims handling expenses

- Loss adjuster fees were directly included in the loss estimates provided to us
- We understand that for certain loss adjusters, the fees were based on a sliding scale of the estimated loss.
- For our clients we did not make explicit allowance for indirect costs of claims handling as the additional administration of the claims was carried out internally with no explicit additional expenses

Calculation of Risk Based Capital Charges

- Under local regulations, the risk charges for Marine Cargo and Property classes were 25% of the claim liabilities at the 75% level of confidence, and 30% for Casualty and Others.
- These charges however were also affected by policy limits

Due to the magnitude of the losses we needed to revisit how these items were applied in the calculations - as discussed in the next few slides

Provision for Adverse Deviations (or Risk Margins)

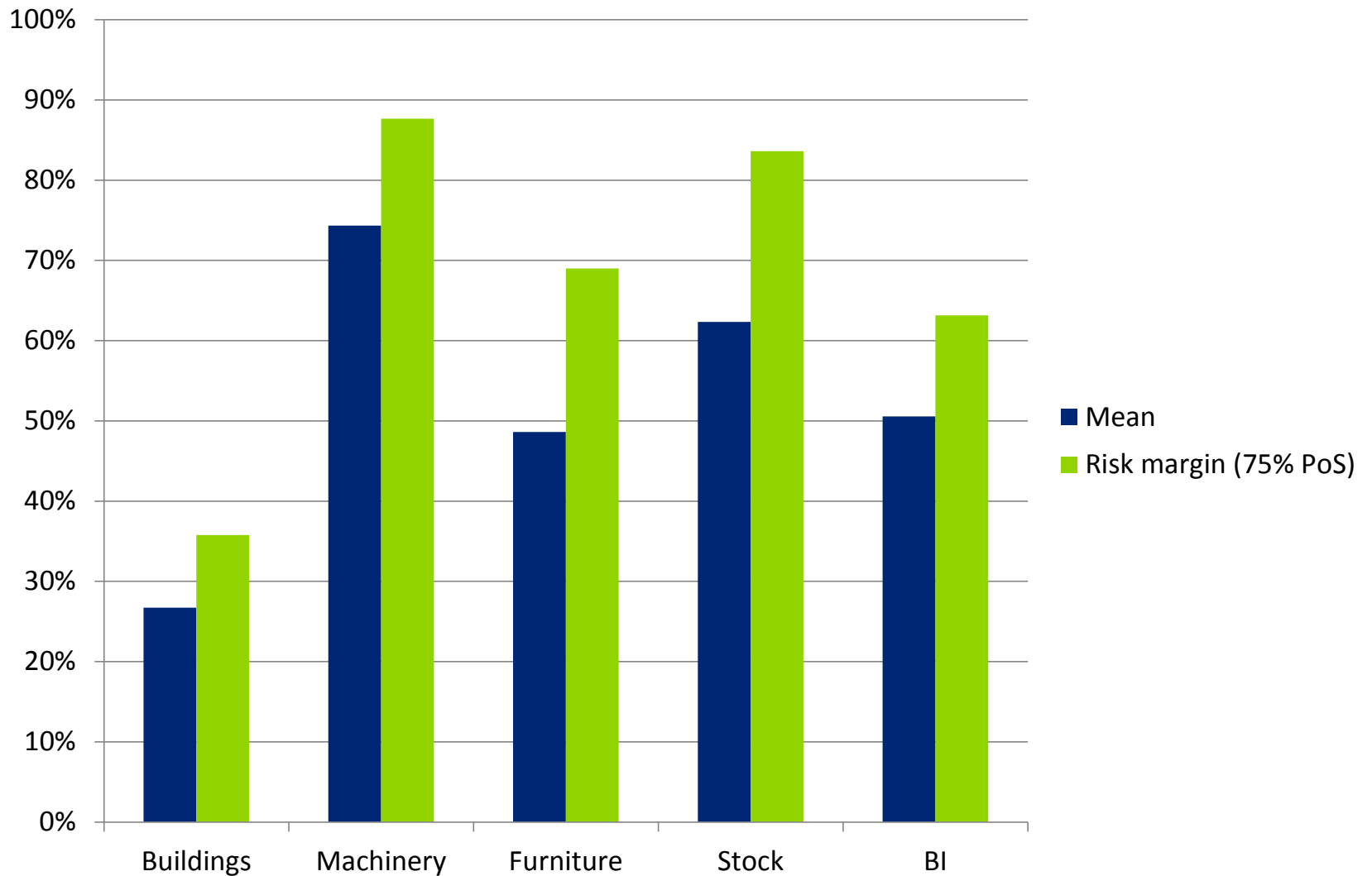
Overview of Approach

- In accordance with local regulatory requirements, we were required to add a provision for adverse deviation (PAD) which is intended to provide a probability of adequacy at the 75th percentile.
- We grouped the data by loss type (building, machinery, stock, furniture and fixtures, business interruption, others) and found the 75th percentile damage ratio assuming a log-normal distribution. We then calculated the PAD by comparing the relativity between the 75th percentile damage ratio with the mean value.

Other Considerations

- In conducting the above statistical analysis we removed outliers (including those where the loss was above sum insured).
- The derived PAD was applied to all cases where no loss reports were available. Where loss reports were available, we judgementally reduced the PAD factor by 75% as those loss estimates are expected to have greater certainty.
- We allowed capping of the loss estimates at the sum insured.
- Where partial payments have been made, we applied the PAD to the outstanding balance.
- Our analysis was performed on the gross FGU loss, before loss adjuster expenses. We then allowed for loss adjuster expenses based on the 75th percentile loss estimates.
- Net (of proportional reinsurance) loss were calculated by multiplying the gross loss by the retention ratio. Net (of Cat XOL reinsurance) loss was derived by applying the Cat XOL programme to the aggregate loss (by class of business).

