Cabinet Retreat

February 17, 2012

Boundless Energy

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Manitoba Hydro International (MHI)

- Consultant hired by PUB to conduct independent review
- MHI is a wholly owned subsidiary of Manitoba Hydro
- MHI has provided consulting services to over 70 countries worldwide

MHI Team

MHI assembled a team of specialists in:

- Load Forecasting
- Project Management
- Utility Resource Planning
- Hydroelectric Generation
- Thermal Generation
- HVdc Engineering
- Hydrology
- Reliability
- AC Integration and Planning Studies
- Submarine Cables and Marine Crossings
- Wind Power
- Financial Analysis
- Additional subject matter experts as needed from the parent company

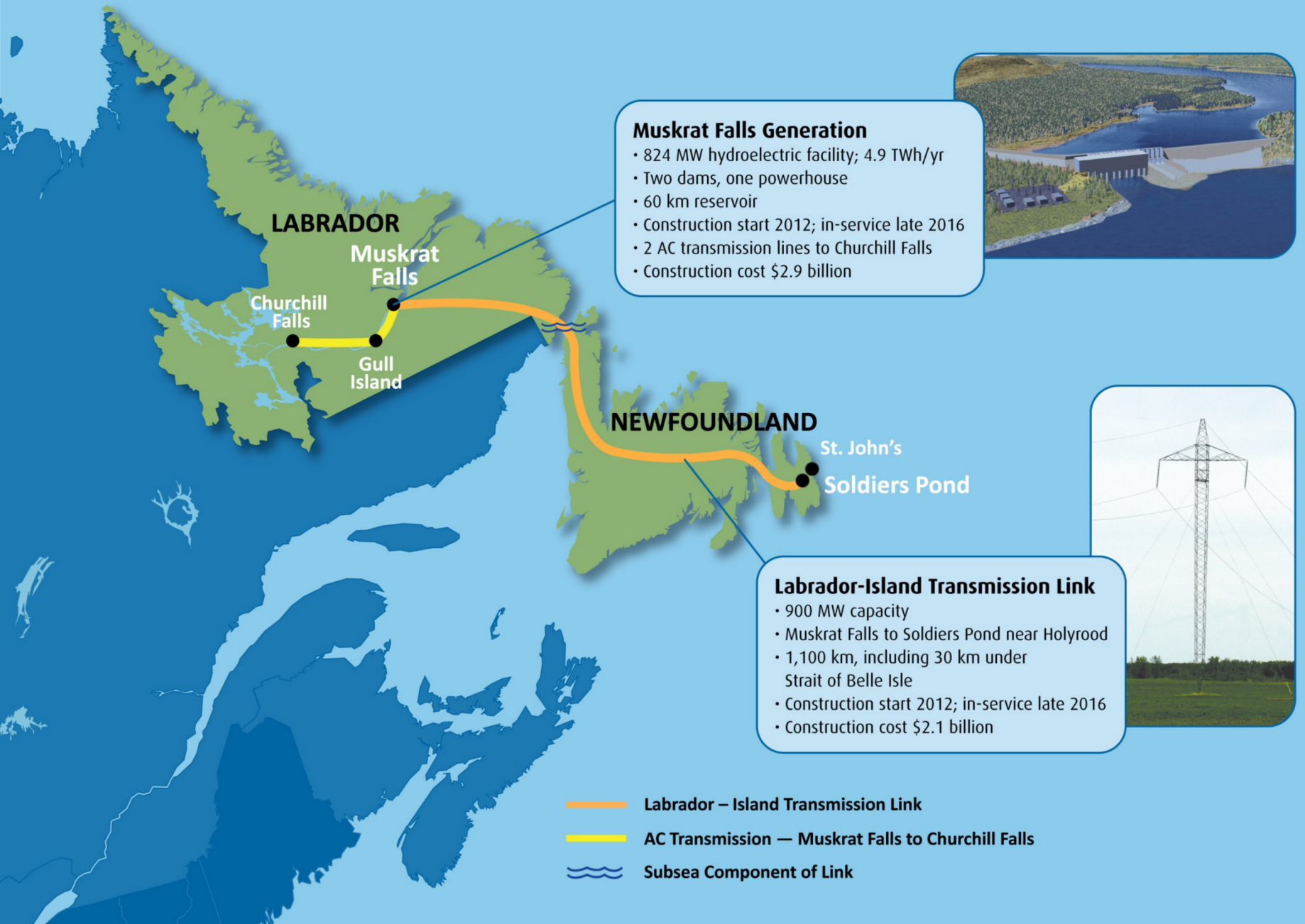
Technical Perspective

- Generation Resource Planning
- Load Forecasts
- Hydrology
- Reliability
- Feasibility Studies of Various Project Components
- AC System Studies
- Cost Estimates and Estimating Methodologies
- Risk Analysis

Financial Perspective

- Review of Nalcor's CPW methodology
  - Capital and Operating Costs
  - Fuel Price Forecasts
  - Allowance for Funds Used During Construction (AFUDC)
  - Escalation Rates
  - Discount Rates
  - Debt and Equity Components
  - Power Purchase Agreements (PPA)
  - PPA vs Cost of Service Approach for Muskrat Falls
- Sensitivity Analyses

Muskrat Falls and Labrador-Island Transmission Link



Muskrat Falls Generation
- 824 MW hydroelectric facility; 4.9 TWh/yr
- Two dams, one powerhouse
- 60 km reservoir
- Construction start 2012; in-service late 2016
- 2 AC transmission lines to Churchill Falls
- Construction cost $2.9 billion

Labrador-Island Transmission Link
- 900 MW capacity
- Muskrat Falls to Soldiers Pond near Holyrood
- 1,100 km, including 30 km under Strait of Belle Isle
- Construction start 2012; in-service late 2016
- Construction cost $2.1 billion

Labrador – Island Transmission Link

AC Transmission — Muskrat Falls to Churchill Falls

