

## Nalcor Energy – Lower Churchill Project



### Muskrat Falls Generation Management Plan – Construction Phase

Nalcor Doc. No. MFA-PT-MD-0000-PM-PL-0001-01

Comments: This document covers the Construction phase of the Project.	Total # of Pages: (Including Cover): 333
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**Inter-Departmental / Discipline Approval (where required)**

Department	Department Manager Approval	Date
PM – MFG	 S. O'Brien	12 Jan 2016
Deputy General PM	 J. Kean	17-JAN-2016



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**Appendix A – Organization Chart**

**Appendix B – Scope Descriptions**

**Appendix C – Component Snapshot**

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## 1 OVERVIEW

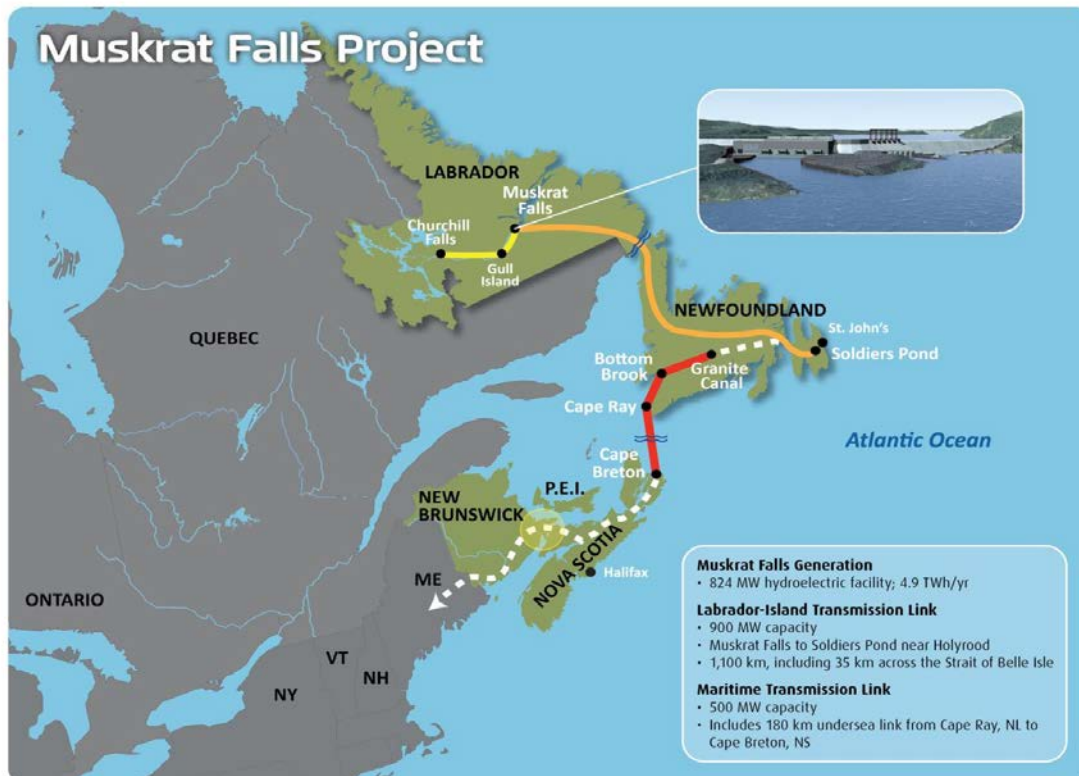
The Lower Churchill Management Corporation (LCMC) recognizes that excellence in Project and Construction Management will lead to the Lower Churchill Project (LCP) success ensuring that the project meets the required objectives related to safety, quality, schedule, cost, performance, environment and reputation. This can be translated to the following principles.

- Ensuring that LCP completion meets LCMC contractual requirements.
- Ensuring that LCP is delivered on time and within budget.
- Ensuring that LCP meets all specified safety, quality, and environmental requirements.

The LCP is comprised of a number of projects, referred to as Components, as follows and as illustrated in Figure 1-1 (also shown in Figure 1.1 is the Maritime Link Project managed by Emera, which is not part of the scope included in the LCP).

- Muskrat Falls Generation Project (Component 1).
- HVdc Specialties Project (Component 3).
- Overland Transmission Line Project (Component 4).
- Strait of Belle Isle Project (SOBI).

Figure 1-1 – Lower Churchill Project



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This LCP Component Management Plan has been prepared for Muskrat Falls Generation (MFG) to provide the MFG Project Manager, Site Manager, Construction Manager, and Project Delivery Team with guidelines for consistent execution including project and construction management processes for all scopes of work related to MFG. Since Engineering activities are effectivity complete, this document will focus on the Construction Phase of the project and has been titled “Muskrat Falls Generation Management Plan – Construction Phase” (hereafter referred to as “Plan”).

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## **2 PURPOSE**

The purpose of this Plan is to provide working level information on the overall execution approach, on how the MFG organization functions and communicates, and on the day to day processes utilized by the Project Delivery Team. It has been written for MFG Project Delivery Team staff and for others wishing to understand how the MFG Project Delivery Team functions. It is intended to be the foundation for project management decision-making amongst the MFG Project Delivery Team. The purposes of this Plan are as follows.

- To provide guidance, clarity and direction with respect to how the construction phase of the MFG scope of LCP will be managed to support the broader Project objectives.
- To establish the key management focus for compliance with the base parameters of safety, quality, environment, goals, values and budgetary limits of the Project.
- To provide a common base for the MFG Project Delivery Team to operate in a harmonious and synergistic manner with common focus and goals.
- To provide details on the all-encompassing management/ delivery for the work, while avoiding duplication of other management plans, philosophies and strategies developed and documented for the Project.



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### **3 APPLICATION AND SCOPE**

This Plan is applicable to all scopes of work executed under MFG covering Home Office and Site activities. However, although Reservoir Clearing activities are covered under MFG budget, this scope is being managed by Component 4 – Overland Transmission Lines (OTL) and this Plan will not make reference to Reservoir Clearing. This Plan applies to the construction phase of MFG and as such shall govern the delivery of the scope. All individuals working within the MFG Project Delivery Team, or providing functional support and oversight, shall be familiar with the contents of this Plan and align activities and approaches in accordance to the requirements stated within. While this document does take into account the contractor's execution plans, it is not designed to give an understanding of how the contractor does business.

This Plan covers the scope and management responsibilities assigned to MFG scope of work, which includes an 824 MW powerhouse with 4 Kaplan turbines, supporting structures including RCC dams and early works and supporting infrastructure. Management responsibilities include health, safety, environmental, quality management, labour management, project controls, risk management, contract management, follow-on engineering, site management, construction management, completions, communications and start-up.

As the timing of this Plan coincides with the completion of Engineering (except follow-on engineering) and a well-advanced construction program, its focus has been limited to ongoing construction activities, completions and their supporting activities. The key elements of how MFG will be managed are covered in this Plan, as follows.

- Execution Strategy
- MFG Project Delivery Team Management
- Construction Management
- Site Management
- Project Controls
- Quality Management
- Environmental Management and Regulatory Compliance
- Health, Safety, and Security
- Labour Relations Management
- Follow-on Engineering
- Commercial Management and Contract Administration
- Completions
- Communications

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#### **4 UPDATING**

The procedures, processes, forms and other best practices referred to in this Plan are updated or revised on a regular basis to reflect changes in the construction management methodology as required to meet project objectives. Latest revisions of these documents are available on the LCP Information Management System – Aconex and responsibility for maintaining and updating this document resides with the MFG Deputy Project Manager.

Other important REFERENCE DOCUMENTS which will guide the execution of the work include:

- LCP-PT-MD-0000-PC-PL-0001-01 - Project Controls Management Plan
- LCP-PT-MD-0000-PM-PL-0002-01 - Project Change Management Plan
- LCP-PT-MD-0000-PM-LS-0001-01 - Project Risk Management Plan
- LCP-PT-MD-0000-PM-PL-0006-01 - Project Technical Interface Management Plan
- LCP-PT-MD-0000-CS-PL-0001-01 - Construction Management Plan

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## **5 DEFINITIONS**

The majority of all definitions associated with the Project can be found in the Project Dictionary, Acronyms & Abbreviations List, document no. LCP-PT-MD-0000-PM-LS-0001-01. Below are definitions that are used frequently or apply directly to the MFG Project Delivery Team as it relates specifically to the administration of the agreements with the construction contractors.

### **Contract Administration**

References the Post Award Contract Management of Contracts and is the process whereby the Contract Administrator makes sure the parties employ due diligence to comply with the terms, conditions, rights and obligations of the contract. It includes the coordination of any changes to the agreement that might occur over the course of the contract and the closeout process when both parties have met their obligations.

### **Company Representative**

The person designated in the Agreement that shall have the authority to act on behalf of Company regarding matters under the Contract, receive Notices, and perform such other duties and acts reserved to the Company Representative under the Contract.

### **Company**

Definition as stated in the relevant agreement articles.

### **Engineer**

LCMC, as referred in project contracts or agreements.

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## **6 ABBREVIATIONS AND ACRONYMS**

The majority of all abbreviation and acronyms associated with the Project can be found in the Project Dictionary, Acronyms & Abbreviations List, document no. LCP-PT-MD-0000-PM-LS-0001-01. Below are abbreviations and acronyms that are used frequently or apply directly to the MFG Project Delivery Team.

ACM	Area Construction Manager
A&D Test	Alcohol & Drug Test
AQL	Acceptance Quality Limit
AQL	Acceptable Quality Level
CON	Concession Request
C-SEPP	Contract Specific Environmental Protection Plan
CTR	Cost-Time-Resource
EA	Environmental Assessment
ECN	Engineering Change Notice
EMP	Environmental Management Plan
EPP	Environmental Protection Plan or Emergency Preparedness Plan
ERC	Environment and Regulatory Compliance
ERP	Emergency Response Plan
H&S	Health and Safety
HV-GB	Happy Valley-Goose Bay
ITP	Inspection and Test Plan
JSA	Job Safety Analysis (JSA)
KPI	Key Performance Indicators
LCMC	Lower Churchill Management Corporation
LCP	Lower Churchill Project
LR	Labrador Relations
MFG	Muskrat Falls Generation
NL	Newfoundland and Labrador
NLH	Newfoundland and Labrador Hydro
PLA	Project Labor Agreement
PPE	Personal Protective Equipment
P-WEPP	Project-Wide Environmental Protection Plan
QA/QC	Quality Assurance/ Quality Control
RM	River Management
SDRL	Supplier Document Requirements List
SIN	Site Instruction
SQY	Site Query
SSAR	South Side Access Road
SWP	Safe Work Practices
WTO	Work Task Order

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## **7 RESPONSIBILITIES**

The following responsibilities are relevant as it relates to this Plan.

### **Project Manager – Muskrat Falls Generation**

- Ensure all members of the MFG Project Delivery Team are familiar with and adhere to the contents of this Plan.
- Ensure this Plan is revised and updated as required (as stated previously, this will be the responsibility of the MFG Deputy Project Manager, under the direction of the Project Manager).

### **Muskrat Falls Generation Project Delivery Team**

- Read and understand this Plan and its intentions, management approaches and protocols.
- Enact their roles in accordance to this Plan.

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## 8 REFERENCES

The following table provides a “sample” of key references to this document in relation to MFG. It should be noted that this is not an “exhaustive” list and references to all policies and procedures related to the management and execution of MFG can be located in Aconex and “The Current”.

<b>Document No.</b>	<b>Title</b>
LCP-PT-MD-0000-PM-ST-0002-01	Overarching Contracting Strategy
LCP-PT-MD-0000-CS-PL-0001-01	Construction Management Plan
LCP-PT-MD-0000-PM-PL-0001-01	Project Execution Plan (Scope and Approach)
LCP-PT-ED-0000-EN-RP-0001-01	Lower Churchill Project – Basis of Design
LCP-PT-MD-0000-PM-CR-0001-01	Project Delivery Team Organizational Charts
LCP-PT-MD-0000-HR-SD-0003-01	Code of Conduct and Business Ethics Handbook
LCP-PT-MD-0000-HS-PL-0001-01	Health and Safety Management Plan
LCP-PT-MD-0000-HS-PL-0009-01	Contractor HS Performance Management Roles/Responsibilities
LCP-PT-MD-0000-HS-PL-0004-01	Project-Wide Emergency Response Plan
LCP-PT-MD-0000-PM-LS-0001-01	Project Dictionary, Acronyms and Abbreviations List
LCP-PT-MD-0000-EV-PL-0002-01	Environmental Management Plan
LCP-PT-MD-0000-EV-PL-0028-01	Waste Management Plan
LCP-PT-MD-0000-EV-PL-0003-01	Avifauna Management Plan
LCP-PT-MD-0000-EV-PL-0024-01	Regulatory Compliance Plan – Generation
LCP-PT-MD-0000-EV-PL-0020-01	Master Spill Response Plan – All Components
LCP-PT-MD-0000-EV-FR-0004-01	Hazardous Material Spill Status Report (HMSSR) Form
LCP-PT-MD-0000-EV-FR-0001-01	Daily Environmental Monitoring Report Form
LCP-PT-MD-0000-EV-PL-0033-01	Wetland Compensation Plan
LCP-PT-MD-0000-HS-SD-0003-01	Site Access Standard
LCP-PT-MD-0000-EN-PR-0001-01	Procedure for Concession Requests
LCP-PT-MD-0000-CS-PR-0002-01	Procedure for Site Instruction
LCP-PT-MD-0000-CS-PR-0001-01	Procedure for Site Query
LCP-PT-MD-0000-CS-PR-0002-01	Procedure for Field Work Instruction
LCP-PT-MD-0000-EN-PR-0002-01	Procedure for Engineering Change Notice (ECN)
LCP-PT-MD-0000-SC-PR-0035-01	Procedure for Post Award Contract Administration
LCP-PT-MD-0000-CS-FR-0004-01	Daily Field Focus Checklist Form
LCP-PT-MD-0000-CS-PR-0003-01	Procedure for Daily Construction Report
LCP-PT-MD-0000-CS-FR-0002-01	Daily Construction Report Form
LCP-PT-MD-0000-HS-FR-0014-01	Daily Health, Safety and Security Report Form
LCP-PT-MD-0000-AD-FR-0018-01	Weekly Vehicle Inspection Checklist
LCP-PT-MD-0000-AD-PR-0001-01	Fleet Administration Procedures
LCP-PT-MD-0000-FI-PR-0001-01	Capital Expenditure Authorization Procedure
LCP-PT-MD-0000-SC-PR-0029-01	Approval Matrix for Key Procurement Recommendations
LCP-PT-MD-0000-SC-PL-0001-01	Procurement Management Plan

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LCP-PT-MD-0000-SC-PL-0002-01	Materials Management Plan
LCP-PT-MD-0000-SC-PL-0003-01	Overall Logistics Plan
LCP-PT-MD-0000-MM-PR-0004-01	Material Receipt Procedure
LCP-PT-MD-0000-MM-PR-0005-01	Material Request, Issue and Return Procedure
LCP-PT-MD-0000-MM-PR-0006-01	Over, Short and Damaged Procedure
LCP-PT-MD-0000-QM-PR-0007-01	Non-conformance Procedure
LCP-PT-MD-0000-QM-PL-0001-01	Overarching Quality Management Plan
LCP-PT-MD-0000-LR-SD-0001-01	Drug and Alcohol Standard
LCP-PT-MD-0000-HR-SD-0002-01	Respectful Workplace Standard
LCP-PT-MD-0000-HS-SD-0003-01	Worker Site Access Standard
LCP-PT-MD-0000-HR-SD-0003-01	Code of Conduct and Business Ethics Handbook
MFA-PT-MD-2000-EN-PL-0001-01	Stage 1 River Management Manual
MFA-PT-MD-2000-CV-MN-0001-01	Stage 2 River Management Manual (Diversion Manual)
MFA-AM-CD-9112-EV-002-01	Fish Habitat Compensation Plan
LCP-PT-MD-0000-PC-PL-0001-01	Project Controls Management Plan
LCP-PT-MD-0000-PM-PL-0002-01	Project Change Management Plan
LCP-PT-MD-0000-PM-PR-0005-01	Change Management Procedure
LCP-PT-MD-0000-RI-PL-0001-01	Project Risk Management Plan
LCP-PT-MD-0000-PM-PL-0006-01	LCP Project Technical Interface Management Plan
LCP-PT-MD-0000-PM-PR-0004-01	Technical Interface Management Procedure
LCP-PT-MD-0000-IM-PL-0003-01	LCP Information Management Plan
LCP-PT-MD-0000-QM-PL-0001-01	Overarching Quality Management Plan
MFA-PT-MD-0000-QM-PL-0001-01	MFG Survey Surveillance Plan
MFA-PT-MD-0000-QM-PL-0002-01	MFG Quality Assurance Surveillance Plan (QASP)
LCP-PT-MD-0000-QA-MN-0001-01	LCMC Materials Laboratory Quality Manual
MFA-PT-MD-0000-QM-MN-0001-01	MFG Civil Inspector Handbook
LCP-PT-MD-0000-CM-PL-0001-01	Completions Implementation Plan
LCP-PT-MD-0000-CM-FR-0001-01	Mechanical Completion Certificate
LCP-PT-MD-0000-CM-FR-0002-01	Punchlist Form
LCP-PT-MD-0000-CM-FR-0003-01	Static Commissioning Certificate
LCP-PT-MD-0000-CM-FR-0004-01	Transfer of Responsibility Form
LCP-PT-MD-0000-CM-FR-0005-01	Handover Certificate
LCP-PT-MD-0000-CA-PR-0003-01	Payment Certificate Procedure
LCP-PT-MD-0000-SC-PR-0012-01	Back-Charges Procedure
LCP-PT-MD-0000-CM-PL-0001-01	Completion Implementation Plan
LCP-PT-MD-0000-HS-PR-0001-01	Authorization Protocol for Access to Project Construction Sites
LCP-PT-MD-0000-AD-PR-0001-01	Project's Fleet Administration Procedures
LCP-PT-MD-0000-AD-FR-0018-01	Weekly Vehicle Inspection Checklist



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## **9 SCOPE OF WORK**

MFG scope of work (not including Reservoir Clearing) is comprised of the Muskrat Falls Hydroelectric Station and associated infrastructure, as follows (broken down by physical component).

### **Infrastructure**

- 34 km of access roads, including upgrading (temporary roads) and new road construction, and temporary bridges spanning the approach channel of the spillway.
- A 300 person starter (temporary) accommodations complex for early works construction.
- A 1,500 person accommodations complex and office buildings (for the construction period).
- Sewage Treatment Facility at the Accommodations Complex.

### **Dams and Spillway**

- A north roller compacted concrete (RCC) overflow dam.
- A south rock fill dam.
- River diversion during construction via natural river channel for first two years and via the spillway for subsequent years.
- Gated spillway.

### **Intake / Powerhouse / Turbine Generator**

- A close coupled intake and powerhouse, including:
  - intakes with gates and trash racks;
  - 4 turbine/generator units at approximately 206 MW each with associated ancillary electrical/mechanical and protection/control equipment;
  - 5 power transformers (includes 1 spare), located on the draft tube deck of the powerhouse;
  - 2 overhead cranes.

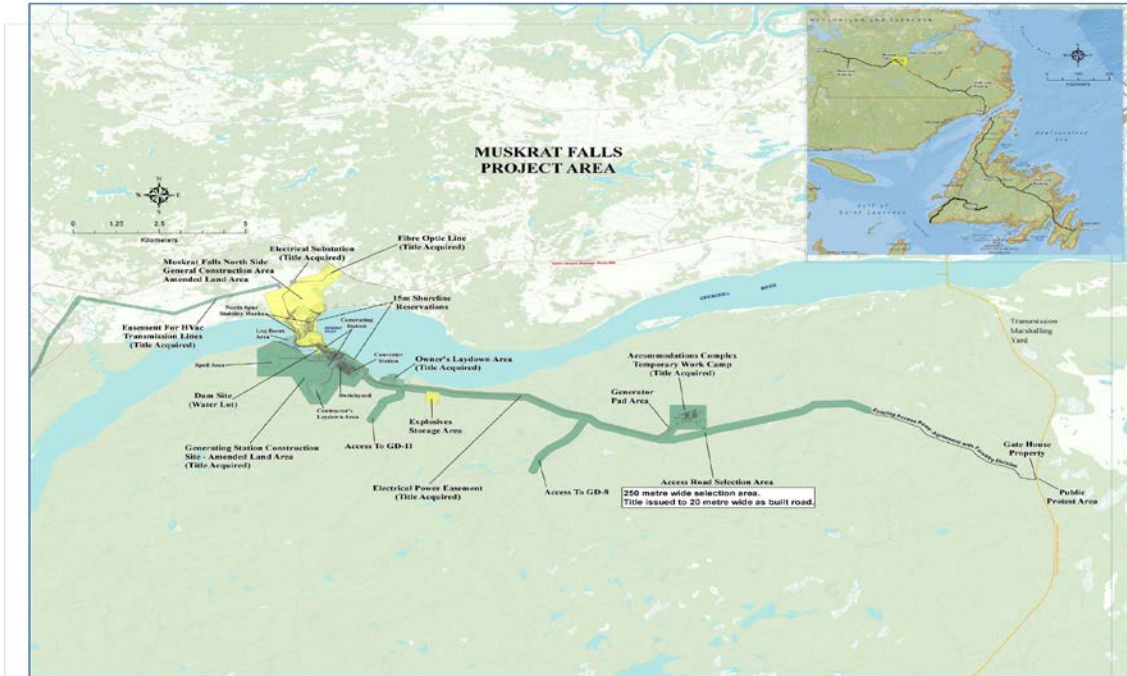
### **North Spur**

- Upstream cut-off wall and downstream stabilization works.

