Offshore Oil and Gas Environmental Assessment – Key Issues Related to Shallow vs Deepwater Environments

Myanmar Drilling & Exploration 2013
25 July 2013
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I will cover:

- An introduction to ERM
- A summary of deepwater Oil and Gas development worldwide
- Some of the differences between shallow and deepwater environmental impact assessment
- Future challenges and opportunities
About ERM

- Leading consultancy providing environment, health, safety, process safety and social services for over 40 years
- Delivers innovative solutions to enable our clients to maximise earnings, comply with regulations and improve their corporate reputation and public perception
- Sustainability is at the heat of the services we provide and how we operate our business.

- 140 offices in 39 countries
- 4700 professional staff
- Completed projects in > 160 countries
ERM in Asia Pacific – 25 Offices in 12 Countries
ERM services

Working together to meet your environmental, health and safety, risk and social needs

<table>
<thead>
<tr>
<th>Service</th>
<th>Description</th>
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<tbody>
<tr>
<td>Transaction Services</td>
<td>Providing critical, time-sensitive advice on the sustainability risks, liabilities and opportunities associated with investment decisions</td>
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<tr>
<td>Contaminated Site Management</td>
<td>Creating strategies and implementing projects to support clients through the life cycle of contaminated site mitigation from initial investigations and risk assessments to remediation</td>
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<td>Risk Management</td>
<td>Quantifying and managing the safety risks associated with hazardous installations and processes, with the objective of protecting people, assets and the environment</td>
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<td>Impact Assessment and Planning</td>
<td>Helping to deliver sustainable projects by managing environmental, social and health impacts</td>
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<td>Air Quality and Climate Change</td>
<td>Helping clients to understand and manage the full cycle of effects their operations can have on the atmospheric environment including regulatory support to ensure long term, successful compliance</td>
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<td>Performance and Assurance</td>
<td>Helping corporations reach their environmental, health and safety performance potential</td>
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The deepwater journey

The world's leading sustainability consultancy
Common themes worldwide

- All deepwater projects tend to be in the Exclusive Economic Zone and generally therefore require differing regulatory requirements to those in territorial waters.
- Rarely a single common regulator responsible for all aspects of operating in deepwater – Environment, Safety etc.
- Different agencies sometimes have differing drivers leading to a lack in an integrated approach.
- Catastrophic events often result in change.
Understanding what the issues are from exploration

Noise
- seismic data acquisition
- drilling activities

Air quality
- air emissions and their impact on public health
- contribution to greenhouse gases and acidification of the oceans

Physical presence
- anchoring, spud cans,
- interference with other sea users

Waste
- drill cuttings
- muds/chemicals

Accidental events
- blowout
- collision
- spill

Socio-economic
- National need
- employment/livelihood
- cultural and spiritual needs
Understanding the environmental and social background

Ecology

■ sensitive receptors
■ ecosystem importance
■ value to community

Society

■ economic
■ public health
■ acceptability
EIA – So how?

Stakeholder engagement

Environmental and Social studies

■ Modelling
■ Surveys
■ Literature reviews
■ More stakeholder engagement
■ Impact assessment and management plans
■ Effective contingency plans
Challenges - Social Licence to Operate

**ENVIRONMENTAL SENSITIVITIES**

- Deepwater coral
- Pockmarks
- Benthic flora and fauna
- Fish
- Marine mammals
- Sea turtles
- Seabirds
- Oil Spills

**SOCIAL SENSITIVITIES**

- Stakeholders
- Reputation
- Loss of livelihood
- Use of local resources
- Outrage
- Stakeholder fatigue

**STAKEHOLDERS**

- Governmental organisations
- Local councils
- Environmental protection organisations
- NGOs
- Cultural heritage

- Other Sea Users:
  - Fishermen
  - Shipping
  - Recreational users i.e. boat charters, diving etc.
Challenges - Other risks

**REGULATORY REGIME**
- International legislation
- National legislation
- Local legislation
- Confusion in overlap of jurisdiction

**COST**
- Increased CAPEX
- Potential increase OPEX
- Liability

**TECHNICAL RISK/ENGINEERING DESIGN**
- Drilling
- Transportation
- Installation
- Mooring Systems
- Riser Systems
- Problematic Start-up and Shut-down
- Blow-Out

- Flow Assurance Issues:
  - Intervention
  - Installation limits
  - Low seabed temp
  - Low velocities
  - High pressures
  - Riser slugging

- Physical Environment
  - Wave
  - Currents
  - Wind
  - Storms
  - Sediment Integrity
Data Gathering
Nothing there - so why worry?

