

Nalcor Energy – Lower Churchill Project



Project Execution Plan (Scope and Approach)

LCP-PT-MD-0000-PM-PL-0001-01

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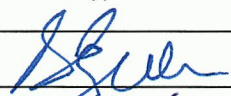
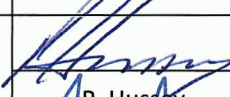
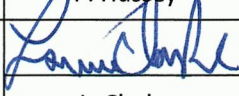
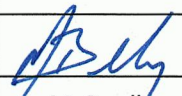
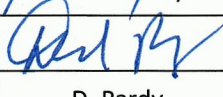
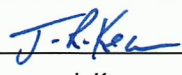


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1.0 Purpose

This *Project Execution Plan (Scope and Approach)* (PEP) provides the framework or approach for **how** Nalcor's management team will plan, manage and execute Phase I of the development of the lower Churchill River.

Its purpose is to:

- Set out guidelines to ensure a consistent execution strategy and approach to the planning, organizing, directing and controlling of the Lower Churchill Project (LCP)
- Provide a basis to develop detailed procedures for the execution of the work
- Provide a communication tool for the Nalcor Energy Lower Churchill Project (NE-LCP) Project Team and other project stakeholders
- Provide a high level overview of the LCP scope, facilities and execution strategy.

This document should be read in conjunction with documents [LCP-PT-MD-0000-PM-PL-0005-01 Project Governance Plan](#), [LCP-PT-MD-0000-PM-CH-0001-01 Project Charter](#), [LCP-PR-ED-0000-PM-PL-0001-01 Nalcor Energy Corporate Plan – Lower Churchill Project](#) and associated functional management plans.

This *Project Execution Plan* is supported by detailed Management Plans for every key element / functional area of the Project as listed in Section 6.0. Each of these Management Plans is a stand-alone document that conforms to the approach and details of the overall execution plan, and is supported by written procedures and forms. Collectively these documents form the Project Management System as illustrated in Section 6.0, Figure 1. As such, this PEP does not detail how these respective functional areas will be managed, rather it provides the overall guiding framework for the broader execution of the Project.

This *Project Execution Plan*, including the various Management Plans with associated procedures, will be monitored for effectiveness and accuracy and will be updated accordingly. In addition, it will be revised to ensure alignment and clarity of roles, responsibilities and execution strategies following the receipt of approved PEP's from the selected EPC/EPCM Consultants.

This document is intended to have a broad circulation amongst all Project stakeholders and is intended to be the foundation for project management decision making amongst Nalcor and its contractors.

2.0 Application and Scope

This *Project Execution Plan* is applicable to the Project during Phase 3 of the [Gateway Process, LCP-PT-MD-0000-PM-PR-0001-01](#) (see Section 10), covering the engineering, procurement, construction and project management associated with the following “Sub-Projects” of the LCP Phase I:

- Muskrat Falls Generation Facility
- Labrador – Island Transmission Link

Another important element of the overall Lower Churchill Project is the Maritime Link Sub - Project, to which the project execution concepts contained herein are applicable and directly transferable.

At this time, however, and due to the early level of definition of this element of the work, and the fact that other Stakeholders are involved in its execution, this Project Execution Plan excludes specific details on how the Maritime Link Project will be planned or executed.

The scope of this Project Execution Plan addresses all Nalcor Energy management responsibilities, from health, safety, environmental and quality management, project controls and information management, the use of best practices in terms of value and risk management, through to procurement, detail design, construction, pre-commissioning, and start-up .

Specific exclusions of this PEP however include certain Nalcor Energy owner activities including power sales, transmission access and commercial arrangements, project financing, environmental assessment and aboriginal affairs.

3.0 Roles and Responsibilities

NE-LCP Project Director	Approver of the Project Execution Plan. Responsible to verify that this <i>Project Execution Plan</i> accurately reflects the selected management approach for the Project and that it is implemented consistently across the Project.
NE-LCP Project Managers	Responsible for day-to-day leadership and management of Nalcor and Contractor project teams in accordance with the objectives, targets and values set out in the <i>Project Execution Plan</i> .
NE-LCP Quality Manager	Responsible for the development, implementation, and maintenance of the overall Project Management System.
NE-LCP Functional Managers	Responsible to develop and implement functional management plans that are aligned with this <i>Project Execution Plan</i> .
NE-LCP Team Members	Responsible to understand the content and adhere to this <i>Project Execution Plan</i> .

4.0 Definitions

Appropriation Plan	Plan detailing when release of capital required for the progression of the Project will be requested in accordance to the capital authorization and release process.
Allowance	Costs added to the base estimate, based on experience, to cover foreseen but not fully defined elements.
Authorization for Expenditure	<p>The mechanism by which approval for appropriations of capital expenditure authority is obtained. Multiple forms of AFE exist as follows:</p> <p>Pre-sanction AFE - The means by which funds for pre-sanction activity for each Project Component are approved for expenditure by the Board of Directors.</p> <p>Master AFE - The means by which funds for post-sanction activity for each Project Component are approved for expenditure by the Board of Directors.</p> <p>Supplemental AFE - The mechanism used to secure approval for capital expenditures that are outside the scope, or in excess of a previously issued AFE.</p>
Base Estimate	Reflects most likely costs for known and defined scope associated with project’s specifications and execution plan.
Baseline	The project scope, in terms of quantity, quality, timing, hours, costs, etc. that establishes a formal reference for comparison and verification of subsequent efforts, progress, analysis and control.
Budget	The Budget will be derived based on the Current Control Budget (CCB) as defined in the Project Controls Management Plan LCP-PT-MD-0000-PC-PL-0001-01 . In the instance where only the Original Control Budget (OCB) exists, then this will form the basis for the Budget. The scope of the Budget will be consistent with that of the OCB/CCB and hence can be multi-year in nature.
Cost Control Account	The Cost Control Account is a unique code applied against each item of cost for the Project.
Decision Gates	A Decision Gate is a predefined moment in time where the Gatekeeper has

to make appropriate decisions whether to move to the next stage, make a temporary hold or to terminate the project. The option to recycle to the current stage is considered an undesirable option unless caused by changes in business conditions.

Escalation Provision for changes in price levels driven by economic conditions. Includes inflation.

Estimate Contingency Provision made for variations to the basis of an estimate of time or cost that are likely to occur, and that cannot be specifically identified at the time the estimate is prepared, but experience shows will likely occur. Contingency does not cover either of scope changes outside the project’s boundaries, events such as strikes or natural disasters, or escalation and currency effects.

Gatekeeper The person responsible for making the decision at the Decision Gate of the Gateway Process.

Goal High-level strategic statement of what the project wants to achieve (overall and/or current phase of the Gateway Process), relevant to the project's policy statement and corporate business plan.

Initiatives Individual activity or action intended to be completed to achieve a strategy or objective.

Key Deliverables High-level listing of key outputs/documents which collectively demonstrate that objectives have been attained.

Objectives High-level results required in support of achieving the project's phase-oriented goal; translates the project's phase-oriented goal into specific, measurable components.

Project Management Team The Project Management Team (PMT) is led by the Project Director and is made up of project leaders and key functional representatives. The PMT meets periodically to identify issues that may affect cost and schedule and to determine how such issues should be resolved.

Purchase Order A Contract with a provider of goods, equipment or materials with a desired delivery time and with specific quantities and prices.

Requisition Documents the internal review and authorization process; to be secured prior to procuring goods and services. A requisition form initiates the purchasing or contracting process, which will result in the issue of a

Financial Commitment document; i.e. Contract, PO, WTO/PAA or Variation.

Risk An uncertain event or condition that, if it occurs, has a positive or negative effect on a project’s objectives.

Shareholder For Nalcor Energy, the Shareholder is the Province of Newfoundland and Labrador.

Strategic Risk Exposure Provision for occurrence of Strategic Risks that can be defined.

Strategies High-level definitive approach for achievement of an objective through identification of initiatives and plans.

5.0 Abbreviations and Acronyms

AACEI	Association for Advancement of Cost Engineering International
AAL	Approval Authorization Limits
AFE	Authorization for Expenditure
CCA	Cost Control Account
CCB	Current Control Budget
DG3	Decision Gate 3
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EPC	Engineer, Procure & Construct
EPCI	Engineer, Procure, Construct & Install
EPCM	Engineering, Procurement, and Construction Management
EPP	Environmental Protection Plan
ERP	Emergency Response Plan
FEL	Front End Loading
HDD	Horizontal Directional Drilling
HSE	Health, Safety and Environment
IBA	Impacts and Benefits Agreement
JDA	Joint Development Agreement
KPI	Key Performance Indicators
LACTI	Leads, Accountable, Consulted, Technical and Informed Chart
LCC	Line Commutated Converter
MOC	Management of Change
NE	Nalcor Energy
NE-LCP	Nalcor Energy Lower Churchill Project
NE-LCPMT	Nalcor Energy Lower Churchill Project Management Team
OCB	Original Control Budget
PAA	Personal Assignment Authorization
PEP	Project Execution Plan
PMT	Project Management Team
PO	Purchase Order
PPA	Power Purchase Agreement
RACI	Responsible, Accountable, Consult and Inform
RCC	Roller Compacted Concrete
RCP	Regulatory Compliance Plan
RFI	Request for Information
RFP	Request for Proposal
RFQ	Request for Quotation
SOBI	Strait of Belle Isle
T&DI	Technical and Design Integrity

T&M	Time and Materials
VSC	Voltage Source Converter
WBS	Work Breakdown Structure
WTO	Work Task Order

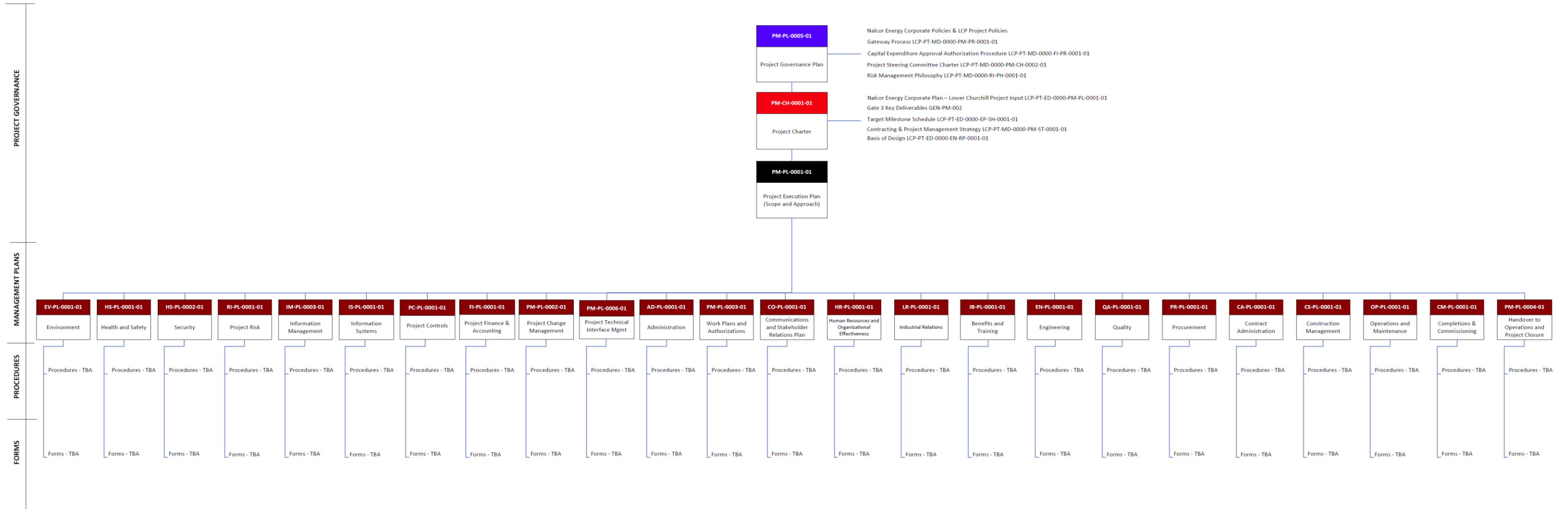
6.0 Document Structure and Hierarchy

The LCP will be implemented in accordance with Nalcor's Corporate Obligations (*Legislation*), Business Direction (*Mission, Values, Principles & Objectives*) and Governance Structure (*Roles & Responsibilities, Controls & Reporting*).

These elements are included in [LCP-PT-MD-0000-PM-CH-0001-01 Project Charter](#) and [LCP-PT-MD-0000-PM-PL-0005-01 Project Governance Plan](#), which lay the foundation for the way the LCP will be planned and executed, as detailed in this PEP.

Detailed project functional Management Plans further detail the day-to-day processes and procedures which will be used to execute and control the work. Collectively, these documents form the LCP Project Management System. A schematic of how these documents work together, in a hierarchical structure, is provided in Figure 1.

Figure 1: NE-LCP Project Management System Structure



Note: Only abbreviated document number is shown above, however for completeness all document numbers start with "LCP-PT-MD-0000"

A list of the principal documents for the Project forming the basis of Decision Gate 2 and available to the Project Team is provided in Table 1 below.

Table 1: Principle Documents at Decision Gate 2

Document No.	Revision	Title
LCP-PT-MD-0000-PM-PL-0005-01	A3	Project Governance Plan
LCP-PT-MD-0000-PM-CH-0001-01	A1	Project Charter
LCP-PT-MD-0000-PM-PR-0001-01	B1	Gateway Process
LCP-PT-MD-0000-PM-ST-0001-01	B1	Contracting and Project Management Strategy
LCP-PT-MD-0000-FI-PR-0002-01	B1	Capital AFE Preparation and Supplement Procedure
LCP-PT-ED-0000-EN-RP-0001-01	B1	Lower Churchill Project – Basis of Design
LCP-PT-ED-0000-EP-SH-0001-01	B1	Target Milestone Schedule
LCP-PT-ED-0000-EP-SH-0003-01	B1	Management Summary Schedule
LCP-PT-ED-0000-EP-SH-0002-01	B1	Project Control Schedule
ILK-PT-ED-8110-MR-RP-0001-01	B1	SOBI Marine Crossing "Phase 2" Conceptual Design
MFA-PT-ED-0000-EP-RP-0001-01	B1	Gate 2 Capital Cost Estimate Report – Muskrat Falls
ILK-PT-ED-0000-EP-RP-0001-01	B1	Gate 2 Capital Cost Estimate Report – Island Link
LCP-PR-ED-0000-EP-RP-0001-01	B1	Gate 2 Escalation Estimate Report
LCP-PT-ED-0000-RI-RP-0001-01	B1	Gate 2 Risk Analysis
LCP-PT-ED-0000-SC-LS-0001-01	B1	Muskrat Falls and Island Link Master Contract Package List
LCP-PR-ED-0000-PM-PL-0001-01	B1	Nalcor Energy Corporate Plan – Lower Churchill Project
GEN-PM-002	B1	Gate 3 Key Deliverables

7.0 Project Objectives

The NE-LCP PMT is dedicated to the concept of **Flawless Execution** in the planning and execution of the Project. This concept has become the operating mantra for the Project.

Flawless Execution requires a comprehensive understanding of risk-critical areas for the Project and an early focus on these activities in order to successfully shape the execution approach that will drive the expectant outcomes. To this effect, the focus of the PMT during Gateway Phase 3 will include:

- Safety By Design
- Environmental Management by Design
- Risk Identification and Management
- Constructability in Design
- Construction Planning
- Construction Productivity
- Labor Relations
- Value Improving Practices
- Asset Management
- Systems Engineering and Integration
- Incorporation of Lessons Learned

The [Project Charter](#) (reference document no. [LCP-PT-MD-0000-PM-CH-0001-01](#)) provides the overall challenge, in the form of a Mission Statement below, which summarily reflects Nalcor's corporate values, objectives, goals, behaviors, and principles by which it expects the Project to be managed.

Project Mission Statement

To develop the Lower Churchill Project, respecting shareholder and stakeholder requirements and commitments, using best-in-class planning and execution practices in order to ensure the safe and environmentally sound delivery of an economically viable source of clean, renewable energy to the marketplace in accordance with the Project Master Schedule.

In accordance with Nalcor's corporate planning framework, the NE-LCP PMT has identified a number of key objectives (targets and strategic initiatives) under each of Nalcor's five

Corporate goals (Safety, Environment, Business Excellence, People and Community) that the Project must steward, and thus will strongly influence the management approach for the Project.

These key objectives are listed below. They will be monitored for progress and reported regularly to Nalcor Corporate Management

Goal 1 – Safety

- Maintain Zero Lost Time Injury record for Nalcor Project Team.
- Achieve and sustain world-class safety performance during the construction phase.
- Lead Nalcor Energy business units as an innovative safety leader demonstrated through visible commitment and by sustained Safety Performance against Targets.
- Develop a culture throughout the project including the EPCM Consultant and all other contractors espousing a Zero Incident mindset through NE-LCP management commitment, employee and contractor engagement and involvement.
- Develop a world-class contractor/supplier Health and Safety Management Program that can be leveraged by Nalcor Energy corporate-wide.

Goal 2 – Environment

- Achieve release from Environmental Assessment for each of the Generation , Labrador-Island Transmission Link and Maritime Link Projects.
- Design, construct and commission LCP Phase I in accordance with Nalcor's Environmental Policy and Guiding Principles.

Goal 3 – Business Excellence

- Secure Power Purchase Agreements (PPA) for Phase I
- Implement Regulatory structure to support the long-term success of Nalcor Energy and NE-LCP.
- Mobilize the EPCM Consultant and world class team.
- Implement the Joint Development Agreement (JDA) for the Maritime Link and take advantage of synergy opportunities.
- Perform engineering and procurement required to provide an estimate suitable for Project Sanction of Phase I elements.
- Achieve Project Sanctions for Phase I
- Manage change to achieve an acceptable cost and schedule at Project Sanction.
- Be on schedule to achieve First Power from Muskrat Falls 6 years after start of Early Works construction and within Project Sanction cost estimate.
- Be on schedule to complete the Labrador – Island Transmission Link and Maritime Link to bring Muskrat Falls power when available from Labrador to the Island and export to Nova Scotia.

Goal 4 – People

- Build an empowered, world-class Owner’s and EPCM project management team.
- Facilitate communication within the project through outlining clear reporting relationships and an understanding of roles and responsibilities of each function group.
- Negotiate collective bargaining agreements that meet the requirements of the Project.
- Create strong linkages between project personnel and other Nalcor Energy lines of business to build project expertise within the organization.

Goal 5 – Community

- Achieve ratification of the Innu Nation Impacts and Benefits Agreement (IBA) and prepare for execution/implementation at Project Sanction.
- Demonstrate Nalcor Energy’s openness and accountability to the people of Newfoundland and Labrador and other stakeholders on the development of LCP Phase I
- Demonstrate benefits that that the Project will provide to the people of Newfoundland and Labrador.
- Effectively manage Project’s reputation and brand.
- Demonstrate Nalcor Energy’s commitment to consult with Labradorians.
- Successfully manage the expectations of the benefits for Labradorians from the Project.
- Demonstrate Nalcor Energy’s commitment to community investment.
- Consult with all aboriginal groups in accordance with EIS guidelines.

8.0 Scope of Work

8.1 Introduction

As detailed in [Lower Churchill Project – Basis of Design](#), reference document no.: [LCP-PT-ED-0000-EN-RP-0001-01](#), the scope of the physical facilities to be constructed during the Project at Decision Gate 2 is highlighted in Figures 2 and 3. It includes the following Sub-Projects:

- **Muskrat Falls Generating Facility**
 - 824 MW powerhouse with 4 Kaplan turbines and supporting structures including RCC dams
 - 2 x 345 kV HVac 263 km transmission lines connecting Muskrat Falls and Churchill Falls (**Note:** *Approved Project Change Notice PCN-0018 has subsequently decreased the operating voltage to 315 kV*)

- **Labrador – Island Transmission Link**
 - 320 kV operating voltage (**Note:** *Approved Project Change Notice PCN-0015 has subsequently increased the operating voltage to 350 kV*)
 - 900 MW Capacity (**Note:** *Approved Project Change Notice PCN-0016 has introduced the requirement for total system overload for the Labrador – Island Transmission Link*)
 - 1080 km Overhead Transmission Line
 - HVac to HVdc converter stations at Muskrat Falls and Soldier’s Pond
 - Shore / Pond Electrodes at SOBI and Dowden’s Point
 - 3 Mass Impregnated Cables crossing the SOBI utilizing Horizontal Directional Drilling (HDD) for landfall protection and rock berms for deep water protection
 - Island System Upgrades, including 3 off 150 MWar inertia synchronous condensers

- **Maritime Link** (as indicated in Section 1.0, this Component has been excluded from this PEP until the Joint Development Agreement has been finalized between Nalcor and Emera).

Other non-facility components of the LCP are excluded from this PEP (e.g. Project Financing or Insurance)

Figure 4, the Project Work Breakdown Structure (WBS), provides an associated listing of the major Physical Components for the Muskrat Falls Generating Facility and Island Link Transmission System.

Figure 2: Lower Churchill Project – Phase I

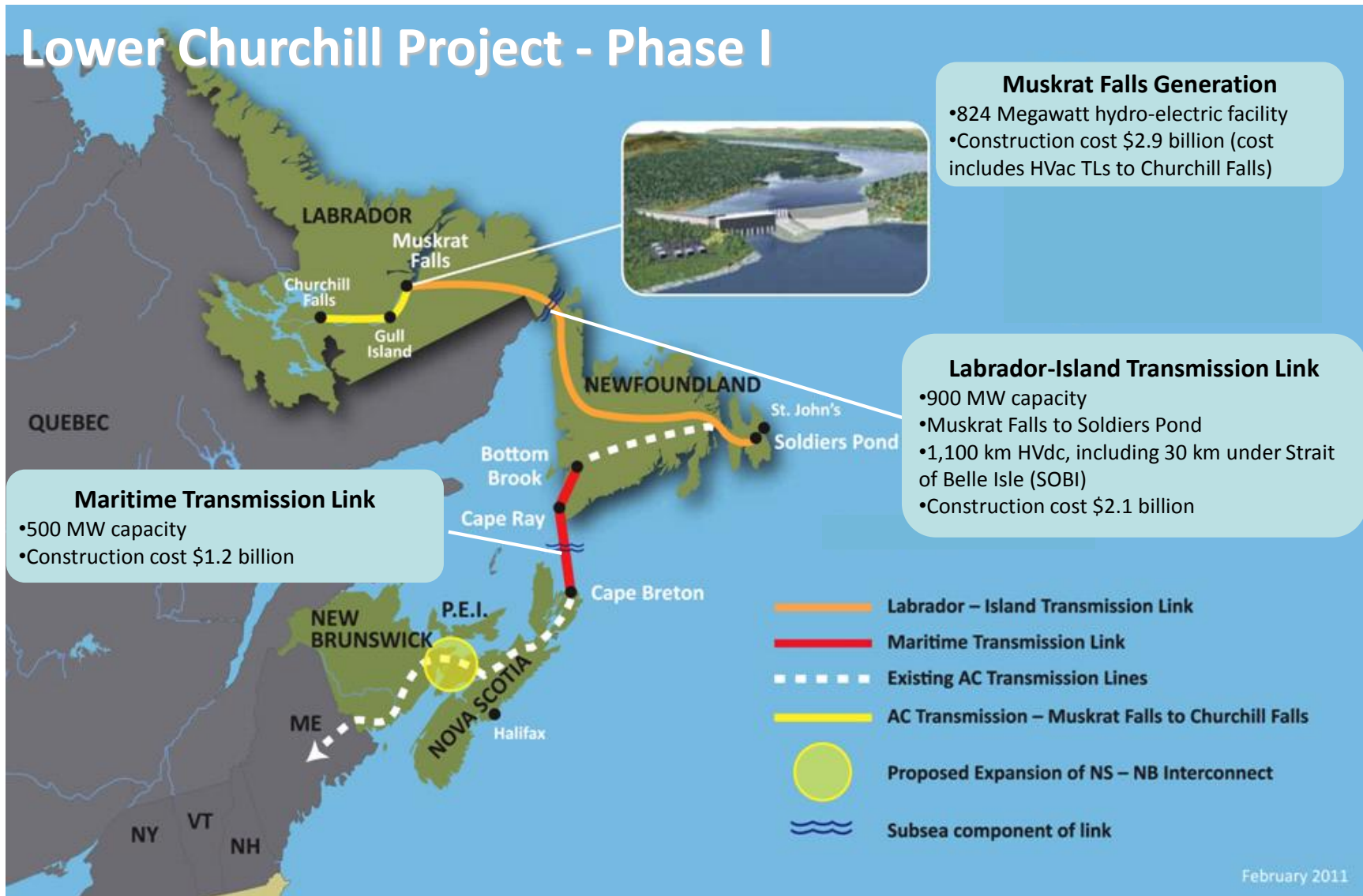


Figure 3: Schematic Depiction of Project Development Scheme (as of Decision Gate 2) – *Illustrative Only*

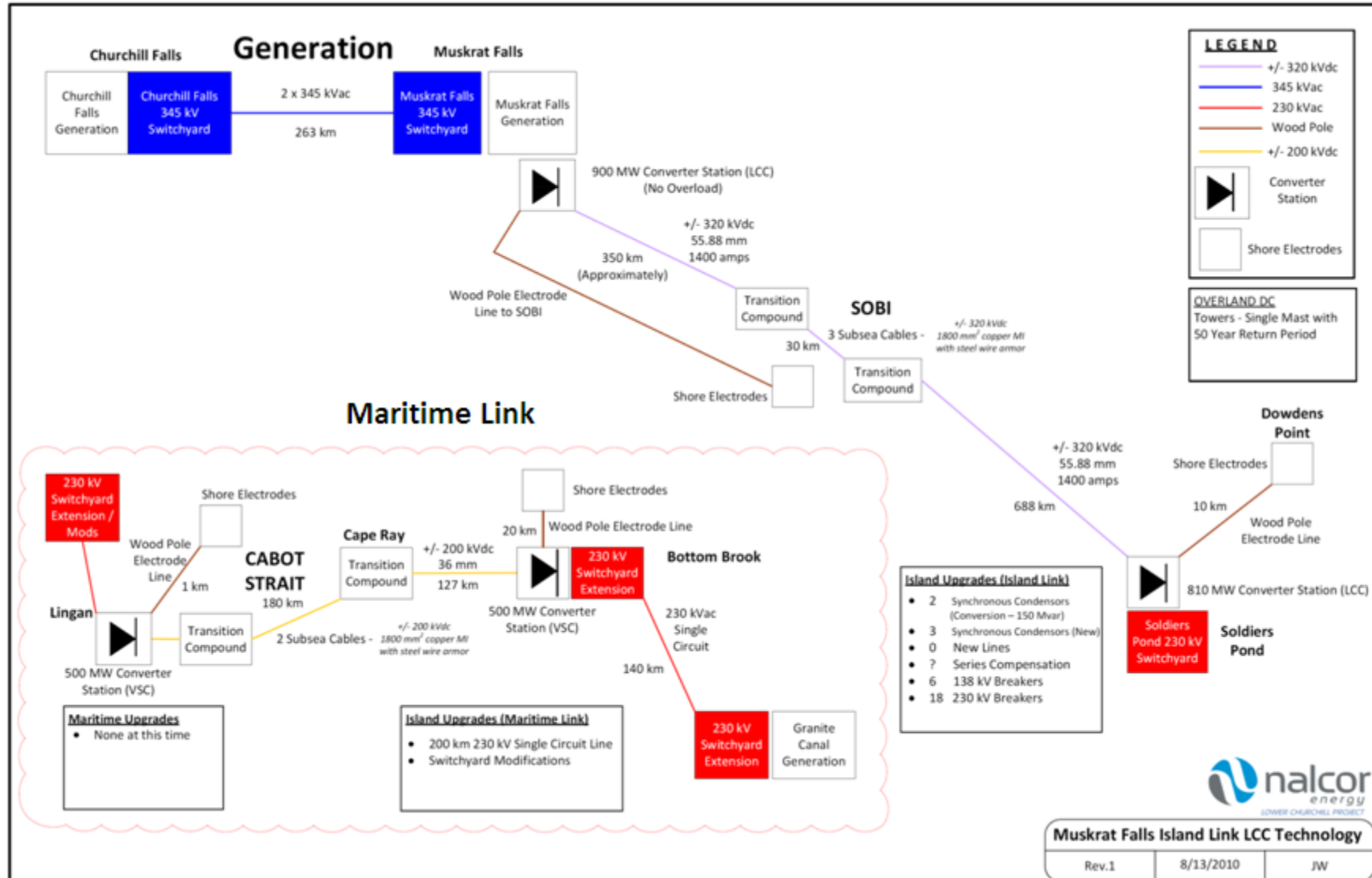


Figure 4: Work Breakdown Structure (WBS)