Provision for Adverse Deviations (or Risk Margins)



Risk Charges

Overview of Approach

- For each contract, we have applied the prescribed risk charge by class of business to the outstanding loss at the 75th percentile.
- The risk charges were limited to the outstanding policy limits, calculated as total sum insured less paid to date.
- This gave us a view of the “effective” risk charge factor, which we have used to apply to the net of reinsurance outstanding loss.

Other Considerations (Dealing with Cat Excess of Loss Arrangements where Coverage is Exceeded)

- Different answers can arise depending on which claims are paid or recovered first
- The risk charge is to be applied to the estimate of net outstanding claims.
- Because the limit has exceeded, recoveries will be allocated to risks that are paid first. Therefore it will be impossible to calculate the risk charge for each risk individually.
- One approach is to conduct a simulation exercise. However, the range of outcome would be:
 - Lowest risk charge for scenario where the lowest hit risks were recovered first, leaving many of the total loss or near total loss risks unrecovered. The risk charge, since capped at policy limit, will be small.
 - Highest risk charge for scenario where the highest hit risks were recovered first, leaving many of the very low damage risks unrecovered. The risk charge will be substantially higher, likely at the full prescribed risk charge.
- For simplicity, we have adopted the “effective” risk charge factor derived from the net loss (before Cat XOL) and applied it to the 75th percentile net estimate at a class level.

Risk Charges

Simplified example:

- 5 contracts, each with gross outstanding loss of 100
- Policy limit on each contract varies, 2 with limit of 100 and 3 with limit of 200
- Risk charge assumed at 25% of outstanding claims
- Recoveries from Cat XL programme of 200 (limit exhausted)
- Case 1 illustrates XL recoveries allocated to 'high' damage claims
- Case 2 illustrates XL recoveries allocated to 'low' damage claims

Contract	Gross OS claims	Policy Limits	Damage Ratio	Gross Risk Charges	XL Recovery	Case 1 Net OS claims	Net Risk Charge	XL Recovery	Case 2 Net OS claims	Net Risk Charge
1	100	100	100%	0	100	0		0	100	0
2	100	100	100%	0	100	0		0	100	0
3	100	200	50%	25		100	25	0	100	25
4	100	200	50%	25		100	25	100	0	0
5	100	200	50%	25		100	25	100	0	0
Risk Charge %				15%			25%			8%

Reinsurance Aspects

Our focus in this presentation has been on reserving for a direct company. Some observations relating to reinsurance are as follows:

Inadequate Cover

- Not enough reinsurance or retrocession bought

Varying clauses in the treaty wordings

- Asian treaties have traditionally combined risk XL and Catastrophe XL covers
- Risk XLs to cover day-to-day attritional losses – common to buy 3 or 4 reinstatements.
- Reinsurers not expecting to provide coverage for so many cat losses
- Treaties have responded based on the wordings – in particular whether the Swiss Re wording is present
- In this clause all losses from a prolonged event are treated as the same event
- Alternatively an hours clause applies – commonly for Flood a period of 168 hours (7 days applies)
- Between 4 October and 14 November 42 days or possibly 7 events.

Unexpected Claims

- Some of our reinsurance contacts have had significant claims from unexpected sources
- e.g. Indian treaties with incidental exposures to Thailand
- Japanese interest abroad treaties
- Further claims from practices of local insurers to swap business. Inward acceptances may cause further claims to reinsurers

Continuing Key Areas of Uncertainty

- Concern over the accuracy of the loss advices presented so far - scope for moral hazard
- Will take some time until extent of business interruption claims are known
- High reliance on the loss adjuster reports both in setting the best estimates and also in estimating the PAD margins. In particular we have used significantly lower PAD margins for policies where a loss adjuster report is available as we have assumed that there would be less uncertainty attaching to these claim estimates.
- It is not possible to put a value on outstanding claim liabilities with certainty and the uncertainty is increased in this instance due to the lack of data available. This is an unprecedented event in Thailand; hence we have not had the benefit of having past development data to assist us in our estimation process.

Going forward

- Government remediation programs
 - Fund will be established to develop infrastructure for water management
 - Financial aid provided to assist businesses and citizens affected by the floods
 - Design of water management and flood prevention plan along the Chao Phraya River Basin
 - Allocated funding for construction of reservoirs, dykes, floodways, and flood diversion channels and improve current water management infrastructure
 - Will take a number of years for construction of flood banks to be completed
- Catastrophe Pool
 - Cover losses of up to THB 500B (US \$16b). Premium .3% up to 1,25%
 - Is very expensive compared to past. Previously cat cover included in Fire premium which may have had rates of .03 to .06% SI.
 - Has a parametric trigger (eg EQ 7+ Richter scale, Windforce > 120k, Flood losses > THB 5B
 - But also the Government can decide what constitutes a catastrophe
- Insurers offering Flood Cover on low sub limit basis
- Reinsurers leaving the market and tightening capacity
 - As evidenced by April renewals
 - Increase in price excess-of-loss covers
 - Tighter sub-limits for natural catastrophes and reduced event limits on pro rata treaties
- Potential industry consolidation
- Research and Development

Time for Q&A



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