

EXTREME EVENTS:

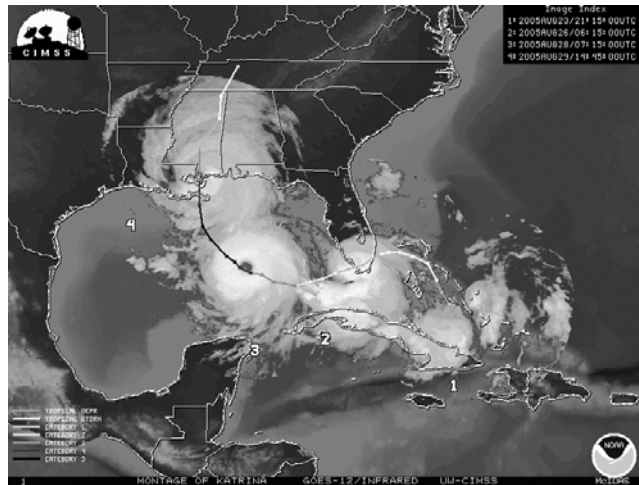
Identification & Measurement

ERM Symposium
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Clifford Angstman

Catastrophes happen..



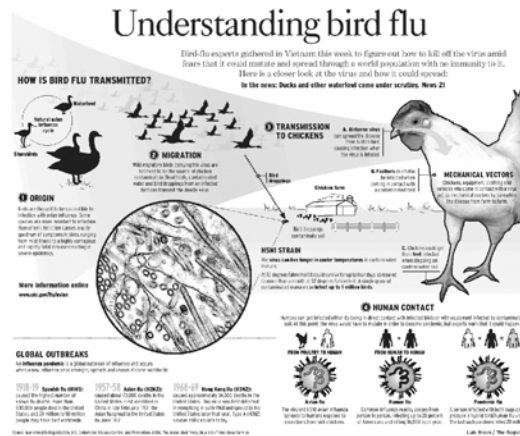
Hurricane Katrina



Terrorism



Avian Flu



Learning to Analyze Risk Events

- **Goals:**
 - Improve skills in developing a event risk mitigation plan
 - Opportunity to learn more about specific events
- **Format**
 - Introduction on risk pitfalls
 - Identification
 - Mitigation
 - Communication
 - Break into discussion groups
 - Reconvene to discuss lessons learned

CLEARLY IDENTIFY RISKS

- Watch for the impact of multiple events
- Look at secondary responses to event

Examples:

- Executive life: regulatory forced sale of junk bonds in S & L's removed liquidity
- 9/11 impact on companies with below investment grade bond strategies

UNDERSTAND RISK COMPLEXITY

Think about correlation with other risks

- Insurance and market value of investments
- Liquidity

Understand the impact of other driving forces after the event

- Regulatory & political responses
- Demographics
- Review of external environment

MITIGATE RISK

Considerations

- How long & how widespread?
- Increased vulnerabilities as a result of the event
- Is insurance or hedging possible?
- Consider all types of responses to the event

- Communication plan to outside parties after the event
- Liquidity & credit needs after an event

Examples

- Impact of Hurricane Katrina
- Many risk failures are caused by multiple events
- Will the reinsurer be solvent?
- How will political responses change the environment?

- How will customers react?
- Should asset structures be changed?

See: *Disarming the Value Killers*, Deloitte & Touche, LLP

RISK MITIGATION TOOLS & METRICS

- Develop early warning metrics
- Establish risk prioritization
- Test response plans
 - Test Liquidity plan
 - Test Damage control and communication plan

RISK COMMUNICATION

- **How can we better communicate the issues?**
 - Simulation results
 - Pro Forma projections
 - Reputation impact of failure
 - Scenario Analysis
 - Cost-benefit metrics
- **Why have certain approaches failed?**
- **Examples:**
 - Risk prioritization for New Orleans's levees and the Challenger Disaster
 - FEMA with regard to New Orleans
 - Risk tolerance complacency
 - Multiple event understanding