Subsea Component of Link

Findings: Planning & Hydrology

- Generation resource planning: consistent with leading North American utilities
- Transmission planning criteria: follows best utility practices.
- Hydrology studies: conducted and prepared by qualified consultants in accordance with utility best practices, and with no apparent demonstrated weaknesses

Findings: Load Forecasting

- Load forecasting process: conducted with due diligence, skill and care and meets acceptable utility practices with the exception that end-use modelling techniques for domestic loads are not currently employed.
- The load forecasting process has produced reasonable results for the domestic and line loss sectors, excellent results for the general service sector, and very poor results for the industrial sector.

Findings: CPW & Least Cost

- MHI endorses the CPW method as a valid approach for comparing the least cost of the two alternatives
- CPW results for each Option have been validated by MHI based on inputs used by Nalcor at DG2
- CPW: approach is reasonable for purpose intended
- PPA vs CoS: Choice of approach has minimal impact on CPW result

Findings: CPW

- However, the CPW results may be significantly impacted by variations from the base case used by Nalcor for changes to:
  - Significant additions/deletions of load, (for example: the continued operation of existing pulp and paper mill)
  - Capital costs (based at DG2 level of review)
  - Fuel prices (difficult to forecast over the long term)

Findings: Holyrood & Wind

- Holyrood
  - Operation beyond 50 years may not be viable
  - Plant may become unsafe and unreliable to operate before the 2033/2036 planned replacement.
- Wind
  - Nalcor's 2004 Study which specified upper limit of 80MW for non-dispatchable capacity is considered reasonable.
  - Additional wind beyond 80 MW could result in potential spilling of water due to the limited hydraulic storage on the Island.