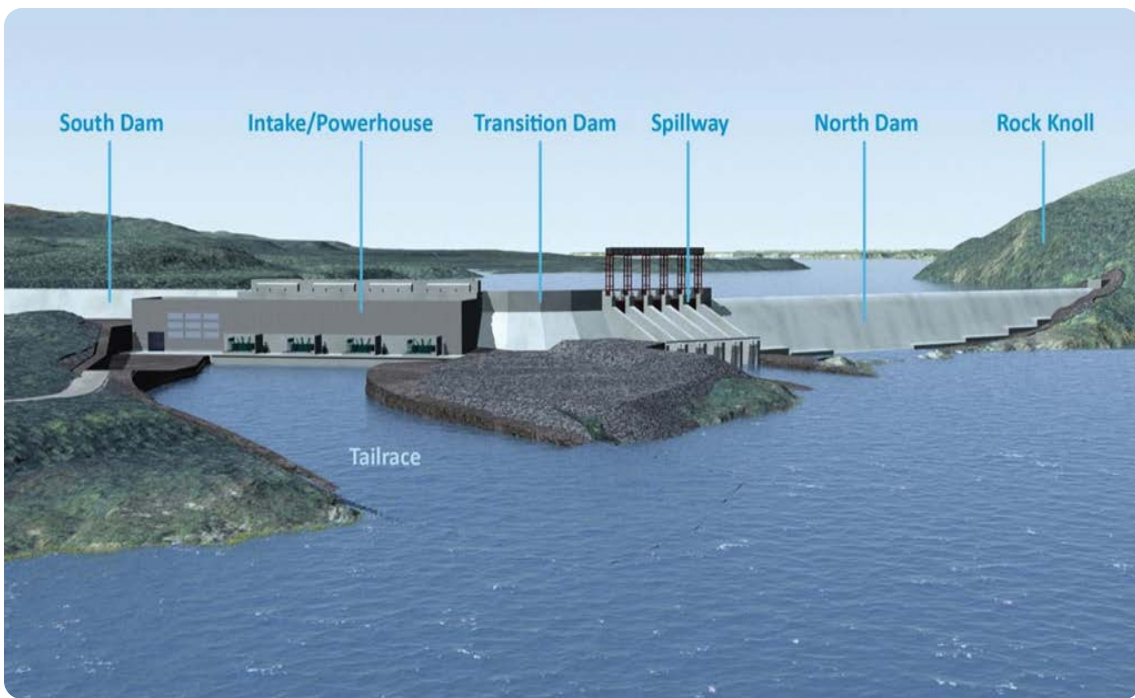
Figures 9-1, 9-2, 9-3, 9-4 and 9-5 present the physical general arrangement of MFG.

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**Figure 9-1 - Physical General Arrangement MFG**

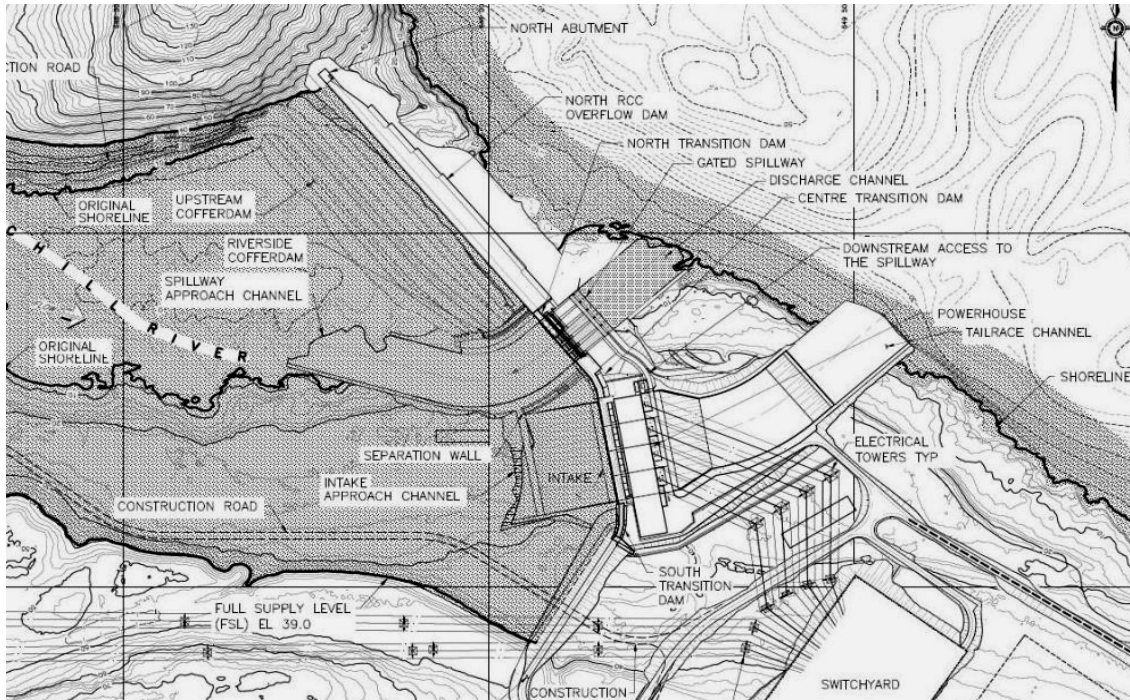


**Figure 9-2 - Three Dimensional View of Muskrat Falls Hydro Facility**

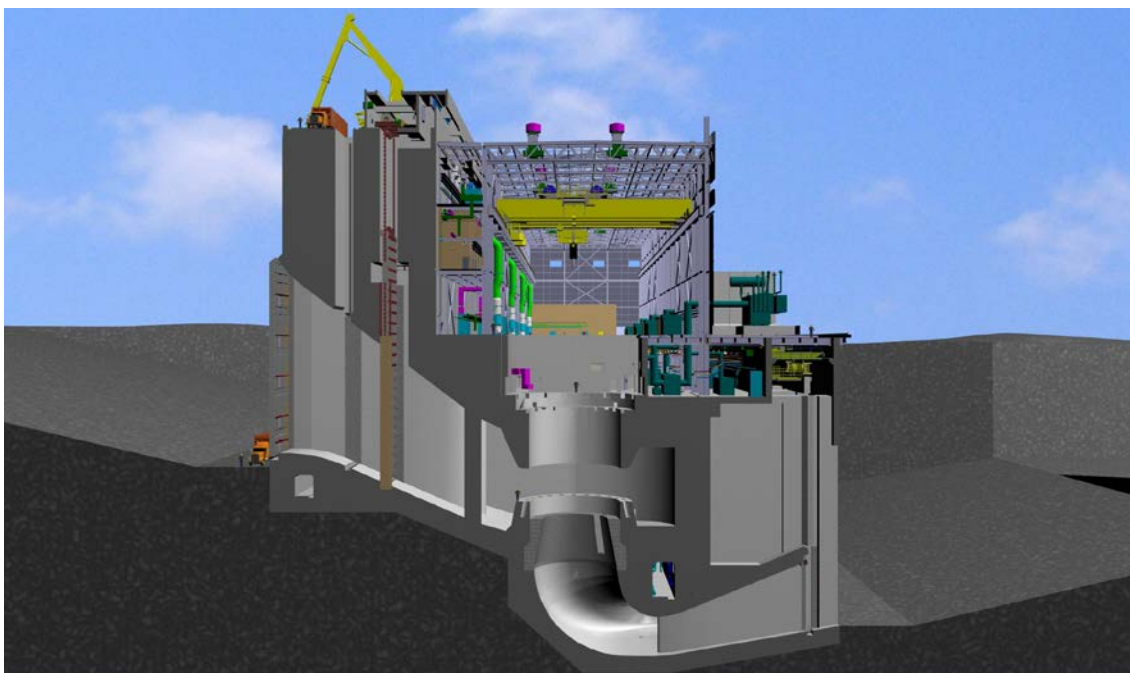


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**Figure 9-3 – Physical General Arrangement of Muskrat Falls Hydro Facility**



**Figure 9-4 – Cross Sectional View of Muskrat Falls Powerhouse**





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Figure 9-5 – Physical General Arrangement of North Spur (Construction Completed)



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## 10 GENERAL BUILD SEQUENCE

MFG construction activities can be categorized into three distinct phases or “stages” of construction, as follows.

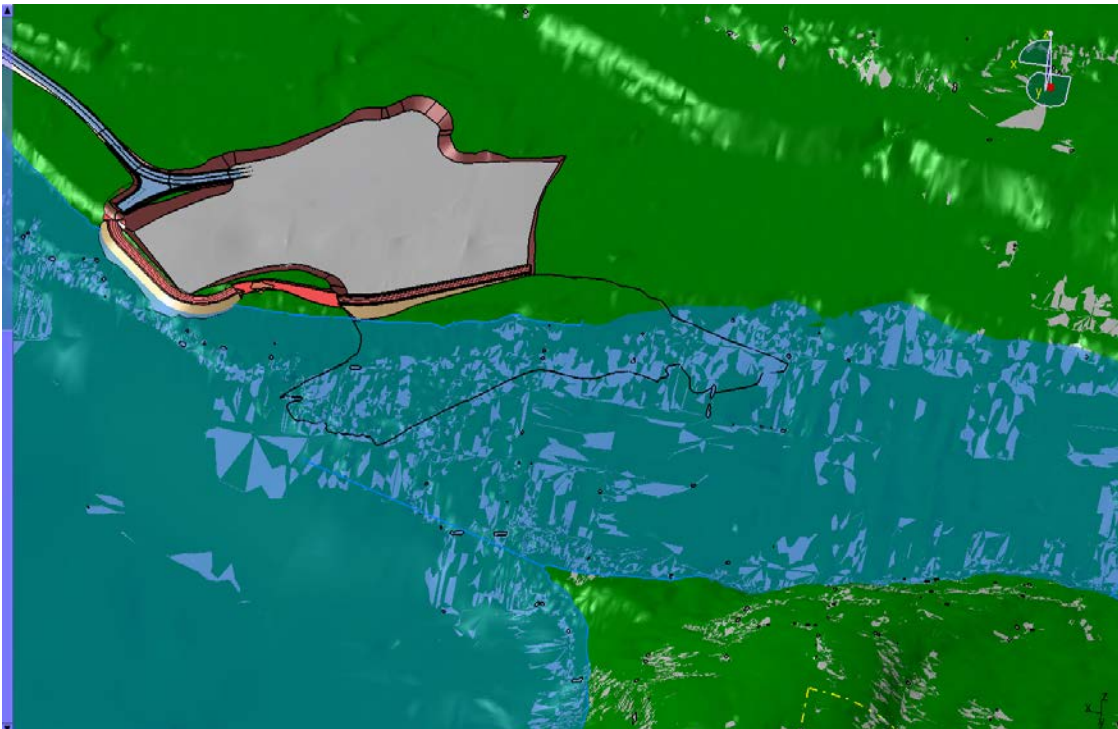
- Stage 1 – Pre-Diversion (includes early works/ infrastructure).
- River Diversion.
- Stage 2 – Post-Diversion (includes completions/ commissioning).

The following sections provide a brief overview of planned construction activities during each stage providing a general build sequence for the project.

### 10.1 STAGE 1 – PRE-DIVERSION

During this stage of construction all activities are taking place outside of the main river channel and control of the river is not required to complete this stage of construction. Early works include the need to construct major infrastructure to support construction, such as the south side access road, site clearing, and ancillary road work. The key objective was to have the road complete to the Muskrat Falls area so as to allow bulk excavation work for the Powerhouse and Spillway to begin, as illustrated in Figure 10-1.

**Figure 10-1 - Road to Site Complete/ Ready for Bulk Excavation**



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During this stage of construction a 300-person Early Works Accommodations Complex was used to allow the Bulk Excavation contractor to execute the work. The 1500-person main Accommodations Complex was completed towards the end of Bulk Excavation. Thus, the full accommodations capacity was available which allowed the Civil Contractor to fully mobilize and begin execution of work. With both complexes now fully operational, this allows for a capacity of approximately 1800 workers at site, which provides operational flexibilities in managing peak workforce demands. Figures 10.2 and 10.3 provide pictures of both Accommodations Complexes.

**Figure 10-2 – Early Works Accommodations Complex (300-person)**



**Figure 10-3 – Main Accommodations Complex (1800-person)**





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Early during the execution of the Bulk Excavation contract it was important to complete cofferdams that will protect the Bulk Excavation works from the natural river. Although the main construction activities during this phase are outside the river channel, due to specific natural occurrences in the river, additional protection is required during this stage of construction. During each winter, there is a natural phenomenon that creates a large ice cover (hanging dam) downstream of Muskrat Falls that creates elevated water levels within the Muskrat Falls area, which is adjacent to the main construction site (see Figures 10-4 and 10-5). Therefore, the protectionary works (cofferdams) must be completed during Bulk Excavation prior to the first winter to protect against this situation. At the end of the first year of construction, the powerhouse and spillway will be excavated fully and the necessary foundations and mud slabs complete ready for the next phase of construction (see Figures 10-6 and 10-7). Essentially, bulk excavation works will be complete and the site will be ready for the main civil contractor to mobilize.

**Figure 10-4 – Hanging Dam Downstream of Muskrat Falls**



**Figure 10-5 – Elevated Water Levels - Muskrat Falls (adjacent to construction site)**





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**Figure 10-6 – Completion of Bulk Excavation (Powerhouse and Spillway)**



**Figure 10-7 – Completion of Bulk Excavation (Powerhouse and Spillway)  
(shows early construction activity by main civil contractor)**

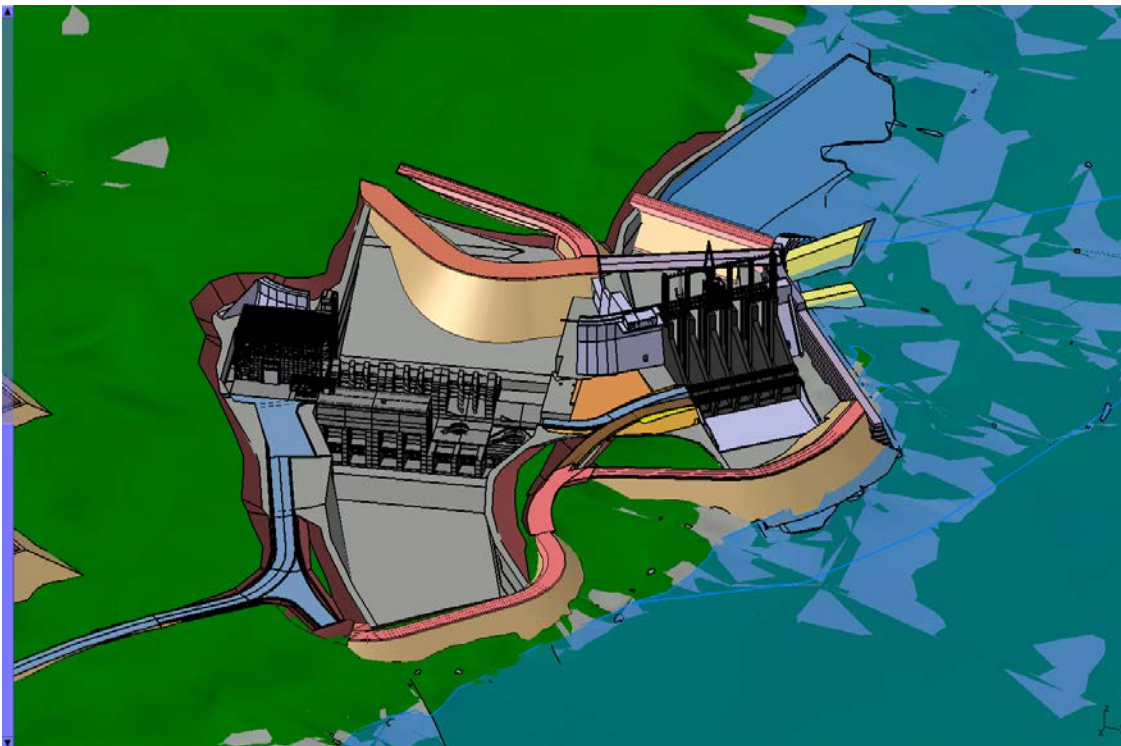


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With site infrastructure and bulk excavation scopes completed, the main focus for the remainder of this phase of construction is continued placing of concrete in the powerhouse and completion of the spillway to allow for River Diversion to take place during the summer of 2016. Completion of the spillway will include both concrete and mechanical completion of gates and hoists. The spillway is required to have five bays open prior to River Diversion to allow for river flows to be diverted from the normal river channel and allowing the next stage of construction. Also during this stage, and during the subsequent stage of construction, fabrication of mechanical components are taking place (primarily in China and other international locations) and delivered to site prior to installation at site. Another key objective during this stage is mobilization of the gates contractor to allow gates and hoist to be installed in the spillway prior to River Diversion. Therefore, towards the end of this stage, the main construction site will have two key contractors in place – main civil contractor and gates contractors. Construction interface management will become a key component of site operations at this point in construction, since up to this point there has only been one main contractor at the Muskrat Falls site. The Dams contractors will also mobilize during this period to be ready for river closure.

The following figures illustrate completion of Stage 1 construction activities to allow for River Diversion and sample Hydro-Mechanical Equipment being fabricated at international locations.

**Figure 10-8 – Stage 1 – Pre-Diversion Construction Completed**





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**Figure 10-9 – Manufacturing of Turbine Components in China**



**Figure 10-10 – Manufacturing of Turbine Components in China**



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## 10.2 RIVER DIVERSION

The key activity in 2016 is completion of pre-diversion construction scopes to allow for the river to be diverted through the spillway and gain control of the river to allow the upstream water level (headpond) to be increased and maintained at el. 25 m prior to winter 2016 for the remaining period of Stage 2 – Post Diversion construction. From closing the river in early to mid-summer, to impounding the headpond to el. 25 m in mid to late fall, it is expected that River Diversion will take approximately 5 months to complete. Figure 10-11 illustrates the two stages of construction with River Diversion being the key activity that bridges both stages.

**Figure 10-11 – Stage 1 (Pre-Diversion) and Stage 2 (Post Diversion)**



The importance of being able to control the river and operating the spillway to maintain a Stage 2 headpond level of el. 25 m relates to minimizing the formation of the downstream hanging dam (Figure 10-4) and eliminating the increased winter water levels that occur naturally in the river. Maintaining the headpond at el. 25 m will allow the upstream headpond to form a thermal ice cover (similar to an ice cover that would naturally form on a pond or a lake) in the winter, thus minimizing the ice that would normally pass downstream and develop the hanging ice dam. This creates lower downstream water levels during construction and allows for construction of the North RCC dam across the lower Muskrat Falls.

For River Diversion, the Dams contractor will be required to be mobilized during late Stage 1 construction activities, since it is within this scope to “close” the river utilizing a Main Upstream Cofferdam. This is achieved by waiting for spring flows to subside and during early summer 2016 construct a cofferdam above the lower Muskrat Falls. As this closure is taking place, the cofferdam above the spillway will have been removed thus allowing flows to be “diverted” through the spillway (all gates open). Once the cofferdam has been completely “pushed” across the river and the flow completely diverted through the spillway, than construction can continue on the Main Upstream Cofferdam during the summer to a completed crest elevation of el. 26 m, prior to impounding the

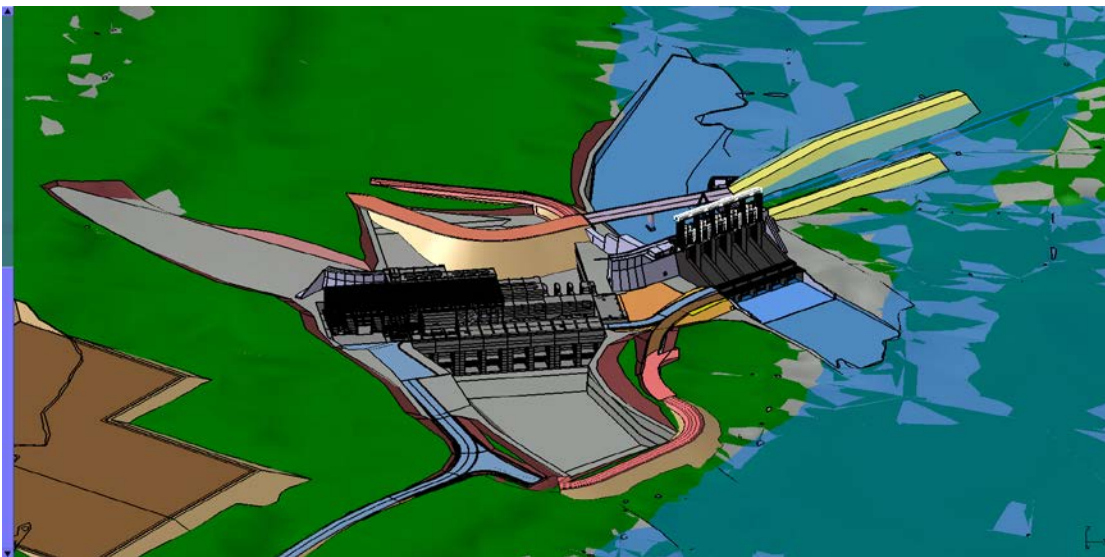


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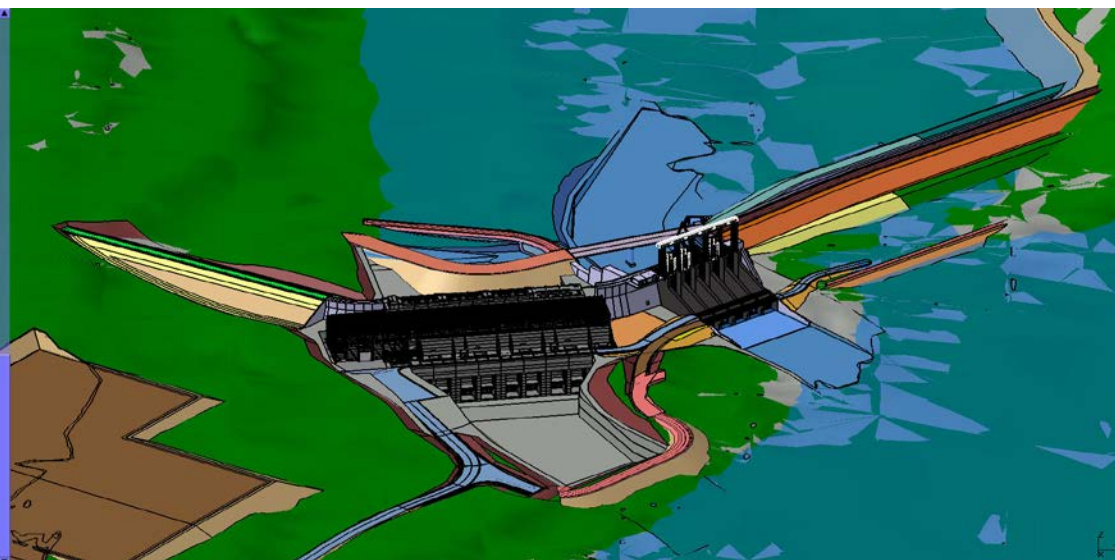
headpond to el. 25 m in mid to late fall. There will also be a lower downstream tailrace cofferdam with a crest elevation of 9 m that will also be constructed to protect against naturally occurring downstream water levels.