1 LCP General	3 Muskrat Falls	4 Island Link	5 Maritime Link
1.0 LCP General 1.0.00 General Administration	3.0 Muskrat Falls General 3.0.00 Muskrat Falls General	4.0 Island Link General 4.0.00 Island Link General	5.0 Maritime Link General 5.0.00 Maritime Link General
1.1 Project Management 1.1.00 Project Management General	3.1 Infrastructure and Support 3.1.00 Infrastructure and Support General 3.1.10 Offices 3.1.11 Access 3.1.13 Construction Power 3.1.14 Construction Telecommunications 3.1.15 Accomodation Complex 3.1.16 Site Services 3.1.17 Housing Facilities HVGB 3.1.18 Offsite Logistics Infrastructure and Support	4.1 Infrastructure and Support 4.1.00 Infrastructure and Support General 4.1.10 Offices 4.1.11 Access 4.1.13 Construction Power 4.1.14 Construction Telecommunications 4.1.16 Site Services 4.1.17 Housing Facilities 4.1.18 Offsite Logistics Infrastructure and Support	5.1 Infrastructure and Support 5.1.00 Infrastructure and Support General 5.1.10 Offices 5.1.11 Access 5.1.13 Construction Power 5.1.14 Construction Telecommunications 5.1.16 Site Services 5.1.17 Housing Facilities 5.1.18 Offsite Logistics Infrastructure and Support
1.2 Engineering 1.2.00 Engineering General			
1.3 Environmental Affairs 1.3.00 Environmental Affairs General			
1.4 Aboriginal Affairs 1.4.00 Aboriginal Affairs	3.2 Generation Facility 3.2.00 Generation Facility General 3.2.21 Reservoir 3.2.23 Dams and Cofferdams 3.2.24 Spillway 3.2.25 Approach Channel 3.2.28 North Spur 3.2.31 Tailrace 3.2.32 Intake 3.2.33 Powerhouse and Related Facilities 3.2.34 Turbines and Generators 3.2.35 Balance of Plant 3.2.92 Operations Telecommunications		
1.5 Construction Management 1.5.00 Construction Management General	3.4 Switchyards 3.4.00 Switchyards General 3.4.10 Churchill Falls Switchyard Extension 3.4.30 Muskrat Falls Switchyard	4.4 Switchyards 4.4.00 Switchyards General 4.4.50 Soldiers Pond Switchyard	5.4 Switchyards 5.4.00 Switchyards General 5.4.60 Maritime Switchyard 5.4.70 Bottom Brook Switchyard 5.4.80 Granite Canal Switchyard
1.8 Power Sales and Marketing 1.8.00 Power Sales and Marketing General			
1.9 Project Financing 1.9.00 Project Financing General	3.6 OL Transmission 3.6.00 OL Transmission General 3.6.14 AC Tx Muskrat Falls to Churchill Falls 3.6.16 AC Collector Lines to Switchyards	4.6 OL Transmission 4.6.00 OL Transmission General 4.6.13 AC Tx Muskrat Falls Switchyard to Converter Station 4.6.22 DC TX SOBI to Soldiers Pond 4.6.27 DC Tx Muskrat Falls to SOBI 4.6.31 Electrode Line - Labrador 4.3.32 Electrode Line - Newfoundland East	5.6 OL Transmission 5.6.00 OL Transmission General 5.6.17 AC Tx Bottom Brook to Granite Canal 5.6.26 DC Tx Cape Ray to Bottom Brook 5.6.33 Electrode Line - Maritimes 5.6.34 Electrode Line - Newfoundland West
		4.7 System Upgrades 4.7.00 System Upgrades General 4.7.10 Island Upgrades - East	5.7 System Upgrades 5.7.00 System Upgrades General 5.7.20 Island Upgrades - West 5.7.30 Maritime Upgrades
		4.8 DC Specialties 4.8.00 DC Specialties General 4.8.11 Marine Crossing - SOBI 4.8.21 Labrador Converter Station 4.8.22 Soldiers Pond Converter Station 4.8.51 Transition Compound Labrador 4.8.52 Transition Compound Northern Peninsula 4.8.61 Electrode Labrador 4.8.62 Electrode Newfoundland East	5.8 DC Specialties 5.8.00 DC Specialties General 5.8.12 Marine Crossing - Maritimes 5.8.23 Maritime Converter Station 5.8.24 Newfoundland West Converter Station 5.8.53 Transition Compound Newfoundland West 5.8.54 Transition Compound Maritimes 5.8.63 Electrode Maritime 5.8.64 Electrode Newfoundland West
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8.2 Project Overview

The Churchill River, located in the Province of Newfoundland and Labrador, Canada is a significant source of renewable, clean electrical energy; however, the potential of this river has yet to be fully developed. The existing 5,428 megawatt (MW) Churchill Falls Generating Station, which began producing power in 1971, harnesses about 65 per cent of the potential generating capacity of the River. The remaining 35 percent is planned to be developed via two sites on the lower Churchill River – the 2250 MW Gull Island Generation Facility and the 824 MW Muskrat Falls Generation Facility.

As detailed in [Lower Churchill Project Basis of Design](#), reference document no. [LCP-PT-ED-0000-EN-RP-0001-01](#), the planned Gull Island Generation Facility will be sited 225 kilometres downstream from the existing Churchill Falls Generating Station, while the Muskrat Falls Generation Facility is located a further 60 kilometres downstream. The remotely controlled 824 MW Muskrat Falls Hydroelectric Plant, illustrated in Figure 5, will be comprised of the following sub-components and associated HVac connector lines to an HVac switchyard:

- Site access road from the Trans-Labrador Highway
- Accommodations Complex and associated site facilities and services for the planned construction program.
- Reservoir preparation and fish habitat compensation facilities.
- A north roller compacted concrete (RCC) overflow dam, 32 m high x 430 m long with upstream and downstream concrete facing, concrete overflow crest designed for 8,000 m³/s flow, and upstream and downstream cofferdams, including:
 - 62,000 m³ of foundation overburden excavation,
 - 213,000 m³ of RCC, and
 - 29,000 m³ of concrete in upstream and downstream faces and overflow crest.
- A south RCC dam 29 m high x 330 m long, with upstream and downstream concrete facing and concrete crest , including:
 - 28,000 m³ of foundation overburden excavation,
 - 53,000 m³ of RCC, and
 - 13,000 m³ of concrete in upstream and downstream faces and crest.
- River diversion during construction via natural river channel for first three years and via the spillway for subsequent years, designed for 5,930 m³/s flow
- Gated Spillway – capacity of 14,420 m³/s, including:
 - Approach and discharge channels,

- 4 submerged gates (**Note:** *Project Change Notice PCN-0021 subsequently adjusted the spillway configuration to 5 vertical gates*)
- 44,000 m³ of overburden and 273,000 m³ of open cut rock excavation, and
- 75,000 m³ of concrete.

- A close coupled intake and powerhouse, including:
 - 4 intakes with gates and trash racks,
 - 4 concrete lined water passages,
 - 4 Kaplan turbines with generator units at 206 MW each with associated ancillary electrical/mechanical and protection/control equipment,
 - 4 power transformers, located on the draft tube deck of the powerhouse,
 - 2 overhead cranes,
 - 155,000 m³ of overburden and 1,270,000 m³ of open cut rock excavation,
 - 278,000 m³ of concrete, and
 - 2,500 tonnes of structural/miscellaneous steel and metal cladding.

- Stabilization works on the North Spur at Muskrat Falls

- HVac switchyard, including:
 - 4-230 kV underground cables from powerhouse (**Note:** *PCN-0027 subsequently approved the use of overhead connection between the Powerhouse and switchyard*),
 - 4 power transformers, and
 - 2 outgoing double circuit 345 kV transmission line to Churchill Falls (**Note:** *Approved Project Change Notice PCN-0018 subsequently adjusted the operating voltage to 315 kV*)

- Port Facilities at Happy Goose Bay and Cartwright – scope to be confirmed in Gateway Phase 3

Note: As of Decision Gate 2, on-going plant layout optimization studies continued for Muskrat Falls (e.g. WTO MF 1340), which was subsequently resulted in a proposed re-orientation of the plant by 30 degrees and a change in some of the above major quantities (reference Deviation Alert Notice DAN-0018). These Project Change are being addressed under the Project's Management of Change process.

It is currently envisioned that the Muskrat Falls Generating Facility will be interconnected with the Churchill Falls Facility via a double-circuit 315 kV transmission lines, approximately 263 km in length. The structures from Muskrat Falls to Churchill Falls will be lattice steel-type towers, although there are two lines on one tower (i.e., a double-circuit line).

Muskrat Falls will be connected to the Island of Newfoundland via a 900 MW Labrador – Island Transmission link, as illustrated in Figure 6. This HVdc link will include an overhead transmission line from a converter station at Muskrat Falls to a converter station at Soldier's

Pond. Early in Gateway Phase 3 the operating voltage for this line has been optimized to 350 kV dc (reference Project Change Notice PCN-0016). This 1080 km long, HVdc system will be a bipole line, single conductor per pole constructed with galvanized lattice steel guyed suspension and rigid angle towers. It will be designed with a 1:50 year reliability level return period for loads.

The overhead transmission line will transition into subsea cables in order to traverse the Strait of Belle Isle (SOBI). HVdc transition compounds on each side of the SOBI will provide for the junction of multiple submarine cables and the overhead transmission line.

The SOBI crossing will be achieved via the use of submarine cables, explicitly designed for this application. It is envisioned that 3 Mass Impregnated HVdc submarine cables, including 1 spare cable, operating at 350 kV dc will be laid on the ocean floor in the SOBI. These cables will be protected along their entire length from scouring icebergs, pack ice, fishing activity, and dragged anchors by a combination of shoreline HDD tunnelling and rock berms.

For successful operation, the HVdc transmission system requires a consistent return path for current flow. Should one pole become partially non-operational, the HVdc system may be temporarily reconfigured to operate at reduced capacity. This temporary reconfiguration requires (sea or shore) electrodes to provide the return path for the electric current.

To facilitate the return path, the placement of shoreline pond electrodes will be used. This option will require building a breakwater in a chosen location along the shoreline and installing the electrodes and supporting infrastructure. Shore electrodes have been selected to address the issues associated with construction in an open sea environment. Two low voltage conductors will connect the converter stations at each of Muskrat Falls and Soldier's Pond via 10 m to 12 m high wood poles with approximately 60 m spacing to the electrodes located at SOBI and Dowdens' Point, NL respectively.

The HVdc technology currently being carried for the Labrador – Island Transmission Link is based upon line commutated converter (LCC) technology. During detailed engineering the potential application of voltage source converter (VSC) technology will be further explored and a decision made regarding the application of this technology based on consideration of cost, reliability and system stability. The development concept for the Maritime Link is currently based on VSC technology.

Upgrades required for the interconnection of the Labrador-Island Transmission Link to the existing isolated Island grid will also be required. These upgrades will include installing three 150 MVar inertia synchronous condensers, including two new units at Soldier's Pond and the conversion of an existing thermal unit at the Holyrood facility.

Figure 5: Muskrat Falls 824 MW Plant Configuration including early Gateway Phase 3 Configuration Changes

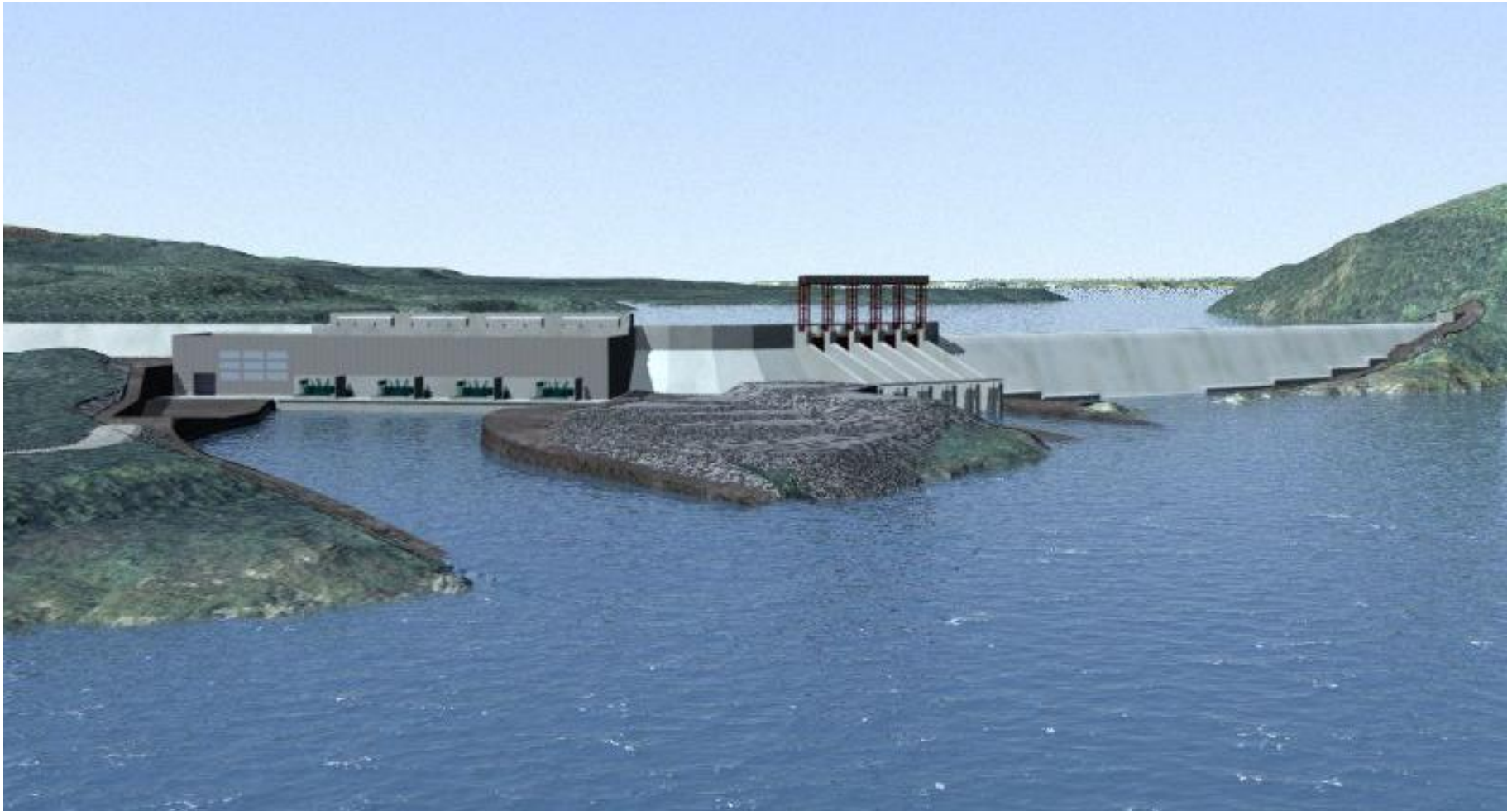


Figure 6: LCP Phase I Generation and Transmission Map



9.0 Project Cost and Schedule

9.1 Schedule Estimate and Basis Summary

As of Decision Gate 2, a Level 3 Project Control Schedule, reference [LCP-PT-ED-0000-EP-SH-0002-01 Project Control Schedule](#), has been developed. This schedule incorporates all available internal information and technical studies completed to-date, and is predicated upon the dates established in [LCP-PT-ED-0000-EP-SH-0001-01 Target Milestone Schedule](#). It has also been used to establish a Management Summary Schedule, reference [LCP-PT-ED-0000-EP-SH-0003-01](#).

It must be emphasized that this current revision of the Project Control Schedule reflects the latest available information on the Project, including anticipated durations for key activities. These durations and the associated activity logic will continue to be matured and reflected in subsequent revisions of the schedule.

Key Assumptions

The development of the *Project Control Schedule* for Decision Gate 2 is predicated on a number of assumptions, including:

- The EPCM Consultant will be able to rapidly mobilize and prepare for the necessary levels of detailed design.
- The environmental process for the Labrador-Island Transmission Link will take approximately 12 months from the acceptance of the EIS to the release from the process.
- The Labrador-Island Transmission Link environmental process timeline assumes provision of the final EIS guidelines by January 2011, and that no EA panel is required.
- The EA Approvals and subsequent permits do not place any unexpected or unplanned specific time restrictions on construction activities.
- The design and orientation of the Muskrat Falls generating facility will not significantly change as a result of the 2010 Field Investigation Program and Feasibility Studies.
- The turbine modeling is able to proceed as scheduled, and provide information necessary for the detailed civil design of the Muskrat Falls generating facility in a timely manner.
- SOBI subsea cables can be, if necessary, placed into service prior to the cable protection being completed.
- The subsea cables can be installed in a single construction season.
- Transmission line construction works will be a year-round operation.
- It is not necessary to have the transmission link to the island of Newfoundland completed in order to commission the Muskrat Falls generating facility.
- It is necessary to have the Churchill Falls – Muskrat Falls transmission link completed in order to commission the Muskrat Falls generating facility.
- Sufficient resources (contractors, personnel, and materials) are readily available to concurrently construct all of the HVdc overland transmission required for the Labrador-

Island link. The construction activities for the various sections of the transmission line have been staggered within the schedule in an attempt to manage resource loading peaks.

Driving Logic

The driving logic for this Project Control Schedule includes:

- Obtaining EA release for each of the Generation and Island Link projects required to facilitate permitting required to start construction.
- The completion of geotechnical evaluations at Muskrat Falls to confirm key parameters required by the EPCM to complete engineering drawings to be included in construction packages.
- The mobilization of the EPCM Consultant which will perform the detailed design, in order to permit the design and contracting for the site works and mass excavation.
- Final feasibility engineering studies to be finalized in Q1-2011.
- Turbine Model Testing contract to be awarded by March 2011 with information available to support civil structure design by January 2012. (Note: Award was completed by December 2010)
- The Turbine Supply and installation largely drives the construction schedule for the generating facility.
- Early Site Infrastructure Works for Muskrat Falls (access, accommodations, communications, construction power) to commence following EA release and permitting.
- The completion of powerhouse excavation and primary and secondary concreting, in order to allow the assembly of the turbine/generator units.
- First Power from Muskrat Falls via Churchill Falls in Q4-2016 or within 6 years following EA release.

9.2 Key Project Milestones

Refer to [LCP-PT-ED-0000-EP-SH-0001-01 Target Milestone Schedule](#) for a complete listing of all Project Milestones. Table 2 provides a listing of key milestones with associated current forecasted dates.

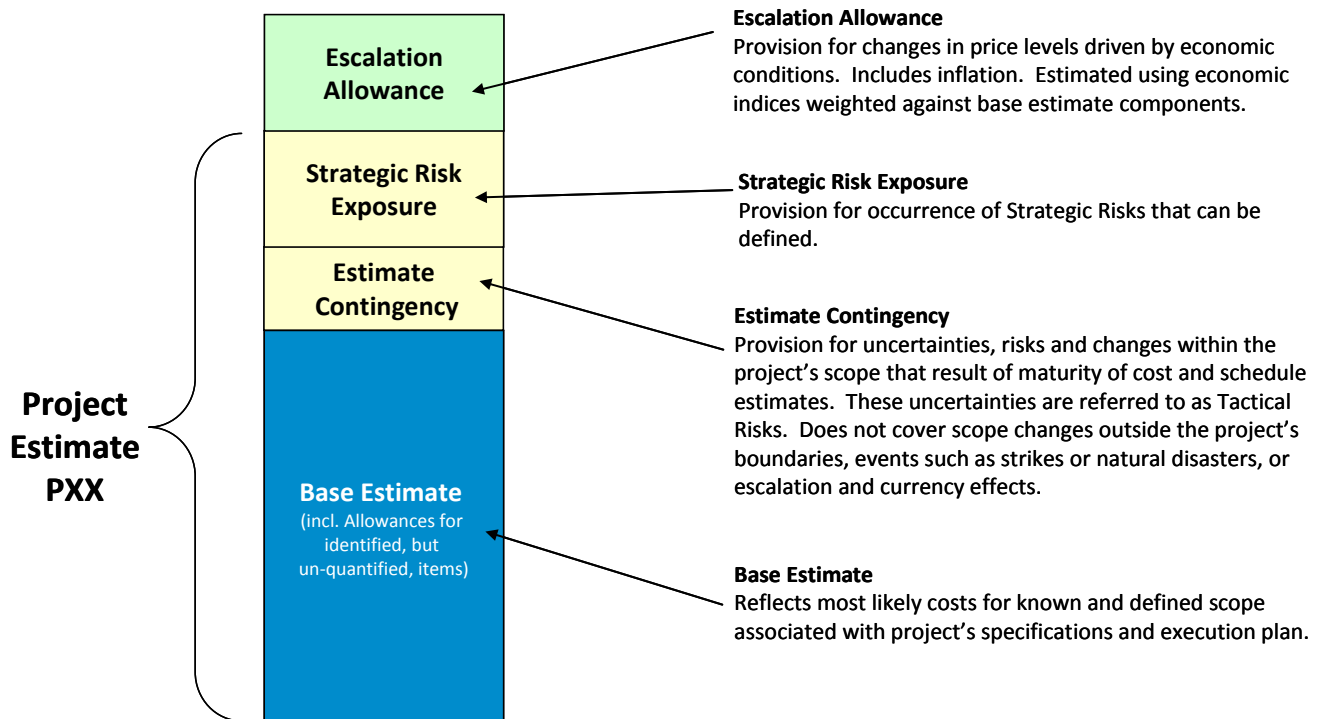
Table 2: Summary of Key Project Milestones

Milestone	DG2 Basis	Actual or Current Forecast
Gate 2 Approval	November 2010	18-Nov-2010
Award EPCM Agreement for Project	December 2010	3-Feb-2011
Environmental Assessment Release for Generation Project	August 2011	Dec-2011
Decision Gate 3 Approval	December 2011	Dec-2011
Environmental Release for Labrador-Island Transmission Link	April 2012	Aug-2012
Muskrat Falls to Churchill Falls Transmission Interconnect Ready for Power Transmission	August 2016	Aug-2014
First Commercial Power from Muskrat Falls	October 2016	Oct-2016
Labrador-Island Transmission System Ready for Power Transmission	January 2017	Jan-2017
Full Commercial Power Available from Muskrat Falls	May 2017	May-2017

9.3 Capital Cost Estimate Basis and Summary

The Gate 2 Capital Cost Estimate provides key input for selecting the preferred development sequencing / phasing and scheme. It is comprised of the four components identified in Figure 7.

Figure 7: Capital Cost Estimate Components



The Capital Cost Estimate includes cost for all Project Components and includes all cost elements such as engineering, project management, procurement, construction and owner’s cost. The Decision Gate 2 estimate is commensurate with the level of technical and execution detail available, reflects latest market pricing, and is aligned with the approved Target Milestone Schedule.

Note: *The capital cost estimate shown below is inclusive of Base Estimate, Estimate Contingency and Escalation, however excludes Strategic Risk Exposure and Financing / Interest Charges.*

Table 3: Capital Cost Summary at Decision Gate 2

Project Component	Cost (as spent \$)
Labrador – Island Transmission Link	\$2.1 Billion
Muskrat Falls Generating Facility	\$2.9 Billion
Maritime Link	\$1.2 Billion
Total	\$6.2 Billion

The Base Estimate, prior to estimate contingency, strategic risk exposure and escalation, is detailed in [MFA-PT-ED-0000-PC-RP-0001-01 Gate 2 Capital Cost Estimate Report – Muskrat Falls](#) and [ILK-PT-ED-0000-PC-RP-0001-01 Gate 2 Capital Cost Estimate Report – Island Link](#).

Estimate Contingency and Strategic Risk Exposure have been developed based upon the guidelines contained in [MSD-RI-003 Project Execution Risk and Uncertainty Management Guidelines](#) and reflects the level of scope and execution definition (i.e. tactical risk), as well as the strategic risk exposure. [LCP-PR-ED-0000-RI-RP-0001-01 Gate 2 Project Risk Analysis](#) provides the results of all risk analysis used for Decision Gate 2 planning purposes.

Escalation estimates have been developed on a component and annual basis using a combination of recommended best-practices and techniques developed within NE-LCP. [LCP-PT-ED-0000-EP-RP-0001-01 Gate 2 Escalation Estimate Report](#) details this methodology as well as the estimated escalation for the Project.

Key Estimating Assumptions

The assumptions made in the development of any capital cost estimate for large scale projects, are many and varied. In many cases there are assumptions made which are an integral part of the cost estimating process. Some of the key assumptions in the development of this cost estimate include:

- The estimate reflects the revision of the basis of design, project schedule, site layout and footprint available at the time of the preparation of the estimate.

- In some cases, lump sum numbers or pro-rated calculations were used in the absence of detailed technical information.
- The project execution strategy method assumed is a EPCM Consultant managed project with strategic oversight from Nalcor Energy.
- The seasonal nature of the work was considered when developing the labour and equipment requirements with peaks during the summer construction seasons.
- Labour rates were developed based on other large projects carried out in NL and proposed for NL.
- Construction equipment hourly costs were developed to suit the operating conditions, using input from other recent civil and transmission projects.
- Commodities and materials were estimated based on recent market quotations, or escalated historical quotes or as-built prices.
- Permanent equipment estimates were based on actual quotations from suppliers.
- Productivity and performance factors have been developed using estimating experienced personnel and validated by expert review and utilization of specialized software.
- Consideration of remote location and logistics constraints posed by weather have been included.
- “Just in time” delivery of materials and equipment has been assumed.
- Contractor’s overhead and profit calculated as a percentage of direct plus indirect costs.
- Construction methodology was developed in accordance with the project schedule and developed using a rotation schedule and day and night shifts.