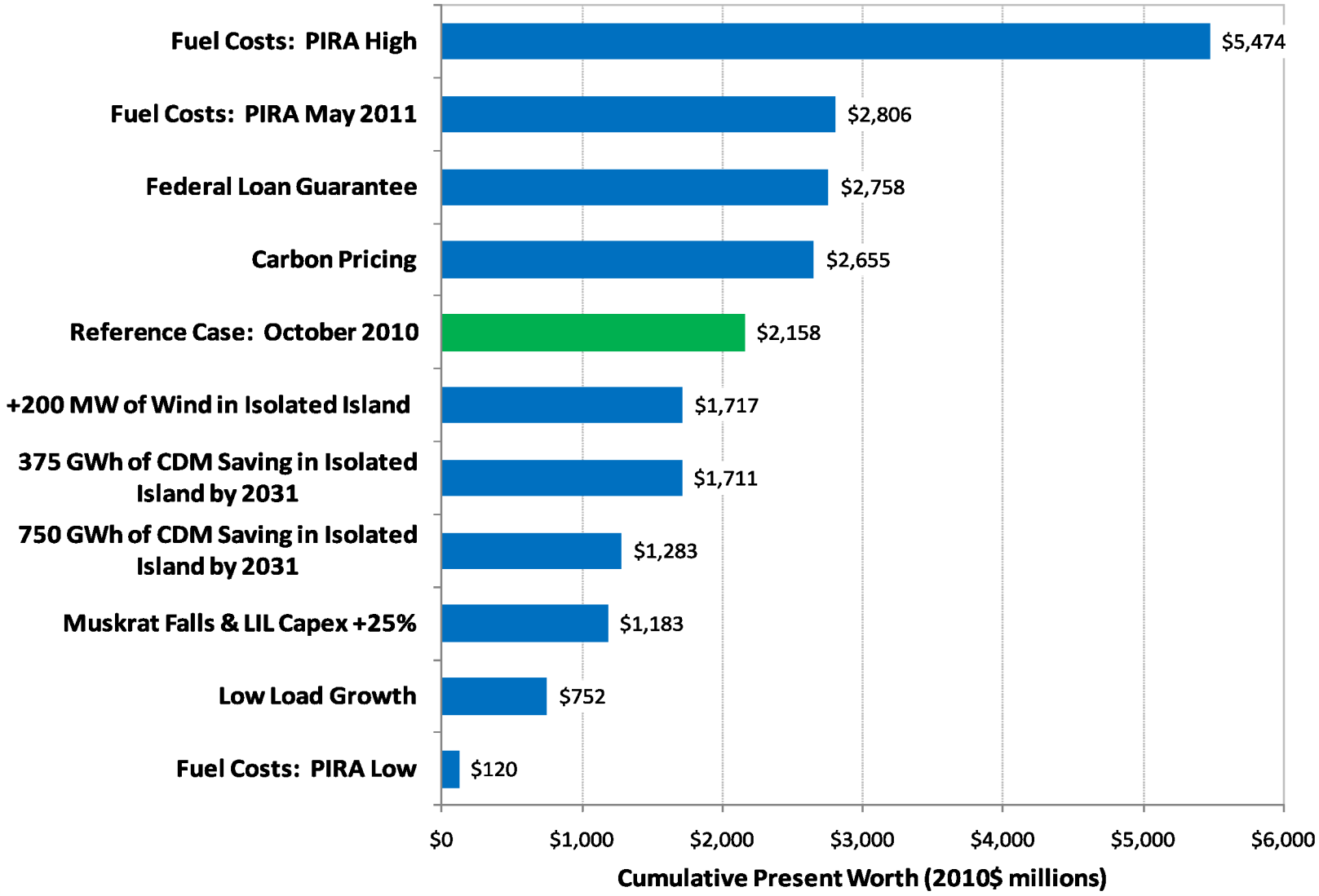
Findings: Muskrat Falls

- Screening: Nalcor's project screening is based on DG2 level with cost estimates commensurate with AACE International Class 4
- The proposed layout and design of the Muskrat Falls Generating Station appears to be well defined and consistent with good utility practices.
- The general arrangement of the permanent works is a reasonable proposal for the optimum development in terms of cost and construction duration.

Findings: Muskrat Falls

- The proposed design and construction schedule of Muskrat Falls Generating Station is consistent with good engineering and construction practices, and should not pose any unusual risks for construction or operation of the facilities.
- Studies have identified technical risks and appropriate risk mitigation strategies.
- Despite the increase in costs, MHI considers the cost estimate at DG2 to be within the accuracy range of an Class 4 estimate (+50%/-30%) which is representative of a feasibility level study.

