Task 5 & 6
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ARCTIC MARINE NATURAL GAS SUPPLY CHAIN STUDY
Work in Progress – Tasks 5 & 6

- Task 5: Human Resources
  - Required Competencies
    - Seagoing
    - Shore-side
  - Training Considerations
    - International
    - Domestic
    - Arctic

- Task 6: Regulatory Considerations
  - Existing Framework
  - Gaps and Uncertainties
Operators of LNG-fuelled vessels and LNG carriers have mandatory certifications under IMO codes (STCW) and national regulations.

Maintainers and shipbuilders also need to understand the hazards associated with systems containing LNG.

Operating shore facilities and conducting shore-to-ship bunkering operations require suitably trained personnel.

Emergency responders should also be trained in measures such as cryogenic burn treatment, fire and spill response.
Early adopters of marine LNG in Canada have drawn heavily on international operators to gain service experience required for certifications.

Training has also used international expertise.

Canadian education and training centres have limited capability and capacity at present.

Arctic projects will need to give special consideration to these issues.
The international marine regulatory system for LNG-fuelled vessels and LNG carriers is quite mature:

- IGF and IGC Codes
- Industry standards (ISO, IEC, IACS, etc)
- Industry guidelines (SIGTTO, IGMF, etc)
- Risk assessment of vessels under IGF required for some aspects of design and for any novel approaches

- Bunkering operations are generally under national jurisdiction; in this case Canada.
- Shore facilities are always under national or local jurisdiction.
Canadian Regulatory Regime

- No Canadian regulations for LNG-fuelled ships or LNG carriers currently exist; though treatment of LNG-fuelled ships is addressed by policy:
  - Application of IGF Code with some supplementary requirements
  - Delegation of design and construction approvals to Recognized Organizations (classification societies) with MTRB approval
  - Treatment of LNG carriers/bunker vessels tbd, but likely to follow similar model
- LNG bunkering approval and inspection currently being led by port authorities
Shore Facility Approvals

- Canadian system involves multiple federal, provincial/territorial departments and agencies
- Often difficult to identify clear responsibilities for final approvals
- Work is ongoing to ensure task report clarifies situation, to extent possible.
Future Work – Tasks 7 & 8

• Task 7: Implementation Scenarios
  • International and Canadian experience
  • Potential projects
  • Roles for incentivization and support

• Task 8: Benefits to Canada’s Arctic
  • Economic opportunities
  • Environmental benefits
  • Longer-term considerations