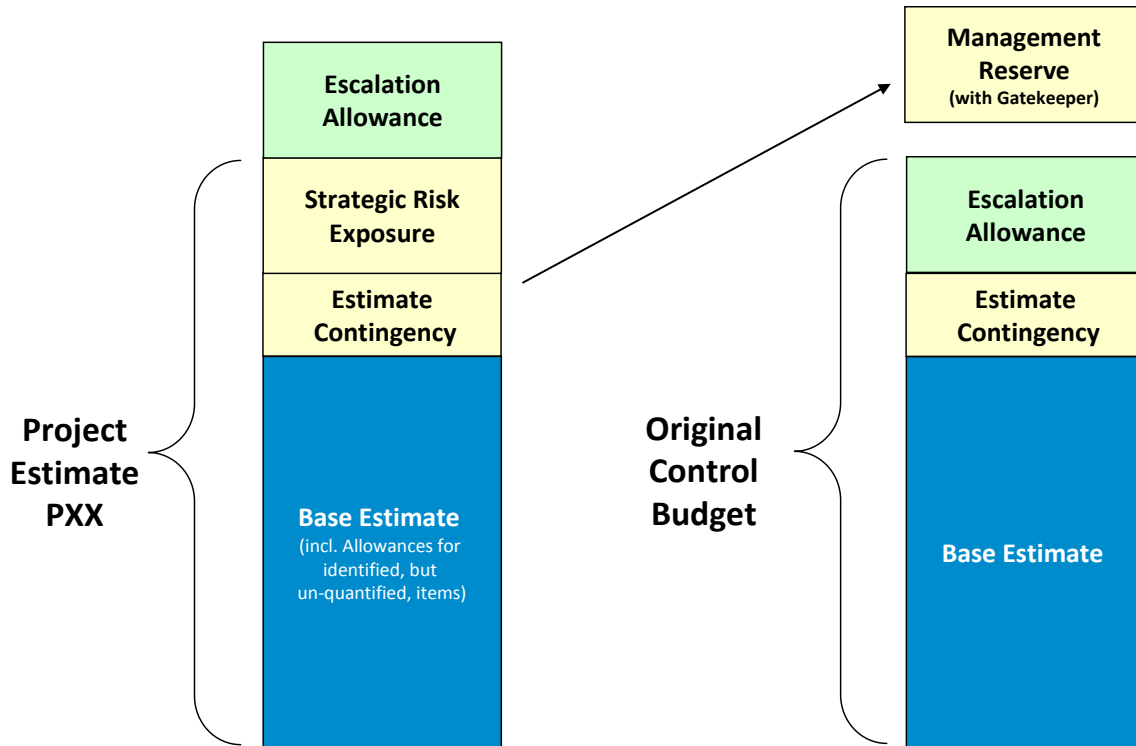
9.4 Establishing the Control Baseline for Gateway Phase 4

Consistent with the Key Deliverables of Gate 3 and in accordance with the process detailed in the [Project Controls Management Plan](#), reference document no. [LCP-PT-MD-0000-PC-PL-0001-01](#), a Class 3 Estimate will be produced (as defined under the Association for Advancement of Cost Engineering International (AACEI) cost estimate classification system) and equivalent Project detailed schedule required for Decision Gate 3.

The Original Control Budget (OCB) is the Project’s Decision Gate 3 estimate as defined by the Project Design Basis and Project Control Schedule. It covers all known Project costs and contains estimate contingency for developmental changes and estimate errors and omissions. It is the baseline tool against which Project costs are measured and will be divided appropriately among all contracts for the work and their respective sub-projects.

Figure 8 illustrates the process by which the OCB is developed from the Project’s cost estimate.

Figure 8: Establishing the Original Control Budget



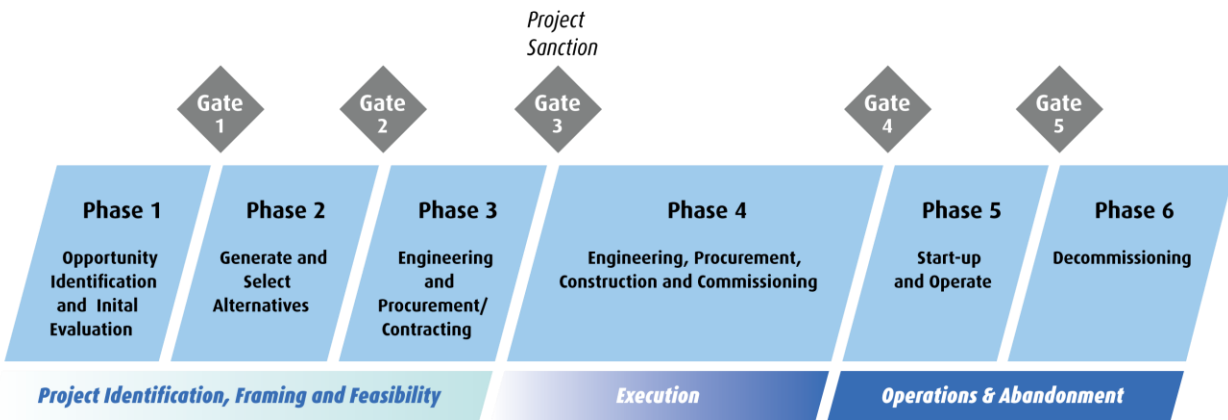
10.0 Project Execution and Delivery Strategy

10.1 Project Implementation Approach

Quality assurance for decision making, as a mechanism to improve project predictability, has been incorporated within the planning and execution of the Project by implementing Nalcor’s structured stage-gate process – the Gateway Process, reference [LCP-PT-MD-0000-PM-PR-0001-01 Gateway Process](#). As depicted in Figure 9, the Gateway Process divides the lifecycle of the Project into several phases starting at opportunity identification and concluding at start-up of the production facility. Each Phase has a list of pre-defined Key Deliverables deemed essential to recommend a risk-informed decision at the end of that Phase, referred to as a Decision Gate, to the Gatekeeper.

Due diligence reviews are required prior to the decision at each Gate. The due diligence review provides an independent review of the status, progress, plans, issues and risks on each key area of the Project, then integrates these into the overall assessment of project risk exposure. Intermittently within each Phase, independent health checks or checkpoints may be performed in order to confirm that the Project is progressing according to plan.

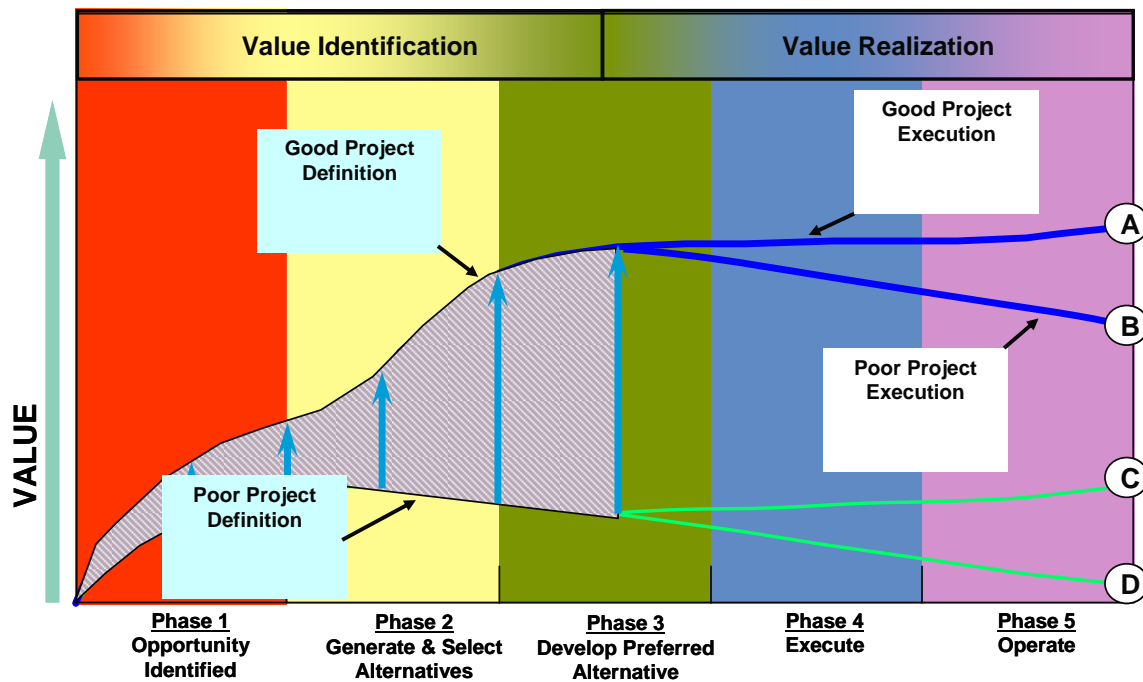
Figure 9: Gateway Process



Consistent with best-practice and lessons learned from other mega-projects, the Lower Churchill Project has been planned using a front-end loading approach where concentrated, focussed effort is made to identify value enhancing opportunities that can be realized during the execution phase as illustrated in Figure 10. This is the underlying approach whereby **Flawless Execution** will be achieved.

In an effort to balance a readiness to commence construction and achieve the target First Power milestone date within the spirit and intention of the Gateway Process, the PMT has and will continue to advance engineering and procurement activities for selective, priority work scopes.

Figure 10: Value Realization



During Gateway Phase 2, the completion of a significant amount of feasibility-level engineering and project planning work was undertaken. As a result of this work, the overarching Project definition is now in place as detailed in [LCP-PT-ED-0000-EN-RP-0001-01 Lower Churchill Project Basis of Design](#). At the end of Gateway Phase 2, referred to as Decision Gate 2, the decision was made to develop the Muskrat Falls generation facility prior to development of the Gull Island facility, with a transmission link to the Island of Newfoundland and an interconnection to the Churchill Falls generating station. This was considered the lowest cost option to meet the island’s energy needs. The Maritime Link will be developed as a means to monetize energy not required on the island.

Following Decision Gate 2, the project moved into Gateway Phase 3, with early activities directed towards ensuring a full readiness of people, processes and tools required to facilitate Nalcor’s effective and efficient interface with the EPCM Consultant selected to manage the Muskrat Falls Generating Facility and the land-based element of the Labrador – Island Transmission Island Link. Concurrently, procurement and contracting activities commenced on bidding the remaining element of the Island Link Component, the SOBI cable supply and installation contract. In addition, on-going feasibility studies are being concluded (e.g. Muskrat Falls geotechnical program, Lidar data collection).

The EPCM Consultant’s immediate focus will be on completion of final feasibility studies and essential engineering and procurement activities to support a start of Early Works at Muskrat Falls following the release from environmental assessment. During Gateway Phase 2, NE-LCP had already undertaken the detailed engineering for selective site infrastructure facilities

referred to as Early Works (e.g. accommodations, access roads, communications and construction power).

Gateway Phase 3 culminates at Decision Gate 3. During this phase, NE-LCP with its EPCM Consultant will complete the level of Project definition (i.e. engineering design, procurement and construction planning) in order to demonstrate that Key Deliverables of Gate 3, reference document [GEN-PM-002 Gate 3 Key Deliverables](#), have been met. These Key Deliverables include a Class 3 Estimate (as defined under AACEI cost estimate classification system) and equivalent detailed schedule for the Project.

Full Project Sanction will occur following the completion of all deliverables required for Decision Gate 3. Project Sanction will trigger the start of Gateway Phase 4 and the award of purchase orders for major permanent plant equipment that have not already been committed to maintain the Target Milestone Schedule, and contracts for the start of major civil construction works. This is the building phase of the Project in which the hydroelectric facility and associated transmission takes shape and peak employment occurs. Concurrent to the start of early construction activities, the remaining engineering, procurement and contracting activities are completed. Early in Gateway Phase 4, a Class 2 Cost Estimate (as defined under AACEI) and commensurate detailed schedule will be produced by Checkpoint 1, as defined in the Project Milestone Schedule.

Gateway Phase 4 ends at Decision Gate 4, which signifies a readiness to commence production of electricity, where all system completion activities have been completed and the generation and transmission facilities are ready to be transitioned to the receiving operations organization. Nalcor Energy will lead the overall Completions activities for the Project as well as establish a Ready for Operations organization who will prepare to progressively accept the plant systems as completed, culminating at Decision Gate 4.

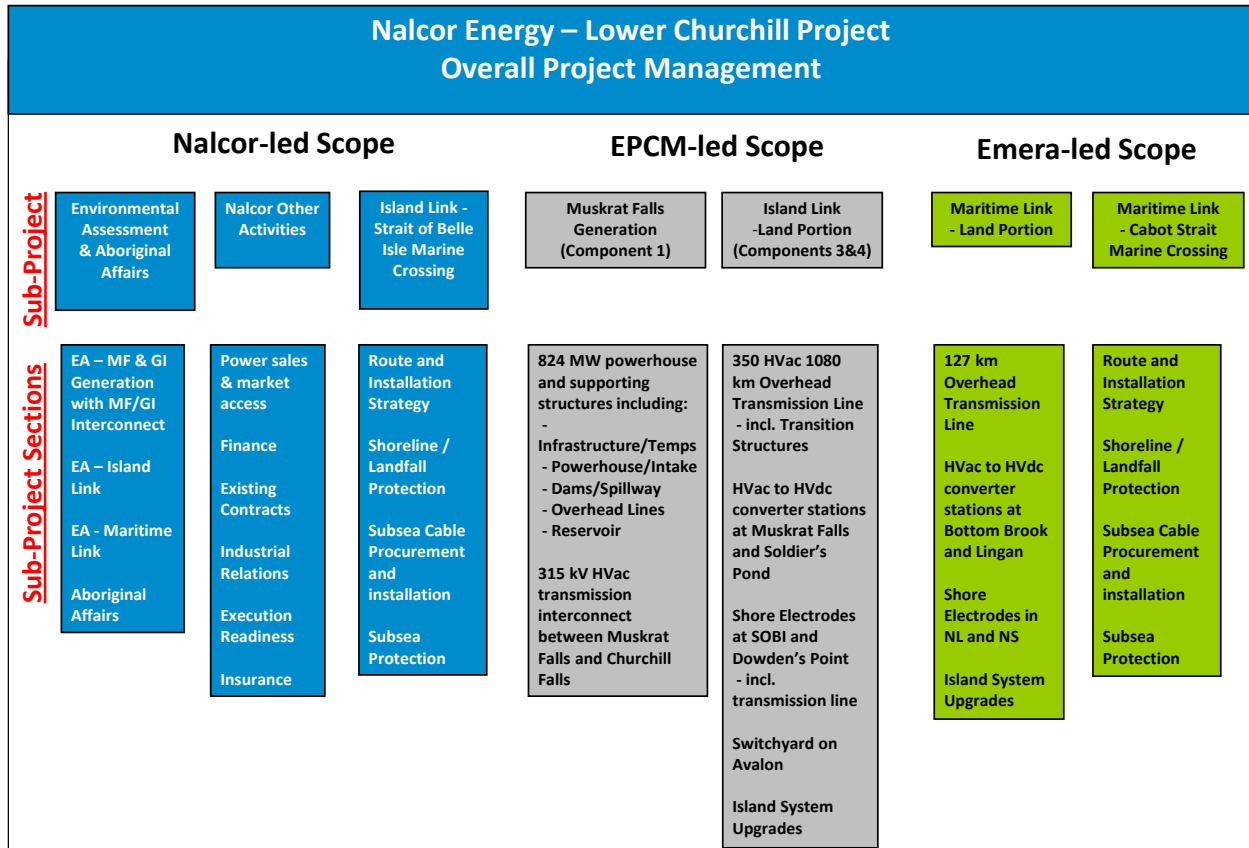
10.2 Project Delivery Strategy

The LCP is a large and complex project. Accordingly, Nalcor has divided the Project Components into Sub-Projects for ease of execution, cost effectiveness and management effectiveness. In terms of overall management however, Nalcor retains responsibility.

The project will distribute the day-to-day management responsibility for the work (by Sub-Project) to the following entities, as displayed in the attached Figure 11:

- In-house NE-LCP teams
- EPCM Consultant
- Emera

Figure 11: Delivery Strategy

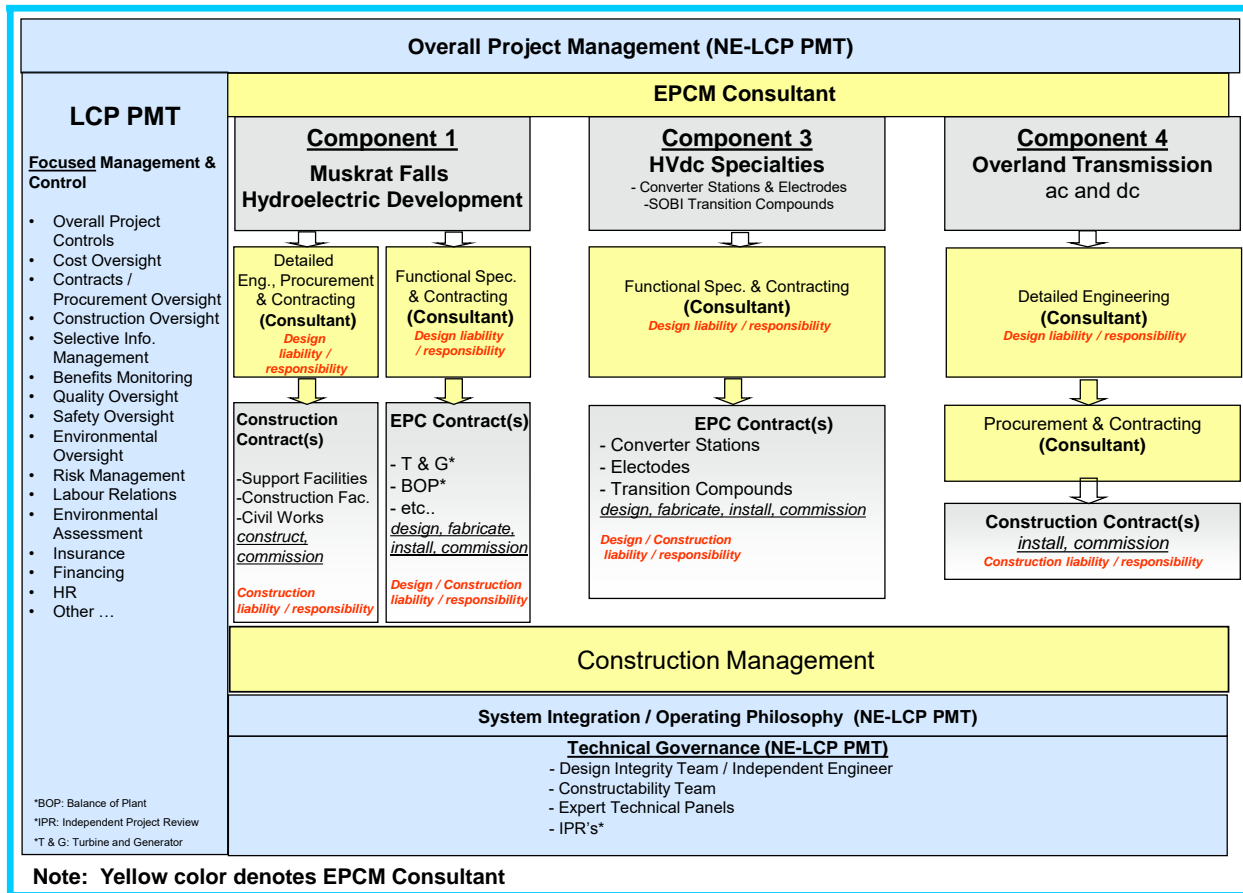


For the EPCM-led scope, NE-LCP PMT provides focussed management and control over the overall project and the selected EPCM Consultant, as illustrated in Figure 12. The EPCM Consultant is responsible for the completion of all project engineering and detailed design, construction execution planning, procurement of permanent plant equipment, issue and management of all supply and construction contracts, and overall construction management for the Project, including custodian for the Project work sites, and Project Completions. The construction contractors will be responsible for the safe and successful execution of their work in accordance with their contracts and approved safety programs, while the suppliers are responsible for delivery of goods and services for the Project.

The scope of Muskrat Falls Generating Facility and Labrador – Island Transmission Link Projects has been divided into three components:

- Component 1: Muskrat Falls Hydroelectric Development
- Component 3: HVdc Specialties, including converter stations and transition compounds
- Component 4: Overland Transmission – both HVac to CF and HVdc to Soldier’s Pond

Figure 12: Overall Nalcor / EPCM Consultant Interfaces and Responsibilities

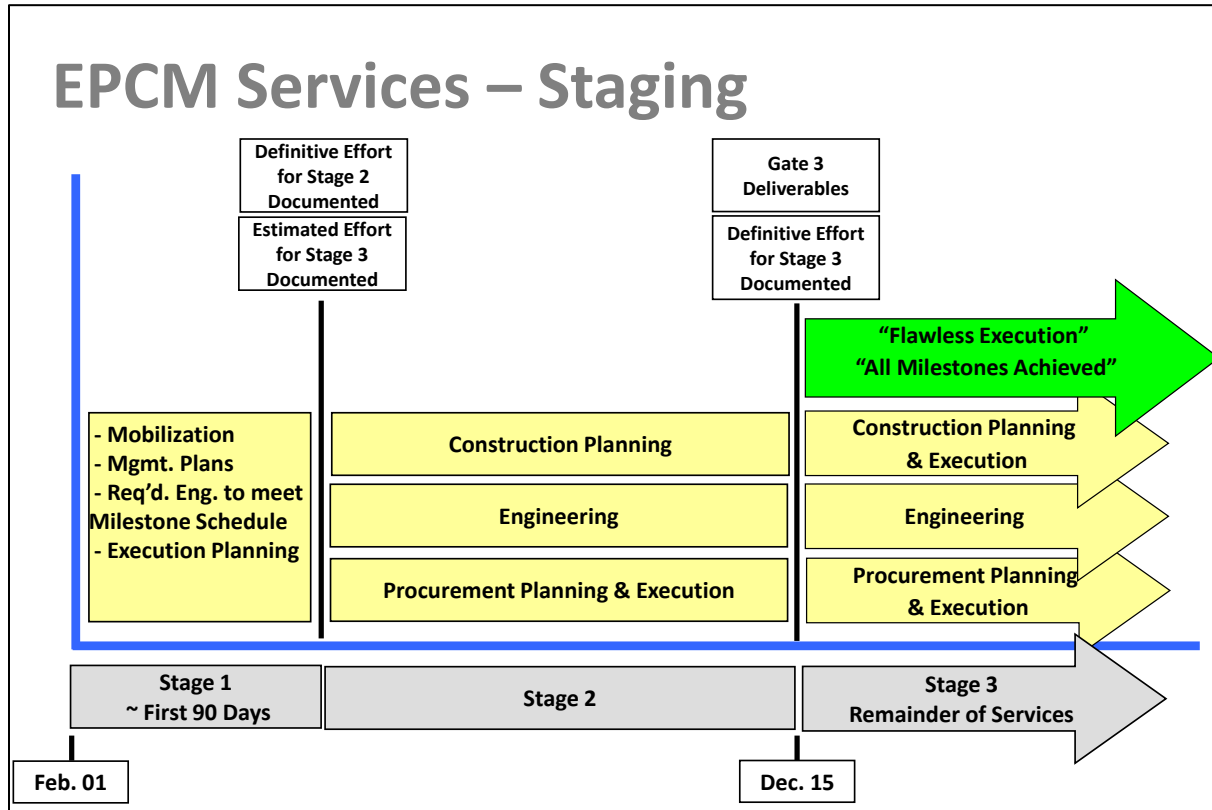


The EPCM Services Agreement is comprised of three (3) distinct stages, each with key objectives:

- Stage 1 – Mobilization of the Services
- Stage 2 – Decision Gate 3 Key Deliverables
- Stage 3 – Balance of Services

This *Project Execution Plan* covers both Stages 1 and 2. Consistent with the requirements of Gateway Phase 3, Stages 1 and 2 are crucial to complete the prerequisite amount of engineering, procurement planning, and construction planning in order to achieve **Flawless Execution** (i.e. all milestones achieved) during the construction phase. Figure 13 illustrates this approach.

Figure 13: Delivery Strategy for EPCM Services through Staging



The Nalcor-led scope includes the development of physical facilities as well as other non-facility elements including Environmental Assessment, Aboriginal Affairs, Power Sales, Finance and other support activities. The Nalcor-led facilities which will be developed include the undersea power cable supply and installation work. This scope is part of the SOBI Crossing Component of the LCP. NE-LCP will execute this work through a series of EPC/EPCI contracts. In this model, NE-LCP PMT provides overall project management across all contracts whilst suppliers and contractors take full responsibility for cost, schedule and quality, as defined in NE-developed performance specifications.

The Emera-led scope covering the Maritime Link Project is planned to be a joint venture arrangement (details to be confirmed) using either an EPC or an EPCM project execution model, while the NE-LCP Marine Crossings Project Team will provide technical and execution leadership for the Cabot Strait cable.

10.3 Overview of Nalcor / EPCM / EPCI Contractor Relationships

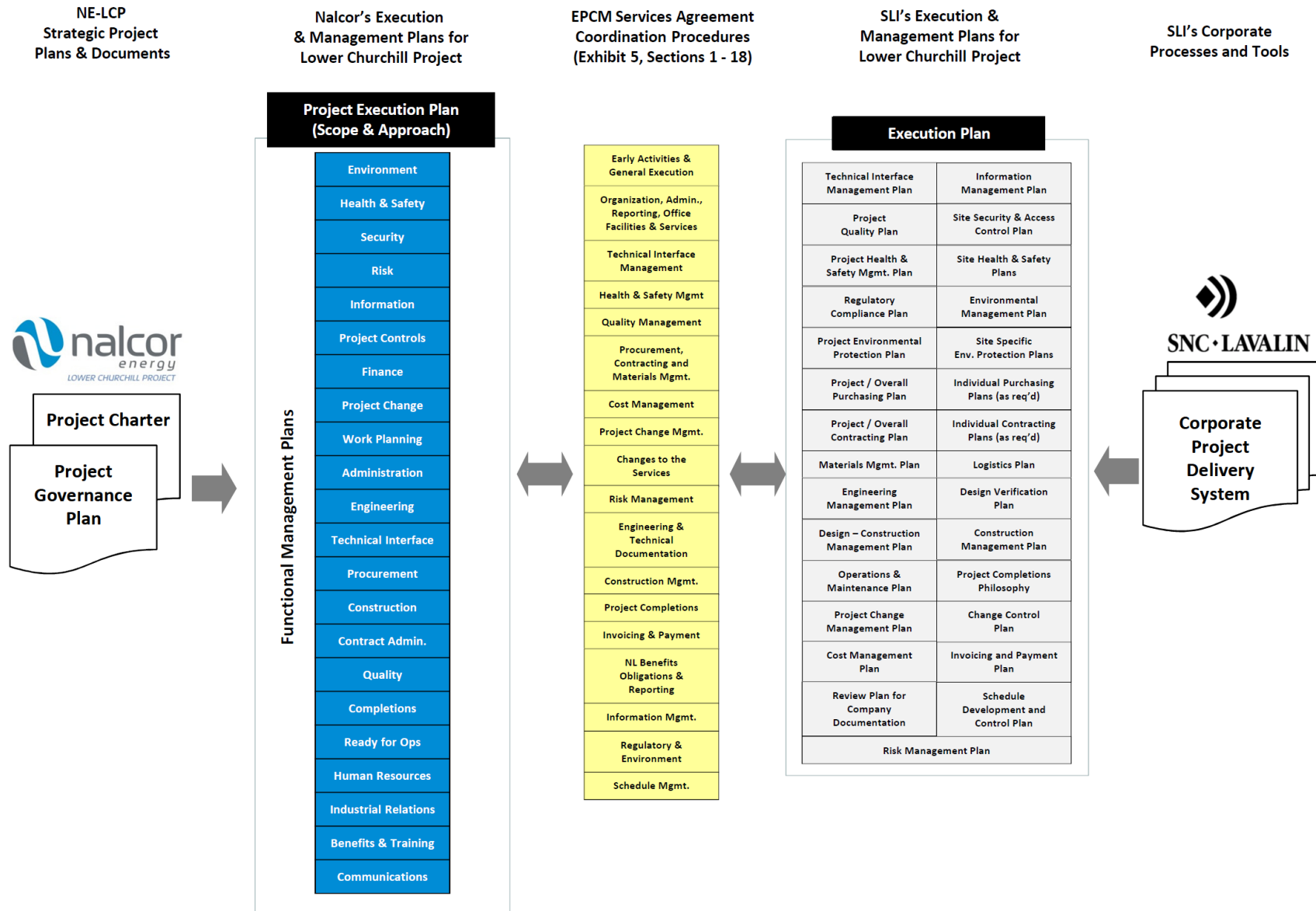
As typical for all projects executed under an EPCM or EPCI Contractor approach, the role of Nalcor as Owner and developer includes many overarching areas that are outside the expertise of the EPCM/EPCI Contractors. NE-LCP will be responsible for a significant number of strategic functions throughout the planning and execution phases of the Project, including:

-
- Establishing the Project Master Schedule and overall execution approach for the Project
 - Establishing the Project Control Budget
 - Establishing and maintaining agreements with outside authorities (e.g. government, stakeholders, etc.)
 - Establishing and maintaining the Project Basis of Design
 - Overall design integrity
 - Recruitment & training of operations staff
 - Industrial (labour) relations and negotiation of Project labour agreement (Special Project Order)
 - Project financing
 - Overall industrial benefits reporting
 - Finance, accounting, treasury, audit functions
 - Establishing Project-wide policies and protocols
 - Placement and management of the Project's insurance program
 - Consultations and agreements with Aboriginal groups, including ensuring all commitments are maintained
 - Environmental assessment and management of all related commitments
 - Overall project-level risk management
 - Conducting Project-level audits
 - Overall Project progress management and reporting against Project cost and schedule baseline
 - Management of interfaces
 - Overall project change management
 - Stakeholder relations and communications

The coordination procedures forming part of the Agreement with the EPCM/EPCI contractors detail this working relationship and how NE-LCP and the contractors will regularly interface, which is captured by Figure 14 in the case of Nalcor and the EPCM Consultant.