The key milestone for River Diversion is to have all construction completed that will allow for the headpond to be increased to el. 25 m prior to winter 2016 such that an ice cover can be formed that winter. The following figures illustrate the construction activities during River Diversion.

**Figure 10-12 – River Diversion (River Closure Underway)**



**Figure 10-13 – River Diversion Completed (Headpond el. 25 m)  
(note downstream tailwater cofferdam in place)**

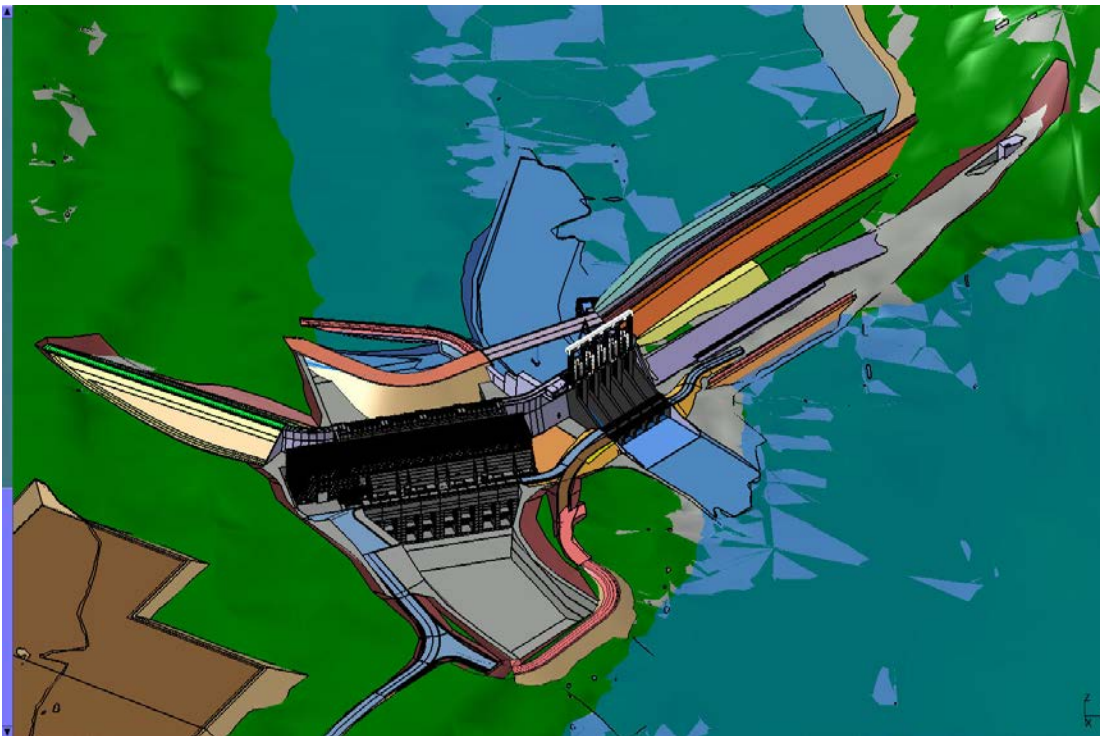


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### 10.3 STAGE 2 – POST-DIVERSION

Once the river is diverted through the Spillway, the Main Cofferdam is at el. 26 m, and the headpond is impounded to el. 25, the project construction will have advanced from River Diversion to Stage 2 – Post-Diversion as shown in Figure 10-14.

**Figure 10-14 – River Diversion Phase Completed**



This is the last stage of construction and the main focus will be completion of the following scopes to achieve First Power by end of 2017.

- Completion of the South Earth Embankment Dam.
- Completion of the North RCC Dam.
- Completion of Spillway Rollways.
- Completion of Powerhouse concreting to allow Hydro-Mechanical Completions.
- Completions and Commissioning.

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#### 10.4 NORTH SPUR STABILIZATION

The North Spur Stabilization is not mentioned above specifically and is discussed separately in this section in relation to the phases of construction during Stage 1, River Diversion, and Stage 2 of the overall project construction. The North Spur contractor will mobilize during Stage 1 – Pre-Diversion to undertake clearing and grubbing, and to start excavation work on the upstream and downstream slopes, on the crest and in the Kettle lakes outfall. The key objective during Stage 1 is to have the cut-off wall and upstream works completed to an elevation of el. 28 m to allow for Stage 2 activities to take place. It is important that the upstream face of the North Spur have the cut off wall completed above the Stage 2 headpond level of el. 25.0. Work will continue on the cut off wall and the downstream slope stabilization for the North Spur into Stage 2 with the North Spur being fully completed prior to final reservoir impoundment to el. 39 m. The following figures illustrate the construction phases for the North Spur Stabilization.

**Figure 10-15 – North Spur Clearing and Grubbing**





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**Figure 10-16 – North Spur Completion Prior to River Diversion**



**Figure 10-17 – North Spur Completion Prior to Reservoir Impoundment**



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## **11 APPROACH TO MFG CONSTRUCTION AND EXECUTION STRATEGY**

Success of MFG will require achieving world class Health and Safety performance, meeting scheduled delivery dates, respecting the Project budget and complying with technical specifications to meet MFG delivery expectations. A strong Health and Safety culture will be developed at all levels of the workforce and the Management Team. Formal Health and Safety training will be given to Management (BeSafe Training) to heighten their safety awareness, instilling a strong safety culture such that they will lead by example. Health and Safety staff on site will support live management, keeping them informed of trends, audits, leading and lagging indicators to develop safety strategies and awareness that will support a “Zero Incident” philosophy. Zero Incidents must be a belief not just a catch phrase.

To support the overall execution of the work, achieving world class Health and Safety performance, and to achieve the Project principals for MFG as outlined in Section 1, the strategy for MFG is to employ an organization structure sub-divided by Technical Areas, Functional Areas, Site Management, and Construction Management with team members either being in the Home Office or Site Locations. This organization will allow for the “One Team” approach to execution. Section 12 provides more details on the overall organization and team effectiveness, with this section discussing more “high level” the approaches to construction and execution strategy.

In relation to construction and execution strategy at Muskrat Falls site, the team will be sub-divided in to two separate teams. One team, reporting to the Construction Manager, will be responsible to provide oversight of construction contractors on site and support overall execution of construction activities (detailed discussion on Construction Management provided in Section 14). This team will be supported by functional groups that have staff residing at site, but reporting to functional managers in the Home Office (detailed discussion on Organization provided in Section 12). The second team, reporting to the Site Manager, will be responsible to maintain and operate the site (detailed discussion on Site Management provided in Section 15). The key goal of this team is to ensure the Construction Management Team does not become encumbered with site operational issues, thus providing a safe and efficient site to promote high productivity. The Site and Construction Management Teams will be composed of skilled individuals experienced in their field and supported by their superiors. Roles and responsibilities will be clearly defined making for efficiency, eliminating duplication and erasing potential friction points between individuals.

A strong project commitment will be developed where success will be celebrated and (the occasional) failure will be regarded as opportunity for change and lessons to be learned. Being proactive will be encouraged and individuals will be given the opportunity to be heard. A “Bad News Early” consciousness will be developed permitting mitigation before issues escalate. The site will be staffed in a timely manner such that the MFG Project Delivery Team will be ahead of the contractor and not in a reactive mode.

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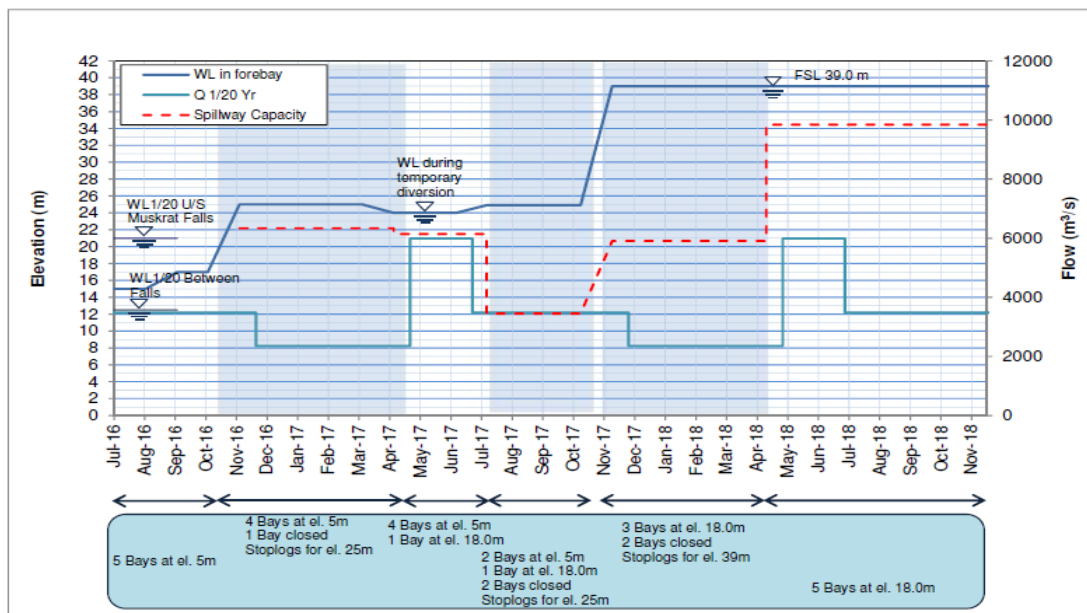
One other important factor regarding the execution strategy for MFG is overall management of the lower Churchill River during Post-Diversion construction activities. As noted in previous sections, once the river is diverted, the river must be managed through operations of the Spillway to allow for continued construction and operation of the Post-Diversion headpond level of el. 25 m. It is the responsibility of the Project, more notably the MFG Project Delivery Team, to provide this operation, which will reside within the overall scope of the Site Management Team, with support from a River Management Team in the Home Office. The following section discusses the scope and execution for River Management in support of ongoing construction activities during Post-Diversion.

### 11.1 RIVER MANAGEMENT

Diverting the lower Churchill River through the spillway structure and impounding to the headpond of el. 25.0 m is dependent on the integration of several contract packages. The River Management Team coordinates with the Construction and Site Management Team, Contract Administrators and Area Managers for these packages to collect information and ensure that the overall integration of these packages will lead to a successful river diversion and headpond impoundment.

River Management work scopes have been planned in two stages: Stage 1 – Pre-Diversion and Stage 2 - Post Diversion. As previously noted, Stage 1 River Management refers to the period prior to diversion of the lower Churchill River; the river flows are in its natural state adjacent to the Muskrat Falls site. Stage 1 ends with diversion of the river in the summer of 2016. Stage 2 River Management includes diversion of the river through the partially completed spillway, while spillway bays are closed in a planned sequence to allow construction of the rollways. The planning sequence for closure of bays to construct rollways is provided in Figure 11-1.

Figure 11-1 – Spillway Construction Sequencing



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### **11.1.1 Stage 1 River Management**

A Stage 1 River Management Manual (MFA-PT-MD-2000-EN-PL-0001-01) has been developed to outline routine monitoring and inspection of the Stage 1 cofferdams, as well as procedures outlined to address unusual conditions that may be noted during inspection and maintenance procedures for the cofferdams. Regular reports are produced that document the inspection results as well as observed river and atmospheric conditions. All Stage 1 work is currently being completed internally by the River Management Team.

### **11.1.2 Stage 2 River Management**

Stage 2 River Management is being managed internally as well; the work has been subdivided into 10 discrete scopes with external parties being engaged as necessary to execute specific pieces of work. The 10 packages include the following scopes of work.

- Installation of Hydromet gauges.
- Inflow Model.
- Rule Curves and Operating Manual (Diversion Manual).
- Programmed Central HMI.
- Trained Operators and Spillway Operations.
- Emergency Preparedness Plans.
- Public Safety Assessment.
- Other Utilities Interfaces.
- Ice Observation Program.
- River Management Independent Review.

An outline of the scope of each package follows.

#### **11.1.2.1 Installation of Hydromet Gauges**

This scope includes an assessment of existing river gauges and meteorological gauges to determine requirements for inflow forecasting and monitoring at Muskrat Falls. In November 2014 a new water level gauge was installed in the mid pool at Muskrat Falls (between the upper and lower falls). This work was completed by Environment Canada Water Survey of Canada under the agreement with Department of Environment and Conservation Water Resources Division. River Management is responsible for ensuring the hydromet gauges continue to meet the needs of the Project. The current planning is to have three water level gauges that will be relied on for spillway operations during Stage 2 Construction, as follows.

- Primary Gauge – Environment Canada Gauge tied directly into Spillway Operations – Real Time.
- Secondary Gauge – Environment Canada Gauge via Satellite Receiver – Near Real Time.
- Emergency Gauge – Staff Gauge located in headpond visible to operators.

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#### **11.1.2.2 Inflow Model**

MFG engaged a third party for the development of a model for Muskrat Falls inflow forecasting. The scope of work included development of the model, including calibration, verification and training for the River Management Team personnel. NL Hydro was engaged for integration of the model and training has been completed. The model was tested real-time in early 2015 with the objective of gaining experience in running the model and producing forecasts to be confident in the 2016 river closure decision process. The River Management team will continue to run this model as required during Stage 1 and Stage 2 River Management, and ensure the model is maintained and meeting the needs of the Project and working effectively for the closure period.

#### **11.1.2.3 Stage 2 River Management Manual**

The Stage 2 River Management Manual (Diversion Manual) (Nalcor Doc No. MFA-PT-MD-2000-CV-MN-0001-01) has been developed by the River Management Team, leveraging input and knowledge from the various stakeholder groups. The manual provides an overview of the sequences for river diversion, formation of the winter headpond and impoundment to full supply level. Roles and responsibilities of key individuals, rule curves and operating parameters, critical information on dam and public safety, and risk management and contingency planning are provided in the manual to guide the operation of the spillway structure during Stage 2 River Management. This manual will be reviewed by an external third party and updated internally as-needed.

#### **11.1.2.4 Programmed Central HMI**

A central Human Machine Interface (HMI) is required for operation of the spillway during diversion. The HMI is part of package CH0032: Hydro Mechanical Equipment. The River Management Team interfaces with CH0032 to ensure information required for spillway operation during diversion is available at the HMI.

#### **11.1.2.5 Spillway Operations Stage 2**

The spillway structure will be used to pass flows through the work site while allowing the powerhouse and RCC dam to be constructed. Diversion of the river is scheduled to occur in 2016 after the spring flood passes, with all five gates open at the spillway structure. During fall 2016 a winter headpond of el. 25.0 m will be formed to aid in the reduction of frazil ice downstream of the lower falls. At this point the first of five rollways will be constructed over an approximately 12 to 18 month period. Rollways will be constructed on a sequence that allows the spillway to pass a 1:20 year flow. Impoundment to the full supply level of el. 39.0 m is scheduled for 2017. These various stages of construction at the spillway structure and changes in operating levels will require close monitoring of the flows and spillway structure to ensure the safety of construction sites and protection of infrastructure (as shown in Figure 11-1 previously).

The River Management Team has been tasked with preparing an execution plan for the safe operation of the spillway structure from river closure/diversion phase through to hand over to Ready for



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Operations. The River Management Team will work to ensure the necessary resources have been secured and trained in time for river diversion.

#### ***11.1.2.6 Emergency Preparedness Plans***

This package includes documentation of contingency plans to be in place for diversion as well as operation of the Muskrat Falls generating facility. This includes Emergency Preparedness Plans (EPP) for winter headpond and FSL stages during the construction phase, as well as Emergency Response Plans (ERP) for dam failure scenarios. The River Management Team will prepare the EPPs and work with LCP Communications and Safety to roll-out these plans to the external stakeholders. The River Management Team will also work with LCP Safety to update the Project Wide ERP to include dam related emergencies.

#### ***11.1.2.7 Public Safety Assessment***

LCP commissioned third party studies to complete a Public Safety Around Dams (PSAD) assessment for Muskrat Falls. The PSADs were subdivided into two phases: river diversion (construction) and operation, and provide recommendation on signage, hazard buoys and fencing. Using information from the PSAD assessments The River Management Team will develop a public safety plan for Muskrat Falls for use during the construction phase at Muskrat Falls.

#### ***11.1.2.8 Other Utilities Interfaces***

This package encompasses other scopes of work not included in tasks noted above, including but not limited to working groups with other utilities and engagement of third party subject matter experts on an as required basis to support engineering, construction and management of risks related to river management.

#### ***11.1.2.9 Ice Observation Program***

An Ice Observation Program will be conducted during the winter before River Diversion. The purpose of this exercise will be to provide additional information to contractors engaged in support of River Management scopes and overall River Management Readiness in relation to Risk Assessment and Mitigation planning for River Diversion activities.

#### ***11.1.2.10 River Management Independent Review***

The goal of the River Management Team is to have all River Management Scopes completed by the end of 2015. This will allow for implementation in 2016 prior to River Diversion to ensure everything is in place. As part of completing all scopes, third parties will be engaged to support an overall Risk Assessment (Cold Eyes Review) of the River Management Scopes and Readiness Planning. This will allow for all Risks and Contingency Planning to be well thought out in advance of River Diversion. In relation to “Readiness Planning”, this is discussed in the next section.

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### 11.1.3 River Management Readiness Planning

For each phase of river transition; from natural condition to diversion, winter headpond and impoundment to full supply level; The River Management Team will continue to develop a “Readiness Plan” which will include a Readiness Checklist. The Readiness Plan will include information on processes, methods, criteria and roles and responsibilities of key individuals involved in the decision making process. The Readiness Checklist will include criteria and backup documentation for signoff from package leads and area managers, with final sign off by Construction Manager, Project Manager and Project Director. A summary of the River Diversion Readiness Checklist is as follows with a schematic illustrating the various elements that support readiness. Similar checklists will be prepared for each of the winter headpond and FSL phases.

- **River Management Team Readiness**
  - Flow forecast < 2,560 m<sup>3</sup>/s for next 7 days with flows forecast to recede.
  - Acceptable 7-day weather forecast (temperature & precipitation).
  - Verification of snow cover conditions.
  - Verification of planned operations at CF(L)Co.
  - Emergency Preparedness Plan for Construction Phase in place.
  - Project Wide Emergency Response Plan in place for dam related emergencies.
  - Trained Operators on staff.
- **CH-0009 Contractor Readiness**
  - Contractor has approved Emergency Response Plan in place.
  - Contractor has approved schedule and execution plan to construct cofferdams.
  - Source and volume of closure material available.
  - Cofferdams 1 and 2 removed.
- **CH-0032 - Spillway Gates Readiness**
  - Five gates wet tested at slab el. 5.0 m and operational.
  - Controls and monitoring system tested and commissioned.
  - Arrangements in place to provide emergency maintenance on controls/ gates.
- **CH-0068 Construction Power Readiness**
  - Construction power and suitable backup power in place to ensure gates are operational.
- **CH-0008 North Spur Readiness**
  - Completion of upstream North Spur to required elevation for winter headpond creation.
- **Engineering Readiness**
  - All necessary engineering completed to permit river diversion.
- **Environmental and Regulatory Compliance Permits and Approvals Readiness**
  - All necessary notifications provided as per permit/approvals/EA commitments.

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- All conditions of permits/approvals/ EA commitments have been met for river closure.
- Confirmation of recovery of archeological sites, reservoir clearing and relocation of beaver colonies below el. 25.0 m have been or will be completed prior to headpond creation on 1-Oct-2016.

**Figure 11-2 – River Management Readiness Planning**





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## **11.2 HABITAT COMPENSATION/ SITE RESTORATION**

Further to the scopes noted above within River Management, the same team provides management of other contract packages such as Supply and Install Log, Safety, and Ice Boom, Habitat Compensation, and Site Restoration. These packages are further described in the following sections, thus representing the full scope of work managed by the River Management Team.

### **11.2.1 CH-0049: Supply and Install Log, Safety & Ice Boom**

This package includes the design, supply, installation and servicing of the log boom and safety booms/buoys, including removal of debris during construction period. This package will be executed under three separate contracts, as follows.

- CH0049-01: Design of the structure, technical support during the bidding, manufacturing and installation process.
- CH0049-02: Supply and installation of the booms and associated anchors, including access and work platforms to allow maintenance and debris removal.
- CH0049-03: Removal of debris from the boom structure.

One multi-purpose boom will be installed just upstream of the upper falls, approximately 1km upstream of the powerhouse structure. The boom will be designed to aid in the formation of a stable ice cover to reduce frazil ice generation, to capture debris which may become mobilized in the Muskrat Falls reservoir and provide public safety and promote self-rescue.

The boom will consist of steel pontoons filled with polyurethane foam connected to a main steel cable anchored with two shoreline anchors; one on the north spur and one on the south bank. The main steel cable will also be supported by in-stream anchor points. The boom will be left in river year round. Hazard buoys, north spur portage buoys and associated anchors will be installed in spring and removed prior to freeze up.

Given the nature of the boom structure and the debris removal process, work activities will be required within the Churchill River. As such, the River Management Team will work closely with LCP Safety and Environment and Regulatory Compliance (ERC) Departments to ensure the work is completed within strict safety and environmental requirements of the Project.