Sensitivities



Key Areas Identified by MHI

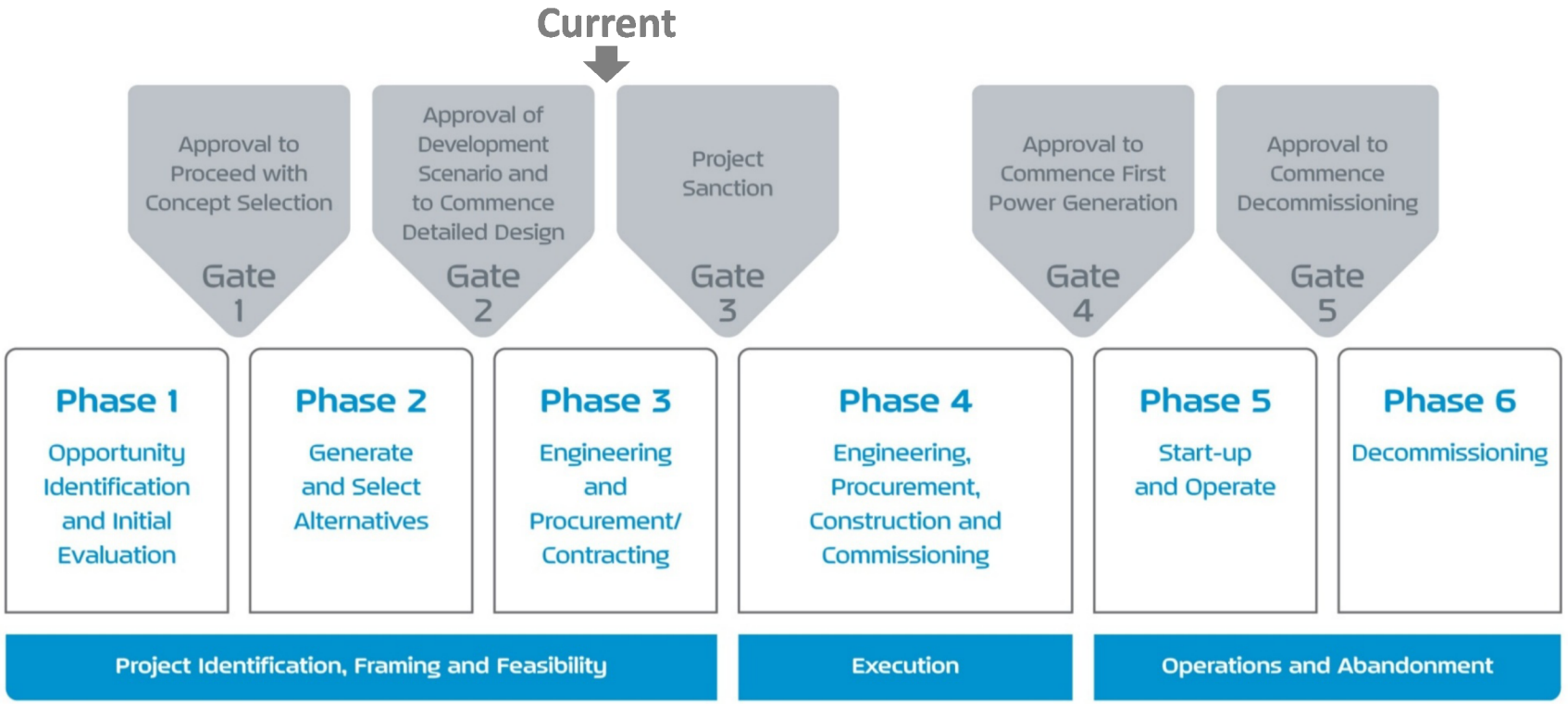
- Reliability Assessment
- AC Integration Studies
- NERC Standards
- Transmission Line Design Criteria
- Complexity and Risks in the SOBI Marine Crossing
- Uncertainty with the continued operation of the Pulp and Paper Mill
- A firm commitment for a large industrial load in Western Labrador
- Fuel price forecasting

MHI's Conclusion

- Overall, Nalcor's inputs (for example, the capital cost estimates, fuel pricing forecasts, and load forecasts) into the CPW were developed in accordance with utility best practices.
- The Infeed Option was found to be the least cost option of the two options reviewed, based on Nalcor's assumptions and the level of available information provided by Nalcor for DG2.