A matrix showing the division of responsibilities between NE-LCP PMT and the EPCM Consultant is provided in Attachment B.2. A similar matrix for the EPC/EPCI contractor(s) is provided in Attachment B.3. The differentiator between the assignment of responsibilities within these two matrices is the assumption of risk – an EPC / EPCI contractor will assume more risk and responsibility, hence Nalcor will have less ability to the EPC contractor's internal process.

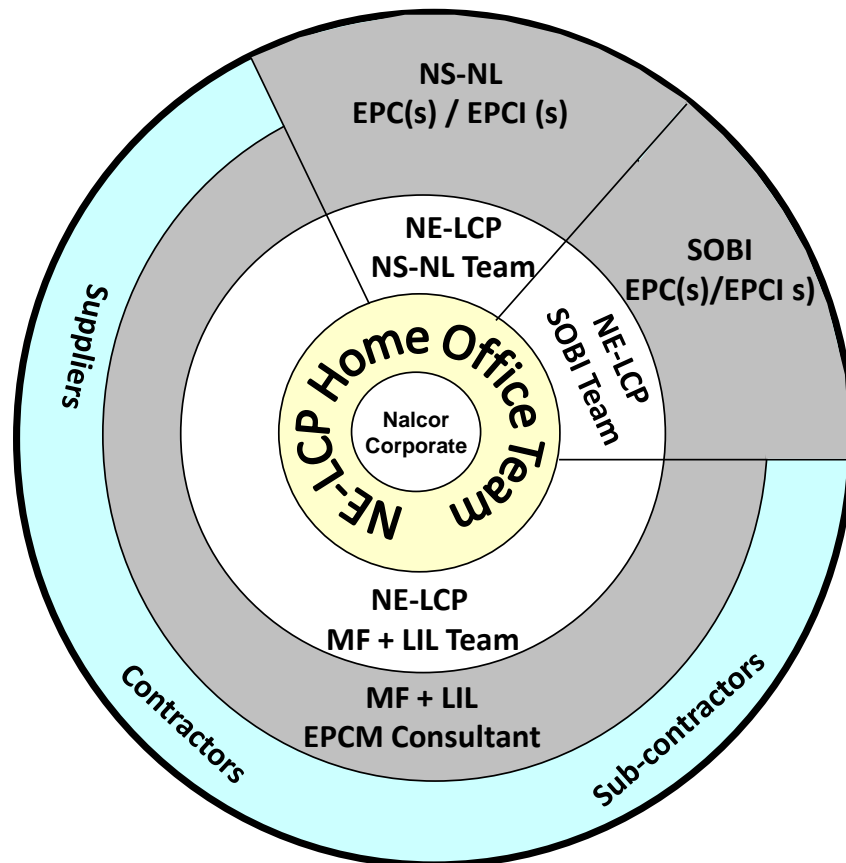
Figure 14: Project Management and Coordination Mechanisms



Within this context the key roles of each of the Nalcor Energy corporate, NE-LCP Home Office Team, NE-LCP Project Management Teams, and EPCM / EPCI contractors are as follows:

- Nalcor Energy Corporate have the role of interfacing with Shareholder and establishing Corporate-wide standards and policies.
- NE-LCP Home Office Team has overall management for the Project and interfaces with NE Corporate.
- NE-LCP Home Office Team establishes the Project Master Schedule, policies, processes and procedures that the Muskrat Falls, Labrador – Island Transmission Link, and SOBI Project Management Teams follow and provide matrix functional support to these teams.
- NE-LCP Project Management Teams manage the EPCI Consultant and EPC/EPCI contractors and EPCM Consultants in accordance with the terms of the contract and this Project Execution Plan and associated Management Plans.
- The EPC and EPCM Consultants manage their vendors, contractors and sub-contractors.

Figure 15: Fundamental Organizational Interfaces



10.4 Contracting Plan

Table 4 provides a summary level listing of the envisioned main supply and construction contract packages for the Project. Refer to [LCP-PT-ED-0000-SC-LS-0001-01 Muskrat Falls and Island Link Master Contract Package List](#) for a complete listing of all packages. The EPCM Consultant(s) will be responsible for the final packaging arrangement (except for the SOBI crossing), which will occur in early Gateway Phase 3.

Table 4: Summary of Major Contract Packages

Nalcor Package Ref. No.	Package Title	Description / Scope	Procurement Philosophy
A-001	Accommodations Complex Buildings – Supply & Install	Muskrat Falls	Combination – lump sum and unit rates
C-001	Main Site Access Road - South Side	Muskrat Falls	Combination – lump sum and unit rates
C-002	Site Preparation & Site Access Roads	Muskrat Falls	Combination – lump sum and unit rates
C-004	Bulk Excavation Works	Muskrat Falls	Unit rate
C-005	Intake and Powerhouse Construction	Muskrat Falls	Unit rate
C-006	Spillway Structure Construction	Muskrat Falls	Unit rate
C-007	North Spur Stabilization & Cofferdams Construction	Muskrat Falls	Unit rate
C-008	RCC Dams - North & South Construction	Muskrat Falls	Unit rate
E-003	Converter Stations @ Muskrat Falls and Soldiers Pond	Island Link	Unit rate
E-005	Electrode design, supply, construction	Island Link	EPC lump sum
E-008	Transmission Line Construction and Installation	Island Link	Unit rate
E-009	Conductor for AC / DC overhead lines – Supply	Common	Lump sum
E-011	Tower Steel – Supply	Common	Lump sum
G-002	EPCM Services	Common	Unit rate
G-014	Reservoir Clearing	Muskrat Falls	Unit rate
G-020	3 rd Party Expediting Services	Common	Unit rate
G-021	3 rd Party Inspection Services	Common	Unit rate
M-002	Turbine & Generators – Supply & Install	Muskrat Falls	EPCI lump sum
M-003	Balance of Plant – Supply & Install	Muskrat Falls	TBD
M-004	Spillway Gates – Supply & Install	Muskrat Falls	Lump sum
M-005	Intake Gates – Supply & Install	Muskrat Falls	Lump sum
M-007	Powerhouse Crane – Supply & Install	Muskrat Falls	Lump sum
M-008	Powerhouse Building	Muskrat Falls	Lump sum
SB-003	Submarine Cable Design, Supply and Install	Island Link	EPCI lump sum
SB-008	HDD Detailed Design	Island Link	Unit Rate
SB-010	HDD Construction	Island Link	Combination – lump sum and unit rates
SB-011	Rock Berm Design, Supply and Install	Island Link	EPCI Unit rate

10.5 Engineering, Procurement and Construction Approach

10.5.1 Engineering Approach

As indicated in Section 10.2, the Project will, with the exception of the Strait of Belle Isle (SOBI) HVdc cable crossing, be executed utilizing a traditional Engineering, Procurement and Construction Management (EPCM) delivery method. The EPCM Consultant is responsible for the completion of all engineering for the Project, with the exception of the SOBI Crossing and Maritime Link. In the case the SOBI Crossing, detailed engineering will largely be completed by the various EPC and EPCI contractors.

Oversight from a technical and design integrity perspective for the EPCM Consultant's scope will be implemented by NE-LCP's Technical and Design Integrity functional led by NE-LCP's Engineering Manager, as detailed in the [Engineering Management Plan](#), document no. [LCP-PT-MD-0000-EN-PL-0001-01](#). In this regard, NE-LCP's Engineering Manager is responsible to lead the function of Technical and Design Integrity for Nalcor, which includes provision of technical and design integrity oversight of the EPCM Consultant as well as execution acceptance of key deliverables as described in the EPCM Agreement. Specific responsibilities will include the following:

- Overall functional management of Nalcor Energy's LCP Engineering and Technical & Design Integrity staff;
- Preparation and stewardship of the Lower Churchill Project – Basis of Design;
- Preparation of and management of NE-LCP Design Philosophies;
- Ensuring that the Project designs reflect the overarching Project policies and principles with respect to design and technical integrity;
- Review and acceptance of all design criteria and Design Briefs produced by EPCM Consultants, SOBI team, and EPC contractors;
- Ensuring consistency of engineering management for all Project components (Muskrat Falls, Island Link, SOBI);
- Ensuring that materials and equipment are provided in compliance with specifications; and
- Ensuring that construction, assembly, commissioning and testing are completed in compliance with specifications.

The delivery approach for the SOBI Crossing Project will largely be via several EPC or EPCI arrangements with NE-LCP acting as overall Project Manager. As is typical for EPC arrangements, the technical basis for the contract is founded in the technical specifications issued by NE-LCP during the procurement process, while NE-LCP's technical oversight will be aligned with the principles outlined in the [Engineering Management Plan](#), document no. [LCP-PT-MD-0000-EN-PL-0001-01](#).

Specifically in support of the SOBI project, the Technical and Design Integrity function shall:

- Maintain T&DI oversight and steward input into key deliverables for the SOBI project as produced by the EPC or EPCI contractors;
- Confirm that SOBI project deliverables are provided to Nalcor in accordance to NE-LCP and Nalcor specifications;
- Accept project final deliverables including mechanical completion, as-built and commissioning documentation on behalf of Nalcor Operations; and
- Ensure the SOBI project deliverables meet the Operations and Maintenance objectives of Nalcor in accordance with the requirements outlined in the project specifications.

Status of Engineering

Significant engineering work was carried out by Nalcor Energy from 2007 through to 2010. All relevant documentation will be made available to the EPCM Consultant. A broader base of study reports dating back to the 1960's is also available in-house, and can also be made available to the EPCM Consultant. As a result of the earlier work, the overarching LCP definition is now in place as described in the [Lower Churchill Project Basis of Design](#), reference document no. [LCP-PT-ED-0000-EN-RP-0001-01](#)

During Gateway Phase 2, Nalcor Energy has already undertaken the detailed engineering and procurement for selective site infrastructure facilities referred to as Early Works (e.g. accommodations, access roads, communications and construction power). The engineering deliverables resulting from this work have been provided to the EPCM Consultant.

Engineering to be performed in Gateway Phases 3 and 4 will build on, and not duplicate, the earlier work. It is noted, however, that the status of engineering at the end of Gateway Phase 2 is preliminary and represents the current state of design development as of the end of Gateway Phase 2. Following award of an agreement with the EPCM Consultant, the EPCM Consultant commenced review of all documentation and data provided by Nalcor Energy.

Technical Interface Management

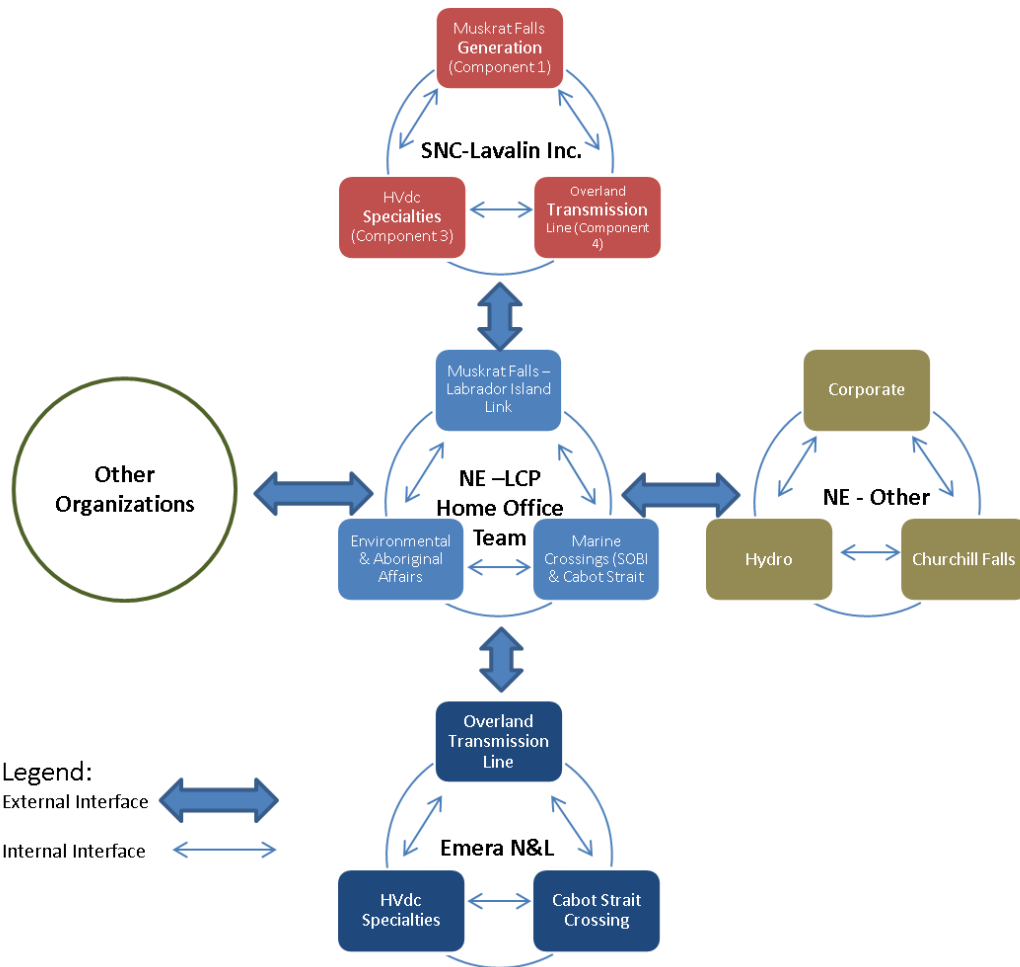
The controlled and structured management of technical interface issues between the various groups responsible for each facet or component is achieved through the ensure clarity for interface ownership and the establishment of a simplistic, visible interface management process. The [Project Technical Interface Management Plan](#), reference document no. [LCP-PT-MD-0000-PM-PL-0006-01](#), provides both the strategy for interface management and the formal process to effectively manage technical interfaces.

Generally the party who is responsible for delivery of the particular project component is responsible for all internal interfaces and as external interfaces that touch them. For example, the EPCM Consultant has primary responsibility for a technical interface management within the Project as it pertains to their project scope. However, where technical interfaces exist

between parties that do not include the EPCM consultant, such as NE-LCP with its EPC contractors or Nalcor Churchill Falls, the NE-LCP Project Technical Interface Management provides the process for management of such interfaces.

Figure 16 below provides an illustration of some of the key groups between which and within which technical interfaces will exist. Examples of both external and internal interfaces are provided.

Figure 16: Lower Churchill Project Interface Management Groups



10.5.2 Procurement Approach

The EPCM Consultant will be responsible for the procurement of the equipment, materials and services required to physically construct the Muskrat Falls Generating Facility and Labrador – Island Transmission Link, excluding the SOBI Cable Crossing. NE-LCP’s Supply Chain Management function will provide oversight of the EPCM Consultant as well as lead the procurement process for equipment, materials and services procured directly by Nalcor for the

SOBI Cable Crossing and those other areas under Nalcor's direct management as discussed in Section 10.2.

NE-LCP's [Procurement Management Plan](#), reference document no. [LCP-PT-MD-0000-SC-PL-0001-01](#), provides the structure and fundamental guidelines by which the Project obtains equipment, materials and services:

- On a competitive basis whenever possible;
- At the lowest evaluated cost;
- Consistent with Project technical, quality and HSE requirements;
- Within a time frame which meets the Project Control Schedule and critical path;
- While satisfying the above objectives, execute commitments based on the Project benefits strategy and other agreements such as, Impacts and Benefits Agreement (IBA) and conditions of release from the Environment Assessment (EA);
- On a timely basis to ensure on-schedule completion; and
- In accordance with coordination procedures included in relevant contracts.

NE-LCP's Supply Chain Management Team will purchase all equipment, supplies and services for the Project in accordance with established NE-LCP procedures detailed in the Project's procurement procedures. If required, any Contractor, Consultant or service provider to the Project is expected to provide their own procurement plan, as detailed in the respective agreement. The EPCM Consultant will be required to provide such a plan.

Purchase Orders/Contracts will be issued using the Project's standard PO/Contract terms and conditions. Procurement will be managed, tracked and coordinated utilizing the Owner's Project Management System (PRISM). PRISM will be used to produce Purchase Orders, thus facilitating purchasing, receiving and invoice payment.

Project Requisitions must be completed and authorized by the appropriate level of authority, in accordance with the [Capital Expenditure Authorization Procedure](#), reference document no. [LCP-PT-MD-0000-FI-PR-0001-01](#), before the Procurement Team can proceed. Section 12.1 Financial Control provides further details on this process.

The scope of the procurement activities are listed below:

- Planning procurement activities;
- Developing and maintaining the Procurement register in PRISM;
- Prequalification of contractors and material suppliers;
- Development of appropriate general terms and conditions of Purchase Orders and Contracts approved by the Owner's legal department. The approved terms and conditions serve as a starting point and basis for negotiation with suppliers;
- Prepare inquiry packages, including bidders list;
- Issue inquiry packages;
- Manage inquiry process, including but not limited to:
 - Issue Requests for Information (RFI)
 - Issue Requests for Proposal (RFP) or Requests for Quotation (RFQ)

- Receive proposals
- Prepare and issue addenda
- Receive and open proposals
- Commercially evaluate proposals
- Prepare complete award recommendation, incorporating commercial, technical, HSE, Quality and Benefits evaluations
- Award PO's and Contracts; and
- Prepare necessary contract documentation.

Following the award of contracts, contract administration will be carried out in accordance to the principles and approaches contained in [Contract Administration Plan](#), reference document no. [LCP-PT-MD-0000-CA-PL-0001-01](#).

Procurement Schedule

The overall procurement schedule (i.e. Commitment Package Network) is a subset of the Project Control Schedule that sets key dates for delivery of packages for materials and services from contractors, suppliers and consultants. Each procurement package will be released against the Project Control Schedule and tracked through a weekly Package Status Report to provide status of key delivery milestones on the basis of scheduled, forecasted and actual delivery. For the EPCM Consultant's scope, the Package Status Report data will be managed through the EPCM Consultant's project management software package (PM+) to facilitate rapid trend analysis and performance assessment / management. In the case of the SOBI Marine Crossing, the Package Status Report will be produced as a sub-set from Primavera within an intertie to Prism.

Procurement schedule activities will be reviewed by the Project team during the Project stewardship meeting process and reported in accordance with this and the Project Management Plans.

Supplier Responsibilities

Suppliers will be held fully responsible for the technical compliance and performance of equipment/systems provided in addition to competency and performance of Suppliers personnel. The provision of quality materials, equipment and workmanship, as well as meeting schedule or delivery commitments will be achieved by including (and, if necessary, exercising) holdbacks, performance securities (performance bonds Letter of Credit (LOC) and/or parent company guarantee) and incentives/disincentives in the Supplier contracts.

Bidders' responses to Requests for Proposals must include specifications and data including quantification of performance criteria, quality standards and a statement that the bidder will co-operate with third party QA/QC inspectors (if applicable) as assigned by the Project.

Commercial

Standard terms and conditions will apply to all purchases of goods and materials, construction contracts and professional / technical services respectively.

Formal sealed competitive proposals will normally be solicited from a minimum of two (2) pre-qualified bidders for equipment, materials, goods and services unless the prequalification process has identified less than two (2) acceptable bidders or a purchase is determined to be a sole-sourced item. Additionally, the Project may take advantage of existing key supplier or standing commodity agreements with the Owner or major contractors to obtain the best possible terms.

Construction materials and commodities that may be deemed a major Project risk may be purchased by the Project and free-issued to contractors. Exceptions will include miscellaneous low risk items or specialized items that can best be supplied by a contractor. Contractors will be responsible for all equipment and parts for equipment that they provide. Items supplied directly by the Owner will be defined prior to start of the procurement process.

Adherence to Benefits Commitments

Nalcor has negotiated an Impacts and Benefits Agreement (IBA) with the Innu Nation and, once ratified, it will be necessary for the Owner's Procurement Team and all Contractors to fulfill the obligations contained within the IBA, including the bidding of designated IBA packages.

Nalcor Energy has also negotiated a Benefits Strategy with the Province of Newfoundland and Labrador and commitments made in that strategy will become obligations of the Contractors as well, including monitoring and reporting of benefits. The consolidation and reporting of all benefits related information will be facilitated by Project Controls, with the support of Procurement, for provision to the Benefits department for communication with key stakeholders.

10.5.3 Construction Approach

The general approach to construction will be to optimize the number of contractors working on site in consideration of contractor capability, the number of interfaces created, and to accommodate market conditions. Individual contracts will be treated as sub-projects within the overall execution approach, with a sharing of common resources and infrastructure managed by the EPCM Consultant (e.g. accommodations, transportation services, fuel, etc.). Section 10.4 details the envisioned primary contract packages at Decision Gate 2. The overall contract package breakdown will be revisited in Gateway Phase 3 in order to produce an updated overall contracting plan for the Project.

The following sub-sections outline the general construction sequence for each of Muskrat Falls, the Island Link, and the SOBI.

Muskrat Falls Generating Facility

The first item of importance to the construction program at Muskrat Falls is to establish site access. This will be done by constructing an access road along the south side of the river from Blackrock Bridge to the MF construction site. This road is approximately 18 km long, and it is currently estimated that it will take about 3 to 4 months to complete this road. However, it is possible to mobilize the construction equipment required for the initial works at the site on this road before it is fully completed.

Once access is gained to the construction site on the south side of the river, site infrastructure works can begin. This includes site roads, accommodations infrastructure and installation/erection, communications and construction power infrastructure, potable & sanitary water supplies, septic infrastructure, etc. The main site accommodations complex and associated infrastructure will be established in two phases – a starter camp to facilitate the initial works and a follow-on or full camp, that will be required to support the main construction.

Once access has been gained to the South Side, work can begin on the clearing operations for the reservoir on the South Side. Clearing for the north side of the reservoir can begin earlier, utilizing access routes on the North side from the Trans-Labrador Highway.

Concurrent to the commencement of early works construction will be the commencement of right-of-way clearing for the Muskrat Falls to Churchill Falls HVac transmission line, with the first line scheduled to be completed by August 2014.

The primary civil works for the facility will begin with the excavation (overburden & rock) for the spillway and the powerhouse, as well as the intake and tailrace areas near the powerhouse.

After excavation, stage 1 concreting can begin in the powerhouse, as well as the intake and spillway. At this time, some components will be required for the spillway and intake gates, as well as the turbines.

During this time, some civil works will also be taking place on the North Spur. This is necessary in order to stabilize the spur in order to ensure its viability as a natural dam, holding back the reservoir. This work is not expected to be critical and could largely be performed during the prime construction months over several years, with the only real constraints being gaining access to the spur, and ensuring that all of the work is completed prior to impoundment, while ensuring that the cultural sensitivities of the north spur are respected at all times.

After the powerhouse stage 1 concreting, the powerhouse superstructure can be built, and the crane erected. The superstructure will start from the assembly hall, and proceed through the powerhouse. Generally, at this same time, the unit assembly will proceed. As the unit erection will require the use of the assembly hall and the powerhouse crane, the superstructure and the turbine build sequence is closely linked.

Once the spillway gates are installed, stage 1 impoundment would occur, requiring the removal of the “plug” at the intake and outlet of the spillway. This is required so that the cofferdam can be placed in the river to facilitate the construction of the North dam. In doing this the course of the river is changed to push it through the spillway. Stage 1 impoundment raises the river level to about elevation 24m.

After the cofferdams are constructed, the foundation works for the north dam can begin. At about this same time, the south dam construction can take place. It is possible to construct this dam earlier, but it is thought that doing so would not gain any schedule advantage, and may come at a slight cost increase, as the current consideration is that both dams would be constructed of RCC and would be done by the same contractor. Early construction would require earlier or double mobilizations, potentially adding to project costs.

After the north dam foundations are complete, the north dam can be built. It is thought that two construction seasons would be required for the dams works – including the cofferdams, foundations preparation and dam construction. The north dam could be constructed in the same season as the south dam, or in the season prior, in order to prove/verify the contractor’s ability and the placement rates.

At about this time the switchyards at Muskrat Falls and switchyard modifications at Churchill Falls will begin. These switchyards could be started earlier, at the risk of increasing Interest During Construction costs, but potentially could provide for a smoother resource utilization for these activities.

It is likely that about this time the reservoir clearing would be nearing completion, and decommissioning of this work would begin. This decommissioning involves removing bridges, as well as any infrastructure created to support the reservoir clearing and habitat enhancement operations (temporary campsites that were not already decommissioned, road surface modification to prevent unintended usage and to promote re-growth, etc.).

During this time, turbine unit assembly should be well along, leading to the commissioning of the turbine units in sequence, with power being generated from each unit in turn. This requires the removal of the tailrace “plug” that was left in place to prevent flooding of the powerhouse, and completion of impoundment to the Minimum Operating Level.

In sequence with the first power generation at Muskrat Falls, it is necessary to have the transmission system in place from Muskrat Falls to Churchill Falls, along with the switchyards at

Muskrat Falls and Churchill Falls. While each component would be commissioned individually, the entire system would be commissioned and synchronized during this commissioning phase.

Note: *The above construction sequence does not consider the implications of WTO MF 1340 and subsequent Project Changes to adjust the plant orientation by 30 degrees or modify the spillway configuration.*

Labrador – Island Transmission Link

Overhead transmission lines are to be installed from the Muskrat Falls generating facility to the Strait of Belle Isle. The lines will leave the Strait of Belle Isle on the Island side and travel to Soldiers Pond on the northeast Avalon Peninsula.