BREAKOUT GROUPS

- **Examine a specific event.**
 - Flu or other Epidemic
 - Geographical Event –Earthquake, Hurricane, Tornado
 - Terrorism
- **Combine the event with a type of business.**
 - Life & Health Insurance Products
 - P & C
 - Banking/Investment
 - Energy, Retail
- **Add products to make it more specific**
- **Run through the three step process**

Case Study – A Hurricane In Louisiana

A category 5 hurricane has again formed in the gulf of Mexico. The national hurricane center anticipates that it will make landfall a few miles west of new Orleans.

➤ **Impact**

- The city and the state are still recovering from hurricane Katrina in 2005.
- The city of new Orleans is still protected by levees that only are adequate for a category 3 hurricane.

A Hurricane In Louisiana

➤ **Response:**

- Identify the various risks, and begin to discuss ways to mitigate these risks.
- Discuss how to communicate the plans? Feel free to draw on experience from national news from previous hurricanes.
- Consider the risks and mitigation from the standpoint of an insurance company located in Louisiana.
- Consider the risks and mitigation from the standpoint of a bank located in Louisiana.
- Consider the risks and mitigation from the standpoint of a retail store located in Louisiana.
- Consider the risks and mitigation from the standpoint of an energy company located in Louisiana.

Case Study- Avian Flu

➤ **Impact:**

- Estimated US deaths range from 87,000 to 1.9 million
- Hospitalization of 3-4 times deaths (young and old)
- NYC worst case is 51k deaths, 267k hospitalized
- AON estimate of 25 % illness
- Estimated \$150 billion economic loss at this level
- Duration up to 9 months
- \$30 to \$130 billion of death claims (Steve Wisebart study)

➤ **Response:**

- Takes 9 months to produce flu shots (from virus), using eggs
- World capacity 300 million doses/year (WSJ 10/28/05)
- Anti-virals - WHO has 3 mill doses – needed within 48 hours
- Quarantine
- School closings

Avian Flu

➤ **Impacts to consider:**

- Will health services be overwhelmed?
- Will people come to work?
- Impact on essential services

➤ **External environment:**

- War could reduce supply of nurses
- 40 million people do not have insurance
- Shaky industries: Airlines, autos, airlines, Amtrak, HMO's

Case Study 3

Terrorism: Tactical Nuclear Bomb Midtown Manhattan

- **Potential Impact:**
 - 4,000 killed, 4,000 severely burned or injured
 - Uranium particle contamination causes added injuries
 - 40 foot deep crater destroys subway around Penn Station, and all structures within 150 feet.
 - 50 buildings damaged or destroyed

Case Study 3

Terrorism: Tactical Nuclear Bomb In Midtown Manhattan

- **Potential response**
 - National emergency
 - Military response
 - Borders sealed

 - Consider that company is also located in midtown
 - Impact on insurance company with exposure of 25 % of capital in the area

Simulated Losses from Midtown Manhattan Nuclear Weapon

- 80,000 workers in surrounding area
- Expected 40,000 casualties (workers)
 - 4,000 fatalities
- \$8-10 billion workers' compensation loss
- \$187M in group life losses
- \$6-8 billion total property loss
 - 50 buildings affected



Questions for Discussion

Risk Identification

- Are there any secondary events caused by the main event? What are they?
- Are other company risks impacted by the event?
- Describe secondary responses to these events.
- Discuss failures in local infrastructure as a result of the event.
- What financial market or other economic reactions might arise?
- Describe local, state, and federal government responses.
- What humanitarian survival issues arise from the event?

