Canada’s Offshore Oil & Gas Industry: Best Practices in Marine Environments

Paul Barnes
Manager, Atlantic Canada & Arctic
Presentation Overview

- Who is CAPP?
- Arctic Potential
- Challenges of Arctic Development
- Engaging Communities
- Lifecycle of an Offshore Oil and Gas Field
- Risk Mitigation at Every Stage
- Progressing Arctic Development
Who is CAPP?

- **Canadian Association of Petroleum Producers**
  - The voice of Canada’s upstream oil and gas industry

- Represents the companies that explore for, develop and produce natural gas and crude oil throughout Canada

- Member companies produce 85% of Canada’s natural gas and crude oil; associate companies provide a wide ranging variety of products and services that support the industry

- On behalf of its members, CAPP advocates for and enables economic competitiveness and safe, environmentally and socially responsible performance
Canada’s Arctic Offshore Basins

*Ultimate recoverable oil and ultimate initial marketable gas
Source: 2009 Drummond Consulting report prepared for Indigenous and Northern Affairs Canada
Challenges to Arctic Offshore Oil and Gas Activity

- Low temperatures
- Sea ice, including extreme ice features up to 30M thick
- Icebergs and/or ice islands
- Ice scour of the seabed
- Permafrost and/or icing
- Seabed hazards, including gas hydrates and shallow gas
- Winter darkness, particularly for high latitudes
- Weak soil and sebeded conditions
- Operational remoteness: distance to facilities and markets
Engaging Communities

● Honest and respectful engagement with Arctic communities
  ▪ Establishing open, effective communications
  ▪ Understanding local issues and concerns
  ▪ Respecting cultural and traditional practices

● Providing tangible benefits to local residents
  ▪ Supporting local initiatives and development to build capacity and skills

● Operating in accordance with industry and international standards
  ▪ Including both industry-wide standards for design, operations, security and safety, and national and international standards for human rights
Lifecycle of an Offshore Oil & Gas Field

1. **Exploration**
   - Seismic
   - Exploration drilling
   - Delineation drilling

2. **Development**
   - Engineering
   - Fabrication/construction
   - Drilling wells

3. **Production**
   - Recovering the resource
   - Transportation to market

4. **Decommissioning/Abandonment**
   - Completion of project
   - Removal of installation

**Environment, Health and Safety**
Risk Mitigation at Every Stage

- Planning begins before any activity is approved or occurs, and continues to be a priority throughout each stage of the oil and gas lifecycle

- Planning involves and considers:
  - Multiple applicable acts/regulations with specific mandates
  - Multiple regulators providing oversight
  - Strategic environmental assessments (SEA) from regulators before land sales
  - Environmental assessment (EA) for seismic, drilling, production and decommissioning activities
  - Environmental protection plan – developed and submitted to regulators
  - Environmental effects monitoring plan – verify EA predictions
Exploration – Marine Seismic Surveys

- Regulators approve seismic survey work and establish conditions for every survey conducted
  - This ensures surveys are conducted safely, with minimal impact on the marine environment

- Environmental Assessment Process
  - Types of marine life that may be present where seismic activity is taking place are identified and mitigations measures implemented

- Fisheries Liaison Officers/Picket Vessels
  - Help identify and minimize interactions with commercial fishing operations
Exploration – Marine Seismic Surveys

• Operators adhere to the *Statement of Canadian Practice with respect to the Mitigation of Seismic Sound in the Marine Environment*
  - Outlines requirements that must be met during the planning and conducting of marine seismic surveys in order to minimize impacts
  - Examples include marine mammal observers trained to identify marine life in the area and the powering down of equipment when if an endangered or threatened species is observed in the water

• Research on the impact of seismic surveys on marine life has been conducted for many years and is ongoing
  - Research shows surveys conducted with mitigation measures are unlikely to pose significant risk of mortality to marine organisms
  - To date, research has identified no long-term, adverse effects on marine mammal populations
Development – Site Specific Mitigations

- Specific mitigations are outlined for construction and development sites (onshore and marine) based on the types of facilities and equipment used at each site
  - Floating concrete support barges are equipped with double-walled fuel storage tanks and inspected regularly
  - Topsoil and organic materials removed during sloping are re-spread over disturbed areas to promote re-vegetation
  - Sediment is removed from water pumped from excavations or work areas, or any runoff or effluent directed out of the project site; sediment removed by settling ponds, filtration or other suitable treatment before discharging to a waterbody or other ecological sensitive area

*Hebron Construction – Bull Arm, NL*
Development – Drilling & Production

- **Low-toxicity water-based muds used for drilling where practicable**
  - Oil-based muds recovered and recycled or transported to shore for disposal

- **Produced water is separated from produced oil and gas and is treated before being discharged**

- **Specialized equipment is used to prevent loss of containment and discharge into the sea, including blowout preventers**
Production – Environmental Effects Monitoring

- Evaluate the effectiveness of actions to reduce effects, provide early warning of changes in the environment and assist in identifying R&D needs
- Programs generally comprised of sampling marine sediments, water and fish at various sites
- EEM results are submitted to regulators for review and approval, and are made available to the public
- To date, EEM programs submitted by Atlantic Canada offshore operators show minimal localized impacts within predicted levels approved during EA process
Production – Spill Prevention & Response

- **Spill prevention measures include:**
  - Identifying and analyzing potential risks and designing/implementing engineering controls and establishing procedures to reduce or eliminate hazards
  - Monitoring, maintaining and repairing equipment
  - Using comprehensive internal and external reviews, inspection, testing and audit programs of facilities, equipment and processes
  - Training workers to recognize and respond to potential emergencies
  - Evaluating and implementing new research and technology as they become available
  - Using global standards, including specific International Standards Organization standards developed for the Arctic

- **While industry’s focus is on preventing environmental incidents, proper preparation is crucial and contingency plans are developed to ensure adequate response measures are in place in the event of an environmental emergency**
Innovation

● **Industry takes a science-based approach to developments that relies on proven technology**
  ▪ From actual development of resources to emergency preparedness, industry relies on the latest scientific developments and technology to plan safe operations

● **Significant advances have been made, resulting in safer offshore operations**
  ▪ Ice and iceberg detection, iceberg management, monitoring equipment, safety systems

● **Industry continues to conduct research and development to fill the knowledge gap and to improve operations**
  ▪ Centre for Arctic Research and Development
Progressing Arctic Development

● The Canadian Arctic offshore still remains a focus area for industry

● Hydrocarbon development in Arctic regions presents significant challenges

● Any Arctic development would have to be done in a safe, responsible and sustainable manner, to the benefit of all involved

● The offshore oil and gas industry has a long history of meeting Arctic challenges through effectively managing environmental and safety risks, and the adaption of world wide best practices
Thank You
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