The overhead transmission system will consist of two conductors and an overhead ground wire connected at the top, the function of which will be to shield the other infrastructure from possible lightning strikes. The overhead ground wire will be equipped with a fiber optic cable (OPGW) to fulfill the communication requirements between the converter stations. All lines along the transmission route will be supported by galvanized steel towers. The spacing of the transmission towers will be based on topographic, meteorological and other environmental factors.

A 2 km wide transmission corridor has been chosen for planning of the HVdc transmission route. This corridor contains the current transmission route along with several alternative segments. Once the actual transmission route is selected, a right-of-way of approximately 60 m will be cleared (the right-of-way width is site specific and may range from less than 60 m and up to 80 m, depending on the areas). Detailed routing of the HVdc transmission lines will be determined by a comprehensive route selection process based on technical and environmental and within the corridor.

The Muskrat Falls and Soldier Pond converter stations are to be built on concrete foundations over a levelled gravel surface yard and grounding grid. Galvanized steel structures will be erected to support the switchgear and other electrical equipment. A valve hall will also be constructed at each converter station site to house the converter equipment.

Four (4) existing transmission lines are to be connected to the Soldiers Pond converter station to allow the transmission of electricity to the Island electrical grid. To ensure proper integration of the HVdc system into the Island grid several modifications may need to be implemented, including the installation of transmission line compensation equipment, synchronous condensers, static var compensators, circuit breakers, disconnect switches and other instrumentation, as well as conductor replacement.

The converter station engineering and construction phases are scheduled for an approximate duration of four years. The first and second years will include design, procurement and manufacturing of specialized equipment. The third and fourth years will encompass the

construction of the facilities, including site preparation, outfitting, supporting infrastructure installation, and testing and commissioning

Two low voltage conductors will connect the converter stations to a small take-off structure. The conductors will be carried on 10 m to 12 m high wood poles with approximately 60 m spacing. Cables will then extend from the take-off structure to attach to each individual electrode element.

Installation of a wood pole line for the shore electrodes, depending upon the amount of clearing along the transmission right-of-way, is scheduled for approximately twelve months. Construction of the electrode site, including electrode installation, take-off structure construction, associated infrastructure installation and breakwater construction is scheduled for an approximate duration of eight months.

SOBI Marine Crossing

The conceptual design of SOBI Marine Crossing portion of the Labrador – Island Transmission Link forming the DG 2 basis is described in [SOBI Marine Crossing “Phase 2” Conceptual Design](#), reference document no. [ILK-PT-ED-8110-MR-RP-0001-01](#). The following sections detail the process for the cable installation on a conceptual design basis.

Routing

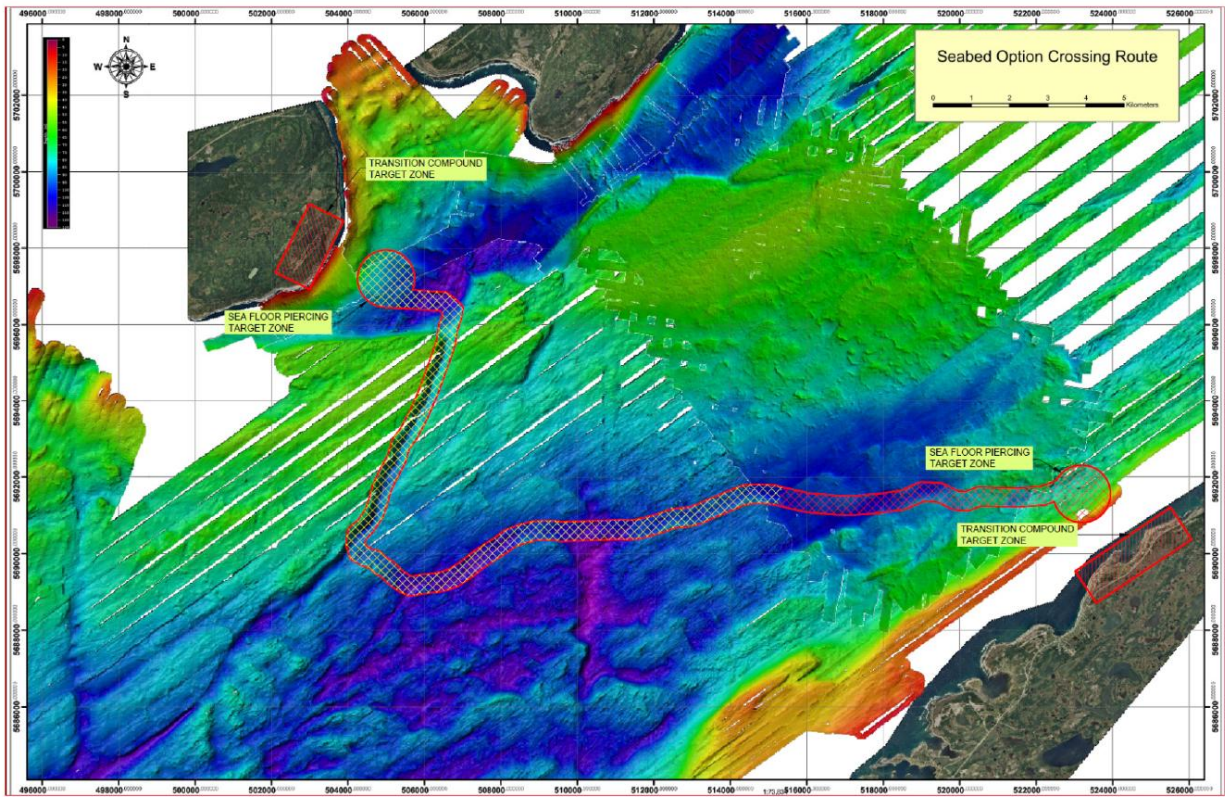
The cable corridor in which the conceptual cable route is to be defined is as shown in Figure 17. This corridor takes into account the landfall and protection methods discussed in this report. The estimated length is approximately 36 km with roughly 32 km on the sea floor. The route is depicted within a 500 m wide corridor with a 1500 m diameter circular seafloor piercing target zone for HDD. Detailed cable spacing and routing will be carried out in Gateway Phase 3 with a recommendation that a no fish zone be established.

Cables

The current conceptual cable design includes:

- Single Core (Copper or Aluminum conductor, pending detailed design)
- Mass impregnated paper insulated cables
- Single Core (Copper or Aluminum conductor, pending detailed design)
- Double wire armor (DWA) in a counter-helical fashion to maximize pulling tension and provide rock armoring. Armor will consist of steel wire coated in Bitumen.
- Outer serving will consist of two layers of polypropylene yarn or high density polyethylene as needed.
- Cables will each be rated to carry 450 MW at 350 kV.

Figure 17: SOBI Conceptual Design Routing



Transition Compounds and Terminations

At each side of the crossing, all three cables will terminate at a Transition Compound, to be designed, supplied, and constructed by the EPCM Consultant. It is envisaged at this time that the cables will be pulled to shore then land trenched to the location of the transition compound. The compound location is not yet defined but will most likely be located 150 m to 1000 m from each shoreline. The compound will house the cable terminations, as well as any switch gear that is required for system operation. Actual footprint and height of the compounds will be determined by the EPCM Consultant and are based on isolation requirements and installation techniques of the terminations. The cables will enter the transition compound through a foundation penetration.

End terminations for each cable will reside inside the Transition Compound, and will be inclusive of the stand, insulator, and ancillary equipment. All equipment associated with the end termination will be supplied and installed as part of the cable supply contract.

Landfall - HDD

For both shore approaches, Horizontal Directional Drilling (HDD) will be utilized to protect the cables and will run from the shore to a point on the seafloor within the designated piercing target zone. This point will be approximately 2 km from the shoreline, however may become shorter or longer pending detailed design. The HDD solution will provide steel-lined boreholes

for each shore approach. A footprint of approximately 2-6 acres is required on both Newfoundland and Labrador sides of the Strait to safely execute the HDD scope.

Cable Installation

The current philosophy is that the cable installation will include a subsea joint to allow for pull-in without laying an over length on the seafloor. The sequence for each current cable installation is as follows:

- Pull-in side 1
- Normal lay
- Abandon
- Pull-in side 2
- Normal lay
- Recover side 1
- Join
- Abandon

Deepwater Zones – Rock Placement

For the deepwater zones rock placement will be utilized to protect the cables between the HDD seafloor piercing on the Newfoundland side and the HDD seafloor piercing on the Labrador side. Each cable will be protected by a dedicated rock berm, which will be 0.5 - 1.5 m high with the potential for higher regions if additional protection is required. Preliminary studies suggest that the rock berm will have a nominal side slope ratio of 1:4 (rise:run) and will be 8-12 m wide at the base. The current rock has been based on a 8" D minus (maximum graded target size will be 8 inch diameter).

11.0 Nalcor's Project Management Organization

The focus of NE-LCP's Project Management Organization in Gateway Phase 3 is to progress the Project through the mobilization of the EPCM Consultant, detailed design activities, and Early Infrastructure Works. This organization plan will be revisited and revised later in Gateway Phase 3 following a review of the overall performance of the project, including that of the EPCM Consultant.

Objectives of the current organizational plan include:

- Successfully prepare for the mobilization and ramp-up of the EPCM Consultant, early design activities and award of the SOBI cable supply and installation contract.
- Establish the concept of Area / Scope Management with Area or Scope Manager as the individual responsible for the overall delivery, including scope, cost and schedule management for a particular project area.
- Encourage functional support, alignment, and buy-in via the Project Management Team and Area / Scope Management concept.
- Facilitate the on-going management of the Environmental Assessment process.
- Recognize the extensive system integration and planning involvement regarding integrating the Island's electrical system with mainland North America.
- Recognize the need to work with Emera to develop the Maritime Link Project.
- Safely support project execution including Early Works.
- Promote team alignment and alignment with Nalcor Energy corporate functional departments.

11.1 Organizational Model and Basis

The overall strategic management of the NE-LCP will be through the Project Director who has a line reporting relationship to the NE-LCP Vice President. The Project Director will reside within the Home Office Team.

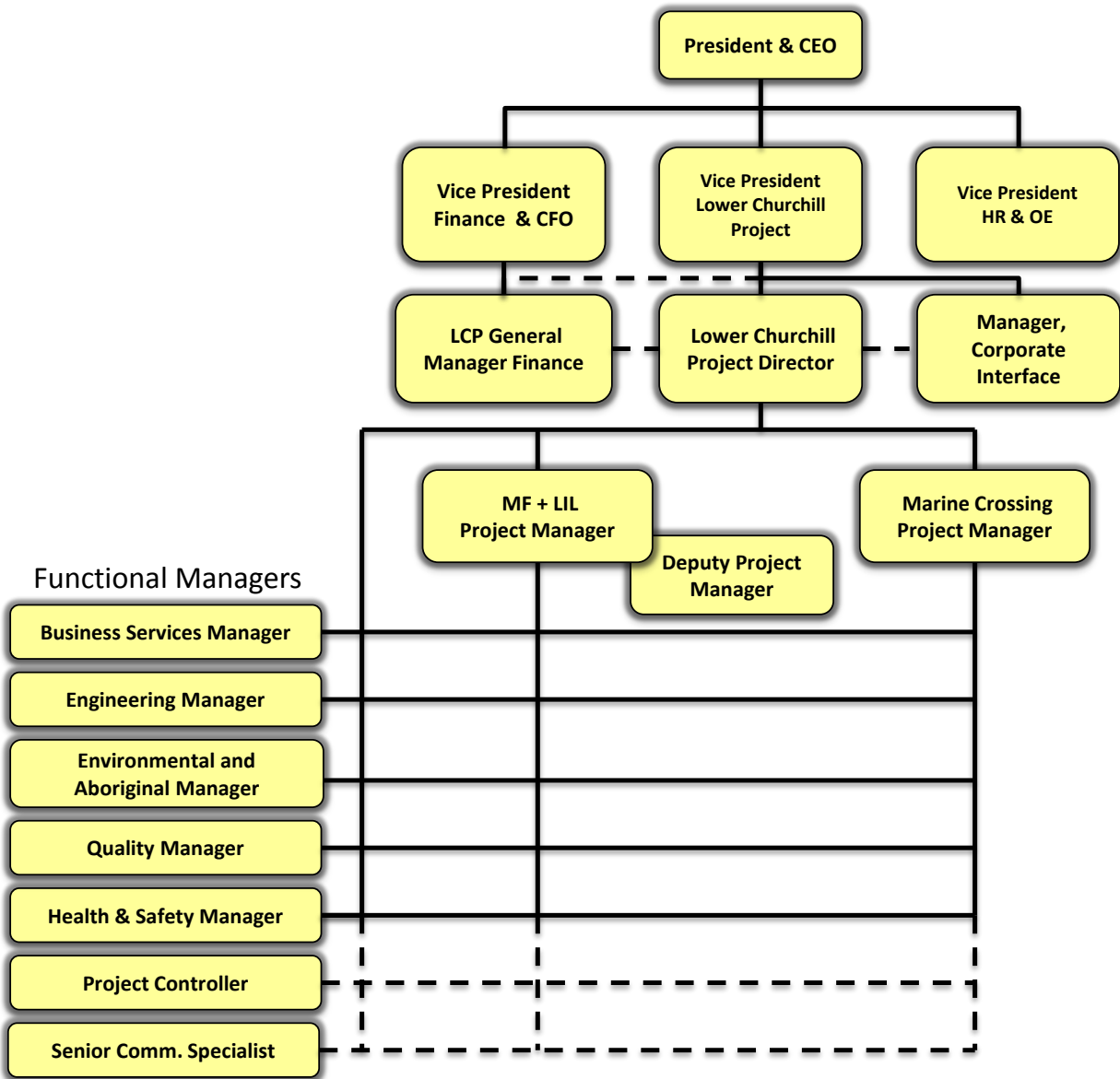
As illustrated in Figure 18, reporting to the Project Director will be designated Project Managers, with supporting teams, for each of the Muskrat Falls and Labrador-Island Transmission Link, and the SOBI Cable Crossing projects (the Maritime Link Component will be addressed in future issues of this PEP), and various Functional Managers. These Project Managers will lead the Project Management Teams for each of these Projects, which will be comprised of full-time, embedded functional expertise provided by the Functional Managers. This "strong project-matrix based organization" has been implemented to support the Project Manager's in the delivery of the sub-Projects.

The role of General Manager Finance, LCP, reporting in solid-line reporting relationship to the CFO & VP Finance and dotted line to Vice-President, LCP has been introduced in an effort to promote alignment with Nalcor Energy corporate functional departments. This position is

accountable for provision of effective financial controls, as well as maintaining a strong focus on corporate interface, risk management and financing support. Reporting to the GM Finance, while embedded within the Project Team, is the Project Controller with his/her supporting functional expertise (e.g. accountants, etc.)

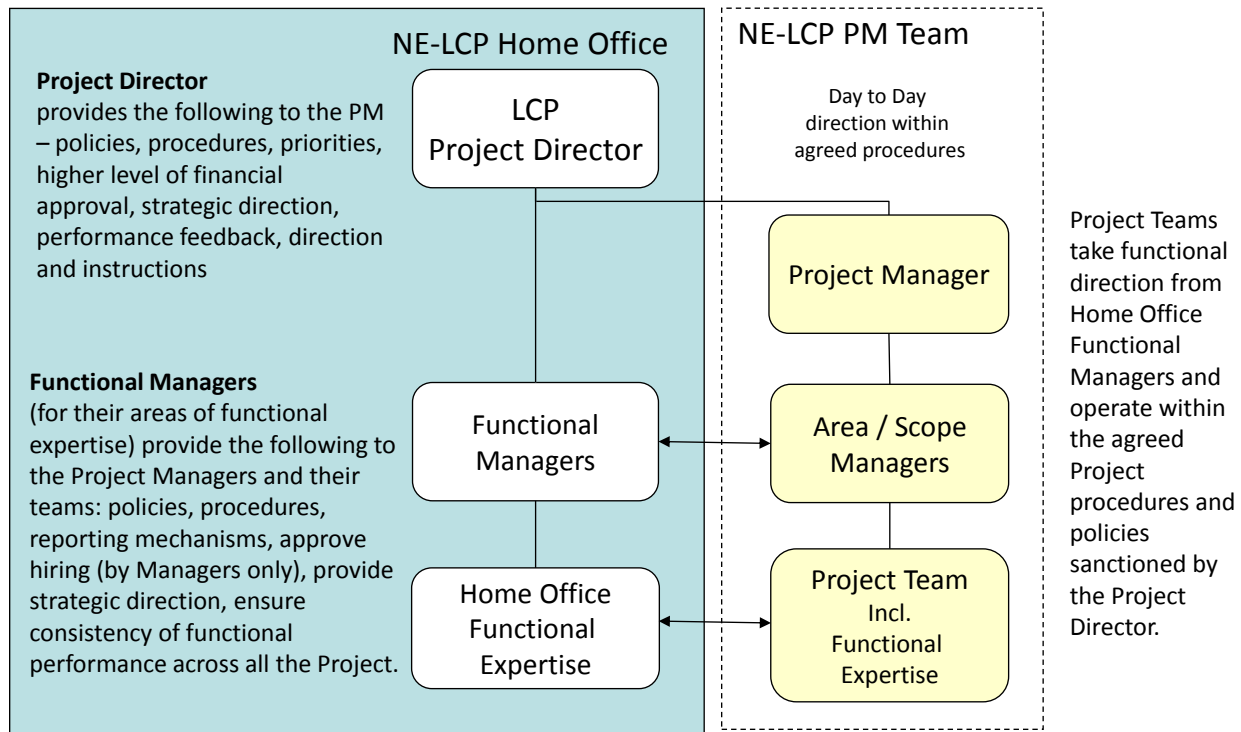
As illustrated in Figure 19, the Project Director, with the functional managers, will provide Project Managers with policies, procedures, priorities, performance feedback, strategic direction and leadership for them to effectively deliver their respective Projects. Functional Managers have a responsibility to provide functional expertise and direction, including sufficient functional resources, and proven processes and tools to support the Project Director and Project Managers in delivering the NE-LCP.

Figure 18: Matrix Based Project Organization



Project Managers and their supporting functional teams will be co-located with their respective EPCM Consultant or EPC/EPCI contractors during the engineering and construction phases, with on-site presence as deemed appropriate. The Project Managers are accountable for the overall delivery of their Project, and as such will design organizational structures and process, and draw upon the necessary functional resources to achieve success. To this effect, the Project Manager will have the necessary decision-making authority to ensure **Flawless Execution** can be achieved.

Figure 19: Functional Expertise and Direction for Home Office to NE-LCP PM Teams

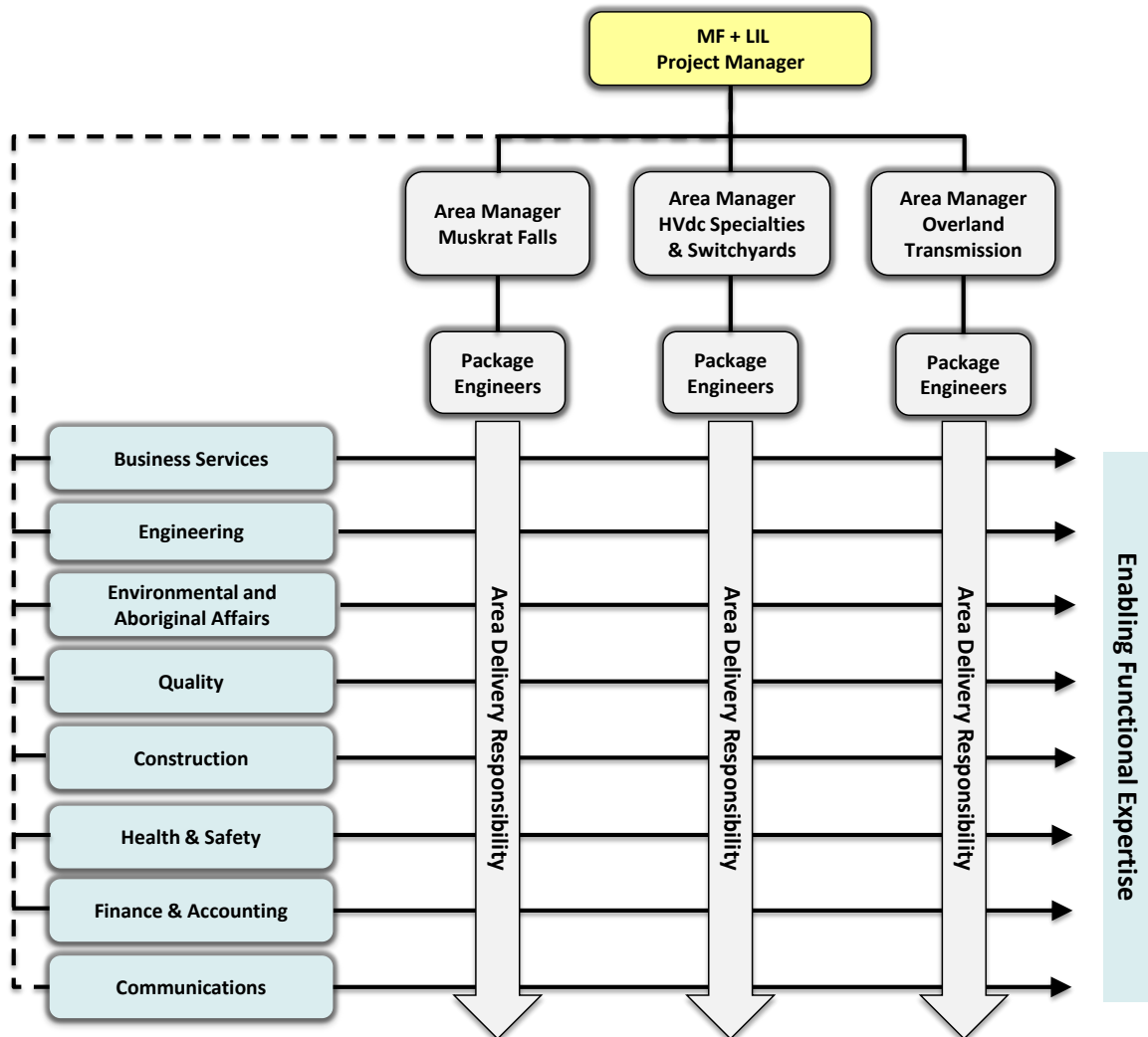


As illustrated in Figure 20, the Muskrat Falls and Labrador – Island Transmission Link Project (excluding SOBI Marine Crossing) will be executed using an area-based approach, led by the critical role of Area Manager. Area Managers will be responsible for the overall delivery, including scope, cost and schedule management, of a particular project component or Sub-Project extending throughout all phases. As Budget Holders, Area Managers are responsible for:

- Management and control of area scope, costs and schedules;
- Identification of cost and schedule drivers, and implementation of associated optimization opportunities;
- Identification of changes and subsequent management of approved changes, in accordance with Nalcor’s protocols;
- Ensuring all relevant team members are engaged and executing their tasks as required;
- Communication with and provision of relevant information to Nalcor team members;
- Progress measurement and achievement of milestones;

- Ensuring Company’s Management System requirements, methods / tools are being employed, are effective and opportunities for improvement are identified and implemented;
- Ensuring deliverables from the ECPM Consultant meet all requirements, including all engineering, procurement, commercial and environmental deliverables required to be able to place purchase orders, award contracts and commence the construction works in accordance with the projects’ schedules;
- Ensuring all associated interfaces are identified and managed;
- Facilitating problem resolution and having responsibility to ensure closure;
- Area Reporting – establishing protocols and being the champion for delivery;
- Ensuring opportunities for improvement (safety, environment, cost, schedule, quality) are items of focus and vigorously championed;
- Ensuring related EPCM Consultant’s related Plan(s) meet Nalcor’s requirements; and
- Ensuring compliance with commitments made in the Impact and Benefits Agreement during the planning/preparation phase and during construction.

Figure 20: Area-Based Management – Enabling Organization



Area Managers will be supported by the role of Package Engineers. The Package Engineers will report to the Area Manager with respect an assigned Package (e.g. particular contract or commitment package, such as the Accommodations Complex). The Package Engineers can be direct reports to the Area Managers, or may be drawn from the NE-LCP Functional Engineering Team or other Functional Teams. The Package Engineer has overall responsibility for the on-time, on-budget, safe delivery of a particular contract or commitment package (e.g. accommodations complex), including all engineering, procurement, and interface with other packages.

In support of this *Project Execution Plan*, the latest revision of line reporting and functional organizational charts and associated role descriptions are contained on the Lower Churchill Project homepage of the Grid Intranet site. These charts include:

- Senior Management Organization
- Home Office Organization
- EPCM Office Organization
- Environment and Aboriginal Affairs Organization
- NE-LCP PMT Functional Organization
- EPCM Consultant Organization

11.2 Team Effectiveness

NE-LCP Project Managers and their counterparts in the EPCM Consultant and EPCI / EPC contractor organizations will take responsibility for forming a cohesive, efficient execution team and maintaining constructive relations at all levels. This will be done through timely communication of plans and procedures and through alignment team building at all levels, as well as strong communication and adherence to Nalcor's Core Values.

The Project team effectiveness function will be led by a designated Team Lead who will oversee all strategic team building plans on behalf of the NE-LCP Project Managers. This will include selective team building sessions. The focus of team building has and will be in:

- Ensuring that Project goals and priorities are understood and guide decisions;
- Recognizing accomplishments;
- Sharing information;
- Establishing safety and controls priorities;
- Ensuring that morale and productivity are high; and
- Respecting differences and conflict avoidance.

All personnel working on the Project will obligated to follow Nalcor Energy's *Code of Conduct and Business Ethics Handbook*.

12.0 Management and Control

The following project Functional Management Plans reside within the NE-LCP Project Management System Structure as described in Section 6.0 (Document Structure and Hierarchy). These Functional Plans translate the objectives and strategies defined in this Project Execution Plan into specific day-to-day processes and procedures which will be used to execute the work. More specifically, these Functional Management Plans:

- Describe the scope of work for each functional area;
- Describe the functional organization planned including how it will interface with other organizational elements;
- Provide roles and responsibility descriptions;
- State functional objectives and targets;
- Identify critical success factors; and
- Describe the systems and processes planned to monitor and control the work.

Table 5: Management Plans Supporting this *Project Execution Plan*

Reference No.	Management Plan Title
LCP-PT-MD-0000-EV-PL-0001-01	Environment Management Plan
LCP-PT-MD-0000-HS-PL-0001-01	Health and Safety Management Plan
LCP-PT-MD-0000-HS-PL-0002-01	Security Management Plan
LCP-PT-MD-0000-RI-PL-0001-01	Project Risk Management Plan
LCP-PT-MD-0000-IS-PL-0001-01	Information Technology Project Systems Plan
LCP-PT-MD-0000-IM-PL-0003-01	Information Management Plan
LCP-PT-MD-0000-PC-PL-0001-01	Project Controls Management Plan
LCP-PT-MD-0000-FI-PL-0001-01	Project Finance and Accounting Management Plan
LCP-PT-MD-0000-PM-PL-0002-01	Project Change Management Plan
LCP-PT-MD-0000-PM-PL-0006-01	Project Technical Interface Management Plan
LCP-PT-MD-0000-AD-PL-0001-01	Administrative Management Plan
LCP-PT-MD-0000-PM-PL-0003-01	Work Plans and Authorizations Management Plan
LCP-PT-MD-0000-CO-PL-0001-01	Communications and Stakeholder Relations Plan
LCP-PT-MD-0000-HR-PL-0001-01	Human Resources and Organizational Effectiveness Plan
LCP-PT-MD-0000-LR-PL-0001-01	Industrial Relations Plan
LCP-PT-MD-0000-IB-PL-0001-01	Benefits and Training Plan
LCP-PT-MD-0000-EN-PL-0001-01	Engineering Management Plan
LCP-PT-MD-0000-QA-PL-0001-01	Overarching Quality Management Plan
LCP-PT-MD-0000-PR-PL-0001-01	Procurement Management Plan
LCP-PT-MD-0000-CA-PL-0001-01	Contract Administration Plan
LCP-PT-MD-0000-CS-PL-0001-01	Construction Management Plan
LCP-PT-MD-0000-OP-PL-0001-01	Operations and Maintenance Plan
LCP-PT-MD-0000-CM-PL-0001-01	Completions and Commissioning Plan
LCP-PT-MD-0000-PM-PL-0004-01	Handover to Operations and Project Closure Plan

The following sub-sections provide an overview of the Management and Control areas for the Project.