### **11.2.2 CH-0052: Construction of Habitat Compensation Works**

This package includes the design, supply and construction of habitat compensation works for the Muskrat Falls Lower Churchill Project to comply with the Fish Habitat Compensation Plan (LCP Doc No. MFA-AM-CD-9112-EV-002-01) submitted to and approved by Department of Fisheries and Oceans

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(DFO). Approval from DFO is in the form of DFO Authorization #13-01-005 and there are three tiers identified in the Fish Habitat Compensation Plan (FHCP) including the following.

- **Tier 1:** Natural utilization of the newly formed Muskrat Falls Reservoir by fish species.
- **Tier 2:** Physical Compensation Works - habitat creation to increase habitat function for specific life stage success.
- **Tier 3:** Monitoring to verify predicted changes in habitat and its use by fish (including success of Tier 1 & 2 compensation identified above).

Tier 2 physical compensation works (which forms the scope of package CH-0052) includes four separate components as outlined below.

1. **Nearshore Habitat:** Creation/enhancement of 34 ha of nearshore habitat for salmonid spawning and rearing by building terraced roads associated with the reservoir clearing activities at elevations that will allow them to be inundated in shallow water to provide productive nearshore shelf habitat after reservoir creation.
2. **Spawning Shoals Habitat:** Creation/enhancement of 99 ha of shoal habitat for salmonid spawning and rearing by preparing the existing shoals in the upper section of Gull Lake to increase their heterogeneity of depth using a series of percussion blasts and shaping with small loaders. All vegetation on the island/shoals will be cleared prior to impoundment to FSL.
3. **Delta Habitat:** Creation/enhancement of 26 ha of tributary delta habitats for salmonid spawning and rearing by preparing the lower sections of Pinus River (15-17 ha) and Edwards Brook (11-12 ha) to create productive fish habitat within the main stem/tributary interface (delta) for spawning and by inference, young-of-year rearing.
4. **Pike Spawning Habitat:** Creation/enhancement of 1.5 ha of aquatic vegetation habitats for Northern Pike spawning by preparing/pre-treating and leaving three (3) areas of unharvested wood in place to provide submerged trees/branches for spawning and cover and placement of 200 m<sup>2</sup> of artificial spawning mats at each area.

Under package CH-0052 the documentation required for reporting the nearshore habitat created under the reservoir clearing activities will be collected and prepared for reporting to DFO. Design, supply and construction will be required for the remaining 3 components; spawning shoals habitat, delta habitats and pike spawning habitat works.

As per LCP Generation Project Undertaking Order issued under the Environmental Protection Act, LCP are required to submit a Riparian Compensation Plan and Wetland Compensation Plan for the Lower Churchill Project. A Wetland Compensation Plan is under development and may result in additions to package CH-0052 or a new package.

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The design of the habitat compensation will be completed using project resources. A civil contractor will be hired for the supply and construction of the spawning shoals habitat, delta habitats and pike spawning habitat works.

### **11.2.3 CH-0029: Construction of Site Restoration at Muskrat Falls**

At the end of the construction phase, temporary infrastructure will be removed and restoration of sites will be carried out in accordance with environmental guidelines.

All temporary infrastructures associated with construction sites will be dismantled and removed. This includes accommodations complexes, workshops, material storage and laydown areas, marshalling yards and concrete plants. Permanent drainage patterns will be established at the sites through grading to prevent erosion. Bridges and culverts along temporary access roads will be removed; road surfaces will be scarified to promote natural re-vegetation of surface cover. Excluded from the scope are borrow pits and quarries and associated access roads; and temporary infrastructure associated with the transmission lines.

The scope of construction for site restoration will undergo review to confirm EA commitments and permit conditions related to this package. Once this has been confirmed an execution plan will be prepared for this package.

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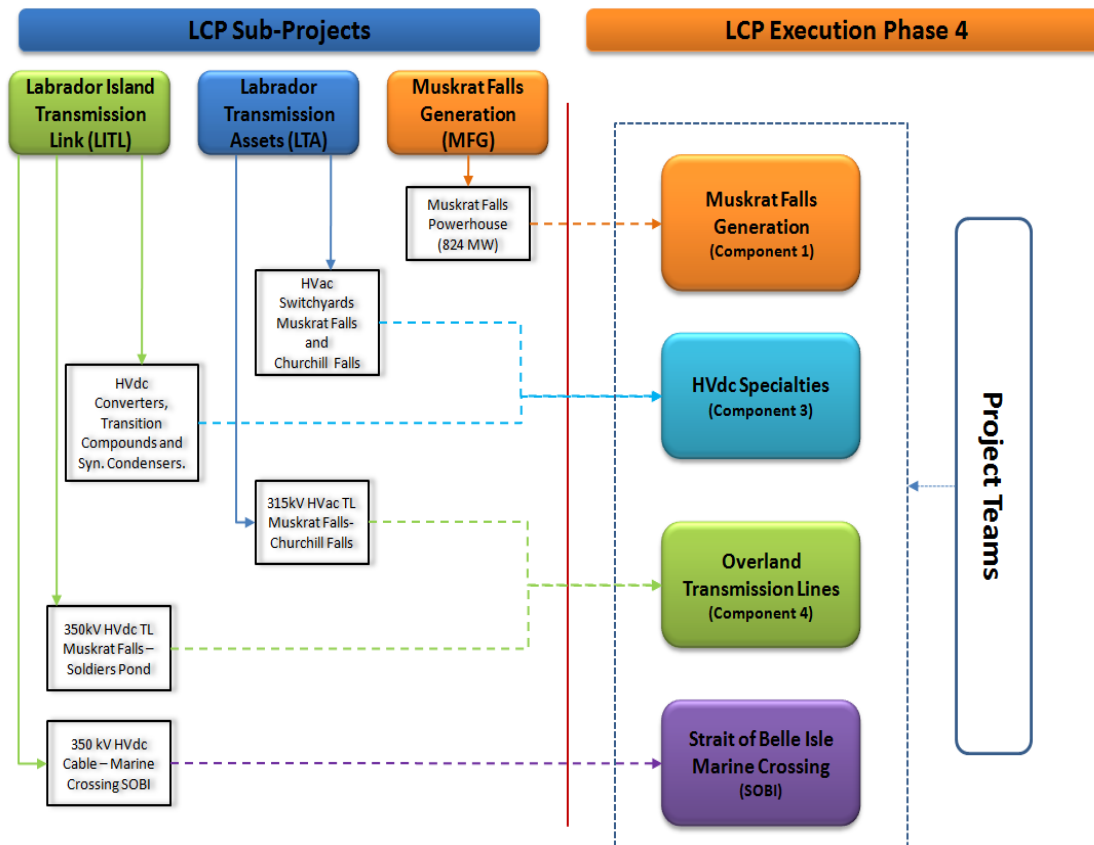
## 12 MUSKRAT FALLS GENERATION MANAGEMENT

Following the discussion in Section 11, the following sections highlight the overall MFG organization and the specific details that provide for an efficient team to deliver the overall MFG objectives and scope. This section presents the overall organization and how the technical areas, functional groups, site management, and construction management teams work together collaboratively and productively as one team to deliver the MFG scope of work.

### 12.1 TEAM ORGANIZATION

As can be seen in Figure 12-1, the MFG Component of the Project (internally referred to as Component 1), is only responsible for assets owned by MFG and is one of four (4) delivery teams within the broader LCMC organization, as described in earlier sections of this Plan.

**Figure 12-1: LCP Sub-Projects and LCMC Component Delivery Team Relationships**



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To achieve the Project’s goals, strong team leadership is paramount to optimize performance. This leadership serves to.

- Provide a high-level view of project strategies and plans (road-map) to ensure high performance of the project delivery team resulting in successful delivery of the LCP.
- Ensure that project goals and objectives are well communicated and a strong decision making process is in place to provide for timely and effective alignment.
- Ensure alignment, communication, and guidance are provided to the MFG Project Delivery Team to build a culture for project success.
- Inspire, motivate, coach, engage, and support the MFG Project Delivery Team to nurture collaboration, ensure results, enhance performance and promote learning.

Overall leadership of the MFG Project Delivery Team will be through the Project Manager. The role has overall accountability for the delivery of the works in accordance to the framework set forth in the Project Execution Plan (Scope and Approach), LCP-PT-MD-0000-PM-PL-0001-01.

Oversight is provided by both the General and Deputy General Project Manager with support being provided to the Project Manager by the MFG Deputy Project Manager. Other supports are provided by other functional managers to ensure the scope is delivered. Each of these individuals will reside in the St. John’s Home Office.

As indicated, the MFG Project Manager is responsible for the overall delivery of the work, and as such will design organizational structures and processes, 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.

The MFG Project Delivery Team will be organized to support the fundamental responsibilities and obligations of LCMC in the delivery of the scope. To that effect, the scope will be organized using an Area-Based approach, wherein reporting to the Project Manager there will be Area Managers responsible for each of the following technical areas.

- Area Manager: Civil Coordination
- Area Manager: Mechanical and Electrical
- Area Manager: River Management/ Habitat Compensation/ Site Restoration

Delivery of the scopes within each of the areas will be conducted by a Construction Management Team supported by Area Construction Managers, Shift Engineers, Construction Monitors, QA Advisors, H&S Advisors, Environmental Monitors, etc. as required to deliver the relevant scopes of work under each Area.

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Also having a direct line reporting to the Project Manager are designated team leaders in each of the functional areas of project control, quality management, environmental management, labour, and health and safety management. Working as part of the MFG Project Delivery Team, these positions **only exist** to provide full-time expertise in their respective areas to ensure MFG’s mandate is achieved. Given LCMC’s organizational structure, this functional expertise will maintain a “soft” functional reporting line to the LCMC manager for these functions who are mandated to ensure that functional areas are well covered off within each individual Component and across the Project, while aiming to ensure an adequate amount of consistency.

In addition to these direct reports, the Project Manager has various specialists or support resources reporting to this position as is required to ensure the scope is delivered. Likewise the MFG Project Delivery Team reaches across the LCMC organization to tap into pan-project services such as Information Management, IS/IT, Stakeholder Management, Benefits, Labor Relations, Communications, Telecoms, Property Management, and Human Resources.

Given the expanse and diversity of the multi-component / faceted LCP, combined with a multitude of work locations, it is essential to maintain and foster solid working relationships across the LCMC organization, in particular with other Components and supporting functional areas.

This basic organizational design and reporting structure for the MFG Project Delivery Team is presented in Appendix A (issued November 2015). For the current detailed organization chart reference the Project Delivery Team Organizational Charts, document no. LCP-PT-MD-0000-PM-CR-0001-01. The Organization is further discussed in the following sections.

- Area Management (Section 13)
- Construction Management (Section 14)
- Site Management (Section 15)
- Project Controls (Section 16)
- Quality Management (Section 17)
- Environmental Management and Regulatory Compliance (Section 18)
- Health, Safety, Security, and Emergency Response (Section 19)
- Labour Relations Management (Section 20)
- Follow-On Engineering Management (Section 21)
- Commercial Management and Contract Administration (Section 22)
- Completions (Section 23)
- Communications (Section 24)

Since the purpose of this Plan is to cover the Construction Phase of the project, provided in this report in Appendix B are copies of all Scope Descriptions for site based positions.

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## **12.2 MFG MANAGEMENT TEAM ROLES AND RESPONSIBILITIES**

Reporting directly to the Project Manager, except in the case of the Construction Manager, the following positions (including Project Manager), along with a brief description of roles and responsibilities, form the overall MFG Management Team.

### **Project Manager**

Under the authority of the General Project Manager, the Project Manager will work within the limits of the Project Instructions while demonstrating adherence to Nalcor's values, to lead, organize and manage the overall delivery of MFG.

Responsibility within this position includes, but is not limited to, organizational design, staffing and human resource management, safety and environmental performance, engineering, procurement, contract formation and administration, quality assurance, interface management and all aspects of project control (risk, cost, schedule, change management).

This individual will lead the MFG organization, providing both strategic and day-to-day direction as is required to ensure that the scope is delivered in accordance to the goals and objectives established in the Project Charter.

The incumbent will have a level of authority required for day-to-day decision-making, including financial approval authority as delegated by the General Project Manager, to fulfil the responsibilities for delivery. The incumbent will act as the Company Representative for various contract packages.

In fulfilling this mandate, the incumbent is expected to liaise extensively with both the relevant contractors and members of the LCMC Project Delivery Team to ensure alignment on key priorities and strategies.

### **Deputy Project Manager**

Under the authority of the Project Manager, the Deputy Project Manager will work within the limits of the project procedures and processes while demonstrating adherence to Nalcor's values, to support overall organization and management of the overall delivery of MFG. This position will act in the role of Project Manager when the Project Manager delegates authority.

Responsibility within this position includes support to organizational design, staffing and human resource management, safety and environmental performance, engineering, procurement, contract formation and administration, quality assurance, interface management and all aspects of project control (risk, cost, schedule, change management).

The incumbent will have a level of authority required for day-to-day decision-making, including financial approval authority as delegated by the Project Manager, to fulfil the responsibilities for

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delivery. In fulfilling this mandate, the incumbent is expected to liaise extensively with members of the LCMC Project Delivery Team to ensure alignment on key priorities and strategies.

Management is provided to Change, Interface, and Risk Management within MFG. Specific to MFG, this position provides leadership and stewards overall development to the River Management Team.

### **Change and Technical Interface Engineer**

The Change and Technical Interface Engineer reports to the Deputy Project Manager and is responsible for stewarding management of change and technical interface management within the Component, with duties that include interface and change tracking, meeting facilitation, action follow-up, etc. This position also supports Risk Management within the Component and management of the Component Risk Register.

### **Completions Lead**

Under the authority of the MFG Project Manager (and a functional reporting relationship to the LCP Completions Manager), the Completions Lead is responsible for the implementation of Processes, Certificates and Forms required to successfully guide the project through to final completion. The Completions Lead works with the Project Delivery Team and Contractors to establish work scope definitions to assign Mechanical Completion and Pre-Commissioning checks to tagged items and define system limits in the Project Completion System.

### **Project Controls Lead**

Under the authority of the MFG Project Manager (and a functional reporting relationship to the LCP Project Controls Manager), the Project Controls Lead is responsible to ensure that the Project's project control requirements are fully implemented within the Component, and that the contractors are fulfilling their obligations with respect to progress reports, schedule updates, cost forecast, etc. Specifically for MFG, this position is subdivided to provide a Project Controls Lead at MF Site with management support provided in the Home Office by the LCP Deputy Project Controls Manager. The LCP Deputy Project Controls Manager is a member of the MFG Management Team and will cover Project Controls at Management Meetings, while liaising with the MF Site Project Controls Lead.

### **Quality Manager**

Under the authority of the MFG Project Manager (and a functional reporting relationship to the LCP Quality Manager), the Quality Manager will be responsible to develop and implement a QA/QC oversight, monitoring, inspection and surveillance program encompassing all project activities including activities performed by contractors and suppliers. Build upon industry best practices and strive for world-class construction execution in QA/QC performance related initiative. In this capacity, the Quality Manager will work closely with the Area Managers, Area Construction Managers, Construction Manager and LCP Quality Manager so as to ensure an adequate surveillance program is implemented.

The Quality Manager will be lead review of all quality related documents and ensure the implementation of the contractors' quality plans and ITP's.



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### **Environmental Engineering Lead**

Under the authority of the MFG Project Manager (and a functional reporting relationship to the LCP ERC Manager), the Environmental Engineering Lead will be responsible to ensure the component fully adheres to the Project’s environmental obligations during the construction phase.

The incumbent will be responsible to support field operations pertaining to the implementation, oversight and maintenance of the Environmental Management System and regulatory compliance at the site level within the broader framework of Nalcor Energy’s guiding policies and principles. To fulfill this mandate, the incumbent will be supported by the Site Environmental Lead and environmental monitors who will conduct inspections and monitoring of the work fronts to ensure compliance with environmental, legislative, and permitting requirements, and provide support and guidance to the Project Delivery Team and contractors.

### **Health and Safety Lead**

Under the authority of the MFG Project Manager (and a functional reporting relationship to the LCP Health, Safety, Security, and Emergency Response Manager), the Health and Safety Lead will provide Project-level health and safety expertise, management and support (as required) during all phases of the Project. The incumbent will be responsible to support field operations pertaining to the implementation, oversight and maintenance of the Health and Safety Management System and regulatory compliance at the site level within the broader framework of Nalcor Energy’s guiding policies and principles.

The Health and Safety Lead is expected to incorporate industry best practices and strive for world-class health and safety performance during the execution of the entire MFG work scope, from engineering through to completions and handover to operations. As such the incumbent is expected to monitor operations at all construction sites to ensure compliance with all requirements and work with the MFG Management Team to address any exceptions noted.

### **Sr. Labour Relations Advisor**

Under the authority of the MFG Project Manager (and a functional reporting relationship to the LCP Corporate Integrations Manager), the Sr. Labour Relations Advisor is responsible to ensure a cooperative approach with the labour unions and contractors in accordance with the Project Labour Agreement (PLA) implemented for the duration of the project. With support from Site Labour Representatives manage labour risks that were identified in the planning stages for the Project, which are labour availability, labour stability and labour productivity.

### **Area Managers/ Coordinators**

Under the authority of the MFG Project Manager, Area Managers/ Coordinators will work within the limits of the Project Instructions while demonstrating adherence to Nalcor’s values, to lead/manage the overall delivery of the assigned work scope. Responsibility within this position includes, but is not limited to, safety and environmental performance, engineering, procurement, contracts administration, quality assurance and control, interface management and all aspects of project control.

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Reporting to this individual will be Package Leaders and Package Engineers, who are designated responsibility for coordination and stewardship of various material supply and construction installation packages. Area Construction Manager(s) and supporting resources providing on-the-ground construction stewardship support overall execution of the package with these team members reporting directly to the Construction Manager, thus forming the overall Construction Management Team.

The incumbent will have a level of authority required for day-to-day decision making, including financial approval authority as delegated by the Project Manager, to fulfil the responsibilities for delivery. In fulfilling this mandate, the incumbent is expected to liaison extensively with both the relevant contractors and members of the LCMC Project Delivery Team to ensure alignment on key priorities and strategies.

### **Engineering Manager**

Under the authority of the MFG Project Manager, the Engineering Manager is Responsible for management of the Follow-on Engineering Team who have the principal obligation for ensuring all technical issues are resolved in a timely manner so as to avoid construction delays. Reporting to the Engineering Manager will be the MF Site Resident Engineer and other site Engineering Resources in support of addressing Site Query's, Engineering Change Notices, and Concession Requests.

### **Muskrat Falls Site Manager**

Under the authority of the MFG Project Manager, the Muskrat Falls Site Manager will provide direction, supervision and guidance to Site and Electrical Services Team, Training Coordination, and manage the overall Permit to Work at Site for Temporary Infrastructure to ensure the proper organization and controls are in place at Muskrat Falls to manage the Site. This position will also be responsible to work closely with Construction Management, Health and Safety, and Labour to support the operation of a safe, secure, and productive site.

The incumbent will have a level of authority required for day-to-day decision making, including financial approval authority as delegated by the MFG Project Manager, to fulfil the responsibilities of managing the site.

### **Muskrat Falls Construction Manager**

Under the authority of the General Project Manager, the Muskrat Falls Construction Manager will provide oversight and leadership to the Area Construction Managers/ Construction Management Team in the performance of all activities related to the execution of the construction work at the Muskrat Falls Site. Although reporting directly to the General Project Manager, the Construction Manager will liaise day-to-day with the MFG Project Manager and Project Delivery Team in relation to supports required to the Construction Management Team.

The individual will have a level of authority required for day-to-day decision making, including financial approval authority as delegated by the Project Manager, to fulfil the responsibilities of construction execution.

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### **Muskrat Falls Disputes Resolutions Manager**

Under the authority of the Muskrat Falls Construction Manager, the Disputes Resolutions Manager will work with the Project Delivery Team and Construction Team to develop an overall strategy for the identification of disputes and events which may lead to disputes and mitigate the impact of these events. This will include management of the Contract Team at site in the administration of contracts in developing and implementing global strategies for addressing contractor issues.

### **12.3 TEAM COORDINATION, EFFECTIVENESS AND MEETINGS**

The MFG Project Delivery Team staffing levels have and will continue to be optimized in consideration of the available Home Office support, experience and number of contractors, value achieved and common industry practice. The Team will be “One-Team”, with both site-based and home office-based personnel. There will be no duplication of roles, rather the team shall operate as one team. The site organization will expand based on requirements and will take advantage of synergies so as to keep site team size to an optimized level.

Proper communications is essential for the overall implementation of the Project. Failure to convey information on a predictable and competent basis is a guaranteed road to failure. It is essential that a “silo” mindset be abandoned in favour of information sharing. It is simply not enough to do your job – communication of information and activities status to the team for use and team members must assume ownership of tasks and activities before initiation and after completion. This applies especially to problems (opportunities) and challenges. Assuming everyone knows about a problem because either it has been ongoing for months or there have been several meetings on the subject is faulty logic. Such issues should be brought up and kept in the forefront while pushing for resolution.

Bringing up the same issue at ten sequential meetings is much more desirable than just shelving it and figuring someone else will address it. Team members must take ownership of the next step. This, more than anything else, will enhance the success of a project while failure will ensure costly surprises and future failures.

### **12.4 REPORTING AND COMMUNICATIONS**

The MFG Project Delivery Team will maintain overall team coordination through the establishment of regular team coordination meetings. These meetings are designed to ensure that all staff are up to date and kept informed of all work and developments. These meetings will be used to relay updated information, identify action items and for open discussion of issues. In fitting with the safety culture of LCP, all meetings that are held between three or more people must start with a safety moment. Below are some of the management level/ team meetings within the MFG Project Delivery Team. There are other regular meetings that occur within the areas and functional groups that are not listed here, but are provided in more detail in subsequent sections of this report.

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### **MFG Management Team “Start-The-Week” Meeting**

Held weekly, the Management Team meets to discuss priorities and plans for the coming weeks. This meeting does not have a fixed agenda and is used more for communication of information between the team members and priority setting amongst the team for the upcoming week.

### **Change Management Meeting**

Held weekly, this meeting is designed to address open Deviation Alert Notices actions and agree a way-forward with respect to items that may have to be tabled to the Change Control Board. This meeting is chaired by the Change and Technical Interface Engineer.

