A Risk-Based Approach to Manage Catastrophes

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Agenda

1. **Black Swan Event**
   Learn about Black Swan event and Catastrophic risk

2. **Systematic Application of Risk Management**
   Systematic application of risk management practices to managing catastrophes

3. **Impact of Regulatory Framework to Catastrophes**
   Introduce Prescriptive Approach and Risk-based Approach

4. **React to Catastrophes**
   Preparedness in reacting to catastrophes
Black Swan Event

► What is a Black Swan event?
► A catastrophe can strike without warning.
► Never considered or thought to be impossible. Proven to be possible and real by its sudden appearance.

► Three Characteristics:
► Rarity
► Extreme impact
► Retrospective (though not prospective) predictability

► The combination of low predictability and large impact makes the Black Swan a great puzzle.
Black Swan Event

- Black Swan Examples:
  - 911
  - Recent /ongoing global credit crisis
  - 2010 BP Oil Spill

- The yet unknown, large, unexpected event neither conceived nor articulated is likely to rock the business the most
  - Leading risk practices are the only real preventive measure
  - Help *expect the unexpected*
A performance and risk-based framework – systematically applying risk management practices

<table>
<thead>
<tr>
<th>Risk Management</th>
<th>Governance</th>
<th>Management</th>
<th>Business Level Performance</th>
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<tbody>
<tr>
<td>Risk Identification &amp; Analysis</td>
<td>Governance &amp; Management Committees</td>
<td>Organization &amp; Decision Making</td>
<td>Self Assessment</td>
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<td>Risk Mitigation &amp; Barriers</td>
<td>Policies &amp; Procedures</td>
<td>Work Program &amp; Budget</td>
<td>Metrics &amp; Measures</td>
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<td>Roles &amp; Responsibilities</td>
<td>Long-Term Plans</td>
<td>Competence &amp; Training</td>
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<td>Internal &amp; External Communications</td>
<td>Follow-up Activities</td>
<td>Emergency Preparedness</td>
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Companies need to demonstrate to the regulator that appropriate risk management systems are in place

Regulations are seen in relation to the specific risks faced by the company

Companies are required to:
  - Systematically identify risks
  - Reduce risks to internally defined acceptance levels
  - Control risks
  - Safety and contingency measures must be commensurate with the risk
  - Use the identified risks as the basis for prioritizing decisions
  - Risk picture must be subject to regular updates

International community has adopted risk-based approaches for energy production
Regulation Framework - Prescriptive Approach

► Based on laws and regulations
► Set specific demands for structures, technical equipment and operations
► Regulatory authorities specify the requirements and monitor compliance

► US regulations - primarily prescriptive

“… prescriptive approach has often turned out to encourage a passive attitude among the companies. They wait for the regulator to inspect, identify errors or deficiencies and explain how these are to be corrected. As a result, the authorities become, in some sense, a guarantor that safety in the industry is adequate and take on a responsibility which should actually rest with the companies.”

Petroleum Safety Authority (Norway)
# Benefits of going beyond prescriptive regulatory compliance

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<th>Deliver incremental value</th>
<th>Provides clarity on roles and responsibilities and expectations between the various partners</th>
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<td>Contributes to the oversight and ongoing assessment of the partners’ most strategic initiatives</td>
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<td>Reinforces the tactics of a risk management culture</td>
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<td>Minimize downside risk</td>
<td>Comprehensive risk assessment performed to identify key risks – with regular updates</td>
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<td>Identifies risks and assists in determining boundaries and tolerances</td>
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<td>Common risk management process aligns partners</td>
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<td>Deliver cost savings</td>
<td>Risk mitigation and barriers focused on high impact risks</td>
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<td>Tangible losses and future loss exposure (e.g., business interruption, lost work days, internal and external investigation costs, fines, penalties and judgments)</td>
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Focus on prevention, but be prepared to react

- Contain the accident
- Care for people
- Consider roles of outside experts

Communications
- Identify key message points
- Identify stakeholders requiring communication
- Consider roles for management and the board
- Consider public relations and investor relations

Plans should be ready to execute with accountability and ownership assigned and completion timeframes

Detailed contingency plans enable improved accident response
“The ancient Romans had a tradition: whenever one of their engineers constructed an arch, as the capstone was hoisted into place, the engineer assumed accountability for his work in the most profound way possible: he stood under the arch.”

-- Michael Armstrong
Thank You