12.1 Financial Control

The Project will have designated functions including Project Controls, Finance and Supply Chain Management who will work together and oversee financial control of the Project.

As detailed in [Capital Expenditure Authorization Procedure](#), reference document no. [LCP-PT-MD-0000-FI-PR-0001-01](#), financial control is exercised in three distinct forms, namely Authorization, Commitment and Verification.

Authorization begins with the approval by the Nalcor Energy Board of Directors of either a Pre-sanction Authorization for Expenditure (AFE) or Master AFE for the Project Component and related budget. Subsequent changes are governed by procedures inherent in the [Project Change Management Plan](#), reference document no. [LCP-PT-MD-0000-PM-PL-0002-01](#) as discussed in Section 12.3.

In the case of the NE-LCP, the Project Director with Project Managers, will delegate authorization authority to Budget Holders, as required to execute the Project.

As discussed in Section 10.4 of this *Project Execution Plan*, for all goods or services to be acquired by the NE-LCP, a Financial Commitment via a commercial Contract between the NE-LCP and the supplier or service provider is required. The raising of Financial Commitments creates a financial obligation on Nalcor and must be supported by and within the scope of a properly approved Requisition.

The terms and conditions, scope, price and other relevant matters are recorded formally by Contracts, PO's, WTO's, Variation Orders, or amendments. Commitment Authority is delegated to and managed by Supply Chain management and can be further delegated to members of the Supply Chain team as it pertains to their respective areas of Responsibility. Commitment approval authority may be delegated to the Budget Holder at the discretion of the Supply Chain Manager.

Verification takes place upon receipt of a third party charge and includes both financial and technical verification. Financial verification occurs by the Budget Holder, with sufficient financial authorization that the invoice is in compliance with the related Financial Commitment document. Technical verification includes verifying quantities, quality and overall work progress or milestone achievement as claimed in the invoice.

An overview of the financial control structure is contained in Figure 21, while Figure 22 provides a representation of the overall cost control process from Authorization through to Verification for the Project.

Figure 21: Financial Control Structure

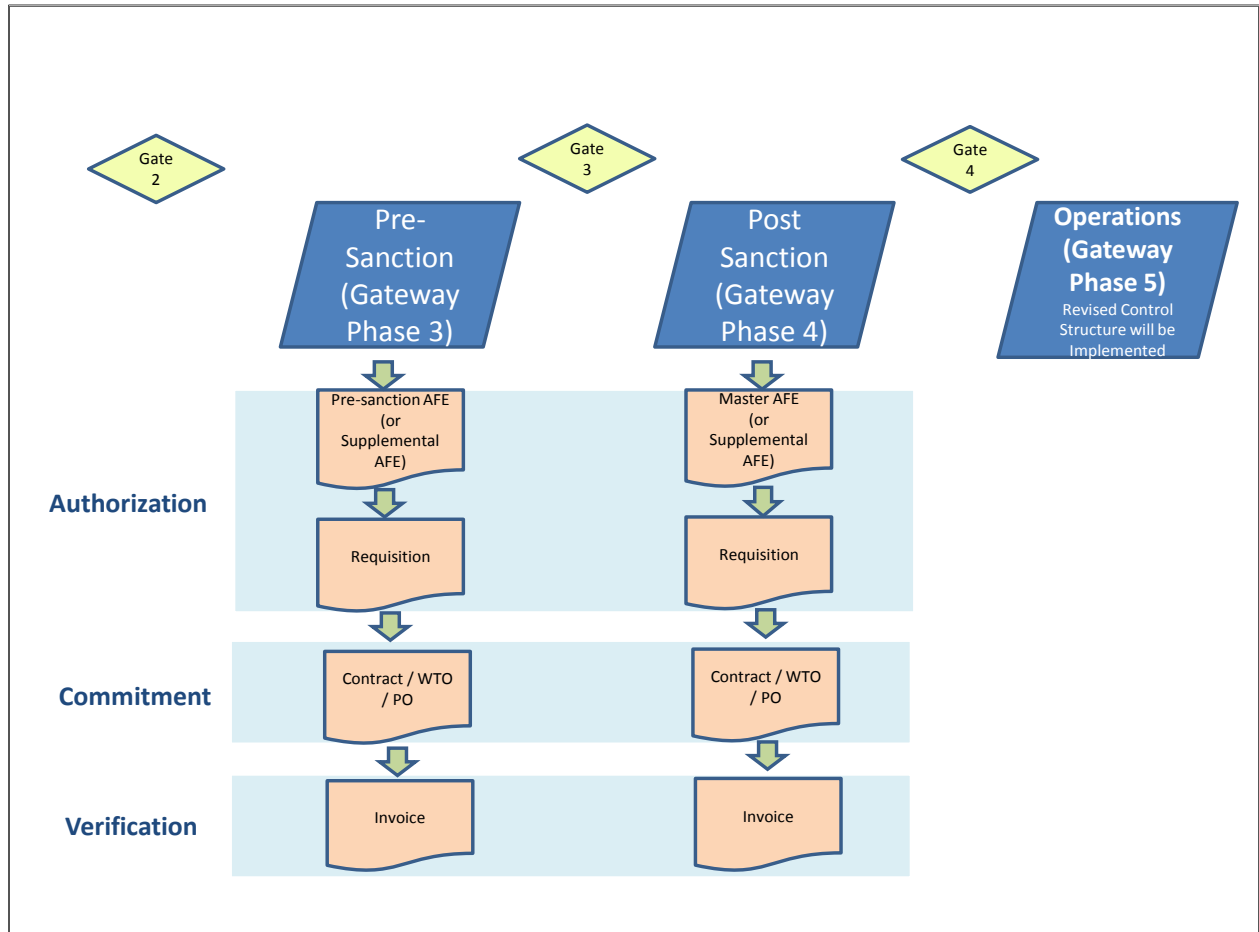
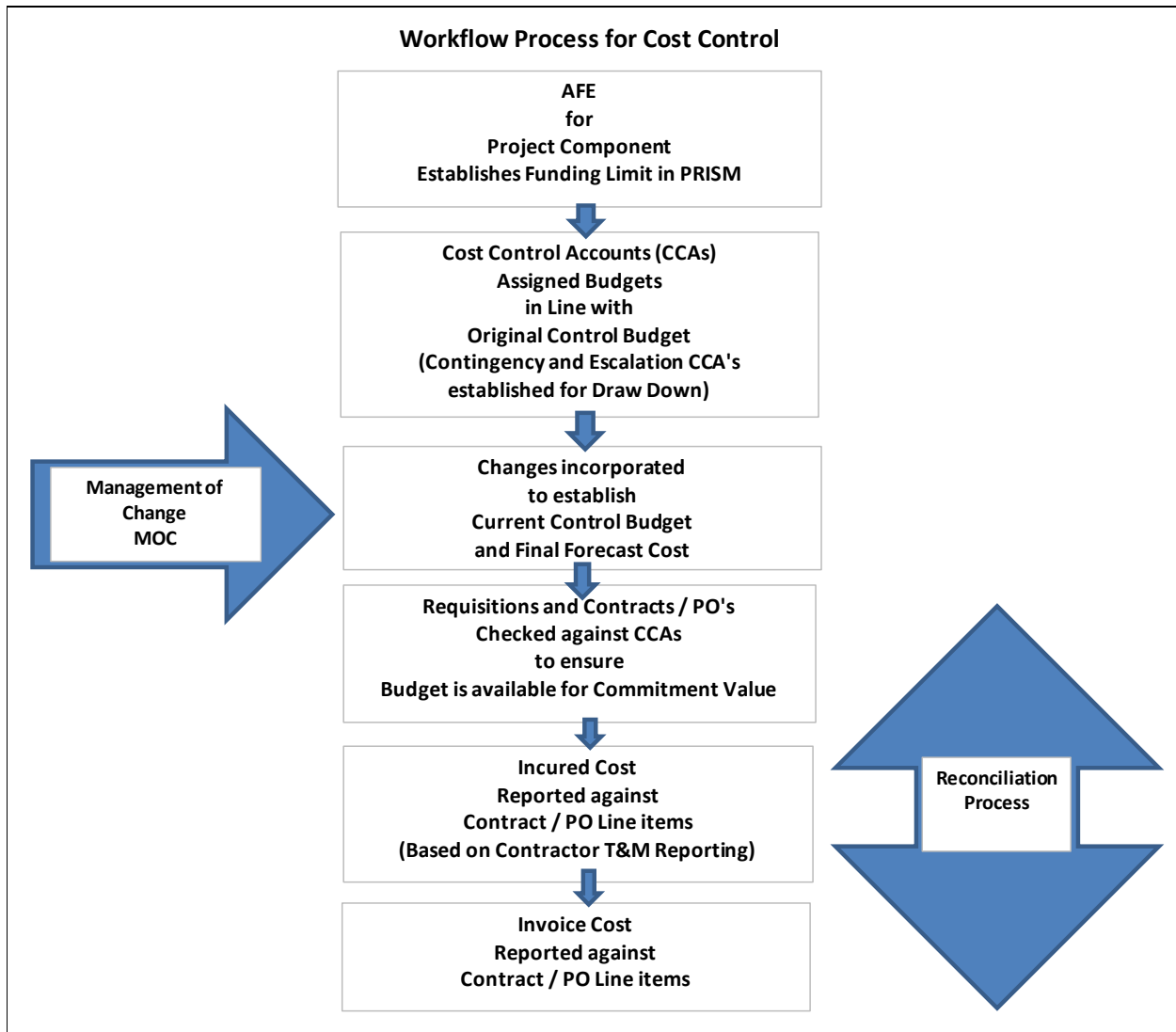


Figure 22: Workflow Process for Cost Control



12.2 Project Controls

NE-LCP has adopted a philosophy of having a strong owner’s project control team to support the Project and Area Managers in delivering their scopes while meeting cost and schedule targets.

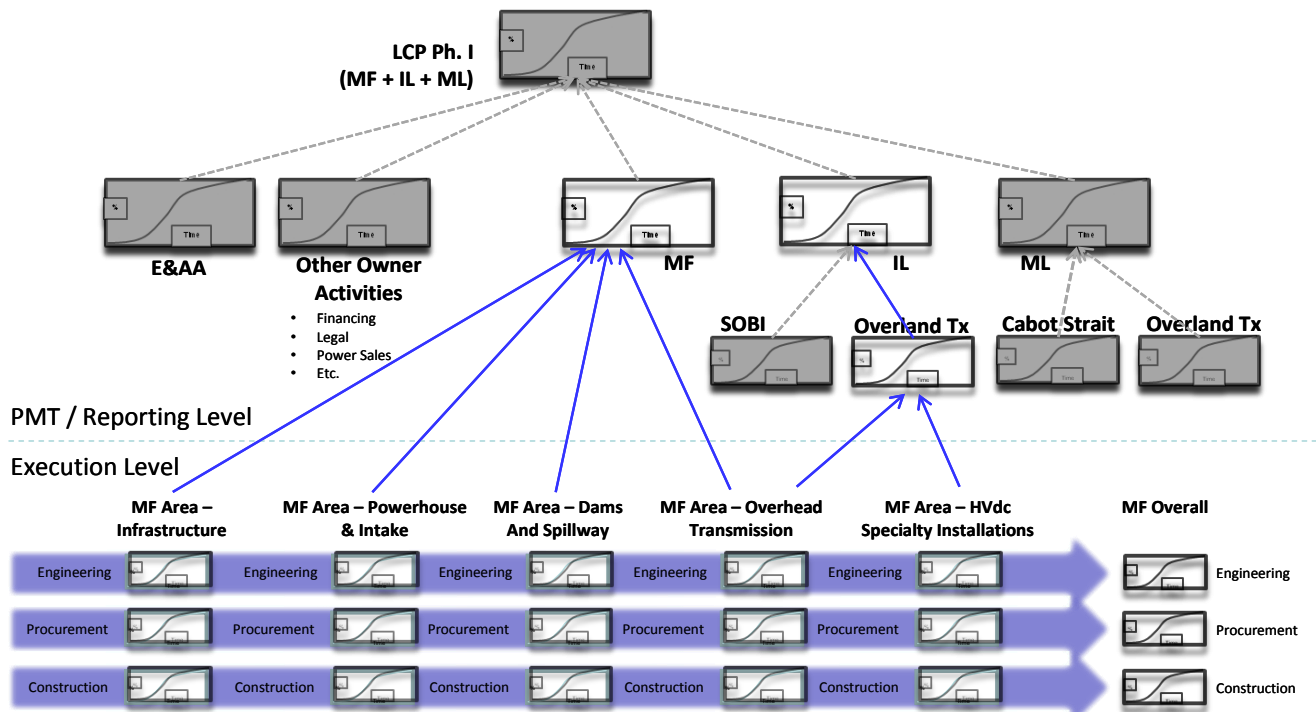
To this effect, the Project Control team will assume the lead role in the consolidation of information and the co-ordination of the planning and scheduling, cost estimating, and cost control. They will provide NE-LCP PMT with critical decision-making information in a timely fashion by establishing appropriate levels of monitoring systems to ensure that control information is clearly defined and that roles and responsibilities of all participants are understood.

The Project control philosophy or approach for the NE-LCP is rooted in the following guiding principles:

- Scope, cost and time (schedule) are intricately linked and therefore must be holistically managed as one.
- “Project control” is a line management responsibility and not the responsibility of the Project Controls Team. The Project Controls Team provides the data needed to control the Project.
- One of the keys to an effective Project control system is the quality of the information it uses and how that information flows. Good Project information is wasted if it is not communicated quickly, correctly and consistently.
- Exercise control at an optimum level – strike the right balance between the levels of detail to which stewardship is being performed and the ability to provide effective Project control as an Owner.

The EPCM Consultant and EPC / EPCI contractors shall be responsible for project control within the scope of their agreements, while Nalcor project control will actively review and validate critical information to provide the PMT will timely and critical information for decision making. Figure 23 provides an illustration of the planned Project Stewardship Progress Reporting on an Area Basis. Further details of the project control approach adopted for the Project are contained with the [Project Controls Management Plan](#), reference document no. [LCP-PT-MD-0000-PC-PL-0001-01](#).

Figure 23: Project Stewardship Progress Reporting – Area Management Emphasis at Detail Level



**ALL PROGRESS BASED UPON PHYSICAL ACHIEVEMENT OF WORK!
Deliverables, quantities, etc.**

12.3 Management of Change

To function effectively, a Project Team must understand the basics of change management and have a management of change plan that establishes the methods and processes to be used for the project team to effectively identify, screen and incorporate changes to the baseline, including project delivery model. By adopting a disciplined approach to managing potential changes, negative impacts to project goals and objectives are minimized and positive opportunities can be realized.

The [Project Change Management Plan](#), reference document no. [LCP-PT-MD-0000-PM-PL-0002-01](#), provides the strategy for management of change and the formal process to:

- Identify potential changes and the conditions that generate them;
- Identify high level contingency plans or responses to potential changes;
- Assess the need to adopt the potential changes;
- Evaluate the impacts of the potential change to the Project baseline;
- Ensure health, safety, environment, operability and maintainability requirements are considered as part of the evaluation of potential change;
- Approve/Accept the potential change by all stakeholders;
- Implement action plans to address the change; and
- Document lessons learned with respect to the change.

It is imperative that the concepts and procedures within the [Project Change Management Plan](#) are understood and used effectively by all NE-LCP team members, and Nalcor co-venture partners, while the EPCM Consultant, and EPC contractors must have management of change plans that align with this Plan.

The Project's Management of Change (MoC) System ensures project changes to applicable documents and processes are identified, evaluated, approved, documented, and implemented properly. This system describes the areas subject to change, the procedures to be used and maintained, and the roles, responsibilities, and approval limits for change management.

The management of change system is an NE-LCP's system for controlling project scope and ensuring that Project Changes are reviewed and approved at the appropriate organizational level. In general, approval of a Project Change follows a vertical process, with those changes having more significant cost and schedule implications, requiring higher level of approvals. In addition Project Changes that alter the Project's boundaries, objectives, key philosophies, or delivery approach must be approved by the Project's Gatekeeper.

The Project's Management of Change (MoC) process is applicable to all changes that have the potential to impact the Project scope, cost and schedule baseline, including changes to the Project's delivery method or execution approach. This includes Engineering Change as well as contract change facilitated through the use of Variation Orders.

Management of change is a shared responsibility between the NE-LCP PMT, EPCM Consultant, the construction and installation contractors and the material and equipment vendors and suppliers working on the Project. Consultant, contractor and supplier change MoC processes will feed into the overarching Project MoC process which is encompassed within the [Project Change Management Plan](#). All change management requirements for contractors will be specified in the contract.

Detailed engineering and design for the Project will be undertaken by various Consultants and contractors, dependent upon the execution plan for the sub-project (e.g. SOBI Crossing), rather than directly by NE-LCP itself. It is planned that the detailed engineering change management procedures (e.g. redline mark-ups, changes design codes and standards, field request for information, etc.) of these entities will be used to support the effective management of engineering and design change embedded within this Project MoC Plan as detailed in the respective contract coordination procedures.

12.4 Risk Management

Nalcor Energy's Risk Management Policy for the Project, reference document [Project Risk Management Policy MSD-RI-001](#), makes a strong commitment towards identifying and managing all project risks. With consideration of this Policy, the Project's risk management program as described in the [Project Risk Management Plan](#), document reference no. [LCP-PT-MD-0000-PL-RI-0001-01](#), is structured to encapsulate the following beliefs held by Nalcor.

- Proactive risk awareness and management is a key enabler of **Flawless Execution**.
- Predictability of outcome will be vastly improved when achievable objectives are first established. A full understanding of project risks early in the project's lifecycle will provide the greatest opportunity to complete the necessary work required to fully understand these risks (i.e. Risk-Driven Front End Loading) from which achievable objectives will be established.
- Quality decision making will be facilitated through a comprehensive understanding of project risks and how they can be managed with least impact on the Project. Such risk-informed decision making will be a standard for the Project.
- Consistent with Pareto's Principle, we believe a few, select, complex risk (15 – 20) will provide the greatest exposure for the Project. These Key Risks will be the subject of heavy focus by Nalcor's Project Management Team and the Risk Resolution Team.
- Many risks are multi-dimensional and complex requiring creative solutions. Cost effectively managing risks will require risks to be allocated to various stakeholders who are best positioned to manage them through Risk Brokering. This process of Risk Allocating will be

featured significantly through the procurement process for the project’s supply and construction contracts.

- Risk management is an on-going, continual looped process as the project progresses through the Gateway Phases (i.e. Plan-Do-Check-Act process).
- Consistent with practice up to Decision Gate 2, the Project will continue to use the Risk Resolution Team to support the development and validation of Risk Response Plans, however its membership will be adjusted to reflect the progression of the Project.

Risk identification activities for the Project in accordance to [LCP-PT-MD-0000-RI-PL-0001-01 Project Risk Management Plan](#) have resulted in the identification of a number of key risks for the Project. As these Key Risks can significantly influence the ability to achieve the Project’s goals and objectives, they are the focus of significant attention by NE-LCP PMT.

Table 6 lists several of these Key Risks that have significantly influencing the execution strategy and management approach for the Project, and the work plan for Gateway Phase 3.

Table 6: Key Risks and Management Strategies

Key Risk	Management Strategy
Achieving timely release from the Generation Project Environmental Assessment in order to facilitate a start of infrastructure works construction at Muskrat Falls in accordance to Target Milestone Schedule.	<ul style="list-style-type: none"> • Focus on ensuring quality information is provided to the Joint Review Panel. • Step up consultation efforts, in particular with aboriginal groups. • Bolster team resources to allow for efficient management and support of the EA process.
Achieving timely release from the Labrador – Island Transmission Link Environmental Assessment.	<ul style="list-style-type: none"> • Make a strategic decision to go with a Comprehensive Review rather than a Screening Study to avoid recycle and schedule slippage. • Strategically manage the EA process, leveraging lessons learned from Generation Project EA • Prepare a comprehensive draft of the EIS prior to release of draft guidelines. • Conduct extensive stakeholder consultation activities • Understand and put plans in place to manage aboriginal interests. • Bolster team resources to allow for efficient management and support of the EA process.

Key Risk	Management Strategy
<p>Installation and protection of the SOBI submarine cable crossing.</p>	<ul style="list-style-type: none"> • Employ team resources with marine installation experience in East Coast harsh environments. • Execute exhaustive studies encompassing all cable installation and protection options. • Engage best-in-class Consultants for HDD technology • Understand the cable supply market and work to develop EPCI RFP for early entry into the market. • Early collection of all field geotechnical and oceanographic (e.g. sea currents) data. • Execute a HDD pilot hole program in the SOBI prior to DG 3 in order confirm the optimal HDD execution program.
<p>Labor productivity and performance aligned with expectations.</p>	<ul style="list-style-type: none"> • Establishing a benefit / reward relationship with the EPCM Consultant and construction contractors that entices them to put the "A-team" on the job. • Consider appropriate incentives for the EPCM Consultant that are strategically aligned with achieving design and construction readiness outcomes that support increased worker productivity. • Recognize threat of competition from other mega-projects (i.e. Hebron) and proactively manage. • Actively recruit Newfoundlanders home – leverage the "legacy" theme to entice end of career experienced supervisors to work on the Project. • Making the work and work site appealing to Newfoundlanders (e.g. attractive camp, compensation, rotation and transportation). • Developing a construction schedule based upon achievable labour productivities. • Negotiating a labour agreement that supports trade flexibility / work team concepts. • Training aboriginal workers in appropriate areas.
<p>Achieving a Zero Harm – Nobody Gets Hurt mindset in a transient construction workforce.</p>	<ul style="list-style-type: none"> • Early and proactive program to promote and secure commitment to best practices. • Work with EPCM to develop and implement a behavioural-based safety program across the Project. • Engaging and retaining contractors who are leaders in safety performance and have demonstrated the ability to proactively manage all aspects of HSE performance on remote worksites. • Recognizing HSE performance is imperative and start embedding an HSE culture early in the project. It all starts with management's commitment to safety. • Maintaining team awareness and establish strong and open communication channels on all aspects of HSE.

Key Risk	Management Strategy
<p>Attracting a capable EPCM Consultant who has a strong background in all engineering, procurement and construction management activities for large hydro and transmission projects.</p>	<ul style="list-style-type: none"> • Developing an innovative contracting strategy to make project attractive to contractors with risk/benefit balance. • Implementing a rigorous EPCM selection process. • Taking early and aggressive action to secure required engineering competencies and resources. • Scheduling sufficient time for engineering completion prior to start of construction. • Implementing a project-wide Quality Management System and embed QA requirements in all contracts.
<p>Site conditions worse than geotechnical baseline.</p>	<ul style="list-style-type: none"> • Mitigate the risk by maximizing geotechnical investigations to determine conditions as well as possible before bidding. Residual risk will have to be accepted by Nalcor since contractors will not accept it. Hence the focus on the 2010 field program for Muskrat Falls.
<p>Limited number of creditworthy hydro turbine suppliers.</p>	<ul style="list-style-type: none"> • Engage existing "bankable" suppliers in model testing scope in order to build and maintain interest during this slower demand period. • Explore contracting model and risk allocation strategy. • Enhanced oversight during design and manufacture phases.
<p>Availability of experienced high-voltage transmission line contractors and skilled labour.</p>	<ul style="list-style-type: none"> • Split into 5 to 6 smaller contracts for cost and scheduling reasons • Actively pursue potential suppliers and expand to worldwide considerations • Phase the transmission build in order to flatten resource demands • Actively support the training of linespersons.

12.5 Quality Management

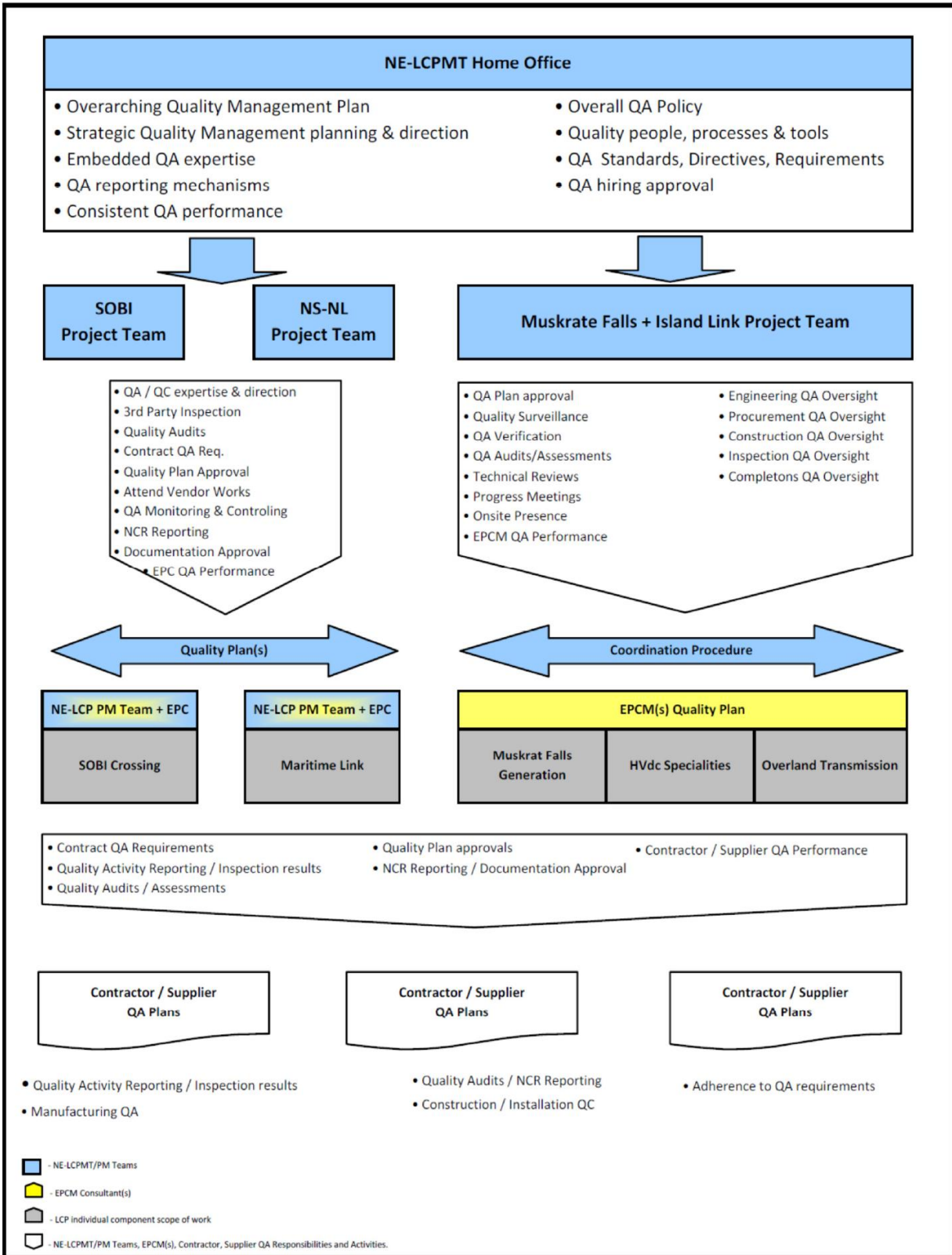
Quality Management is paramount in all activities undertaken on the Project. Quality is a shared responsibility between the NE-LCP PMT, the EPCM Consultant, the construction and installation contractors, and the materials and equipment vendors and suppliers working on the Project. Quality is recognized as a key imperative for cost and schedule performance.