### **MFG Project Delivery Team “Snapshot” Meeting**

Held monthly, this meeting is designed to provide a project update to the MFG Project Delivery Team using the MFG Snapshot that is produced each month. The following section provides an overview and content of the MFG Snapshot.

### **MFG Project Delivery Team Monthly Cost Review Meeting**

Held monthly, this meeting is designed to review cost potentials within the Project and ensure all trends are captured within the potentials and the Project Change Management System. The output of this meeting is used during the LCP Cost Review Meeting held monthly.

### **MFG Project Delivery Team Monthly Safety Meeting**

Held monthly, this meeting is designed to review safety highlights, LTI's, High Potential Near Misses, SafetyNet, Occupational Health and Safety, Safety Absolutes, and Safety Statistics all in the interest of Safety engagement and visibility across the Project and to focus in on areas for specific initiatives. This meeting is held prior to the monthly Integrated Management Team monthly meeting.

MFG will have a structured reporting process to communicate status and progress of execution activities to internal and external stakeholders. Activities related to management, engineering, procurement and construction for MFG will be communicated through the reporting process to inform about the MFG Component status, progress and forecasting activities.

MFG Component status refers to the state of the Component at a given date; progress is the performance of the Component since the last status date and forecasting covers the expected Component performance from this status date to the next status date and to the end of the MFG Component execution phase.

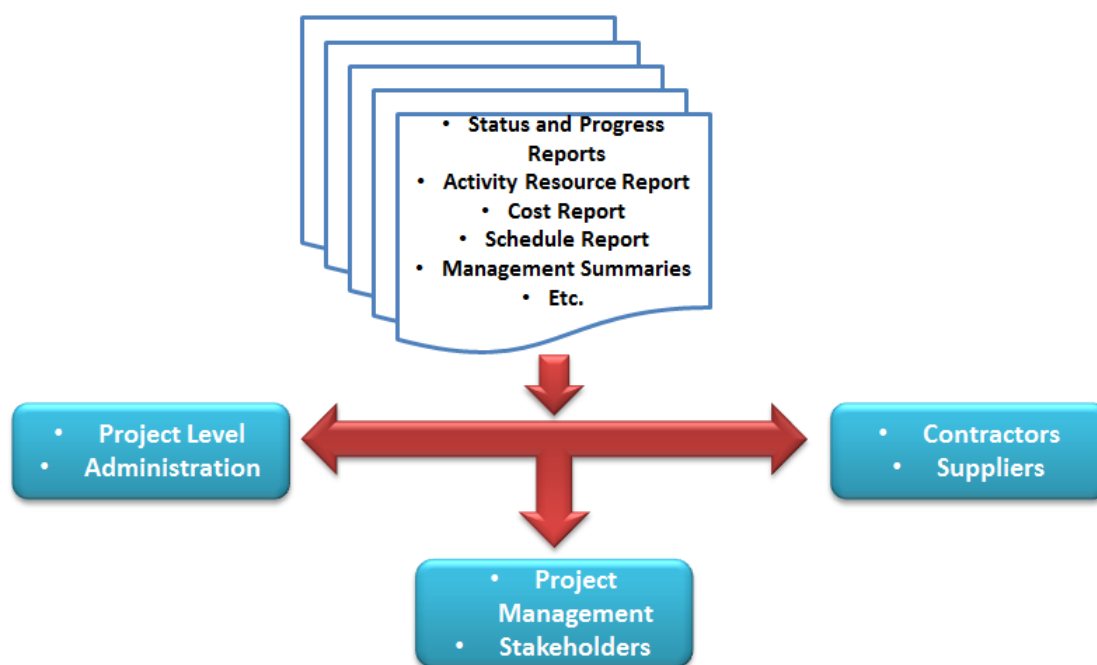
Interrelation of the MFG Component reports and stakeholders are depicted in Figure 12-2. The reporting process will principally include but not limited to:

- Project Status meetings.
- Meeting notes – Minutes of Meetings.
- Status and progress reports (weekly – monthly).

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- Executive meetings (monthly).
- Steering committee meetings.
- Snapshot – MFG Component

Figure 12-2: MFG Project Reporting



All members of the MFG Project Delivery Team are responsible and accountable to collect, organize, process and report information related to the execution of the MFG Component to comply with the reporting process requirements.

**12.5 MFG “SNAPSHOT”**

To support with team engagement and providing another avenue for sharing project specific information to all staff, each month a MFG “Snapshot” is issued highlighting status of information within the component areas and functional groups. As noted previously, a meeting is held monthly to review the “Snapshot” and then the information is provided to the full component team for information. A copy of the November 2015 “Snapshot” is provided as Appendix C to this report and, in general, the information covered in the “Snapshot” follows.

- Project Milestones.
- Completions summary.

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- River Management Readiness Update.
- Package Updates.
- River Forecasting.
- Status on Change, Interface, and Risk Management.
- Camp Occupancy Forecast.
- Staffing Reports.
- Functional Group Updates (Safety/ Quality/ Environment)
- Isometric Project Views Illustrating Project Progress.

## **12.6 STAFF ORIENTATIONS**

All new MFG staff will initially be given orientation and training. Site staff will first work from the Home Office for a few days to complete orientation, meet the team, understand role, and ensure all measures are in place for mobilization to site.

The following is a check list for all new team members when they join the team. This list is a guide to help navigate and integrate into the organization and become effective team members. Upon joining the team all new employees should ensure that they do the following.

- Attend the LCP orientation session that covers human resource orientation, Health Safety and Environment, Information technology, information management, and LCP Tracker.
- Fill out the form for new employee information with Human Resources.
- Acquire laptop, password, learn Citrix, Lotus Notes.
- Confirm the request for iPad , Blackberry or other required equipment is completed and approved by supervisor.
- Acquire key card to access St. John's Project Office.
- Complete request forms for safety equipment (PPE) (done in conjunction with supervisor and HSS&ER Lead).
- Attend document control session on Aconex.
- Get training on the use of Pronto Form.
- Confirm camp accommodations have been arranged.
- Confirm all flight arrangement for field location.



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- Confirm fleet vehicle assignment, as required.
- Confirm schedule for SafetyNet training with H&S.
- Get Site Orientation training.
- Ensure that ID tag is acquired.
- Ensure that the following information is reviewed.
  - Code of Conduct and Business Ethics Handbook.
  - Worker Site Access Standard.
  - Respectful Workplace Standard.
  - Drug and Alcohol Standard.

## **12.7 ROTATIONAL SCHEDULES**

To provide clarity on staff deployment, a rotational schedule for all field staff is prepared by the Site Manager and Construction Manager with the assistance of the Office Administrator. The rotational schedule is accessible by all staff under the directory *T:/General Information/Site Rotation* and is also located on the MFG section of *"The Current"*.

Rotational travel is arranged through the Project Office in St. John's in accordance to an individual's assignment conditions.

## **12.8 RECRUITMENT STRATEGIES**

All recruitment for MFG is managed by the Human Resources department. In general, following is the process for bringing new staff on to the project.

- Ensure position is approved on overall staffing plan and there is a position ID number.
- Provide approved Scope Description for position to Human Resources.
- Position will be posted with approved agencies for a normal period of two weeks.
- When position closes, CV's for candidates are provided to the hiring manager.
- Candidates are selected for interviews.
- Interviews are coordinated by Human Resources and include hiring manager.
- Recommended hire is presented to Project Manager and Deputy Project Manager for approval.
- Once recommendation confirmed, Human Resources work with Supply Chain to establish a staffing contract and start process of onboarding the candidate.

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## 12.9 ADHERENCE TO CORE VALUES

Identified operating principles for the MFG Project Delivery Team include the Nalcor Core Values of:

- **Teamwork:** sharing our ideas in an open and supportive manner to achieve excellence.
- **Open Communication:** fostering an environment where information moves freely in a timely manner.
- **Honesty and Trust:** being sincere in everything we say and do.
- **Safety:** relentless commitment to protecting ourselves, our colleagues, and our community.
- **Respect and Dignity:** appreciating the individuality of others by our words and actions.
- **Leadership:** empowering individuals to help, guide, and inspire others.
- **Accountability:** holding ourselves responsible for our actions and performance.

The power of these Values has been defined as:

- Values are the deeply ingrained principles that guide all of the Integrated Team’s actions; they serve as the cultural cornerstone.
- Values can guide decisions and behaviour independent of supervision.
- Values exert influence consistently and powerfully on decisions and behaviour when they are widely shared and deeply held.
- Widely held values can enhance cooperation and coordination within the organization.

To align actions of the Project Delivery Team with these Core Values, it’s required that:

- All members of the Project Delivery Team must confirm and understand these Values.
- Ask ourselves questions such as “Are my actions consistent with these Values?”
- We must conduct all business activities – project execution activities consistent with these Values.
- Walk the Talk.

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- Practice positive reinforcement through affirmative actions: communication, decision making and handling conflict.

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

## **12.10 INTERFACE WITH OTHER COMPONENTS**

The Project's Technical Interface Management Plan serves to guide the interface of the MFG activities with the other Components underneath the LCMC delivery organization. Embedded with the MFG Project Delivery Team is a Change and Technical Interface Engineer with principle responsibility in the coordination and resolution of technical interfaces that the Component may have with other Components or with an external entity (e.g. NLH or CF(L)Co.).

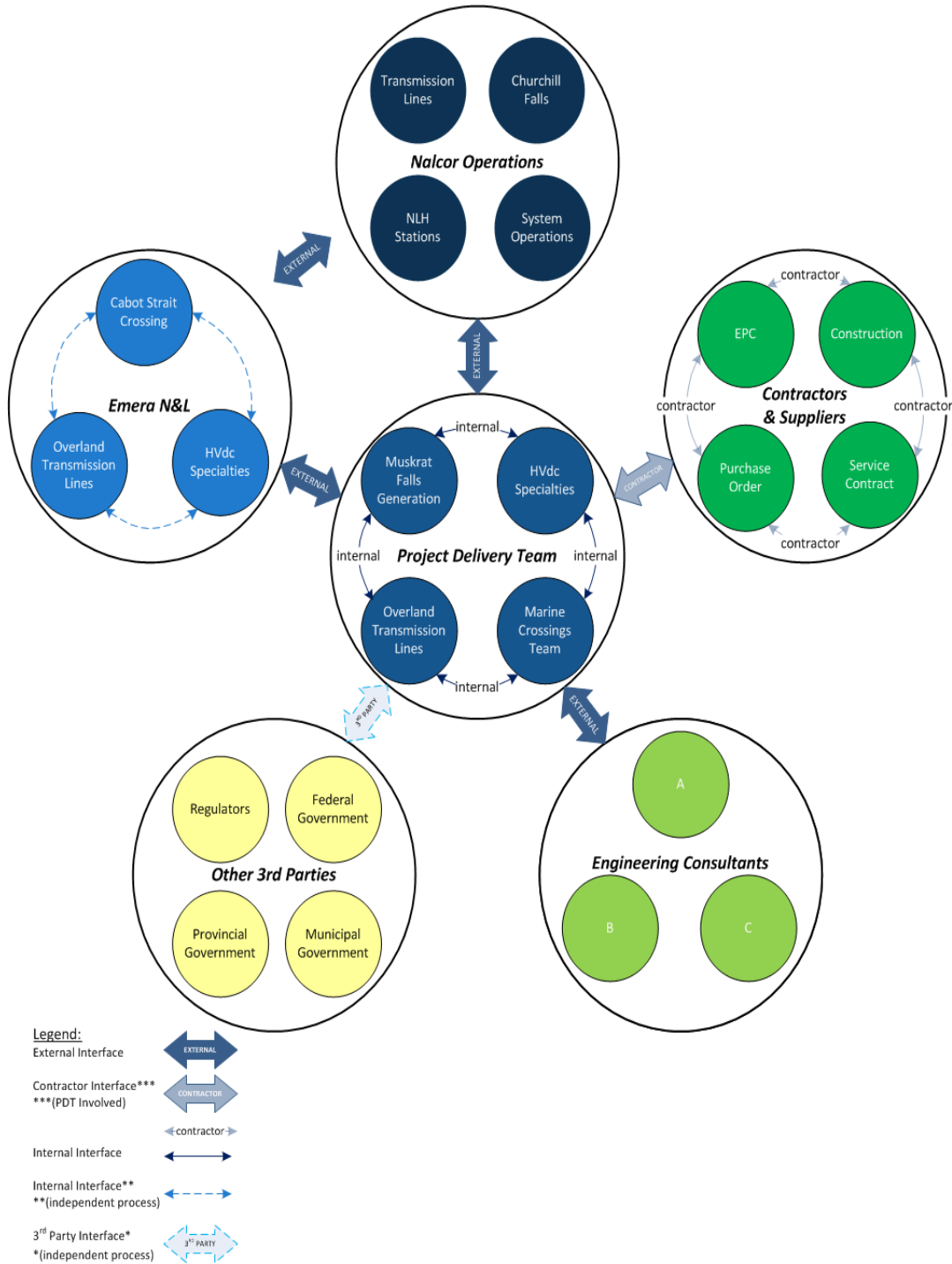
The Change and Technical Interface Engineer will represent the component or scope in support of the Project Manager. This individual will organize workshops and meetings to assist in the identification of technical interfaces as well as provide guidance and support to their team on the overall process. The Change and Technical Interface Engineer will also facilitate the raising, completion, monitoring, and closure of technical interfaces.

To assist with technical interface management, the Change and Technical Interface Engineer will chair a weekly working interface meeting within the Component, ensure priority attention is given to critical interfaces with other entities. As required, the Engineer will arrange and facilitate interface meetings or workshops with these entities to adequately progress an open interface through to satisfactory resolution by both entities.

All MFG Technical Interfaces will be logged in the Project Interface Register which will be issued Project-wide each week by the Change and Technical Interface Engineer or designate. MFG Project Delivery Team members are responsible to review and action open interfaces assigned to them, providing regular status updates to the Change and Technical Interface Engineer. Figure 12-3 presents the overall technical interface information flow across the Project.

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Figure 12-3: Technical Interface Flow Chart





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### 12.11 “THE CURRENT”

“The Current” is a project specific intranet that all Project Delivery Team members have access. It is an informational portal that provides specific details and updates regarding the project across all Components and Functional Areas. There is a specific location within “The Current” for the MFG Team and this site is dynamic with materials being updated and added monthly. Following is an example of information that can be found on “The Current” related to MFG.

- Commitment Package Responsibility Matrix.
- Planning Isometrics.
- MFG Organization Chart.
- Staff Rotational Schedule – Muskrat Falls.
- Staff Rotational Schedule – North Spur.
- Muskrat Falls Construction Presentation.
- Muskrat Falls Virtual Tour.
- Muskrat Falls Site Plan.
- Site Visitor Information.
- Emergency Meeting Points.
- Project Delivery Team contact Information.
- The MFG “*Snapshot*”.
- MFG Management Plan – Construction Phase.

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### **13 AREA MANAGEMENT**

Detailed sections are provided within this Plan on the various Functional supports as it relates to MFG as follows.

- Project Controls (Section 15)
- Quality Management (Section 16)
- Environmental Management and Regulatory Compliance (Section 17)
- Health, Safety, Security, and Emergency Response (Section 18)
- Labour Relations Management (Section 19)
- Follow-On Engineering Management (Section 20)
- Commercial Management and Contract Administration (Section 21)
- Completions (Section 22)
- Communications (Section 23)

As noted in Section 12, Construction Management is discussed in detail in Section 13 and Site Management in Section 14. The purpose of this section is to provide an overview of the following areas, which together form to create the overall MFG Project.

- Area: Civil Coordination
- Area: Mechanical/ Electrical
- Area: Early Works (Infrastructure and Bulk Excavation)
- Area: River Management (discussed previously in Section 11)

The Area Management Teams reside in the home office and are responsible for coordinating home office support to the MFG Construction Management Team, to ensure successful delivery of the various contract packages. Each Area has a specified manager/ coordinator and is supported by various Package Leaders and Package Engineers. Following are key roles that report directly to Area Managers.

#### **Package Leader**

Reporting to the Area Manager, Package Leaders provide direction, from a delivery perspective, to the various functions/ disciplines involved in the delivery of specific contract packages. The position will support activities of engineering, procurement, construction, quality assurance, project services, and completions assigned to support the scope delivery, including direct reports (as required). The individual is expected to exercise professional judgment when making both technical and commercial recommendations to both the Area Manager and Area Construction Manager as it relates to delivery of the specific scope, including all contractual administration requirements.

#### **Package Engineer**

Reporting to the Package Leader or Area Manager, the Package Engineer is responsible to coordinate the planning and execution of the works including performing engineering tasks. In fulfilling this role, the incumbent will be required to analyse and recommend options that will enable the work to be

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effectively completed. In delivering this work scope, the individual will be responsible for identifying and coordinating the necessary resources required to ensure all engineering and quality assurance activities are completed. The incumbent will work as part of the team to select and manage contractors that will be required to complete the work scope while meeting the LCP's safety, environment, quality, cost and schedule objectives.

### **Area Engineer**

Reporting to the Area Manager, the Area Engineer is a senior engineering resource specializing in either Civil, Mechanical, or Electrical Engineering. These individuals provide specialized supports to the various Areas while maintaining a soft reporting relationship to the Engineering Manager. In fulfilling this role, the individual will work collaboratively with Area Managers, Package Leaders, Package Engineers, Engineers, Engineering Manager, Resident Engineer, and Construction Management Team to ensure the overall design and design changes are within the overall design criteria for the project.

### **Engineer**

Reporting to either the Package Leader or Area Engineer, this individual is responsible for providing engineering and follow-on engineering supports to the Area.

The Area Management Teams perform the following functions in support of the MFG Construction Management Team.

### **Site Interfaces**

The Area Managers are the primary interface with the site regarding the various contract packages and have a direct line of communication with the Construction Manager and Area Construction Managers. The Area Managers are responsible to coordinate the participation of the broader organization (engineering, quality, health and safety, environment, project controls, etc.) in support of the successful execution on construction.

Area Management team members regularly travel to site to attend progress meetings (Quality, Engineering, and Interface.) and relevant workshops with the Construction Management Team and Contractors.

### **Technical Interface Management**

The Area Management teams are responsible for interfacing with the various contractors for technical interface issues and coordinating resolution with the MFG Project Delivery Team and including, where necessary, coordinating face-to-face interface meetings with other Contractors or outside component stakeholders.

### **Change Management**

The Area Management Teams are responsible for assurance that all necessary internal change management processes (DCNs, DANs, PCNs, CTRs, etc.) are implemented and approved as necessary to support package execution.

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### **Engineering and Construction Management Documentation**

The Area Management Team is responsible for coordinating, in conjunction with the Engineering Manager, all Follow-on Engineering or 3<sup>rd</sup> party engineering review of queries, concessions, NCRs and revision of technical documentation.

ECN's are issued through the Engineering Manager, however the Area Managers/ Coordinators have direct responsibility for verifying ECN's and all Construction Management documentation are in accordance with overall philosophy for the package execution and are responsible for approving all engineering drawings/documents produced.

### **Contractor Deliverables Management**

The Area Management Team is responsible for coordinating the review of all documentation and deliverables issued for the package including stewardship of the review of all deliverables under the SDRL. The team through management of the package distribution matrix shall ensure key stakeholders are engaged across the organization and are responsible to consolidate commentary prior to return to Contractor.

The team is also responsible to coordinate all audits of Contractor Submissions in accordance with Project requirements, as approved by the Area Managers.

### **Cost Control / Trending**

The Area Management Team supports the budget stewardship and reporting processes and will be the primary interface with the Construction Management Team and home office project controls for cost management and cost trending. The team will support these activities and communicate quantity changes during the ECN issue process.

### **Contract Administration**

Contract administration is managed at site by the Construction Manager, Area Construction Managers and Contracts Management Team. The Area Managers provide support to the Construction Management Team for formulating and responding to correspondence with Contractor as applicable and is copied on all inbound and out bound correspondence with Contractor.

### **Reporting**

The Area Managers are responsible for producing a weekly report summarizing the status of all package management processes.

## **13.1 AREA: CIVIL COORDINATION**

The Civil Area Management Team resides in the home office and are responsible for delivering the following Contract packages.

- CH-0007 – Construction of Intake and Powerhouse, Spillway and Transition Dams
- CH-0008 – Construction of North Spur Stabilization Works

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- CH-0009 – Construction of North and South Dams

The team is led by the Manager – Civil Coordination and supported by Package Coordinators and Package Engineers for each of the individual packages. A summary of the scopes of work for each of the contract packages follows.

### **13.1.1 CH-0007: Construction of Intake and Powerhouse, Spillway, and Transition Dams**

Astaldi Canada are executing the scope of work for Package CH-0007, summarized as follows.

- Construction of the powerhouse and the intake which includes concreting, steel structure, embedment parts and miscellaneous metals as well as the architectural works related to the envelop of the powerhouse building.
- Construction of the gated spillway including the upstream and downstream permanent bridges and downstream temporary bridge over the gated spillway.
- Construction of the centre and north transition dams.
- Civil works related to permanent access roads to the powerhouse and to the spillway.

### **13.1.2 CH-0008: Construction of North Spur Stabilization Works**

Gilbert Contracting Newfoundland and Labrador are executing the scope of work for Package CH-0008, summarized as follows.

- Clearing and grubbing.
- Overburden excavation.
- Embankment construction of different materials.
- Slurry cut-off walls.
- Construction of relief wells.
- Pumpwells installation including the electrical and mechanical works.
- Permanent access roads construction.
- Construction access roads.



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### **13.1.3 CH-0009: Construction of North and South Dams**

Bernard-Pennecon are executing the scope of work for Package CH-0009, summarized as follows.

- The North Upstream Rockfill Cofferdam, including cutoff, foundation preparation and treatment.
- The North Downstream Cofferdam.
- The North RCC dam, including excavation, foundation preparation, treatment, drainage, and instrumentation.
- The South Rockfill Dam including foundation preparation, treatment, drainage, and instrumentation.
- Removal of the downstream part of the RCC Riverside Cofferdam.
- Construction of the Powerhouse/ Intake cofferdam, inclusive of temporary road and temporary upstream bridge.