Looks like mud and more mud .......
Example of deepwater sensitivities

Tube worms with clams deepwater Gulf of Mexico

An orange roughy swims by marine tube worms, Calyptogena (clam) shells, and carbonate (limestone) rocks at cold seep site, NZ

Bivalve mollusc (Acharax sp.) found at a cold seep site during seeps voyage in NZ

Tube worms with clams deepwater New Zealand
Differences – baseline data

- Baselines - plan, plan and plan again – once you are out there it is too late to change anything

- Much greater use of different remote sampling technology
  - Use of existing geophysical data
  - Drop down camera and video systems
  - Large scale sampling equipment
  - Not collecting data for the sake of collecting data – water samples are a great example

- Partnering
  - Pooled data sources – deepwater data collection is expensive - eg SERPENT project, research programmes
How are these managed?

- Understanding the deepwater environment for all aspects is very different to shallow water.
- Regulators must approach deepwater offshore projects understanding the need for different treatment to shallow/nearshore projects.
- This does not mean a lessening on the environmental expectations on operators.
- Therefore tools such as the EIA process are important to enable gaps to be identified, develop pragmatic solutions to challenges in obtaining data to inform the process and satisfy stakeholders.
- Make technology work for all.
Opportunities

- Strong existing environmental and social protection mechanisms
- Establish an integrated approach to managing environmental and social risks
- Build capacity
- Plan for the whole deepwater project lifecycle – from data acquisition to decommissioning
- But most of all bring sustainability and value
Case Study
Licence to Operate or not – case study

- In 2001 the Corrib Developers sought a number of consents and approvals to develop the Corrib Project.
- In April 2002 the pipeline from Corrib was authorised.
- After initial refusal due to sensitivity of environment, permission was gained for the onshore terminal in 2004 this was followed by local people blockading the terminal site and compounds.
- A high court order was obtained restraining protesters from restricting access to its Rossport compound This led to the imprisonment of the five men who became known as the Rossport Five.
- Concerns expressed by members of the community in the area of the project led to the Corrib Developers agreeing to suspend works, pending the outcome of an independent safety review.
Outrage

- In 2009, the Corrib Gas Project were informed that Bord Pleanála could not approve the pipeline application and told the developers that they must come up with a new plan to route the pipeline away from Rossport, connecting the offshore natural gas wells to a refinery in nearby Bellanaboy via Sruwaddacon Bay, a protected area. The board also ordered that the new route meet international safety standards in order to go forward with implementation in the sensitive ecosystem.

- In 2009 Vermillion a partner in the project wrote down its investment by €203 million and in 2010 Statoil, wrote down the value of the gas field by almost €200 million due to project delays and changes in market conditions.

- Approval for the pipeline was received in 2011. First gas is expected in 2014, 13 years after the initial application.
The imperative for change – sources of project delays

Non-technical risks (NTR), including community and social issues, create significant capital risk and opportunity in the extractives sector

**ERM Study of 19 Goldman Sachs Top 190 Projects by Cause of Delay**

- **Sustainability (73%)**
  (e.g. stakeholder, community, environment, regulatory, safety-related)

- **Commercial (63%)**
  (e.g. cost or contract-related)

- **Technical (21%)**

**Frequency by Delay Type**
(% of sample Goldman Sachs Top 190)
Integrating social risks in project decision-making

*Integration of social risks in project life-cycle decision-making can lead to impact avoidance and improved management*

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<th>Life cycle stage</th>
<th>Typical risks</th>
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<td>Project design</td>
<td>• Financing delays</td>
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<tr>
<td></td>
<td>• Internal sign-off delays</td>
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<tr>
<td>Permitting</td>
<td>• Permitting delays</td>
</tr>
<tr>
<td></td>
<td>• Community opposition</td>
</tr>
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<td>Construction</td>
<td>• Compensation claims</td>
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<tr>
<td>Operation</td>
<td>• Non-compliance/changing regulations</td>
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<tr>
<td></td>
<td>• Compensation claims</td>
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<tr>
<td>Closure</td>
<td>• Changing regulatory environment</td>
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<td>• Long term compensation/clean up costs</td>
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Case Study: Consideration of social and environmental risks in NPV analysis

![Water source options analysis chart]

The world's leading sustainability consultancy
ERM can mitigate your Environmental, Health, Social and Safety risks to help make your project happen!

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