Decision Gate Process

Purpose: provides checks and balances that Decision Makers require to demonstrate an acceptable level of readiness has been achieved.



Project Readiness

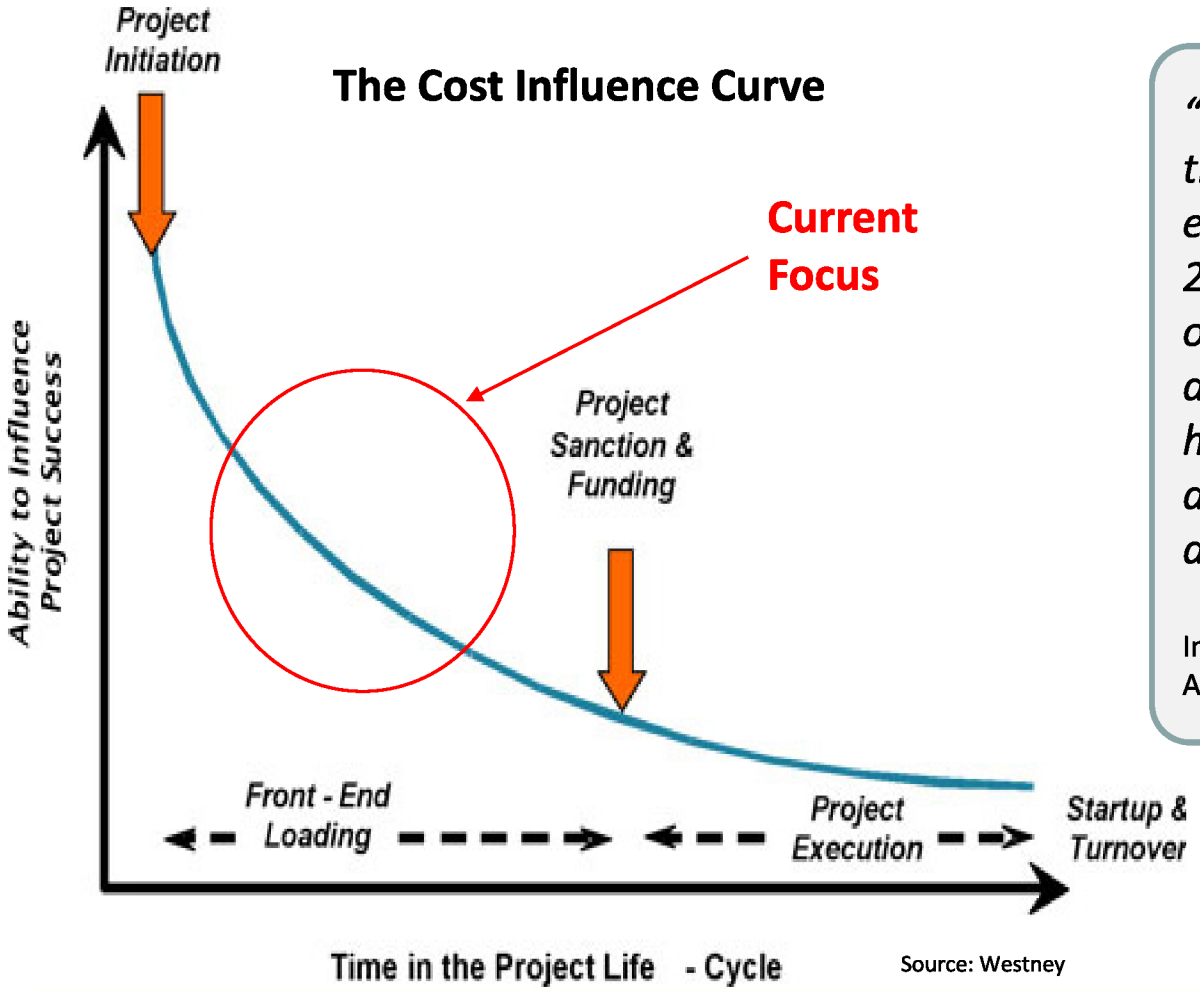
- Reviewed in the following areas:
  - Business: Formal agreements, financing, governance, funding, CPW, system planning, system integration, facility operations
  - Project Execution: Project management and controls, technical/engineering and design, construction execution, contracting and procurement, health safety and environment, operations and maintenance
  - External: Regulatory, environmental, authorizations and, aboriginal, independent and other reviews