The NE-LCP Project Director, along with the NE-LCP Home Office Management Team has the ultimate responsibility for Quality in all aspects of the Project.

As detailed in the Project's [Overarching Quality Management Plan](#), reference document no. [LCP-PT-MD-0000-QA-PL-0001-01](#), NE-LCP's approach to Quality is structured upon the Plan-Do-Check-Act model of continual improvement and the eight management principles set out in ISO 9000 standards. These principles form the basis upon which NE-LCP PMT establishes and measures Quality performance in all our activities and the activities of our EPCM consultant, contractors and suppliers.

Effective Quality Management is a key component of Project Management philosophy. The NE-LCP PMT believes that the real value to be gained from adopting a Quality Management System lies in its ability to help the NE-LCP PMT, the EPCM Consultant, contractors and suppliers achieve Quality objectives. The execution model for how Quality Management shall be implemented throughout all components of the Project is illustrated in Figure 24.

Figure 24: LCP Quality Management Execution Model



12.6 Health and Safety Management

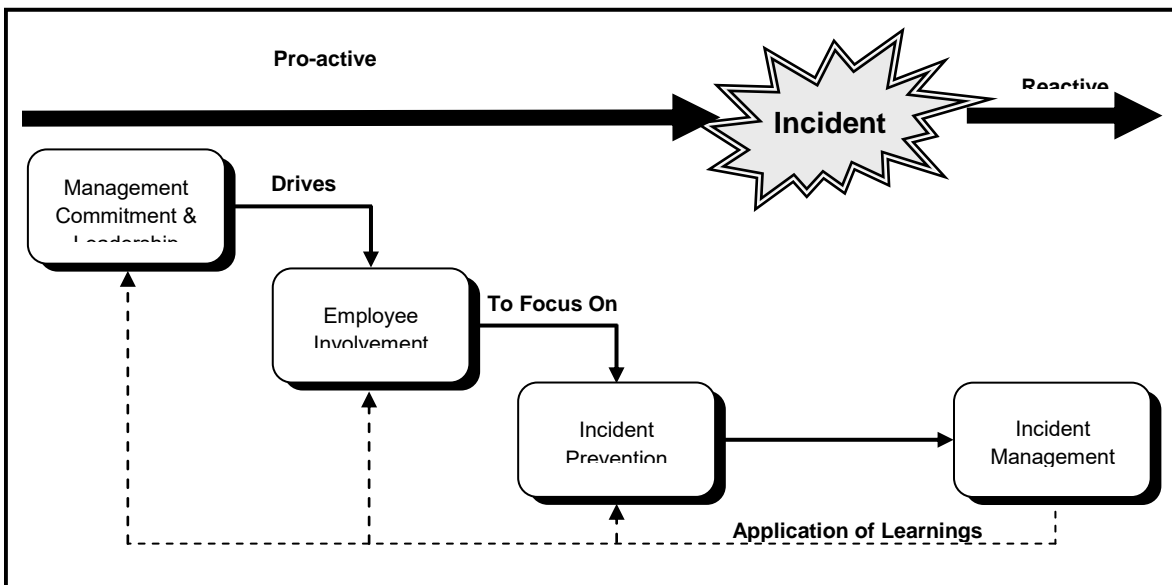
NE-LCP is committed to undertake its business in such a way as to minimize the risks of injury or ill health to people and damage to property or the environment. Nalcor believes sound health and safety performance is fundamental to successful business performance. It is therefore NE-LCP PMT’s requirement and expectation that everyone associated with the Project shall play their part in the implementation of its occupational health and safety management strategy, performing at the highest possible levels, and foster continuous improvement in the areas of health and safety. Nalcor believes that achieving its safety commitment of “Zero Harm – Nobody Gets Hurt” requires the, contractors, and suppliers is only attainable from proactive health and safety management at the work-face level.

Simply stated our health and safety management vision of the Project is the “Relentless pursuit of an injury and illness free workplace where **“Nobody Gets Hurt.”**”

Achieving this Vision requires both visible and committed leadership and the implementation of a formal management system, including its key enablers. Such a systematic approach will be predicated upon a proactive culture focussed on preventative measures, while having the ability to respond to incidents should they occur. Figure 25 illustrates this approach. Key factors influencing the success of this approach include:

- Management involvement, leadership, and commitment (i.e. visible safety leadership);
- Getting line supervisors and workers actively involved in health and safety management;
- Competent safety and technical resources to support the implementation of this Health and Safety Management Plan and Site-Specific Health and Safety Plans for the Project; and
- Dedication and persistence.

Figure 25: Nalcor’s Fundamental Approach to Safety Management



NE-LCP's health and safety management system for the Project consistent with the principles of ISO 18001 and based upon Nalcor's existing corporate health and safety management system.

The Project's [Health and Safety Management Plan](#), reference document no. [LCP-PT-MD-0000-HS-PL-0001-01](#) details how the following twelve (12) key strategies will be utilized to achieve this health and safety Vision.

1. Communicating our Vision.
2. Ensuring clear accountability for safety performance with line management.
3. Implementing a formal safety leadership training program for all levels of management and supervision.
4. Demonstrating tangible commitment and involvement from Senior Management towards the *"relentless pursuit"* of safety excellence is essential.
5. Selecting competent contractors for the work, while coaching and guiding them in the delivery of the Project in order to achieve our Vision.
6. Involving all workers in safety management.
7. Utilizing safe work practices/behaviors to avoid accidents.
8. Implementing risk management and control processes.
9. Ensuring union-management alignment on health and safety and work jointly to achieve our vision.
10. Establishing strong functional expertise in health & safety management who are fully engaged in both strategic direction-setting and day-to-day project delivery activities with Area / Scope Managers and Construction Managers.
11. Focusing on measuring leading indicators (e.g. field observations & interventions and worksite inspections).
12. Development an incident management and emergency response program that reflects the uniqueness / specifics of the work and associated work locations.

12.7 Environmental and Regulatory Compliance Management

Nalcor has made a commitment that the Project will be designed and constructed in accordance with Nalcor Energy's Environmental Policy and Guiding Principles. The Project's [Environmental Management Strategy](#), reference document [LCP-PT-MD-0000-EV-ST-0001-01](#), provides the strategic direction of how Nalcor's Environmental Management System (EMS) and associated Corporate EMS Targets will be adhered to by the Project Team, EPCM Consultant, and EPC / EPCI contractors during the engineering and construction of the Project.

In readiness for the Project's transition from the environmental assessment phase into the engineering and construction phase, the NE-LCP E&AA team's overall responsibilities will expand to implement this Environmental Management Strategy, including overall environmental and regulatory compliance management. Specific responsibilities of the E&AA organization with respect to the above will include:

- Communicate, follow-up and tracking of requirements and commitments made part of on-going assessment, aboriginal agreements or requirements of EA release.
- On-going public consultation.
- Participate in environmental management committees resulting from EA requirements or aboriginal agreements.
- Design and implement an environmental effects monitoring program to confirm the predictions made in the EA.
- Review and acceptance of the EPCM Consultant's Regulatory Compliance Management Plan, Environmental Management Plan (EMP), and Overall Environmental Protection Plan (EPP).
- Obtaining owner Required Permits.
- Providing strategic direction to the EPCM Consultant with respect to obtaining all permits, consents and licenses that the EPCM Consultant is responsible to obtain for the Project.
- Managing all regulatory interface activities, including all communications with regulators.
- Auditing the EPCM Consultant's performance with respect to obtaining all necessary permits and releases and the compliance of the construction phase with all conditions of environmental release, commitments made as part of the EA Process, applicable regulations and legislation and permits and associated conditions of permits.
- Directly responsible for the oversight of the EPCM Consultant and EPC/EPCI contractors for environmental compliance during construction of the specific component.

The NE-LCP Engineering Manager has the responsibility to develop design philosophies that reflects Nalcor Energy's Environmental Policy, and to ensure consistency between the sub-Projects for incorporating environmental management into the design of Project Components. The Engineering Manager will communicate these requirements to the EPCM Consultant who shall incorporate the requirements into the overall facility design and construction execution program, including individual construction contracts. The Design and Integrity Function will

verify that these environmental requirements are adhered to by the EPCM Consultant during the review and acceptance of all Project specifications, drawings and other technical documents.

12.8 Information Management

One of the key enabling components of a successful project is a well-planned and executed information management strategy. Information Management is an encompassing term that includes the people, processes, and tools within an organization that are required to manage a piece of information throughout its life cycle; from its creation to its ultimate destruction. The [Information Management Plan](#), reference document no. [LCP-PT-MD-0000-IM-PL-0003-01](#), has been prepared to meet the following Information Management policy:

- The PMT is committed to providing an effective Information Management environment where people can work collaboratively and with a confidence that information is accessible, accurate, reliable and timely throughout the full life cycle of the asset.
- Good IM practice is the responsibility of everyone working on the Project.
- Information Management considerations and requirements must be inherent in all Project program and processes.
- Information Management functional organization will establish an electronic environment that will provide efficiencies by facilitating a centralized and/or integrated storage of data with the ability to access, use and present the information in different ways in order to meet the specific needs of users.
- Information Management goal will be to produce and deliver a quality 'information asset' that will support and enable the on-going operation and maintenance of the 'physical asset'.

The scope of the Information Management Plan embodies all Project information created, generated, or received as a result, or in support of, the activities required for planning, execution, and project delivery and broken down into the following main components:

- Document Management
- Administrative Records Management
- Data Management
- Information Systems
- Information Technology
- Information Security

Information systems, technology, and security are covered in separate document [Information Technology Project Systems Plan](#), reference document no. [LCP-PT-MD-000-IS-PL-0001-01](#).

13.0 Performance Management

The Project shall implement an overall performance management program in order to effectively and efficiently monitor and manage overall progress as well as make timely and efficient decisions. This performance management program will include a number of key metrics that are definable, measurable and able to be reported monthly. Table 7 lists some of the envisioned key metrics for the Project during Gateway Phase 3. Project Controls will be responsible for stewarding the reporting of these Key Metrics.

Table 7: Key Performance Indicators

Category	Key Metric	Basis	Target
Health, Safety and Environment	All Injury Frequency Rate (AIFR)	(Number of Loss Time Incidents + Medical Aids X 200,000 hrs worked) ÷ Total Hrs worked to date	0
	Total Reportable Incident Frequency (TRIFR) Year to Date	(Number of Loss Time Incidents + Medical Aids + Restricted Work Cases 200,000) ÷ Total Hrs worked to date	<1.0
	Environmental Releases	Numbers of releases	0
	Leading / Lagging Ratio	Number of Leading Indicators ÷ Number of Lagging Indicators (as reported in SWOP Database)	350:1
Organizational Effectiveness	NE-LCP PMT Mobilization	Actual FTE (Full Time Equivalents) against plan DG2 MFL	1.0
	EPCM Mobilization	Actual FTE (Full Time Equivalents) against plan Stage 2 MFL	1.0
	EPCM Key Personnel Not Filled	Number	0
	Recruitment & Retention	# of departures / Total # FTE	<5%
	Overtime Usage	O/T Hours / Regular Hours	<10%
Progress	Readiness for DG3	On Target for DG3 Decision Support Package for December 2011	
	Overall EPCM Progress	Actual / Plan (against Stage 2 Project Control Schedule - PCS)	>1.0
	Engineering Deliverables Issued For Use	Actual vs Plan # of Documents	>1.0
	RFP's Issued	Number	
	PO's / Contracts Awarded	Actual vs Plan (against Stage 2 PCS)	
	Key Risks	Number of Key Risks Closed During Period	
	EPCM Mgmt Plans	Table 1.1 Deliverables in Place	All
Cost Performance	Commitments	Total value of commitments against plan	No variance
	Incurred Cost	Total incurred cost against plan	No variance
	Project Changes	<ul style="list-style-type: none"> Quantity of DANs Quantity and Value of PCNs 	-
	Contingency Usage	Contingency Drawdown for Project Changes	
	Aged Invoices	Number of invoices not paid within contract period due to information shortfall	0

A.0 Activity Flowchart (Excel Format)

A.1 N/A

B.0 Attachments/Appendices

B.1 NE-LCP / EPCM Consultant Responsibility Matrix

B.2 NE-LCP / EPCI or EPC Contractor Responsibility Matrix

Attachment B.1

NE-LCP / EPCM Consultant Responsibility Matrix

Responsibility Assignment Matrix - Nalcor Energy / EPCM Consultant

(Refer to Agreement LC-G-002 for Inclusive Listing of Responsibilities)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPCM Consultant	NOTES
Project Management / General			
Prepare Overarching Project Execution Plan	R		
Establish / Implement Project-wide Policies	R		EPCM Consultant to input as appropriate.
Project Management Plans and Associated Procedures	R	R	2 sets - Nalcor and EPCM Contractor
Project Execution Plan for EPCM Services Scope		R	
Prepare / Implement Project Procedures for within EPCM Services Scope)		R	
Prepare Technical Interface Management Plan		R	
Overall Technical Interface Management for EPCM Project		R	
Prepare Deliverable List & EPCM Work Packages		R	
Approval of EPCM Personnel	R		Reimbursable personnel only.
Recruitment & Training of Operations Staff	R		EPCM to support training
Health, Safety and Security Management			
Develop and implement a Project-specific H&S Management Plan for all phases of the work		R	Within EPCM's scope.
Chairs Project-level OHS Steering Committee	R		
Monitors contractor / sub-contractor performance and coaches to achieve desired outcomes		R	
Develop and implement site-specific H&S Management Plans		R	
Establish supporting H&S procedure, processes & tools for the H&S Plan.		R	
Prepare and implement Emergency Preparedness/Response Plans		R	
Develop & Implement Security Plan and Procedures		R	
Compliance with Occupational Health and Safety Act and Safety Regs		R	
Monitor Safety Performance and Prepare Safety Statistics Reports		R	
Establish construction safety targets		R	
Investigate and report Accidents and Near Misses		R	
Site Safety Inductions		R	
Verifying Contractor Safety Management Systems and site safety plans		R	
Implement a Safety-By-Design program to support the Engineering phase		R	
Environmental Management and Regulatory Compliance			
Obtain Environmental Release	R		
Develop a Project-specific Environmental Protection Plan for all phases of the work		R	
Develop and implement environmental mitigations and rehabilitation plan for use during and post the construction phase		R	
Monitors contractor compliance with EPP		R	
Obtain and manage all construction permits, licences, notifications and maintain conditions.		R	Constructor will be responsible for individual permits
Establish construction environmental management targets		R	
Develop Site Specific EPPs		R	
Prepare and implement Project Regulatory Compliance Plan		R	
Identify requirements and complete applications for permits and licenses		R	Permits in Nalcor's name.
Compliance with applicable Environment Regulations and Conditions of Permits		R	
Environmental Awareness Training		R	
Verify Contractor Environmental Management Systems and EPPs		R	
Environment Management Committee	R		
Labor and HR Management			
Establish Project Labor Agreement (incl. Special Project Order)	R		EPCM supports negotiations and implements.
Overall management of Project labor agreements used by Contractors.		R	
Administer dispute resolution mechanisms outlined in Project labor agmt		R	
Overall labor management include productivity and performance.		R	

Responsibility Assignment Matrix - Nalcor Energy / EPCM Consultant

(Refer to Agreement LC-G-002 for Inclusive Listing of Responsibilities)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPCM Consultant	NOTES
Administer of policies and procedures related to Personnel on site.		R	
Project Human Resources Policies	R		
External and Public Relations / Communications			
Project Press Releases	R		
Project Presentations	R		EPCM Consultant deliver presentations as approved by Nalcor.
Agreements with Outside Authorities			
• Government	R		
• Public Affairs	R		
• Community	R		
Manage Environmental Assessment Commitments	R		EPCM to execute commitments.
Property Assessment and Acquisition	R		
Innu Nation IBA Commitments	R		EPCM to execute commitments.
Reviews and Audits			
Project Audits			
• General Technical		R	
• Project-Level/Financial	R		
• Management		R	
• Environmental		R	
Prepare Design Verification Plan		R	
Independent Project Reviews	R		
Constructability Reviews		R	
Operability Reviews	R		
Technical Peer Reviews		R	
Engineering and Design			
Establish and maintain Project Basis of Design	R		
Establish Design Philosophies	R		
Prepare Review Plan for Company Supplied Documentation		R	
Engineering Management Plan for EPCM Scope		R	
Develop Engineering Procedures for each discipline		R	
Develop Design Integrity Stewardship Procedures	R		
Identify Design Codes and Standards		R	
Identify all engineering deliverables for each discipline		R	
Estimate a Person-hour effort for production of engineering deliverables		R	
Prepare Design Briefs & Criteria		R	
Prepare Technical and Functional Specifications		R	
Implement a Value Improving Practices (VIP) program as a means to improve cost, schedule and operability/reliability		R	
Equipment Spec/Data Sheets/Evaluation/MOC, Drawings - All Disciplines		R	
Preparation of all tender drawings		R	
Prepare any Technical Specifications for Tenders		R	
Manage all hard and soft technical interfaces within and touching the EPCM scope		R	
Perform Interdiscipline checks on all engineering deliverables		R	
Prepare Construction Drawings		R	Except contractor or supplier furnished
Prepare Operations and Maintenance Plan		R	
Prepare Design - Construction Management Plan		R	
Conduct design in accordance to Company-supplied Life Cycle Cost Analysis Philosophy		R	
Arrange and coordinate HAZID and HAZOP reviews		R	
Perform Safety Integrity Level (SIL) studies as required		R	
Detailed Technical Studies		R	
Overall System Engineering and Integration Studies		R	
Complete Equipment Criticality Ranking for use in determining surveillance		R	
Technical Bid Analysis		R	
Technical Review of Contractor Shop Drawings		R	

Notes: If there any discrepancy between this matrix and Agreement LC-G-002, the later shall be assumed to be accurate.

Responsibility Assignment Matrix - Nalcor Energy / EPCM Consultant

(Refer to Agreement LC-G-002 for Inclusive Listing of Responsibilities)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPCM Consultant	NOTES
Equipment Model Testing		R	
Ensure equipment Installation Procedures are available		R	
Automation, Control, Monitoring, Remote Operation		R	
Review of Construction Contractor's Drawings		R	
Supply Chain Management			
Contracting and Procurement			
Establish Master Contract Package List and Contracting Strategy		R	
Prepare Contracts/Purchasing Policies	R		EPCM implements
Prepare Overall Purchasing Plan		R	
Prepare Overall Contracting Plan		R	
Prepare and implement Contracts/Purchasing Procedures		R	
Define Construction/Procurement Packages		R	
Establish standard Commerical Terms and Conditions for agreements	R		
Special and Supplementary Conditions - Inquiry Document	R		
Develop procurement and contracting schedule including Delivery Schedule (ROS Dates)		R	
Data Submittal Schedule		R	
Prepare list of qualified Bidders		R	
Prepare and Issue EOI & Pre-Qual. Documents		R	
Prepare and issue tender / RFP packages		R	
Respond to Clarification from Bidders		R	
Receive Bids/Opening		R	
Commercial and Technical Evaluations of Tenders		R	
Conduct pre-award meetings		R	
Contract/Purchase Requisition		R	
Issue Purchase Order (PO)/Contract		R	
Contract/Purchase Order Register		R	
Status of Purchase Orders/Contract		R	
Contract/Purchase Order Amendments		R	
Contractor Competency Evaluations		R	
Claims Management		R	
Dispute Resolution		R	
Close Out PO/Contracts		R	
Materials Management and Control			
Material Management Plan		R	
Produce Detail Material Management Control Procedures/Plans		R	
Provide and maintain Material Management Control System		R	
Report Progress and Update Regularly		R	
Establish a Site Materials Storage Area		R	
Schedule Deliveries to Site		R	
Perform receiving inspection		R	
Establish and Maintain Material Receipts Register		R	
Distribute Equipment and Material to Contractors		R	
Report and manage non-comforming material		R	
Carry Out Regular Inventory Checks		R	
Procure and maintain Commissioning Spares		R	
Procure and maintain Operating Spares	R		
Warehousing of Spares		R	
Secure Vendor Commissioning Assistance		R	
Transfer Insurance and Operating Spares to Owner's Warehouse		R	
Stored Equipment Maintenance & Preservation		R	
Expediting			
Expediting and Inspection Procedures		R	
Expediting Visit Register		R	
Vendor Information		R	
Equipment and bulk materials		R	
Status Reporting		R	

Notes: If there any discrepancy between this matrix and Agreement LC-G-002, the later shall be assumed to be accurate.

Responsibility Assignment Matrix - Nalcor Energy / EPCM Consultant

(Refer to Agreement LC-G-002 for Inclusive Listing of Responsibilities)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPCM Consultant	NOTES
Logistics			
Develop Logistics and Materials Movement Plan		R	
Develop Logistics and Materials Movement Procedures		R	
Coordinate Inland Freight		R	
Obtain shipping documents		R	
Coordinate Ocean Freight		R	
Prepare Customs Documents for importing into Canada		R	
Prepare shipping data for export		R	
Operating Plant Logistics Planning	R		
Construction Management			
Prepare and implement Construction Management Plan		R	
Overall construction management for the Project		R	
Construction Planning		R	
Develop and Implement Construction Management Procedures		R	
Complete modularization / prefabrication analysis		R	
Prepare Detailed Construction Execution Plan & Schedule		R	
Manage Site Queries		R	
Engineering Query Process		R	
Manage Owner supplied materials		R	
Develop and implement Constructability Program and supporting procedures in order to incorporate industry best practice		R	
Carry Out Constructability Design Reviews		R	
Develop and implement a Productivity Improvement Plan		R	
Overall management of Project sites and provision of common services (e.g. accommodations, fire, security, transportation, etc.)		R	
Provision of Temporary Facilities at Site including Construction Office		R	For EPCM and NE-LCP team.
Provide Services to Offices		R	
Provision of Site Administration Services and Accommodations / Messing		R	
Establish and maintain Fire Protection and Medical Facilities and Services		R	
Provide Suitable access and lay down / storage areas to allow contractors to mobilize		R	
Reports/Communication External to Project Team	R		
Relocations of Services and Site Clearing		R	
Overall work site coordinator		R	
Control of the Work and Contractors.		R	
Contractor Performance Monitoring		R	
Productivity Monitoring and Improvement		R	
Managing and Checking the setting out of the works on site including control survey		R	
Liaison with Contractors to determine material/equipment requirements and expediting from field where necessary		R	
Procure, administer, maintain all construction equipment, consumables, small tools, safety supply		R	Monitors contractors
Provide site communications - backbone system	R		
Provide construction power feed to site	R		
Provide Site Transport (to and from the site and within the site)		R	
Construction Power - Site Distribution		R	
Provide site communications - Local system		R	
Establish and maintain Warranty Register		R	
Project Completions			
Prepare Project Completions Philosophy		R	
Prepare Mechanical Completion (MC), Commissioning, and Preservation Specifications		R	
Prepare project-specific procedures for punch-list, preservation, permit-to-work, lock-out/tag-out, material handling		R	

Notes: If there any discrepancy between this matrix and Agreement LC-G-002, the later shall be assumed to be accurate.

Responsibility Assignment Matrix - Nalcor Energy / EPCM Consultant

(Refer to Agreement LC-G-002 for Inclusive Listing of Responsibilities)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPCM Consultant	NOTES
Establish and implement a computerized Project Completion System		R	
Mechanical Completion (MC) - Manual, Execution / Management		R	Monitors contractors
Prepare Commissioning Manual		R	
Develop preservation program		R	
System / Equipment Preservation - Manual, Execution / Management		R	
Mechanical Completion Hand-Over Plan & Execution		R	
Prepare Handover Packages after Mechanical Completion		R	
Prepare M/C Inspection Test Records		R	
Prepare Mechanical Completion Certificate		R	
Prepare Commissioning Plan		R	
Readiness Process - define and implement	R		
Prepare and Update Pre-Op Schedule	R		
Commissioning Procedures		R	
Prepare commissioning static and dynamic documentation (e.g. checklist, run logs, etc.)		R	
Commissioning Spares Recommendation		R	
Prepare Testing Requirements, Procedures and Check Lists	R		
RFO Turnover Packages	R		
Arrange for Equipment Data Books, Operating and Maintenance Manuals to be supplied		R	
Hand-Over As-Built Drawings after Acceptance Tests		R	
Arrange for Contractors or Consultants to provide Commissioning Services		R	
Spare Parts Recommendation		R	
Prepare Spare Parts Lists		R	
Arrange for the provision of the necessary spare and replacement parts for initial Operation	R		
Prepare / maintain Master Equipment List		R	
Prepare Training Manuals		R	
Prepare Operations Procedures	R		
Prepare Operating Manuals		R	
Prepare Maintenance Manuals		R	
Prepare As-Built Documentation		R	
Quality Management			
Prepare Overarching Project Quality Assurance Plan	R		
Prepare and implement Project Quality Plan		R	Nalcor to audit implement.
Develop risk-based contractor / supplier screening tools for use in determining surveillance requirements		R	
General Quality Audits	R		
EPCM / Contractors Audit Function		R	NE will approve / accept the Contractors Audit Process
Develop and implement NCR Process		R	NE will approve / accept the Contractors NCR Process
Closure of Audit Findings		R	
Continuous Improvement Process		R	
Assess Contractors Quality Plans		R	
Overall Quality Statistics / Metrics		R	
Quality Training		R	
Lessons Learned		R	EPCM responsible for its scope.
In Engineering			
Development and implement engineering QA plan		R	
Engineering QC process		R	
Engineering Quality Reviews		R	
In SCM			
Risk-Based evaluation of suppliers / contractors for surveillance program development		R	
Prequalification - Establish Quality requirements		R	
Prequalification - Establish Quality requirements		R	
RFP - Quality Requirements		R	

Notes: If there any discrepancy between this matrix and Agreement LC-G-002, the later shall be assumed to be accurate.

