Current issues in general insurance
Richard Lobley, PwC

Risk in the energy sector

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Agenda

• Introduction and relevance to/definition of risk
• Classifying risk in the Energy Sector
• Risks in the Nuclear Sector
• Questions and Comments
Classifying risk in the Energy Sector

Risk categories

- Operational
- Commercial and Reputational
- Health, Safety and Environment
Classifying risk in the Energy Sector

Operational and Reputational Risk

• Generating, Transmission and Distribution
  – Stop the lights going out
  – Gas leaks
  – Burst Pipes

• Security of Supply
  – Redundancy of equipment, “gold plating”

• Reputational
  – Fines / Government Intervention
  – NI – job losses

Commercial Risk

• Trading strategy – Big 6
  – Balance supply and demand
  – Balance portfolio of generation (physical hedge)
  – Hedge Contracts (futures)
  – Short term trading

• Non-compliance
  – Mis-reporting around infrastructure replacement
  – Anti competitive behaviour
  – Cartels
Classifying risk in the Energy Sector

Health, Safety and Environment

- Energy environments are potentially dangerous and pose material risks to the environment
  - Upstream (and downstream) Oil and Gas
  - Offshore wind
  - Power transmission
  - Nuclear Power

Risks in the Nuclear Sector

Three Key lessons from international safety events

Need for independent regulator
- Hands off approach
- Operator retains responsibility for safety (so needs technical knowledge)

Need for “safety case” including
- Identification and analysis possible accidents
- Identification of safety system requirements
- Identification of training requirements
- Identification of emergency arrangements

Importance of a safety culture
- Awareness of safety at all levels
Risks in the Nuclear Sector

The market drivers: Merchant Power – public need vs commercial return

- ENERGY SECURITY
- CLIMATE PROTECTION
- AFFORDABILITY

Levels of Fatal Risk

<table>
<thead>
<tr>
<th>per annum</th>
<th>Description</th>
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<tbody>
<tr>
<td>1 in 100</td>
<td>risk of death from 5 hours of solo rock climbing every weekend</td>
</tr>
<tr>
<td>1 in 1,000</td>
<td>risk of death due to work in high risk groups within relatively risky industries such as mining</td>
</tr>
<tr>
<td>1 in 10,000</td>
<td>general risk of death in an accident at work in the very safest parts of industry</td>
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<td>risk of death in an accident at work in the very safest parts of industry</td>
</tr>
<tr>
<td>1 in 1 million</td>
<td>general risk of death in a fire of explosion from gas at home</td>
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<tr>
<td>1 in 10 million</td>
<td>risk of death by lightning</td>
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</tbody>
</table>
Risks in the Nuclear Sector

ALARP and the Tolerability Of Risk

Unacceptable Region

ALARP or Tolerability Region

Risk is undertaken only if a benefit is desired

Basic Safety Limit (BSL)

$= 1 \times 10^{-3}$/yr worker, $1 \times 10^{-4}$/yr Public

Basic Safety Objective (BSO)

$= 1 \times 10^{-6}$/yr

Broadly acceptable

Negligible Risk

The economics of risk reduction

Nuclear Businesses are driven by the need to reduce RISK

- improve safety management arrangements
- reduce frequency of initiating event
- introduce additional safety systems
- improve operator procedures
- improve emergency response procedures
- eliminate / reduce hazard
- improve reliability/availability of safety equipment

Cost / benefit analysis of ALARP

- Comparing financial costs of options with dose reduction / lives saved benefits needs a value for preventing fatality or £/Sv saved
- VPF (Value For Preventing a Fatality) = £1m in 1998
Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.
The views expressed in this presentation are those of the presenter.