Activities Leading to DG3

- Engineering to increase the project definition and obtain a Class 3 estimate
- Procurement and contracting of long lead items
- Aboriginal consultation and agreements
- Environmental release
- Commercial and financing terms
- System integration planning
- Operations, reliability and regulatory compliance

Front-end Loading

Highest ability to influence project success occurs early in the process



Source: Westney

"Project is better prepared than a typical megaproject at end of Front-End Loading (FEL) 2," and the "Project has clear objectives and a well-developed project team that has closed the project scope and achieved optimal project definition."

Independent Project Analysts, August 2010

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MF capital cost is driven by favourable construction characteristics

Key Element	Muskrat Falls Site Characteristics
Geotechnical Conditions	• Competent bedrock (Canadian Shield) exposed / near surface • Minimal overburden to remove and dispose • Conditions validated by comprehensive site investigations, thus limited exposure with respect to quantity growth
Constructability	• All construction materials primarily sourced from site excavations • Very good material balance leading to minimal excess material / spoils • Mostly conventional concreting methods and equipment, in dry conditions

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MF capital cost is driven by favourable construction characteristics

Key Element	Muskrat Falls Site Characteristics

Physical Layout	• No peripheral structures (i.e. dykes) required to create the Reservoir, leveraging Churchill Falls reservoir – no land purchase issues
	• Reliable, predictable flows leading to smaller variations in operating water levels
	• All power structures located at one main site
	• Robust /conventional designs for major permanent structures (Intake , Powerhouse, Spillway, Aux. Dams)
	  • Conventional or roller-compacted concrete founded on bedrock
	  • Generally low-profile dam structures (30 to 40 m high)
	• No underground works (MF has surface powerhouse)
	• No temporary spillway facilities to be constructed
	• Diversion uses existing topography & permanent structures (i.e. Spillway) rather than expensive temporary structures (e.g. Diversion Tunnels)
	• Conventional equipment (T&G sets, gates, cranes)
	• Access by road from Trans-Labrador Highway

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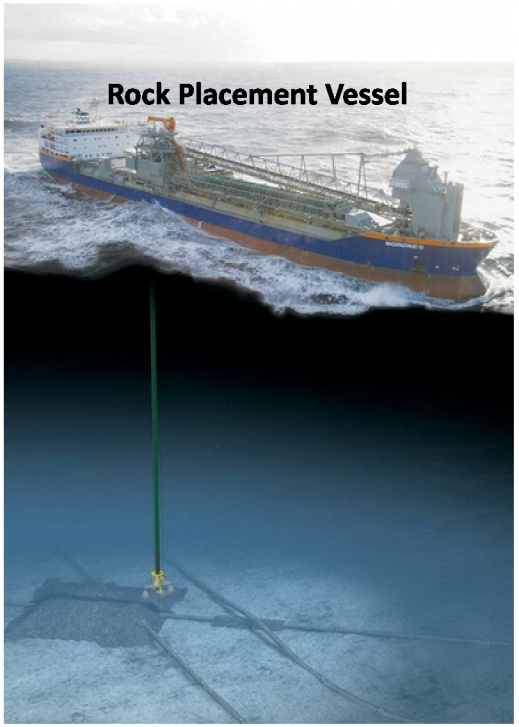
SOBI Crossing

SOBI cable crossing builds upon team's extensive experience in the design and installation of subsea infrastructure in harsh environments combined with learnings from global cable projects.

