Atlantic Canada Activity Update and Regulatory/Operational Challenges

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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

- Offices in Calgary, Ottawa, St. John’s and Victoria
Atlantic Canada Offshore

- **Bringing substantial benefits to region:**
  - Directly employs over 9,000 people (thousands more indirectly)
  - Supports 800 local supply/service companies
  - Capital investment since 1995 - over $40 billion

- **Current market conditions are having a significant impact on the Canadian industry**
  - Oil prices down by 60% since 2014
  - Canadian capital investment down by 62%
  - Over 44,000 direct layoffs nationally (110,000 including indirect)
  - Atlantic Canada is not exempt
Nova Scotia Offshore Operations

- Two producing gas projects: Sable Offshore Energy Project and Deep Panuke
  - Over $8.5 billion in capital spending in Nova Scotia since 1995
  - Sable Project nearing end of field life

*Sable image courtesy of ExxonMobil

*Deep Panuke image courtesy of EnCana*
Two companies exploring in deep water:

- Over $2 billion in work commitments combined
- Shell Canada concluding drilling on its first well in Shelburne Basin; drilling of the second well has commenced
- BP expected to commence drilling in 2018
- 2016 Nova Scotia Call for Bids to close October 27th; six parcels in total up for bid
Newfoundland & Labrador Offshore Operations

- Three producing oil projects: Hibernia, Terra Nova, White Rose
  - 20% of Canada’s conventional light/medium crude production

- Hebron will be the fourth major oil development – expected capital cost $14 billion
  - Hebron first oil expected in 2017
Newfoundland & Labrador Developments & Activity

- Exploration activity focused largely in deep-water Flemish Pass basin (site of discovery by Statoil in 2013) and Jeanne d’Arc Basin (site of current projects)

- Multi-billion dollar tie-back projects/expansions planned/underway; some on hold due to current market conditions

- 2015 Land Sale: seven parcels awarded to nine companies for more than $1 billion in work commitments

- 2016 Land Sale: closes November 30th; 16 parcels up for bid

- All three operators have current drilling contracts/activity ongoing
Newfoundland & Labrador Offshore License Map
Regulatory Environment

• Three offshore regulators in Canada: C-NLOPB, C-NSOPB and NEB

• Arms-length regulators with relatively broad mandates

• Two offshore boards provide oversight in four areas:
  ▪ Safety
  ▪ Environment
  ▪ Resource management, including exploration
  ▪ Industrial Benefits

• Two offshore boards report to the federal and provincial ministers of Natural Resources/Energy plus Labour ministers
Regulation of Oil Spill Prevention and Response

- Offshore boards are the lead regulatory agencies for oil spill response respecting drilling and production installations on site and a resource agency in all other cases
- Chief Conservation Officers have the authority to intervene in response to the extent of “taking over” from an operator
- Federal and provincial agencies with environmental emergency related responsibilities provide advice
- Operators are responsible for emergency response. Requirements include:
  - Report all spills to the Boards
  - Contingency plans
  - Countermeasures exercises
  - Take “all reasonable measures” to respond to and mitigate spills, including subsea well intervention and relief well drilling where necessary
  - Financial responsibility for all “actual loss or damage” resulting from spill or debris
New Regulatory Considerations and Uncertainty

- Paris Agreement on climate change
- Canada-US Commitment to reduce methane
- Zero routine flaring by 2030
- Federal Environmental Assessment Review
Climate Change

- Climate change is high on the Federal government’s list of priorities:
  - Paris Agreement on climate change signed April 2016
  - Binding agreement with global participation
  - Aim at limiting global warming to 2 degrees
  - Not time limited (no expiration)
  - Countries to prepare national targets
  - Progress to be measured and reported (from 2018)
  - Federal government announces plans for carbon tax (October 2016)

- Boards include climate change in environmental assessments

- Offshore facilities have particular challenges:
  - Not tied into the power grid, facilities have to generate their own electricity, the major source of offshore GHG emissions
  - Installations are constrained by a fixed footprint and remote location, making upgrades and retrofitting difficult
Methane Reduction

- March 10, 2016: President Obama and Prime Minister Trudeau announce joint commitment to reduce methane emissions in the offshore oil and gas sector
- Canada committed to reduce levels by 40-45% below 2012 levels by 2025
- Methane regulations expected by the end of 2017 with first requirements coming into effect in 2018
- The World Bank Group calling for Canada to endorse an international initiative to end the practice of routine gas flaring at oil production sites by 2030
- Offshore challenges to meeting this goal include:
  - Constrained space offshore for additional equipment/personnel
  - Significant lead teams for maintenance (generally, at least 12 months)
  - Facilities not connected to gas export pipelines, requiring produced gas to be re-injected into the reservoir. Flaring therefore generally associated with safety events
  - Not tied into the power grid, facilities have to generate their own electricity, the major source of offshore GHG emissions
Federal Environmental Assessment Review

- The minister of Environment and Climate Change has established an Expert Panel to review federal environmental assessment processes. The Expert Panel is engaging broadly with indigenous people, key stakeholders and all Canadians.

- The petroleum boards conduct environmental assessments under the Atlantic Accord Acts but are not yet “responsible authorities” under the Canadian Environmental Assessment Act, 2012.