### **13.2 AREA: MECHANICAL AND ELECTRICAL**

The Mechanical and Electrical Area Management Team resides in the home office and is responsible for delivering the following Contract packages:

- CH0030 – Supply and Install Turbine Generators
- CH0031 – Supply and Install Mechanical and Electrical Auxiliaries (Balance of Plant)
- CH0032 – Supply and Install Powerhouse and Spillway Hydro- Mechanical Equipment
- CH0033 – Supply and Install Powerhouse Crane
- CH0034 – Supply and Install Powerhouse Elevator
- CH0068 – Muskrat Falls Construction power – Remaining Works

The team is led by the Area Manager – Mechanical and Electrical and supported by Package Leaders and Package Engineers for each of the individual packages. A description of the scopes for each of the contract packages follows. This group also manages the supply of Generator Step Up Transformers (PH0014), Isolated Phase Bus (PH0015), and Generator Circuit Breakers (PH0016).

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### **13.2.1 CH-0030 – Supply and Install Turbine Generators**

Andritz Hydro Canada are executing the scope of work for Package CH-0030, summarized as follows.

- Vertical axis Kaplan Turbines.
- Digital Governor Systems with servomotors and high pressure oil supply systems.
- Synchronous Generators, vertical axis, water/ air cooling.
- Static Excitation Systems including transformers, rectifiers, field breakers, automatic and manual voltage regulation, and black start capability.
- Generator Neutral Cubicles.
- Control, protection and monitoring system, including cabling between the control and protection panels and the equipment supplied as part of the turbine/ generator package.
- Split phase CT's on the line side of the generator.
- Generator neutral phase CT's.
- Electrical and mechanical ancillary services inside the generator pit and the turbine pit.
- Cable trays inside the generator pit.
- Lighting inside generator pit.
- Fire detection and protection inside generator.

### **13.2.2 CH-0031 – Supply and Install Mechanical and Electrical Auxiliaries**

This package is currently in the bidding phase and has yet to be awarded. The scope of work for this package includes Mechanical piping, HVAC systems and Powerhouse, Intake, Dams and Spillway Auxiliary Electrical Systems and installation of Major Electrical Equipment and cabling under the supervision of Suppliers. Site testing of the supplied equipment and installations is also included. Supply and installation of Mechanical and Electrical Auxiliaries and Architectural Interior Works for the Muskrat Falls Powerhouse are also included.

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### **13.2.3 CH-0032 – Supply and Install Powerhouse and Spillway Hydro- Mechanical Equipment**

Andritz Hydro Canada are executing the scope of work for Package CH-0032, summarized as follows.

- Vertical-lift intake gates with a dedicated hoist system, embedded components, and controls.
- Intake bulkhead gates and embedded components.
- Trashracks and embedded components.
- Trashrack cleaning system.
- Installation of secondary concrete for embedded parts.

### **13.2.4 CH-0033 – Supply and Install Powerhouse Crane**

Groupe Lar are executing the scope of work for Package CH-0033, summarized as follows.

- Two Powerhouse Overhead Cranes of 380 metric tonnes capacity each with two Main Hoists and one Auxiliary Hoist with a capacity of 25 metric tonnes.
- Spreader beams to distribute load to both trolleys, or to all trolleys on both cranes to pick largest load in the Powerhouse.
- 600 V main disconnect switch, power conductor bars for the length of the overhead crane travel.
- Perform Pre-Start Health and Safety Review/ Inspection as required by the laws and regulations of Newfoundland and Labrador.
- Certification of crane for use including all field testing required for certification load tests.

### **13.2.5 CH0034 – Supply and Install Powerhouse Elevator**

Thyssenkrupp Elevator (Canada) Limited are executing the scope of work for Package CH-0034 that includes the design, fabrication, supply, transport, and delivery to site, installation and testing, commissioning, warranty and performance guarantee of an elevator as well as accessories.

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### **13.3 AREA: EARLY WORKS (INFRASTRUCTURE AND BULK EXCAVATION)**

For MFG, all infrastructure and bulk excavation related scopes are completed and represented the Early Works Packages for MFG. For completeness of this document, following are descriptions of the key Early Works scopes.

- Included the design, fabrication, supply, delivery, installation, and commissioning of a 1,500 person main accommodation complex including an initial 300 person starter camp for Early Works Packages. Also included in this scope were associated furnishings, fittings, equipment, mechanical and electrical systems and components.
- Included the design, fabrication, supply, delivery, installation, connection and commissioning of administration buildings to support the overall project construction. Also, included in this scope were associated furnishings, fittings equipment, mechanical and electrical systems and components.
- Included construction of approximately 22 km of access road from the Trans Labrador Highway on the south side of the Churchill River to the main project site. Also, included the access road to the Accommodations Complex Site, Company's Laydown Area, and access roads to designated pits and quarries.
- Included supply and installation of water and sewerage utilities, including mechanical and electrical components and connections and associated infrastructure for the Accommodations Complex site including administration buildings. Also, included the supply of site services to those buildings and includes the potable and fire water distribution system, the sewage distribution system and the electrical distribution system.
- Included overburden and rock excavation for the Spillway Structure and Intake, Powerhouse, and Tailrace Structure, excluding tailrace rock plug. Pre-construction percussion drilling to determine thickness of overburden prior to commence excavation. Construction of RCC Riverside Cofferdam and associated Rock fill Cofferdams to protect Spillway and Powerhouse Complex against flooding during Stage 1 construction activities.

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## **14 CONSTRUCTION MANAGEMENT**

### **14.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Plan depicts the positions and reporting lines for MFG. The following construction management roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- Construction Manager.
- Deputy Construction Manager.
- Sr. Construction Engineer.
- Construction Enhancement Coordinator.
- Disputes Resolutions Manager.
- Contracts Administrative Assistant.
- Contract Administrators.
- Contract Technicians.
- Area Construction Managers.
- Shift Engineers.
- Construction Monitors.

The Construction Manager will ensure all members of the Construction Management Team are familiar with and adhere to the contents of this Management Plan. Construction management will have the overall responsibility to manage all aspects of construction contracts, Contractors on site, and inspection and monitoring of the works. The team will be focused on construction activities and supported by a Site Management Team that has the responsibility of managing the site. All other functional groups that support construction are available and managed directly by the MFG Project Manager with the prime focus of supporting all construction activities. To achieve the Project's goals, strong construction team leadership is paramount to optimize and monitor the overall performance. This construction leadership will serve to do the following.

- Ensure that project goals and objectives are well communicated and a strong decision making process is in place to provide for timely and effective alignment.
- Ensure alignment, communication, and guidance is provided to the Construction Management Team to build a culture for planning and success.
- Inspire, motivate, coach, engage, and support the Construction Management Team to nurture collaboration, ensure results, enhance performance and promote learning.

Overall leadership of the Construction Management Team will be through the Construction Manager. The role has overall accountability for the construction of all contract packages at site. The Construction Management Team will be tasked with the overall monitoring and performance of the



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construction activities. This will include supporting completions and commissioning activities. Depending on the skill sets within other functional groups (e.g., Quality) other site team members could be called upon to support construction monitoring activities, but the responsibility for construction monitoring (inspecting) lies with the Construction Management Team.

## **14.2 CONTRACTOR MANAGEMENT PHILOSOPHY**

The overall approach for contractor management will follow in line with the fundamental approaches and meet the objectives of the Area Management Teams and the overall MFG Project Delivery Team. The objectives of the management function are simple but focused; they are to complete all construction operations:

- safely;
- in conformance with contract documents;
- meeting environmental requirements;
- within budget;
- to an optimum level of protection against controllable risks; and
- taking advantage and leveraging strategic opportunities.

These principles build upon the foundation established in the *Construction Management Plan* document number LCP-PT-MD-0000-CS-PL-0001-01 with respect to providing clarity as to how the Construction Management Team will be organized to ensure the above objectives are fulfilled. They will take into consideration the execution and contracting strategy defined for the scope.

## **14.3 CONSTRUCTION COORDINATION**

Construction coordination is a key role for the Construction Management Team. This is done by having various daily/ weekly coordination meetings that are regularly scheduled between the Construction Management Team and on-site Contractors. Where multiple contractors will be working in an area, contractors and MFG Construction Management Team will coordinate work to ensure safety and efficiency. MFG are developing a procedure that will be applicable when MFG Contractors are working in the same area(s) at the Muskrat Falls site. This procedure will be used by the Construction Management Team in support of managing contractors at site. This construction coordination procedure will be based on the following inputs.

- Contractor baseline schedules.
- Contractor 3 week look ahead schedules.
- LCP integrated schedule.
- Exhibit 9 milestone schedules.
- Daily construction coordination meetings.

The Construction Management Team will as much as possible coordinate multiple contractors work in the same area to reduce interferences using the contractors look ahead schedules. Day to day

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activities will be coordinated in the daily construction coordination meeting. Area construction managers will ensure a work area has a lead contractor designated responsible for HS&E, worksite maintenance, control of work, etc. This will be documented and transferred to and from contractors through the transfer of responsibility form (if appropriate) or through formal letter correspondence complete with a sketch and detailed description including conditions for the Work. Other contractors will coordinate with the lead contractor to work within the lead contractors work area. LCP Construction Management Team will oversee this coordination and only direct contractors when necessary to align activities for the betterment of overall project schedule or to avoid potential commercial issues.

#### **14.4 CONSTRUCTION PRODUCTIVITY**

The Construction Manager will establish a program to monitor contractor productivity on a regular basis to ensure that the project schedule can be achieved. The productivity monitoring will be quantity based; a program of quantity measurement will be set up based on schedule milestones for each discipline by area. To ensure that the productivity can be achieved the units per day or per week will be established at time of contract award to ensure that the resources required to achieve the productivity are included in the contract.

Commodity curves will be developed based on the project schedule for each of the following:

- rock excavation (m3);
- backfill (m3);
- concrete (m3);
- concrete reinforcement (tonne);
- steel erection(tonne);
- cladding/roofing (m2);
- equipment installation
- pipe (m);
- cable tray (m);
- terminations;
- IO's;
- T/G Installation Milestones;

Each of these commodity curves will be set up showing planned quantities per day or per week and updated on a regular basis to indicate trends. Negative trends will be evaluated to determine cause and what recovery plans need to be implemented to maintain schedule. The contracts will be set up to ensure that the contractor will retain responsibility for productivity to achieve the required quantity production to meet schedule.

There are many factors that affect manpower productivity in an isolated construction site such as, accommodation, food, health services, security, communications, etc. these services will be managed

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by MFG. MFG will establish critical KPI's for each service contract to ensure that services contracted, are met, and there will be no negative impact on contractor's productivity. As noted early, site services are managed by a separate Site Management Team, thus allowing the Construction Management Team to focus on contractor management.

#### **14.5 RISK MANAGEMENT IN CONSTRUCTION PHASE**

Package and project risks related to construction that were identified in pre-construction phase must be monitored during the construction phase. They are subject to regular (monthly) reviews including site reviews with the Project personnel involved in construction and with contractors as stipulated by corresponding package contracts. Progress of implementation of the risk addressing actions/ response plans will be in the focus of these reviews.

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## **15 SITE MANAGEMENT**

### **15.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Management Plan depicts the positions and reporting lines for MFG. The following site management roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- Site Manager.
- Site Deputy Manager.
- Administrative Assistant.
- Project Engineer.
- Fleet Coordinator.
- IT Coordinator.
- IT Analyst.
- Lead Electrical.
- Electrical Services Monitors.
- Services Contracts Administrators.
- Site Buyer.
- Site Services Lead.
- Maintenance Supervisors.
- Training Coordinators.

The Site Manager will ensure all members of the Site Management Team are familiar with and adhere to the contents of this Management Plan.

### **15.2 SCOPE OF THE WORK**

The primary responsibility for the Site Management Team is to provide security, infrastructure, maintenance, facilities, transportation, accommodations and all other site related activities to support the Construction Management Team and workforce. This generally includes providing transportation and transportation routes to staff, workers and equipment, safe facilities to work and stay and reliable power and telecommunications. The Site Management Team will administer and manage the following service contracts as provided in Table 15-1 to provide services to the Site and Contractors.

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**Table 15-1 – Site Services Packages**

<b>Package No.</b>	<b>Package Name</b>	<b>Contractor</b>
SH0018-001	Provision of Catering, Housekeeping and Janitorial Services (MF)	Labrador Catering
SH0019-001	Provision of Security Services	Speuata Security
SH0020-001	Provision of Medical Services	Innu-Med
SH0022-001	Provision of Fuel Supply and Dispensing Services (MF)	Woodward's / Utapen
SH0040-001	Provision of Garbage Removal and Disposal Services (MF)	Pardy's WM
SH0041-001	Provision of Ground Transportation Services (HVGB to MF)	PENCAL / SBH
SH0051-001	Provision of Buildings Maintenance Services (third party services, materials and equipment procurement)	Various
SH0054-001	Temporary Site Services	Labrador Catering

### 15.3 ASSETS

Current site assets include, but are not limited to the following.

- South Side Access Road, Bridges and associated infrastructure.
- Roads, areas and all above ground and underground infrastructure associated with the accommodation's complex.
- Roads and areas associated with the Company Laydown.
- Site construction roads to the powerhouse, spillway, converter station and switchyard.
- Road and area associated with the Contractor Laydown.
- Accommodation's Complex (Kitchen, Dining and Recreation Building, Permanent Dorms, Sports Complex, Early Works Dining Complex and Dorms).
- Water Treatment Plant and associated wells and water storage tank.
- Sewer Treatment Plant.
- Site Administrative Buildings (Gatehouse, Communications Building, Maintenance Workshop, Fire and Ambulance Shelter, Security Building, Administrative Office Building and Laboratory and Tech Offices).
- Site Construction Power and Back-up Power systems.

### 15.4 CONSTRUCTION POWER

At the Muskrat Falls Site, Company's Laydown area and Contractor Laydown area and the main construction areas, construction power will be provided for lighting and heating of buildings. Each



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contractor is entitled to a maximum electrical load with any power required in excess of the specified load being the contractor's responsibility. Construction power will be supplied from mini substations located at various locations throughout the site. The maximum power available per contract will range between 0.4 MW and 2.0 MW depending on need. It is the responsibility of the contractor to supply all labour and material required for connection and distribution.

## **15.5 ACCOMMODATIONS AND ROTATIONAL TRAVEL FOR STAFF AND WORKERS**

MFG operates a main accommodations complex with a capacity of 1500 persons as well as the Early Works Camp facility (with a 300 person capacity) for peak demand periods. The Accommodations Complex consists of eleven (11) 3-storey dormitory units, a kitchen/dining/recreation building with a 500 person single seating capacity and a sports complex. Equipment and furnishings are provided by the Company. Each room will have a private washroom (vanity and toilet) with a shared shower with the adjacent room. All rooms will have cable television and Wi-Fi internet access.

MFG will provide all catering, janitorial, recreation and maintenance services through the services contractor to ensure safe, healthy and enjoyable accommodations for the staff, contractors and workforce.

Workers will be accommodated free at the Accommodation Complex. Breakfast (morning) and dinner (night) will be served at the cafeteria. The same will be available for workers assigned on the night shift. Lunches will be provided by the camp kitchen and will be eaten at the job site lunch room and workers will not be allowed to return to the Accommodation Complex for mid shift meal.

MFG will provide transportation for workers and staff to/from the Goose Bay Airport to the Muskrat Falls Camp as well as local daily bus transportation to/from the Muskrat Falls Camp. Transportation from the camp to the various work fronts will be the responsibility of the applicable contractors.

In addition to providing space at the Accommodations Complex, MFG staff have the option of staying in Goose Bay and being provided a Live-Out-Allowance (LOA). For staff members that choose this option, there will be available a shuttle bus service between Goose Bay and the Administration Building. For those not using the bus, travel arrangements will have to be made within departments with regards to available fleet vehicle usage.

## **15.6 PROJECT FLEET**

Project Fleet vehicles will be managed by the Fleet Coordinator of Muskrat Falls. Field Staff will be assigned a fleet vehicle, as required or within departmental usage, for business-use purposes, while users are responsible to adhere to the Project's Fleet Administration Procedures, document no. LCP-PT-MD-0000-AD-PR-0001-01. Individuals designated as primary user of a fleet vehicle are responsible to ensure that the vehicle is maintained and serviced to fully function for its intended use. Fleet vehicle users are required to complete Weekly Vehicle Inspection Checklist, document no. LCP-PT-MD-0000-AD-FR-0018-01, available through Pronto Forms.

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## **15.7 FUEL DISPENSING**

MFG will provide Diesel and Gasoline dispensing and delivery on and around the Muskrat Falls site through the services contractor. The fuel dispensing system will be electronically recorded, reported and invoiced to MFG and contractors.

## **15.8 GARBAGE REMOVAL AND DISPOSAL**

MFG will provide garbage removal to all contractors on the site through the services contractor. The service will include the collection and disposal of domestic waste, the supply and distribution of non-potable water, the collection and disposal of sewage effluent and sewage sludge, transportation and disposal of all waste materials to an Authority Approved landfill site, and the implementation of a segregated waste stream.

## **15.9 MEDICAL SERVICES**

MFG will provide Medical and Health services for the Project Site, Reservoir Clearing, and the North Spur. The Medical and Health services will be provided 24 hours per day, 7 days per week. MFG will provide a site medical clinic, mobile treatment vehicles and aircraft (for emergency evacuation if required) for the medical contractor to execute the service. The medical services provided are as follows and further discussed in Section 19.

- Emergency medical services as required.
- Work related injury medical treatment.
- Medical treatment for non-work related illness.
- Limited pharmacy services.
- Maintain medical records.
- Post Incident and Reasonable Cause Alcohol & Drug testing.

## **15.10 SITE SECURITY SERVICES**

MFG will provide security and other services required for the control, protection, and security of the Muskrat Falls Site. The Security Service Contractor will provide security to the site 24 hours per day, 7 days per week. The security services provided are as follows and further discussed in Section 19.

- Site Surveillance.
- Access Control.
- Emergency Assistance.
- Enforcement of Site Rules and Regulations.
- Baggage, Vehicle and Room searches as required.

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### **15.11 GENERAL WORK PERMIT PROCESS**

General Work Permits (GWP) are initiated by the Contractor on LCP Form “General Work Permit Application” (MFA-PT-MD-0000-CS-FR-0003-01). The Site Project Engineer, in consultation with the Resident Engineer, determines admissibility and whether documentation is complete and sufficient to evaluate the application. The Resident Engineer will inform the Engineering Manager and the Package Engineer(s) concerned with the contract(s) affected of any relevant site related information needed for the engineering evaluation of the GWP by Home Office. The Engineering Manager will review the GWP with the Site Project Engineer to confirm the level of priority and identify the engineering disciplines or others to be involved in the evaluation of the GWP and determination of the response. Approved permits will be provided with an expiry date and the Site Project Engineer will monitor the GWP register and identify any permits that are nearing expiry. Any permit which expires will be set to “CLOSED”. Contractor is to cease work immediately on expiry. If an extension is required, work is not to be undertaken until the permit extension has been approved.

### **15.12 TEAM COORDINATION AND EFFECTIVENESS**

The Site Management Team staffing levels have and will continue to be optimized in consideration of the available Home Office support, experience and number of service contractors, value achieved and common industry practice. The Team will be one-team, with both site-based and home office-based personnel. There will be no duplication of roles; rather the team shall operate as one-team. The site organization will expand with requirements and will take advantage of synergies so as to keep site team size to an optimized level.

Proper communications is essential in the proper implementation of the Services and organization of the team and ownership of duties.

### **15.13 CONTRACTOR MANAGEMENT APPROACH**

Throughout the project, the Team will work with the services contractors to achieve desired goals through a collaborative approach. The Site Services Team will not function as a ‘traffic cop’; rather, the team will work in a collaborative and cooperative manner. The team will be fair, but firm. This covers all aspects of the contract execution including Safety, Environment, Quality, Management, Contract Administration etc.

To achieve an acceptable level of confidence with the services contractors and execution plan, a review and inspection program will be implemented that will be more intense during the early portion of the contract work and later reduced reflected of the success observed in implementation of the work.

### **15.14 TEAM COORDINATION MEETINGS**

The Site Management Team will maintain overall team coordination through the establishment of regular team coordination meetings. These meetings are designed to ensure that all staff are up to

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date and kept informed of all issues, concerns and developments. These meetings will be used to relay updated information, identify action items and for open discussion of issues. In fitting with the safety culture of LCP, all meetings that are held between three or more people must start with a safety moment.

### **15.15 SITE TOURS**

Site Tours can be a regular occurrence at the Muskrat Falls site. With various stakeholder groups (as discussed in Section 24) there are requirements to provide services for conducting tours. These tours can vary from staying on the bus to having the requirement for tour participants to enter the construction site. All tours are managed within the MFG Project Delivery Team and are in accordance to the Authorization Protocol for Access to Project Construction Sites document number LCP-PT-MD-0000-HS-PR-0001-01. Generally, all tours are managed either by the Change and Technical Interface Engineer or the MFG Deputy Project Manager. In addition to the Authorization Protocol for Access to Project Construction Sites the MFG Project Delivery Team has developed a standard tour checklist to support organization and consistency for tours.

### **15.16 FREIGHT**

Except for the material provided by MFG, contractors are fully and solely responsible for all transportation logistics for materials, equipment, building materials required to complete their contracts. Each contractor will have a storage area, designated by the Site Management Team to set up offices, warehouses and garages and storage for all material received on site.

MFG will provide some equipment directly on site. The logistic of receiving and transferring to the contractor installer will be coordinated by the Site Management Team.

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## **16 PROJECT CONTROLS**

### **16.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Management Plan depicts the positions and reporting lines for MFG. The following project controls site roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- Project Controls Lead – Muskrat Falls.
- Project Controls Lead – North Spur.
- Site Cost Engineer.
- Estimator.
- Lead Site Planner.
- Site Planner.
- Quantity Coordinator.
- Information Management Analyst.