- Each of the 3 submarine cables will each have a dedicated horizontally directionally drilled (HDD) conduit to protect the cable from shore and pack ice at the landfall points.
- The conduits will take each cable to a water depth of between 60 to 80m, thus avoiding iceberg scour.
- The cables will then be laid on the sea bed and each protected with a separate rock berm which will protect against fishing gear and dropped objects



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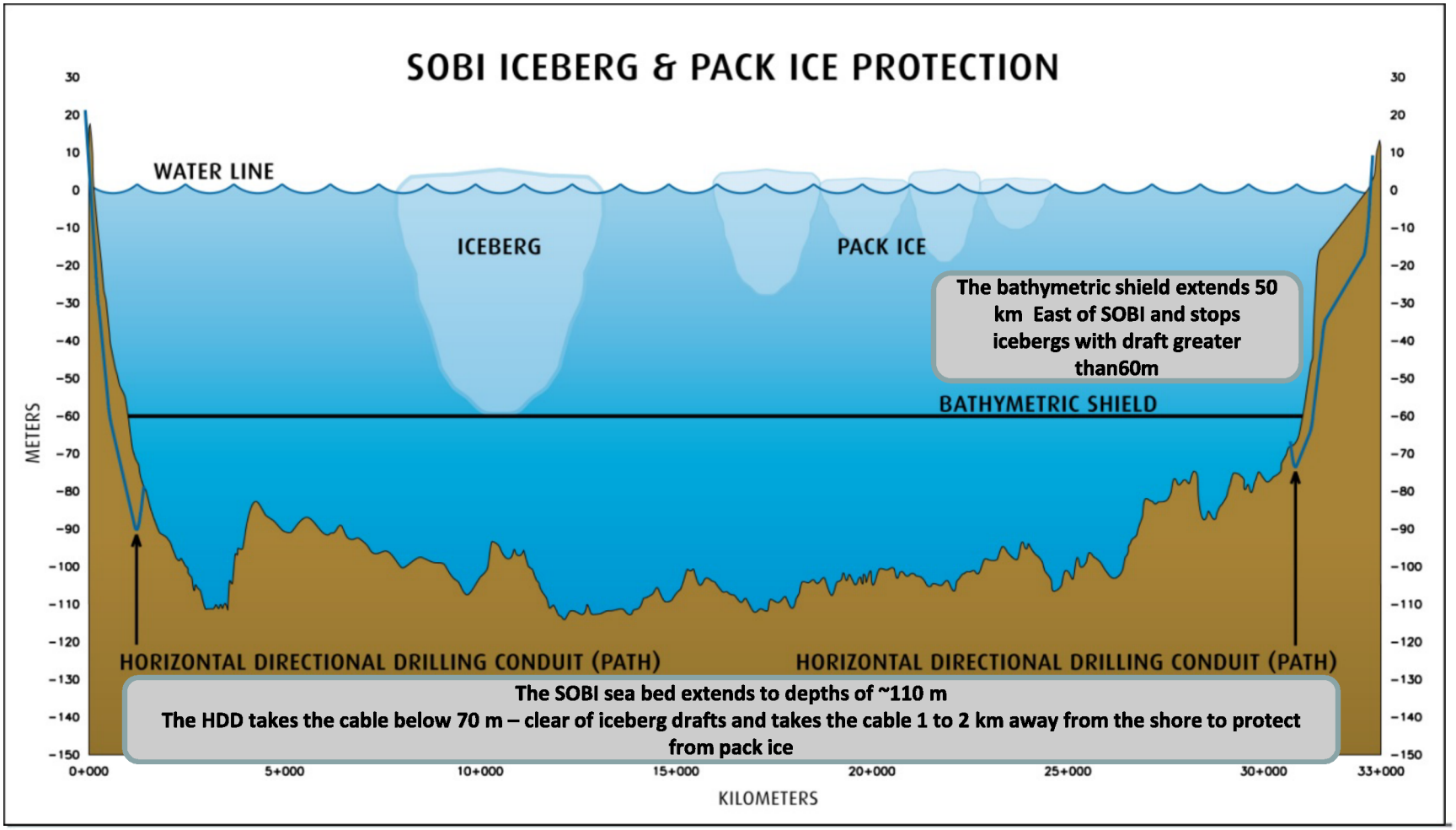
SOBI - Iceberg and Pack Ice Protection



QUESTIONS

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2012/02/16

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E Martin/NALCOR
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A Presentation was received from the President and Chief Executive Officer of Nalcor Energy.

Clerk of the Executive Council