- CAPP presented industry’s views in front of the Panel in October. Main points include:
  - Offshore boards, with their experience and expertise in our regions, should be designated “Responsible Authorities”
  - Timelines and certainty regarding changes to CEAA 2012 are paramount
  - Flexibility in the EA process is essential
  - Exploration drilling should not be a designated project under CEAA 2012; the offshore boards’ existing process is holistic and effective.
Other Key Challenges Facing the Atlantic Canada Industry Offshore

- **Current market conditions**
- **Increasing costs**
- **Uncertainty related to future policy and regulatory changes**
- **Challenges related to prescriptive requirements**
Industry Focused on Prevention of Incidents/Spills

- Focus is on safeguards to prevent incidents, and preparedness to respond

- Operators need to produce:
  - Safety plans
  - Environmental assessments
  - Environmental protection plans
  - Emergency response and contingency plans
  - Spill response plans
  - Numerous other documentation and inspection requirements

- Significant improvements since Macondo, including:
  - Advancements in blow-out preventer design and testing
  - Onshore, real-time monitoring of drilling operations
  - Increased training and competency requirements
  - Enhanced spill trajectory modeling
  - Additional spill response plans and exercising
Industry Focused on Prevention of Incidents/Spills

- **Aim is to further reduce possibility of a major oil spill**
  - 50,000 offshore wells drilled worldwide; only 127 exploration wells offshore Nova Scotia and 167 offshore Newfoundland & Labrador
  - Two major blowouts (Gulf of Mexico in 1979 and 2010)

- **For an exploratory well being drilled offshore Atlantic Canada:**
  - Chance of success in finding any hydrocarbons less than 1 in 5
  - Nova Scotia is predominately gas-prone and no oil has been encountered to date outside of the Sable sub-basin area
  - A spill of light oil would naturally break down, requiring limited spill response and significantly lesser impact to environment/fisheries than heavier oil
  - Release of natural gas would not require spill response
  - Focus mostly on Newfoundland & Labrador, which is oil-prone
Industry Focused on Prevention of Incidents/Spills

Blow-out Preventer (BOP)

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<thead>
<tr>
<th>Pre-Macondo</th>
<th>Post-Macondo</th>
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<tr>
<td>BOP recertification not required</td>
<td>Five year recertification required</td>
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<tr>
<td>Shearing of pipe within the BOP not always possible (preventing sealing of well in some instances)</td>
<td>Verification of shearing capability required at maximum anticipated</td>
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<td>One blind shear (cutting) ram required</td>
<td>Two blind shear rams mandatory</td>
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<td>ROV intervention at BOP not robust enough to perform all required functions in case of emergency event</td>
<td>ROV functional testing must be undertaken and verified at the time BOP is installed</td>
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<tr>
<td>No acoustic back-up system for BOP activation in case drilling installation loses connection</td>
<td>Acoustic back-up system required and must be tested</td>
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Oil Spill Response – The Toolkit

Natural Dispersion

Booms

Capping Stack

Dispersants

In-situ Burning

Courtesy of the C-NSOPB
Oil Spill Response – Capping Stack

- Developed specifically as a result of Macondo
- Since then, there has not been a reason to deploy
- Objective is to have a capping stack on-site for deployment once preparatory work at sea floor has been completed
- Globally, expected deployment time estimated up to 30 days
- For offshore Atlantic Canada, plan would have capping stack at location in approximately 10-14 days
- Having a capping stack located in the region would not save time
Major focus in recent years. Fishing industry has expressed concerns

Dispersants rapidly disperse large portions of certain oil types from the sea surface by transferring it into the water column in small droplets, allowing for enhanced biodegradation

Only be utilized in cases where there is a net environmental benefit (NEBA), taking into account potential impacts to shoreline, fisheries, marine mammals and other wildlife

Many studies conducted on environmental benefits and impacts of dispersants:
- Some indicate dispersants are completely safe; others indicate dispersants are dangerous to use. Best available science concludes they are a valuable tool
- In conducting scientific research on dispersant use, it is critical that experiments best simulate the natural environment, that they are extensively peer reviewed and repeated numerous times to confirm results. Otherwise, conclusions may not be supportable

Boards’ Chief Conservation Officer must give approval dispersants can be used

Decision-making process requires consultation with Environment Canada’s environmental Emergencies Science table, and with federal and provincial ministers
Conclusion

- Safety and environmental protection are paramount for industry
- Current Canadian regulatory environment poses uncertainty
- Focus is on prevention of spills/incidents; significant improvements since Macondo lowering further the possibility of a major oil spill
- The persistence and fate of, and response to, an oil spill requires complex analysis and technical solutions, and should not be over-simplified
- Fishing industry and other public engagement is important
- The fisheries and oil and gas sectors have successfully co-existed for years, and the public can be assured that they can continue to do so
Capital Investment in Canada’s Oil and Natural Gas Industry

2014
$81 Billion

↓

FORECAST
2016
$31 Billion

62% DECREASE

COMPARISON: CAPITAL INVESTMENT BY INDUSTRY (2015)

Utilities $31.3 Billion
Transportation & Warehouse $26.4 Billion
Manufacturing $17.5 Billion

Source: Statistics Canada