Communication of Risk and Mitigation Planning

- How will the results of simulations be described in a report?
- How will failures be described to the public?
- Will decision-makers believe that the risks are plausible?
- How are cost/benefit metrics developed?
- What will convince business and government leaders to take action?
- What could cause the plan to fail?
 - **Cost / benefit priority in daily life?**
 - **Complacency about risk tolerance?**
 - **Understanding of multiple event risk?**
 - **Failure of local infrastructure planning?**
 - **Misunderstanding of how widespread or how long the impact will last?**

➤ Planning for Mitigation

- **Describe the key risk considerations:**
 - How long are the consequences?
 - How widespread are the consequences?
 - What can be done ahead of time to reduce the impact? Examples might include a government plan, physical barriers, asset hedges, etc.
 - What special services are needed after the event?
- **How can risks be prioritized?**
- **How can industry planning help?**
- **How can a government plan help?**
- **Describe any early warning or monitoring benefits?**
- **Who will develop any mitigation plans?**
- **How will the public respond to plans during the event?**
- **How can plans be tested ahead of time?**

Results of Discussions

Risk Identification

FLUE:

- Oil Price decreases
 - Hotel/leisure/airline stocks decline
 - Impact on Asian securities more, esp Singapore
 - Credit spread increase
 - Yield curve steepens as liquidity is added
 - More impact in developing countries
 - Are there Possible civil disturbances related to access to drugs, etc
 - Logistic problems getting supplies to the right place
 - Employees unable to work -sick or children
 - Review Disability insurance program
 - Economic decline
 - Need for liquidity
 - Hospital services overwhelmed
 - Airline travel curtailed
 - Increase in crime
 - New business will decline
 - Funeral home capacity issues
 - Mandatory quarantines in outbreak areas
 - Overwhelmed Medical System
 - Asset values decline
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- Time Line issue: world will be much more prepared in 18 months

Industry Specific

➤ Banking

Less on site banking
More use of internet and ATM's
Concern about spread through banking functions
Concern about ability to maintain infrastructure (internet/ATM)

➤ Insurance

Reinsurers.recoverables may be more at risk
Potential for more claims fraud (disability)
Auto claims decline as people stay home
Higher litigation
Claims payment function will be key
Networks will need to function
Vendors could fail
Company reputation is at risk

Results of Discussions

Risk Identification

HURRICANE

- Flooding
 - Decline in real estate market
 - Asset declines
 - Reinsurance recoverables may not be paid
 - Company rebuilding costs
 - Political Risk
 - Claim denial for flood or wind
 - Loss expenses
 - Airports closed
 - Supply chain problems
 - Unable to contact policyholders
 - Reputation risk
 - Costs of logistical operations
 - Increased cost of reinsurance
 - Increase in Fraud
 - Widespread impact
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- Timeline – months to years to recover

Results of Discussions

Mitigation:

FLUE:

- > Identify assets and liabilities likely to be directly impacted
- > Reduce investments in industries directly affected: (travel, leisure)
- > Review contracts for exposure
- > Test disaster recovery plan
- > Increase liquidity
- > Set up a line of credit (liquidity)
- > Establish trigger points (transmission) to escalate and initiate plan
- > Timely communication with stakeholders (Web, press, 800 number)
- > Plan to avoid communication breakdown
- > Establish clear, centralized decision process
- > Short Asian markets
- > Invest in pharmaceutical industry
- > Calm customers through internet TV, Radio
- > Back-up systems
- > Backup staff for critical functions

Industry Specific

> Banking

Reallocate risk exposures (weekly)
Hedging and buying insurance

> Insurance

Lobby for TRIA like limits
Promote and educate on loss prevention
Reinsurance plan
Restrict fund withdrawals
Hedging of assets
Plan for sale of assets by industry

> Hurricane

Watch asset concentration risk in area, esp mortgages
Raise policy deductibles
Look for modeling error
Update models for current situation
Tighten underwriting

Results of Discussions

Communication

- > Use scenarios to establish event triggers
- > Use scenario testing looking at a range of severity
- > Scenario driven prioritization
- > Worst case analysis
- > Visual presentations
- > Analyze a range of deaths
- > Stress test organization
- > Start communicating early
- > Avoid discussions of probability
- > Compare company survivability versus competitors
- > What risk will people pay for?