Responsibility Assignment Matrix - Nalcor Energy / EPCM Consultant

(Refer to Agreement LC-G-002 for Inclusive Listing of Responsibilities)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPCM Consultant	NOTES
Third Party Inspection		R	
Materials Traceability		R	
<u>In Construction</u>			
Overall responsibility for construction quality		R	
Contractor adherence to codes and regulations		R	
Establish site survey control system and control points		R	
Processing of Site NCR's		R	
Producing Construction Surveillance Reports		R	
Receiving Inspection at Site		R	
Prepare and implement Inspection Policies		R	
Prepare and implement Inspection Work Plan		R	
Review Quality Assurance (QA) programs/inspections		R	
Review of Vendors ITP's for equipment		R	
Conduct Shop Inspections		R	
Coordinate Factory Acceptance Testing and Site Integration Testing		R	
Develop FAT and SIT procedures		R	
Witness Shop Performance Testing		R	
Establish and operate site laboratories		R	
Review Vendor's Inspection and Testing Reports		R	
Status Reporting		R	
Endorse equipment Release for Shipment		R	
Project Control			
Establish and manage Management Summary Schedule (MSS)	R		Overall Project
Establish and manage Integrated Project Schedule (IPS)	R		Overall Project
Develop Project Controls Work Plan		R	For EPCM scope
Business Systems Integration	R		EPCM runs its PM tools (i.e. PM+)
Develop Work Breakdown Structure(WBS) & Cost Code of Accounts	R		
Progress and Performance Management		R	
Planning & Scheduling		R	
Progress Reports			
• Overall Project	R		
• EPCM Scope		R	
<u>Estimating</u>			
Estimating Work Plan & Procedures		R	
Prepare Services Budget Estimate		R	
Prepare Cost Estimates for the Work		R	
Assign Coding System		R	
Equipment and Material List		R	
Prepare Basis of Estimate		R	
Develop Material Quantities (bulks and consumables)		R	
Develop Equipment and Material Supply Cost (rates)		R	
Develop Labor Rates for use in estimating	R		
Develop production norms / rates to be used in the estimate		R	
Prepare Capital Estimate of Direct Costs and Matrix Summaries	R		
Develop Construction Hours including Productivity Factor	R		
Establish Estimate Contingency	R		
Contingency Management	R		
Capital Cost Estimate Details and Matrix Summaries	R		
Prepare estimates for Project Changes		R	
Check Bid Estimates for Construction Contracts		R	
Operating Cost Estimate	R		
<u>Planning and Scheduling</u>			
Manage EPCM Services to achieve Project Milestone Schedule		R	For EPCM Scope
Prepare Scheduling Development and Control Plan		R	For EPCM Scope
Implement Scheduling Development and Control Plan		R	For EPCM Scope
Develop Scheduling Procedures		R	For EPCM Scope
Prepare detailed Project Control Schedule and updates		R	For EPCM Scope

Notes: If there any discrepancy between this matrix and Agreement LC-G-002, the later shall be assumed to be accurate.

Responsibility Assignment Matrix - Nalcor Energy / EPCM Consultant

(Refer to Agreement LC-G-002 for Inclusive Listing of Responsibilities)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPCM Consultant	NOTES
Prepare detailed schedule of Engineering Activities by work Package		R	For EPCM Scope
Prepare detailed schedule of Equipment Procurement by Package		R	For EPCM Scope
Prepare detailed Construction Schedules and updates		R	For EPCM Scope
Prepare schedules showing sequence and timing for individual Contracts		R	For EPCM Scope
Prepare work hour histograms and "S" curves		R	For EPCM Scope
Cost and Schedule Stewardship			
Convert EPCM Consultant's Services Budget and Sanction Cost Estimate into a Project Budget		R	For EPCM Scope
Prepare Cost Management Plan		R	For EPCM Scope
Implement Cost Management Plan		R	For EPCM Scope
Develop forms and Procedures for Capital Cost Control		R	For EPCM Scope
Develop Progress and performance management procedures		R	For EPCM Scope
Code of Accounts for Asset Classification and Capitalization	R		
Cost Control for the Work		R	For EPCM Scope
Maintain and update EPCM Budget		R	For EPCM Scope
Allocate funds for Contract Change Orders	R		
Receipt and review of contractor cost reports		R	For EPCM Scope
Prepare monthly Project Cost Report		R	For EPCM Scope
Management of Change			
Prepare Change Management Plan for EPCM Project		R	
Management of Change within EPCM Services		R	
Engineering / Design Change Management		R	Using EPCM's process, linked to Project MOC process.
Maintain the individual Contract Scope Change Register		R	
Accounting & Invoicing			
Prepare Invoicing and Payment Plan for construction contracts and supply agreements		R	
Establish a Project Bank Account to Disburse all Payments	R		
Attest invoices from Vendors/Contractors		R	
Issuing Payments	R		
Submit detailed invoice progress payment listing complete with reconciled order status as stipulated in the purchase order		R	
Final Plan Cost Reconciliation and Closeout Report		R	
Maintain a comprehensive Accounting service to maintain a full set of books of Accounts in accordance with General Accepted Accounting Practice for the entire Project Cost through to Balance Sheet	R		
Annual Audit of Project Accounts	R		
Prepare and maintain a comprehensive Assets Register which reconciles with the total Project expenditure	R		
Cash Management	R		
Maintain Payment Ledger	R		
Develop Currency Management Strategy	R		
Prepare monthly Cash Flow Report		R	
Prepare Certificates of Payments		R	
Forecasts for Cash Flow demand and foreign currency requirements		R	
Project Tax Management	R		
Risk Management			
Prepare Risk Management Plan for scope within EPCM Services		R	
Approval of Contractor Risk Management Plans		R	Dependent upon contract form.
Project Risk Assessments		R	Within EPCM scope
Management of Tactical Risks		R	Within EPCM scope. Nalcor approves plans.
Management of Strategic Risks	R		Project wide.
Establish Project Insurance Program	R		Project wide.
Information Management			
Prepare Information Management Plan		R	

Notes: If there any discrepancy between this matrix and Agreement LC-G-002, the later shall be assumed to be accurate.

Responsibility Assignment Matrix - Nalcor Energy / EPCM Consultant

(Refer to Agreement LC-G-002 for Inclusive Listing of Responsibilities)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPCM Consultant	NOTES
IS/IT			
Infrastructure integration of Business Systems, if required	R	R	Requirements to be determined.
IT Infrastructure Contractor Offices/sites.		R	
Hardware/Software for NE-LCP team members located at Contractor offices/sites.		R	
Help Desk Support for NE-LCP team members located in Contractor offices/sites.		R	
Document Management			
Management of Engineering data and documents.		R	
Management of Vendor data and documentation.		R	
Management of Contractor data and documentation		R	
Provide Company with on-line / electronic access to key documentation		R	
Project Information Coding	R		EPCM Implements
Document /Data Standards (formatting)	R		EPCM Implements
Signing, stamping and sealing of Engineering documents		R	
Document Review Coordination		R	
Provision and use of existing project data/documentation	R		EPCM Utilizes
Deliverables List Submission Timing Matrix		R	
Prepare Final Documentation		R	
Deliverables Handover/Retention Matrix		R	
Benefits and Training			
Adhering to Nalcor/LCP hiring adjacency protocol and commitments from other agreements		R	
Meeting Participation Nalcor/LCP objectives with respect to under represented groups		R	
Developing and Delivering Training, orientations and apprenticeship programs			Apprenticeship Programs require Input by EPCM
Encouraging relevant stakeholder groups to access and develop training opportunities	R		
Providing manufacturers, consultants, contractors, and service companies in Newfoundland and Labrador with full and fair opportunity to participate on a competitive basis in the supply of goods and services		R	
Developing and Implementing supplier development Initiatives		R	
Implementing Diversity plan and Diversity Commitments as per other Agreements		R	
Carrying out consultant and contractor proposed programs in Newfoundland and Labrador to promote education, technology transfer and research and development		R	
Collecting and reporting Relevant Benefits Data as per Nalcor/LCP Benefits Criteria		R	
Defining and Executing commitments based on Nalcor/LCP Benefits Strategy and other agreements		R	

Attachment B.2

NE-LCP / EPCI or EPC Contractor Responsibility Matrix

Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor (Guidance Document)

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Project Management / General			
Prepare Overarching Project Execution Plan	R		
Establish / Implement Project-wide Policies	R		
Project Management Plans and Associated Procedures	R		EPCI uses standard processes
Project Execution Plan for EPCI Services Scope		R	
Prepare / Implement Project Procedures for within EPCI Scope		R	
Prepare Technical Interface Management Plan			Not Applicable - Internal to EPCI
Overall Technical Interface Management for EPCI Project		R	
Prepare Deliverable List & EPCI Work Packages		R	
Approval of EPCI Personnel			Not Applicable - Internal to EPCI
Recruitment & Training of Operations Staff	R		EPCI to support training
Health, Safety and Security Management			
Develop and implement a Project-specific H&S Management Plan for all phases of the work		R	Within EPCI's scope.
Chairs Project-level OHS Steering Committee	R		
Monitors contractor / sub-contractor performance and coaches to achieve desired outcomes		R	
Develop and implement site-specific H&S Management Plans		R	
Establish supporting H&S procedure, processes & tools for the H&S Plan.		R	
Prepare and implement Emergency Preparedness/Response Plans		R	
Develop & Implement Security Plan and Procedures		R	
Compliance with Occupational Health and Safety Act and Safety Regs		R	
Monitor Safety Performance and Prepare Safety Statistics Reports		R	
Establish construction safety targets		R	
Investigate and report Accidents and Near Misses		R	
Site Safety Inductions		R	
Verifying Contractor Safety Management Systems and site safety plans		R	
Implement a Safety-By-Design program to support the Engineering phase		R	As specified
Environmental Management and Regulatory Compliance			
Obtain Environmental Release	R		
Develop a Project-specific Environmental Protection Plan for all phases of the work		R	As specified
Develop and implement environmental mitigations and rehabilitation plan for use during and post the construction phase		R	As specified
Sub-contractor compliance with EPP		R	
Obtain and manage specified construction permits, licences, notifications and maintain conditions.		R	
Establish construction environmental management targets	R		
Develop Site Specific EPPs		R	As specified
Prepare and implement Project Regulatory Compliance Plan	R		
Identify requirements and complete applications for permits and licenses	R	R	Permits in Nalcor's name. As specified.
Compliance with applicable Environment Regulations and Conditions of Permits		R	
Environmental Awareness Training		R	

**Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor
(Guidance Document)**

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Verify Contractor Environmental Management Systems and EPPs	R		
Environment Management Committee	R		
Labor and HR Management			
Establish Project Labor Agreement (incl. Special Project Order)	R		EPCI supports negotiations and implements.
Overall management of Project labor agreements used by Contractors.	R		
Administer dispute resolution mechanisms outlined in Project labor agreement	R		
Overall labor management include productivity and performance.		R	
Administer of policies and procedures related to Personnel on site.		R	
Project Human Resources Policies	R		
External and Public Relations / Communications			
Project Press Releases	R		
Project Presentations	R		EPCI deliver presentations as approved by Nalcor.
Agreements with Outside Authorities			
• Government	R		
• Public Affairs	R		
• Community	R		
Manage Environmental Assessment Commitments	R		EPCI to execute commitments.
Property Assessment and Acquisition	R		
Innu Nation IBA Commitments	R		EPCI to execute commitments.
Reviews and Audits			
Project Audits			
• General Technical	R		
• Project-Level/Financial	R		
• Management	R		
• Environmental	R		
Prepare Design Verification Plan	R		
Independent Project Reviews	R		
Constructability Reviews		R	As specified
Operability Reviews	R		
Technical Peer Reviews		R	As specified
Engineering and Design			
Establish and maintain Project Basis of Design	R		
Establish Design Philosophies	R		
Prepare Review Plan for Company Supplied Documentation			Not Applicable
Engineering Management Plan			EPC uses standard procedures and processes
Develop Engineering Procedures for each discipline			EPC uses standard procedures and processes
Develop Design Integrity Stewardship Procedures	R		
Identify Design Codes and Standards		R	
Identify all engineering deliverables for each discipline		R	
Prepare Design Briefs & Criteria		R	As specified
Prepare Technical and Functional Specifications		R	As specified
Implement a Value Improving Practices (VIP) program as a means to improve cost, schedule and operability/reliability		R	As specified
Equipment Spec/Data Sheets/Evaluation/MOC, Drawings - All Disciplines		R	
Manage all hard and soft technical interfaces within and touching contracted scope		R	
Perform Interdiscipline checks on all engineering deliverables		R	
Prepare Construction Drawings		R	Except contractor or supplier furnished
Prepare Operations and Maintenance Plan		R	As specified

**Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor
(Guidance Document)**

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Prepare Design - Construction Management Plan			As specified
Conduct design in accordance to Company-supplied Life Cycle Cost Analysis Philosophy		R	As specified
Arrange and coordinate HAZID and HAZOP reviews		R	
Perform Safety Integrity Level (SIL) studies as required		R	
Detailed Technical Studies		R	
Overall System Engineering and Integration Studies	R		
Complete Equipment Criticality Ranking for use in determining surveillance		R	
Technical Bid Analysis		R	EPCI within its scope
Technical Review of Contractor Shop Drawings	R		
Equipment Model Testing		R	As specified
Ensure equipment Installation Procedures are available		R	
Automation, Control, Monitoring, Remote Operation		R	As specified
Review of Construction Contractor's Drawings	R		
Supply Chain Management			
<u>Contracting and Procurement</u>			
Establish Master Contract Package List and Contracting Strategy	R		
Prepare Contracts/Purchasing Policies		R	EPC uses standard procedures and processes
Prepare Overall Purchasing Plan		R	EPC uses standard procedures and processes
Prepare Overall Contracting Plan		R	EPC uses standard procedures and processes
Prepare and implement Contracts/Purchasing Procedures		R	EPC uses standard procedures and processes
Define Construction/Procurement Packages		R	
Establish standard Commerical Terms and Conditions for agreements		R	
Special and Supplementary Conditions - Inquiry Document		R	
Develop procurement and contracting schedule including Delivery Schedule (ROS Dates)		R	
Data Submittal Schedule		R	
Prepare list of qualified Bidders		R	
Prepare and Issue EOI & Pre-Qual Documents		R	
Prepare and issue tender / RFP packages		R	
Respond to Clarification from Bidders		R	
Receive Bids/Opening		R	
Commercial and Technical Evaluations of Tenders		R	
Conduct pre-award meetings		R	
Contract/Purchase Requisition		R	
Issue Purchase Order (PO)/Contract		R	
Contract/Purchase Order Register		R	
Status of Purchase Orders/Contract		R	
Contract/Purchase Order Amendments		R	
Contractor Competency Evaluations		R	
Claims Management		R	
Dispute Resolution		R	
Close Out PO/Contracts		R	
<u>Materials Management and Control</u>			
Material Management Plan		R	
Produce Detail Material Management Control Procedures/Plans		R	
Provide and maintain Material Management Control System		R	
Report Progress and Update Regularly		R	
Establish a Site Materials Storage Area		R	
Schedule Deliveries to Site		R	
Perform receiving inspection		R	
Establish and Maintain Material Receipts Register		R	

**Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor
(Guidance Document)**

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Distribute Equipment and Material to Contractors		R	
Report and manage non-conforming material		R	
Carry Out Regular Inventory Checks		R	
Procure and maintain Commissioning Spares		R	
Procure and maintain Operating Spares		R	
Warehousing of Spares		R	Until specified
Secure Vendor Commissioning Assistance		R	
Transfer Insurance and Operating Spares to Owner's Warehouse		R	
Stored Equipment Maintenance & Preservation		R	
Expediting			
Expediting and Inspection Procedures		R	
Expediting Visit Register		R	
Vendor Information		R	
Equipment and bulk materials		R	
Status Reporting		R	
Logistics			
Develop Logistics and Materials Movement Plan		R	
Develop Logistics and Materials Movement Procedures		R	
Coordinate Inland Freight		R	
Obtain shipping documents		R	
Coordinate Ocean Freight		R	
Prepare Customs Documents for importing into Canada		R	
Prepare shipping data for export		R	
Operating Plant Logistics Planning	R		
Construction / Installation			
Prepare and implement Construction Management Plan		R	
Overall construction management for the Project		R	
Construction Planning		R	
Develop and Implement Construction Management Procedures		R	
Complete modularization / prefabrication analysis		R	
Prepare Detailed Construction Execution Plan & Schedule		R	
Manage Site Queries		R	
Engineering Query Process		R	
Manage Owner supplied materials		R	As specified
Develop and implement Constructability Program and supporting procedures in order to incorporate industry best practice		R	
Carry Out Constructability Design Reviews		R	
Develop and implement a Productivity Improvement Plan		R	As specified - EPCI Risk
Overall management of Project sites and provision of common services (e.g. accommodations, fire, security, transportation,etc.)		R	
Provision of Temporary Facilities at Site including Construction Office		R	For EPCI and NE-LCP team
Provide Services to Offices		R	
Provision of Site Administration Services and Accommodations / Messing		R	For MF Site, Nalcor provides
Establish and maintain Fire Protection and Medical Facilities and Services	R	R	For MF Site, Nalcor provides
Provide Suitable access and lay down / storage areas	R	R	For MF Site, Nalcor provides
Reports/Communication External to Project Team	R		
Relocations of Services and Site Clearing		R	
Overall work site coordinator		R	
Control of the Work and Contractors.		R	
Contractor Performance Monitoring		R	

**Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor
(Guidance Document)**

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Productivity Monitoring and Improvement		R	As specified - EPCI Risk
Managing and Checking the setting out of the works on site including control survey		R	
Liaison with Contractors to determine material/equipment requirements and expediting from field where necessary		R	
Procure, administer, maintain all construction equipment, consumables, small tools, safety supply		R	
Construction power	R		For MF, Nalcor provides.
Provide Site Transport (to and from the site and within the site)		R	
Construction Power - Site Distribution	R	R	For MF Site, Nalcor provides
Provide site communications - Local system		R	For MF Site, Nalcor provides
Establish and maintain Warranty Register		R	
Project Completions			
Prepare Project Completions Philosophy		R	
Prepare Mechanical Completion (MC), Commissioning, and Preservation Specifications		R	
Prepare project-specific procedures for punch-list, preservation, permit-to-work, lock-out/tag-out, material handling		R	
Establish and implement a computerized Project Completion System		R	
Mechanical Completion (MC) - Manual, Execution / Management		R	
Prepare Commissioning Manual		R	
Develop preservation program		R	
System / Equipment Preservation - Manual, Execution / Management		R	
Mechanical Completion Hand-Over Plan & Execution		R	
Prepare Handover Packages after Mechanical Completion		R	
Prepare M/C Inspection Test Records		R	
Prepare Mechanical Completion Certificate		R	
Prepare Commissioning Plan		R	
Readiness Process - define and implement	R		
Prepare and Update Pre-Op Schedule	R		
Commissioning Procedures		R	
Prepare commissioning static and dynamic documentation (e.g. checklist, run logs, etc.)		R	
Commissioning Spares Recommendation		R	
Prepare Testing Requirements, Procedures and Check Lists		R	As specified
RFO Turnover Packages	R		
Arrange for Equipment Data Books, Operating and Maintenance Manuals to be supplied		R	
Hand-Over As-Built Drawings after Acceptance Tests		R	
Services		R	
Spare Parts Recommendation		R	
Prepare Spare Parts Lists		R	
Arrange for the provision of the necessary spare and replacement parts for initial Operation	R		
Prepare / maintain Master Equipment List		R	
Prepare Training Manuals		R	As specified
Prepare Operations Procedures	R		
Prepare Operating Manuals		R	As specified
Prepare Maintenance Manuals		R	As specified
Prepare As-Built Documentation		R	As specified
Quality Management			
Prepare Overarching Project Quality Assurance Plan	R		

**Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor
(Guidance Document)**

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Prepare and implement Project Quality Plan		R	Nalcor to audit implement.
Develop risk-based contractor / supplier screening tools for use in determining surveillance requirements	R		
General Quality Audits	R		
EPCI / Contractors Audit Function		R	NE will approve / accept the Contractors Audit Process
Develop and implement NCR Process		R	NE will approve / accept the Contractors NCR Process
Closure of Audit Findings		R	
Continuous Improvement Process		R	
Assess Contractors Quality Plans	R	R	Include EPCI subs
Overall Quality Statistics / Metrics		R	
Quality Training		R	
Lessons Learned		R	EPCI responsible for its scope.
<u>In Engineering</u>			
Development and implement engineering QA plan		R	
Engineering QC process		R	
Engineering Quality Reviews		R	
<u>In SCM</u>			
Risk-Based evaluation of suppliers / contractors for surveillance program development	R		
Prequalification - Establish Quality requirements	R		
Prequalification - Establish Quality requirements	R		
RFP - Quality Requirements	R		
Third Party Inspection		R	
Materials Traceability		R	
<u>In Construction</u>			
Overall responsibility for construction quality		R	
Contractor adherence to codes and regulations		R	
Establish site survey control system and control points		R	
Processing of Site NCR's		R	
Producing Construction Surveillance Reports		R	
Receiving Inspection at Site		R	
Prepare and implement Inspection Policies		R	
Prepare and implement Inspection Work Plan		R	
Review Quality Assurance (QA) programs/inspections		R	
Review of Vendors ITP's for equipment		R	
Conduct Shop Inspections		R	
Coordinate Factory Acceptance Testing and Site Integration Testing		R	
Develop FAT and SIT procedures		R	
Witness Shop Performance Testing		R	
Establish and operate site laboratories		R	
Review Vendor's Inspection and Testing Reports		R	
Status Reporting		R	
Endorse equipment Release for Shipment		R	
Project Control			
Establish Project Master Schedule	R		
Changes to Project Master Schedule	R		
Develop Project Controls Work Plan		R	For EPCI scope
Business Systems Integration	R		
Develop Work Breakdown Structure(WBS) & Cost Code of Accounts	R	R	To required levels
Progress and Performance Management		R	

**Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor
(Guidance Document)**

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Planning & Scheduling		R	
Progress Reports			
• Overall Project	R		
• EPCI Scope		R	
Estimating			
Estimating Work Plan & Procedures			Not Applicable - Internal to EPCI
Prepare Services Budget Estimate			Not Applicable - Internal to EPCI
Prepare Cost Estimates for the Work			Not Applicable - Internal to EPCI
Assign Coding System		R	
Equipment and Material List		R	
Prepare Basis of Estimate			Not Applicable - Internal to EPCI
Develop Material Quantities (bulks and consumables)			Not Applicable - Internal to EPCI
Develop Equipment and Material Supply Cost (rates)			Not Applicable - Internal to EPCI
Develop Labor Rates for use in estimating			Not Applicable - Internal to EPCI
Develop production norms / rates to be used in the estimate		R	
Prepare Capital Estimate of Direct Costs and Matrix Summaries	R		
Develop Construction Hours including Productivity Factor	R		
Establish Estimate Contingency	R		
Contingency Management	R		
Capital Cost Estimate Details and Matrix Summaries	R		
Prepare estimates for Project Changes		R	
Check Bid Estimates for Construction Contracts		R	Not Applicable - Internal to EPCI
Operating Cost Estimate	R		
Planning and Scheduling			
Manage Work to achieve Project Control Schedule		R	
Prepare Scheduling Development and Control Plan			Not Applicable - Internal to EPCI
Implement Scheduling Development and Control Plan			Not Applicable - Internal to EPCI
Develop Scheduling Procedures			Not Applicable - Internal to EPCI
Prepare detailed Project Control Schedule and updates		R	
Prepare detailed schedule of Engineering Activities by work Package		R	
Prepare detailed schedule of Equipment Procurement by Package		R	
Prepare detailed Construction Schedules and updates		R	
Prepare schedules showing sequence and timing for individual		R	
Prepare work hour histograms and "S" curves		R	
Cost and Schedule Stewardship			
Convert EPCI Consultant's Services Budget and Sanction Cost Estimate into a Project Budget	R		
Prepare Cost Management Plan			Not Applicable - Internal to EPCI
Implement Cost Management Plan			Not Applicable - Internal to EPCI
Develop forms and Procedures for Capital Cost Control		R	Not Applicable - Internal to EPCI
Develop Progress and performance management procedures		R	For EPCI Scope
Code of Accounts for Asset Classification and Capitalization	R		For EPCI Scope
Cost Control for the Work		R	Not Applicable - Internal to EPCI
Maintain and update EPCI Budget		R	Not Applicable - Internal to EPCI
Allocate funds for Contract Change Orders	R		
Receipt and review of contractor cost reports	R		
Prepare monthly Project Cost Report		R	As specified
Management of Change			
Prepare Change Management Plan for EPCI Project		R	
Management of Change within EPCI Services		R	

**Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor
(Guidance Document)**

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Engineering / Design Change Management		R	Using EPCI's process, linked to Project MOC process.
Maintain the individual Contract Scope Change Register		R	
Accounting & Invoicing			
Prepare Invoicing and Payment Plan		R	
Establish a Project Bank Account to Disburse all Payments	R		
Attest invoices from Contractors	R		
Issuing Payments	R		
Submit detailed invoice progress payment listing complete with reconciled order status as stipulated in the purchase order		R	
Final Plan Cost Reconciliation and Closeout Report		R	
Maintain a comprehensive Accounting service to maintain a full set of books of Accounts in accordance with General Accepted Accounting Practice for the entire Project Cost through to Balance Sheet	R		
Annual Audit of Project Accounts	R		
Prepare and maintain a comprehensive Assets Register which reconciles with the total Project expenditure	R		
Cash Management	R		
Maintain Payment Ledger	R		
Develop Currency Management Strategy	R		
Prepare monthly Cash Flow Report		R	Not Applicable - Internal to EPCI
Prepare Certificates of Payments		R	
Forecasts for Cash Flow demand and foreign currency requirements	R		Based upon Project Control Schedule and milestone payment schedule
Project Tax Management	R		
Risk Management			
Prepare Risk Management Plan for scope within EPCI Services	R		
Approval of Contractor Risk Management Plans			Not Applicable - Internal to EPCI
Project Risk Assessments	R		
Management of Tactical Risks		R	Within EPCI scope.
Management of Strategic Risks	R		Project wide.
Establish Project Insurance Program	R		Project wide.
Information Management			
Prepare Information Management Plan	R		
IS/IT			
Infrastructure integration of Business Systems, if required	R	R	Requirements to be determined.
IT Infrastructure Contractor Offices/sites.		R	
Hardware/Software for NE-LCP team members located at Contractor offices/sites.		R	
Help Desk Support for NE-LCP team members located in Contractor offices/sites.		R	
Document Management			
Management of Engineering data and documents.		R	
Management of Vendor data and documentation.		R	
Management of Sub-Contractor data and documentation		R	
Provide Company with on-line / electronic access to key documentation		R	
Project Information Coding	R		EPCI Implements
Document /Data Standards (formatting)	R		EPCI Implements
Signing, stamping and sealing of Engineering documents		R	
Document Review Coordination		R	
Provision and use of existing project data/documentation	R		EPCI Utilizes

**Responsibility Assignment Matrix - Nalcor Energy / EPC or EPCI Contractor
(Guidance Document)**

CORE ACTIVITY	RESPONSIBILITY ASSIGNMENT		
	Nalcor Energy	EPC / EPCI Contractor	NOTES
Deliverables List Submission Timing Matrix		R	
Prepare Final Documentation		R	
Deliverables Handover/Retention Matrix		R	
Benefits and Training			
Adhering to Nalcor/LCP hiring adjacency protocol and commitments from other agreements		R	As specified
Meeting Participation Nalcor/LCP objectives with respect to under represented groups		R	As specified
Developing and Delivering Training, orientations and apprenticeship programs	R		
Encouraging relevant stakeholder groups to access and develop training opportunities	R		
Providing manufacturers, consultants, contractors, and service companies in Newfoundland and Labrador with full and fair opportunity to participate on a competitive basis in the supply of goods and services		R	As specified
Developing and Implementing supplier development Initiatives		R	As specified
Implementing Diversity plan and Diversity Commitments as per other Agreements		R	As specified
Carrying out consultant and contractor proposed programs in Newfoundland and Labrador to promote education, technology transfer and research and development		R	As specified
Collecting and reporting Relevant Benefits Data as per Nalcor/LCP Benefits Criteria		R	As specified
Defining and Executing commitments based on Nalcor/LCP Benefits Strategy and other agreements		R	As specified