Project Controls at MF site will be managed by a site lead. This person will be supported by the LCP Deputy Project Controls Manager who will provide Home Office supports. These two positions will work collaboratively, while both reporting to the MFG Project Manager, in the execution of Project Controls for MFG. Due to the geographical nature of the MF and North Spur sites, project controls for the North Spur will report to the LCP Deputy Project Controls Manager.

MFG will be controlled in accordance to the general practices and procedures established within the Project Controls Management Plan, reference document No. LCP-PT-MD-0000-PC-PL-0001-01. All construction activities must be carried out in accordance with this Plan.

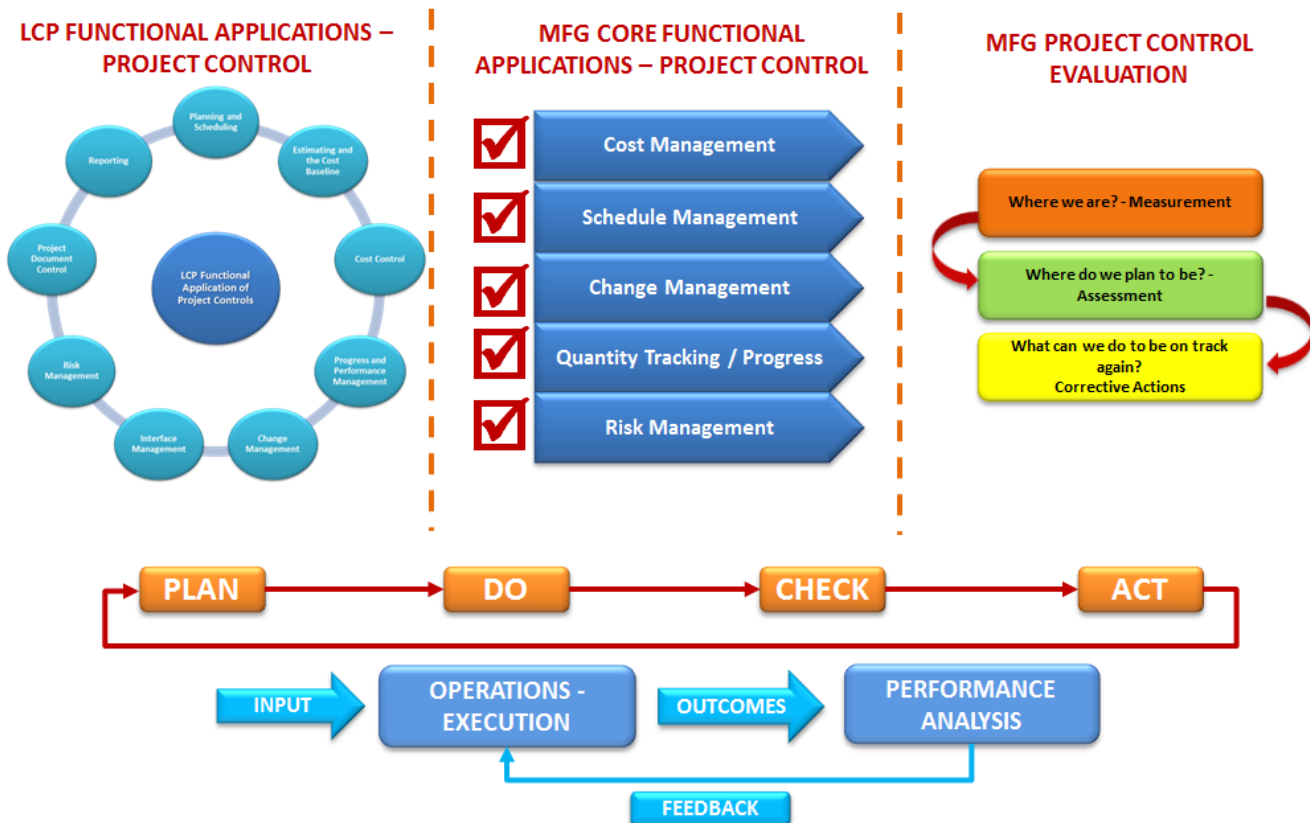
With the purpose to encompass resources, processes and tools to be used to perform functional applications of project controls, during the execution phase (construction) of MFG in a systematic way and oriented to bring effectiveness of the control process, a set of core functional applications for project controls have been identified for MFG as depicted in Figure 16-1.



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Figure 16-1 – MFG Project Control Systematic Approach

**MUSKRAT FALLS GENERATION (MFG) – PROJECT CONTROL SYSTEMATIC APPROACH**



The following sub-sections provide details on how the principals and practices contained within this Plan and related to these core functional applications for project controls will be applied to MFG.

**16.2 COST MANAGEMENT**

Cost control is an essential Project activity that employs tools and processes that facilitate measuring, analyzing, controlling and making available financial capital to fund the progression of work for accomplishing the MFG scope of work in an efficient manner. The LCP Deputy Project Controls Manager has accountability for the development and maintenance of Project budgets and control of monetary commitment for MFG. All Project Delivery Team members have responsibility for content and adherence to established budgets.

This section of the Plan describes cost control objectives and strategies for the Project Delivery Team and lays out plans for their achievement. Cost Management function will serve to:

- facilitate the release of work by ensuring that authorizations are in place;

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- establish the Baseline Cost Plan;
- monitor Performance against that Plan;
- perform analysis of trends and maintain up to date forecasts of remaining work;
- provide information to the Project Delivery Team to develop Corrective Actions;
- provide the necessary visibility to support Cost Control for MFG; and
- eliminate Cost and Schedule surprises.

The mandate of the Cost Control Team is to provide to the MFG Management Team with timely updated information on MFG cost status for analysis and control to deliver the MFG scope of work within budget. Major activities performed as part of this mandate include:

- budgeting;
- reporting commitments and actual status;
- trending and forecasting final cost;
- explanation of variances; and
- identification of potential issues for initiation of corrective actions as required.

**Budgeting:** Refers to the process of recasting estimates into the commitment package structure and cost control accounts defined for MFG as indicated in the LCP Work Breakdown Structure (WBS). Once the budget has been defined, it represents the budget baseline for monitoring and controlling.

**Reporting Commitment and Actual Status:** Refers to the process of reporting the value of commitments following agreements made with MFG Contractors and Suppliers. Actual status refers to the comparison of the commitments value against the current budget to ensure that proper funds have been allocated following appropriate requisition process to perform financial obligations as indicated in the agreements.

**Trending and Forecasting Final Cost:** Refers to the process of capturing, registering and monitoring trends (potential cost deviations) related to the execution of the scope of work for MFG. Proper management of the trend process will bring accurate values of the cost forecast (cost forecast at completion). Typical sources of trends to be considered for MFG are as follows.

- MFG Scope Changes.
- Design Development.
- Commitment Package Scope Changes.
- Prices Changes.
- Productivity Rates.
- Schedule Changes.
- Site Conditions.
- Indirect Cost.

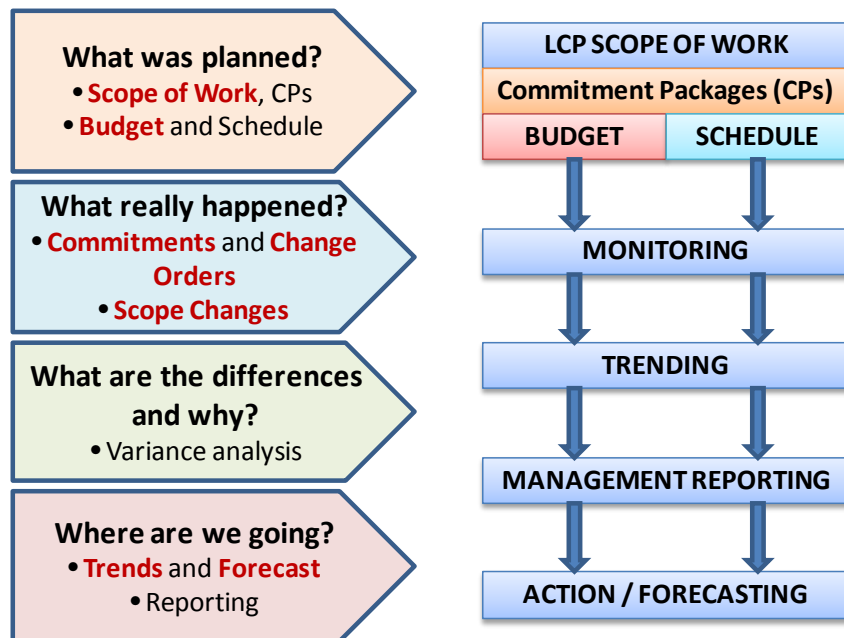
**Explanation of Variances:** Refers to the process of comparing actual performance values against planned values and explain the reason of the variance and how these deviations will be managed (mitigation and/or corrective actions). In terms of cost control these variances applies to cost flows,

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cash flows, forecast against current budget, forecast against previous period forecast and other specific cost control analysis required for MFG.

**Identification of Potential Issues:** Refers to the process of identifying, registering and reporting potential cost deviations to identify and implement mitigation-corrective actions to bring cost performance on-track. Cost deviations must be logged in the trend log and referenced to a Deviation Alert Notice (DAN) as part of the overall LCP Change Management Process. Proactive behaviour for identification of cost deviations will facilitate accomplishment of the MFG execution objectives in terms of cost control. Structure and cycle of Cost Control process and activities is depicted in Figure 16-2.

Figure 16-2 – Cost Control Cycle



**16.2.1 Cost Reporting**

Cost reporting provides information on expenditures and analysis of variations. This information coupled with forecasting and any apparent trends provides a good indication of performance against budget, and provides budget holders and other Project Delivery Team members the information and the opportunity to direct course corrections if needed to maintain budget adherence.

**16.2.2 Invoicing**

As payment certificates and invoices are received, the Project Controls team works with the contract administrators and the financial group to review these documents and attest to their validity against actual physical work performed and accepted by MFG.

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### **16.3 SCHEDULE MANAGEMENT**

Schedules are an important part of any project as they provide the project delivery team a picture of the project's status at any time enabling the management team to make necessary course corrections and recovery plans to keep the project on track.

A Schedule Management Plan (SM Plan) is created to provide guidance on how the schedules will be developed, monitored, controlled and reported throughout the project lifecycle. Through the use of this SM Plan the Project will be able to develop schedules that include all scopes for the project, identify and manage risks to the project, establish baselines, track activities in progress, identify those activities that are critical or near critical, measure performance against the baselines, and manage scope changes.

In addition to defining the schedule development approach, the plan defines who is responsible for monitoring and reporting schedule progress, how schedule updates are received and incorporated, how variances and changes will be addressed, and how to establish baselines of the schedules. The plan briefly describes the Project's schedule management tool. This plan also provides continuity in the development and maintenance of the project schedules. As new personnel join the team, this document will serve as an orientation document for the application and maintenance requirements of the project schedules.

This SM Plan will be updated as necessary to incorporate lessons learned and new information. It is acknowledged that most, if not all, external organizations participating in the execution of the MFG Component will have their own schedule management documents. Issues that arise from conflicting schedule guidance will be resolved on a case by case basis as contracts and partnering relationships are established. It is also acknowledged and understood that all projects are not the same and may require different levels of schedule visibility, scrutiny and control. Project type, value, and complexity are factors that typically dictate which schedule management practices should be employed.

#### **16.3.1 Scheduling Team/ Responsibilities**

The MFG scheduling team has responsibility for building and maintaining the Project Control Schedule (PCS) for the Component. The PCS is the integrated schedule incorporating the schedules of all material suppliers with the construction schedules. The various suppliers and contractors involved in this work will provide schedules for their assigned scopes of work in accordance with the specific agreement and the coordination procedures. These individual schedules will be incorporated, either in detail or in summary, into the PCS for MFG by the Component scheduling team.

The MFG planning and scheduling team will operate from the St. John's office and Site. This team will have the responsibility for incorporating updates and any necessary changes provided by the various suppliers and construction contractors. The MFG scheduling team has the ultimate responsibility for tracking and reporting progress. This team will provide status updates, schedule analyses, and independent reporting to augment information provided by the individual suppliers and construction

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contractors. This scheduling team will also highlight areas of risk to the project goals based on performance monitoring data.

The Suppliers/Contractors scheduling teams have the responsibility to provide weekly progress updates. As well the Contractor will provide monthly copies of updated execution schedule to the MFG scheduling team. Once received and confirmed against Quality reports and acceptance records, these schedule updates will be incorporated into the PCS by the MFG scheduling team. Weekly analysis will be conducted by the scheduling team to identify variances from expectation and to evaluate performance.

Variances and changes to the schedule will be analyzed for impact and will be addressed by both Contractor and the MFG scheduling teams. Some variations are to be expected on a plan of this magnitude. The scheduling teams will determine if the observed variances warrant immediate recovery actions or are to be monitored.

### **16.3.2 Scheduling System/ Software Requirements**

The Project will use Primavera P6 to input and monitor schedules and performance of MFG. This Component is in a stand-alone Primavera database and milestones within the individual schedules will be monitored for use in input and updates to the Integrated Project Schedule (IPS).

Suppliers and construction contractors are asked to provide schedules in P6 format. Due to a wide gradient of scheduling abilities and expertise, the project receives schedules in various formats—excel spreadsheets, Microsoft project, and Primavera P6. The schedules provided by suppliers and construction contractors will be incorporated into the MFG PCS, baseline and updated and monitored throughout the life of the contract.

### **16.3.3 Schedule Development and Management Guidelines**

**Level of Detail:** The level of detail in the schedule will be sufficient to facilitate monitoring of progress. Activity descriptions shall be complete and unambiguous. Activity IDs and Descriptions, once assigned, shall not be changed or deleted. Contractor’s schedule will be incorporated into the MFG PCS. Contractor will maintain schedule on their system and will provide monthly updates of schedule for use by the MFG scheduling team for monitoring and analysis.

**Logic Relationships:** Tasks are linked together through the use of logical relationships to identify the planned sequence of activities, the relationship between activities and their deliverables. The following rules should be applied when creating logic relationships.

- All tasks must have at least one successor and at least one predecessor so that there are no unlinked tasks.
- Start and Finish dates should not be entered when creating new tasks—the logic ties should dictate start and finish dates.

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- To support critical path modeling and analysis, all dependencies should be linked to a detail task or deliverable and not to a summary task.
- Constraints will be applied only when required, to maintain a flexible, realistic schedule and when logic ties cannot adequately represent the plan.

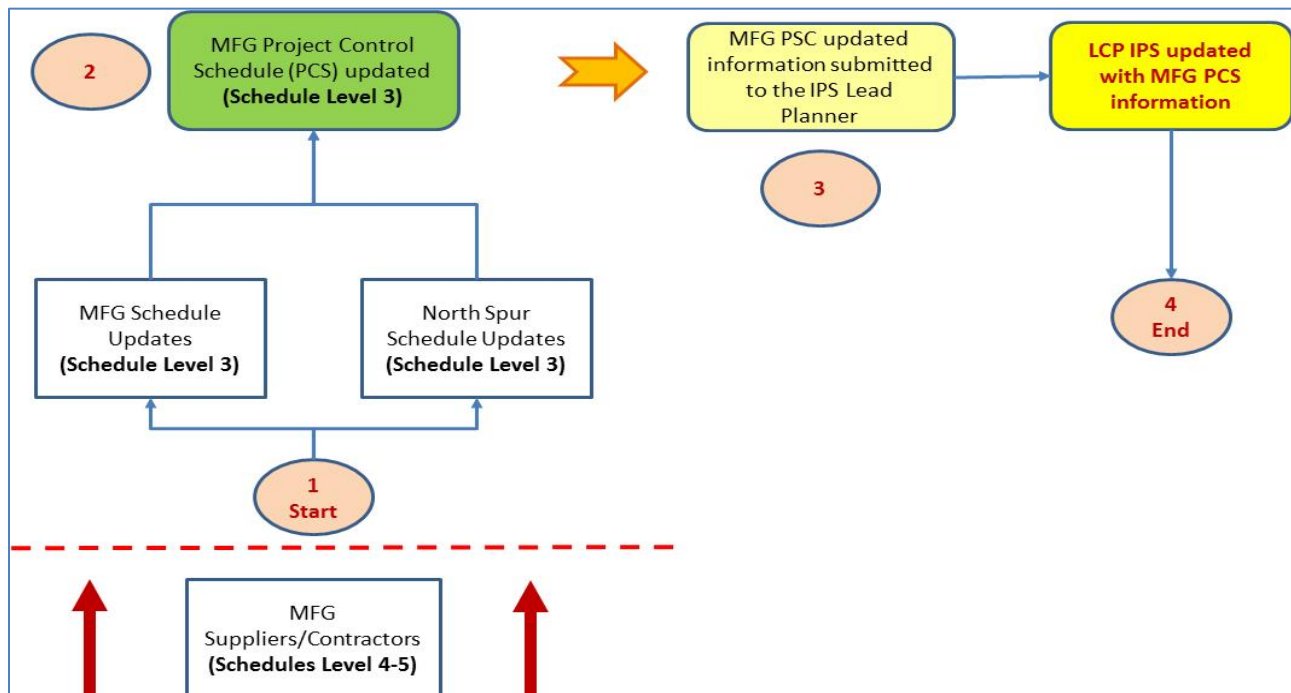
**Establishing the Baseline:** Contractor has the responsibility to develop the initial schedule which, once accepted, will become the baseline against which progress and earned value will be measured. Once established, the baseline is frozen and will only change through a structured change management process to establish a re-baseline if significant changes require. Otherwise, the baseline is the gauge against which project performance is measured throughout the life of the project.

**16.3.4 Schedule Output**

The project schedule serves as both a management tool as well as a historical record of performance. As a management tool, the schedule helps to identify conflicts between various LCP Components of the project and helps to ensure a realistic, achievable plan for performing the work. A fully integrated schedule allows for accurate forecasting and supports detailed performance monitoring and analysis. Management of change will be the responsibility of both scheduling teams to accurately evaluate deviations from plan to identify impact to time, resources, and cost.

The schedule will provide many reporting capabilities including look-ahead, performance statistics and metrics, trend analysis, the impact of proposed changes and what-if analyses.

**Figure 16-3 – MFG PCS Schedule Management Process**





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#### **16.4 CHANGE MANAGEMENT**

The responsibility for stewardship of Change, Technical Interface and Risk Management within MFG lies with the MFG Deputy Project Manager and the MFG Change and Technical Interface Engineer. The Change and Technical Interface Engineer works within the Project Delivery Team to ensure proactive change management stewardship consistent with the Project Change Management Plan, reference document No. LCP-PT-MD-0000-PM-PL-0002-01, and assists with the coordination of interfaces both internal and external, and manages the MFG Risk Register.

To ensure MFG activities are aligned with project procedures for management of change, technical interface and risk a number of practices have been implemented. Successful execution of Change, Technical Interface and Risk Management requires extensive liaison and day-to-day interaction with the Project Delivery Team. Fostering the core values of Teamwork, Open Communication, Respect and Dignity, and Accountability are key contributors to success.

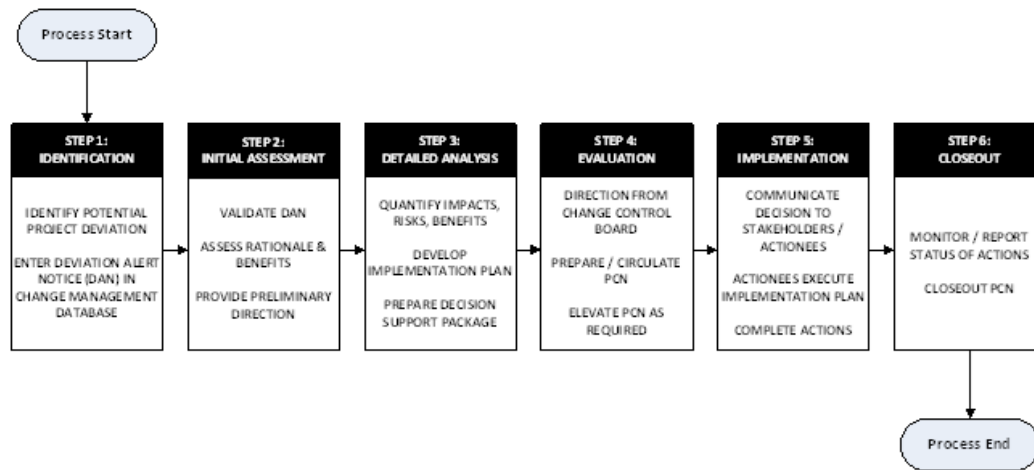
The Project Change Management Plan, reference document No. LCP-PT-MD-0000-PM-PL-0002-01, and Change Management Procedure, document no. LCP-PT-MD-0000-PM-PR-0005-01, provide a detailed description of the Change Management Process to be applied on the Project. As stated above, embedded within the MFG Project Delivery Team is a Change and Technical Interface Engineer who's principle responsibility is the facilitation of the Project Change Management Process within MFG.

The MFG Change and Technical Interface Engineer is responsible for stewardship and supporting Change Management. This includes providing guidance on the use of the Change Management Database, leading change management meetings, as well as managing, reporting, and facilitating closure of Deviation Alert Notices (DANs) and Project Change Notices (PCNs). Duties also include working with the managers within their team to foster timely development, decision making, and action of all change management notices. To assist with Change Management, the Change and Technical Interface Engineer will chair a weekly Change Management Meeting. In addition to the Change and Technical Interface Engineer; attendees at this meeting include the Project Manager, Deputy Project Manager, Area Managers, Cost Controllers, Planners and other Project Delivery Team members as required.

This meeting is designed to review the MFG Change Management Dashboard which provides a summary of Change Management activity and progress within the Project Delivery Team. It is also used to review, update and determine a way forward on active DANs with a particular focus on High Impact and new items. Round table discussions are held to maintain visibility of potential changes within MFG. During this meeting, items that may have to be tabled to the Change Control Board are also discussed and agreed. Figure 16-4 presents the overall Change Management Process Flow across the Project.

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Figure 16-4 – High Level Change Management Process Flow



All MFG potential changes will be logged in the Project Change Management Database in LCP Tracker. Weekly summary reports will be issued by the Change and Technical Interface Engineer to the MFG Area Managers for review within their respective teams. Project Delivery Team members are responsible to review and action open items assigned to them, providing regular status updates to the Change and Technical Interface Engineer.

The MFG Change and Technical Interface Engineer will maintain a log of all DANs and pending PCNs, which indicate whether these are Scope or Non-Scope related changes, status, potential cost and schedule impacts, and other information as required. On a weekly basis, the Change and Technical Interface Engineer will issue a report to the MFG Management Team containing the following information.

- **Potential Changes** – Changes that have been identified (initiated) but not rigorously estimated or reviewed by all affected Scope / Area Managers.
- **Pending Changes** – Changes that have been initiated and subject to further investigation (through the stewardship process), but not yet approved for implementation. Typically the cost impacts of these changes have been estimated.
- **Approved Changes** – Changes that have been approved by the appropriate level of management. These changes will be included in the Current Control Budget and current forecast.
- **Cancelled Changes** – Changes that have been rejected. When this occurs, the reason for not approving the change should be noted on the change form and it should be communicated to the originator and any others who reviewed the change.

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## **16.5 QUANTITY TRACKING - PROGRESS**

The quantity tracking progress process starts with the definition of the estimated quantities based in major commodities covering a defined scope of work for the MFG commitment packages and reflected in the respective construction agreements.

The Construction Management Team and the site project control team must define major commodities to be tracked to reflect construction/installation status and progress at specific points of time. Based in general requirement for MFG reporting, project status refers to the state of the project in terms of commodities at a given date; progress is the performance of the project since the last status date for a defined commodity (quantity) to be tracked, monitored and reported.

### **16.5.1 Types of Commodities**

For MFG, the following commodities have been identified to perform quantity tracking activities as indicated in Table 16-1. This table is only a reference to identify commodities related with the scope of work for an specific commitment package within MFG, the Construction Management Team and site project controls team could identify additional commodities not included in the table to have a better representation of the scope of work for quantity tracking, monitoring and reporting process.

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Table 16-1 – Major MFG Commodities

Discipline / Commodity	Unit of Measure
<b>Concrete - Civil</b>	
Excavation, foundations, back-fill	m3
Concrete installations	m3
Footing, slabs, columns, walls and formwork	m2
Rebar requirements	kg
<b>Structural</b>	
Steel installation – erection (columns, girders, beams, plates)	kg
<b>Mechanical</b>	
Equipment weight by pieces for large process equipment	kg
<b>Piping</b>	
Lineal quantities for different size diameter and materials of pipes	m
Installation of various size valves	unit each type
<b>Electrical</b>	
Lineal quantities for a variety of voltages	m
Installation of various size transformers, switchgears and disconnects	unit each type
Installation of fixtures, terminations	unit
<b>Instrumentation</b>	
Programming	hours
Installed instruments	unit
Lineal quantities for wiring	m
<b>Engineering, Procurement and Management</b>	
Engineering disciplines, management	hours by area
Specifications, drawings, equipment list	deliverables
Purchase Orders, agreement and enquires	quantity

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### **16.5.2 Quantity Tracking Process**

The method of collecting and reporting quantities for MFG will require upfront planning from the MFG Site Project Control Team and the Construction Management Team. The MFG Construction Management Team needs to be aware of the commodities that need to be tracked for monitoring, controlling and reporting construction activities.

The progress of deliverables and commodities identified as baselines will be charted in an “S” type curve presenting actual performance values against baseline values. An overall progress curve will be charted for any specific area using weighting factors for commodities tracked.

### **16.6 RISK MANAGEMENT**

A detail description of the Risk Management Process to be applied to the planning and execution for the LCP is indicated in the Project Risk Management Plan, reference document No. LCP-PT-MD-0000-RI-PL-0001-01.

This document is also applicable to the Risk Management Process to be applied to the planning and execution of MFG from the identification of the Sub-Project risk (tactical) to establishing the appropriate risk plans that address these risks and the subsequent monitoring and control including periodic reporting process.

The Risk Management Process comprises the following four specific, continuous loop steps.

1. Risk identification and organization.
2. Risk assessment and prioritization.
3. Risk response (mitigation).
4. Risk monitoring and control.

These four Risk Management steps indicated above are depicted in Figure 16-5, including elements and tools used to perform each step.

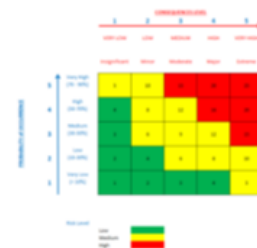
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Figure 16-5 – LCP Risk Management Process Cycle



**1. Risk Identification and Organization**

**2. Risk Assessment and Prioritization**



**3. Risk Response**

**4. Risk Monitoring and Control**



Risk Register



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This Risk Management Process is fully implemented within MFG. Package and project risks related to construction that were identified in pre-construction phase will be monitored in the construction phase. These are subject to regular reviews including site reviews with the Project personnel involved in construction and with contractors as stipulated by corresponding package contracts. Progress of implementation of the risk addressing actions/ response plans should be in the focus of these reviews.

To assist with risk management, the Change and Technical Interface Engineer will chair a monthly risk management meeting within MFG ensuring priority attention is given to critical risks. In addition, dedicated risk sessions will be planned as required and chaired by the Change and Technical Interface Engineer.

MFG tactical risks will be logged in the Project Risk Register maintained by the Change and Technical Interface Engineer or designate. MFG Project Delivery Team members are responsible to review and action open items assigned to them, providing regular status updates to the Change and Technical Interface Engineer.

Monthly reports, exported from the Project Risk Database, will be issued by the Change and Technical Interface Engineer to the MFG Risk Owners for updating.

## **16.7 TECHNICAL INTERFACE MANAGEMENT**

The LCP Project Technical Interface Management Plan, reference document No. LCP-PT-MD-0000-PM-PL-0006-01, and Technical Interface Management Procedure, reference document No. LCP-PT-MD-0000-PM-PR-0004-01, serves to guide the technical interface management of MFG activities with other Components, external entities (e.g. NLH or CF(L)Co.) or within MFG between various Commitment Packages.

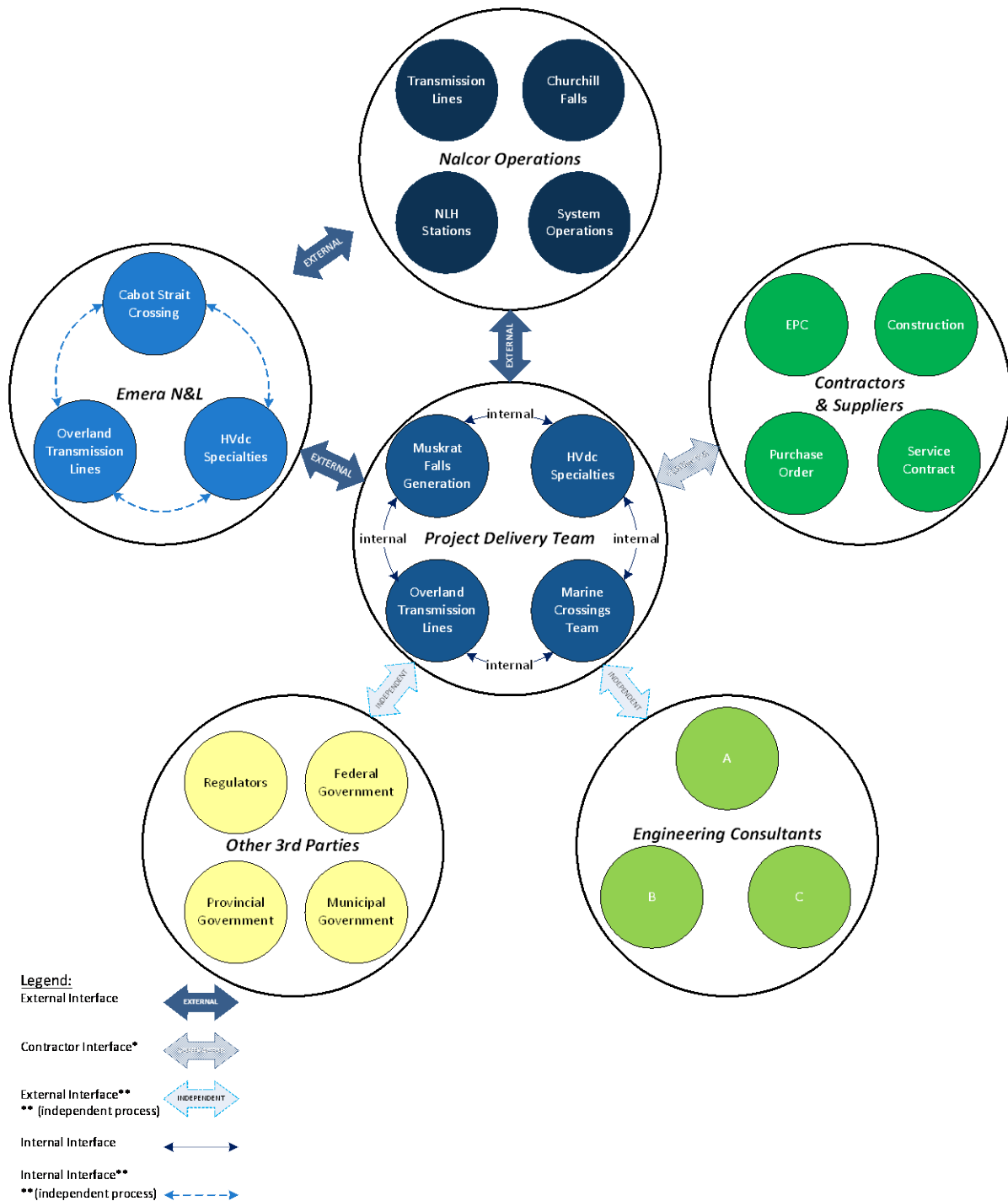
As stated above, embedded in the MFG Project Delivery Team is a Change and Technical Interface Engineer who's principle responsibility is the coordination and resolution of technical interfaces within the MFG Component. This individual will organize workshops and meetings to assist in the identification of technical interfaces as well as provide guidance and support to the team on the overall process. This includes interacting with other Technical Interface Engineers/Coordinators to determine appropriate routing and when necessary assisting in the development of Supplementary Technical Interfaces. In addition they will also act in the role of Technical Interface Coordinator to facilitate the raising, completion, monitoring, and closure of Technical Interfaces ensuring that all relevant information associated with technical interfaces is properly documented, maintained and communicated.

To assist with technical interface management, the Change and Technical Interface Engineer will chair a monthly interface meeting within the MFG Project Delivery Team, ensuring priority attention is given to critical interfaces with other entities. As required, this person will arrange and facilitate interface meetings or workshops with these entities to adequately progress an open interface through to

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satisfactory resolution by both entities. Figure 16-6 presents the overall technical interface information flow across the Project.

Figure 16-6 – Lower Churchill Project Technical Interface Information Flow



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While the MFG scope has many internal interfaces to be managed, in particular between the various packages within Powerhouse scope, there are some key technical interfaces outside the component that require significant attention. These include, but are not limited to the following.

- Protection, Control and Monitoring between the Powerhouse and the Switchyard.
- OPGW termination at the Powerhouse.
- Interfaces related to readiness for River Diversion.

All MFG technical interfaces will be logged in the Project Technical Interface Register within Aconex and a dashboard summary report will be issued Project-wide each week by the Change and Technical Interface Engineer or designate. MFG Project Delivery Team members are responsible to review and action open interfaces assigned to them, providing regular status updates to the Change and Technical Interface Engineer.

In addition, the Change and Technical Interface Engineer will work with Package Leaders and Engineers to ensure Package Distribution Lists include and are updated with appropriate distribution of documentation related to technical interfaces.

## **16.8 PROJECT DOCUMENT CONTROL MANAGEMENT – INFORMATION MANAGEMENT**

One of the key enabling components of a successful project is a well-planned and executed Information Management (IM) – project document control management process. Information Management is an encompassing term that includes the people, processes, and tools within an organization that are required to manage information throughout its life cycle; from its creation to its ultimate disposition.

The LCP Information Management Plan, reference document No. LCP-PT-MD-0000-IM-PL-0003-01, serves to guide Document Control Management – Information Management for the MFG Component. To ensure compliance to this plan, a dedicated Information Management team has been allocated at MF Site to support construction activities as part of MFG project controls services.

Types of documents to be managed during the life of MFG are indicated in Table 16-2.

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**Table 16-2 – Document Types**

<b>Type</b>	<b>Origin</b>	<b>Examples</b>	<b>Responsible</b>
Technical	MFG internal Technical documents including engineering documents prepared by MFG Consultants.	Engineering deliverables, e.g. drawings, specifications, technical requirements, LCP specifications and standards. Management System Documents (plans, procedures, forms, etc.).	Document Control.
Contractors/Suppliers	MFG Suppliers and Contractors	Equipment fabrication and installation-construction documents.	Document Control.
Administrative/Correspondence	Various	Letters, faxes, e-mails, memos, invoices, procurement documents.	Document Control. Procurement Administrative Assistants.

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To ensure proper management of documents (receive, register, coding, filing and retrieving) as indicated in Table 16-2, an Electronic Document Management System (EDMS) – Aconex has been implemented for the LCP Project and Components to enhance capabilities of this technology for the use of electronic documents as normal course of business for the LCP Project and Components.

MFG is taking advantage of these processes, procedures, work methods and tool of the EDMS. A key element related to the EDMS tools is the management of metadata. Metadata is captured to enable MFG records to be understood and to support their management and use. Such descriptive information ensures that reliable, meaningful and accessible records are preserved and carried forward through time to satisfy LCP Project requirements and to facilitate document disposition.

Some of the processes supported for a proper metadata management are as follows.

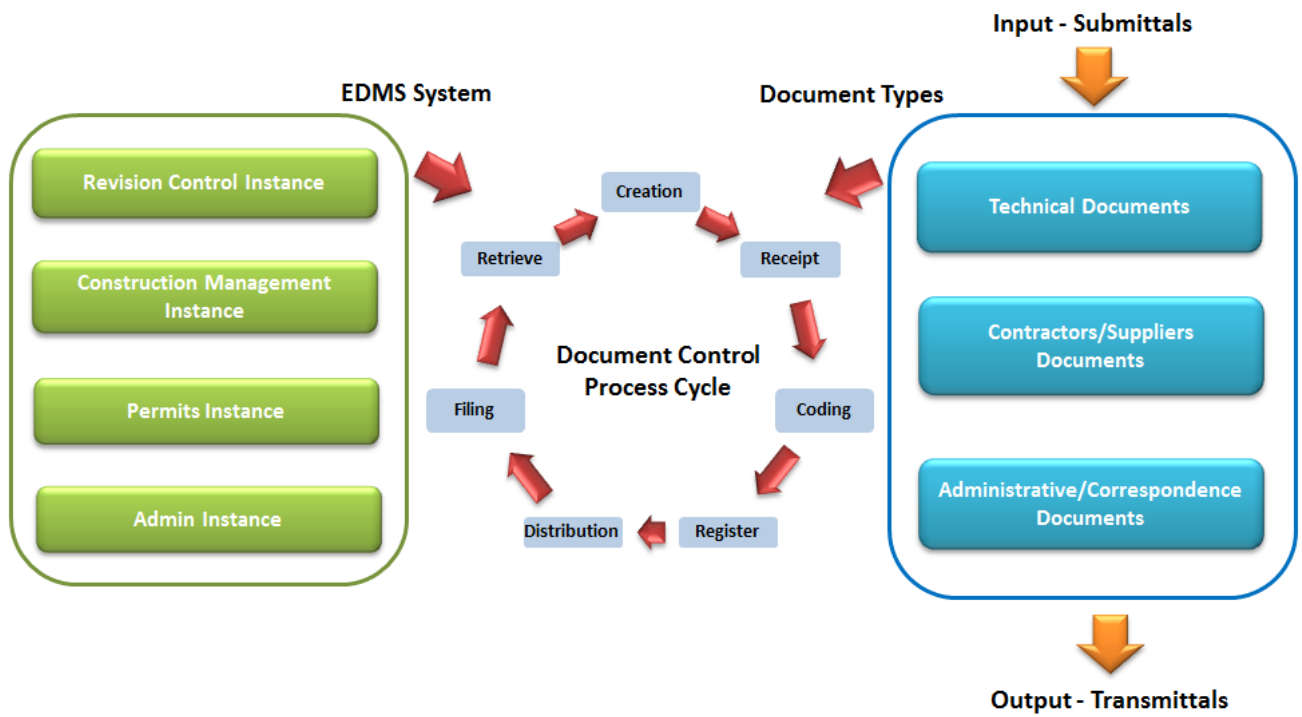
- Identification and description of documents.
- Classification of documents.
- Search of and retrieval of documents.
- Viewing and reproduction of documents.
- Workflow and version control of documents.
- Establishment of relationship between documents.
- Security of and access to documents
- Management of documents throughout their life cycle.

EDMS – Aconex is the most widely-used online collaboration platform for construction, infrastructure, energy and resources projects. It is a secure online platform for storing, managing and distributing all project information. It can be accessed via internet connection, 24 hours-a-day, 7 days-a-week.

Interaction among the EDMS, types of documents and document control process for the LCP Project and Components is depicted in Figure 16-7.

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**Figure 16-7 – LCP Document Control Process – EDMS System**





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## **17 QUALITY MANAGEMENT**

### **17.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Management Plan depict the positions and reporting lines for MFG. The following quality management site roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- Quality Assurance Lead – MF Site.
- Quality Advisor.
- Laboratory Supervisor.
- Deputy Laboratory Supervisor.
- Lead Surveyor.
- Deputy Lead Surveyor.
- Sr. Quality Advisor – NS Site.
- NS Quality Advisor/ Lab Supervisor.

Quality Management at MF site will be managed by the site assurance lead. This person will report to the overall MFG Quality Manager and will be responsible for “on-site” quality activities. There will be a Home Office position (Quality Coordinator) reporting to the MFG Quality Manager who will be responsible for all “off-site” quality management. This will include all auditing of site contractors and sub-contractors manufacturing facilities. This will also include all international manufacturing, such as Turbine and Generators in China. Due to the geographical nature of the MF and North Spur sites, quality management for the North Spur will report to the Home Office Quality Coordinator and not the MF Site Quality Assurance Lead.

### **17.2 QUALITY MANAGEMENT SYSTEM**

LCMC Project Delivery Team and LCP contractors will have an established Quality Management System (QMS) in place. The QMS for LCMC is described in Overarching Quality Management Plan, LCP-PT-MD-0000-QM-PL-0001-01 and the MFG construction execution team is aligned with the requirements of this plan. It is incumbent on all staff to comply with approved plans, procedures and forms to maintain the QMS. Opportunities for improvement and lessons learned are welcomed and where appropriate will result in updates to the QMS documentation. LCP Contractors are expected to comply with the quality requirements in agreements. The below approach describes how this will be accomplished by the MFG construction execution team.

### **17.3 QUALITY SURVEILLANCE APPROACH**

All Quality Assurance and Quality Control activities for the construction of MFG scopes will align with the requirements of the Overarching Quality Management Plan. Further to these points, specific Quality Management Plans have been written specifically for MFG scopes. For this reason, detailed

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execution of Quality Management for MFG will not be discussed in this Management Plan, but an overview of these documents. Having these Quality Management Plans prepared specifically for MFG fulfill the requirements of the Overarching Quality Management Plan. For the current scope at MFG, the following documents/ management plans for quality have been implemented.

- **MFG Quality Assurance Surveillance Plan (QASP), MFA-PT-MD-0000-QM-PL-0002-01**
  - The purpose of this document is to outline development and deployment of a QASP by the MFG construction execution team for contract package CH0007 - Powerhouse, Spillway, and Transition Dams. This QASP provides a proactive and risk-based approach to determine the level of quality involvement and quality effort by MFG construction execution team in performing: Quality Oversight, Quality Monitoring, Quality Surveillance, and Inspection of Astaldi Canada and its subcontractors. This document will be expanded as the scopes of work at MF site are expanded and other contractors mobilize.
- **MFG Survey Surveillance Plan, MFA-PT-MD-0000-QM-PL-0001-01**
  - The purpose of this document is to provide guidance, clarity and direction with respect to how surveying surveillance of contractor's construction and installation activities will be executed by the MFG construction execution team. More specifically, the plan outlines the methodology that will be developed and implemented by the MFG construction execution team, including focus on critical construction activities to support the broader Quality Assurance initiatives.
- **LCMC Materials Laboratory Quality Manual, LCP-PT-MD-0000-QA-MN-0001-01**
  - This document sets out quality management and operating procedures for the Lower Churchill Project (LCP) Site Materials Laboratory located at the MF Site. The main role of site materials laboratory work is the performing of field and laboratory testing of soils, aggregates and concrete materials. The quality of services provided by site laboratory has an important influence on the quality of materials used as per LCP-SN-CD-0000-QA-SP-0010-01, SM0705 Laboratory Services Scope of Work. This manual is intended for daily use by site laboratory staff at all levels for managerial and operational functions including outline of test procedures. The primary aim is to maintain quality, consistency and standards. The manual contains the following aspects of laboratory management and administration
    - Resources.
    - Handling samples.
    - Sample storage.
    - Incoming work.
    - Planning workload.
    - Quality control of testing.
    - Reporting results.

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- Keeping records.
  - Staff training.
  - Calibration of equipment.
- **MFG Civil Inspector Handbook, MFA-PT-MD-0000-QM-MN-0001-01**
    - The purpose of this handbook is to:
      - be used as a reference tool for the MFG Construction Management Team during monitoring of the work;
      - provide checklist to help the MFG Construction Management Team to focus on various aspects of the work;
      - outline the general requirements of the different aspects of work and associated inspection points; and
      - illustrate MFG Construction Management Team approach to oversight, monitoring and surveillance of civil works.
    - It is emphasized, that this manual is a general guide to inspection requirements. Detailed information regarding the work must be obtained from the Contract Agreement and/or the Construction Manager. This document will be expanded as the scopes of work at MF site are expanded and other contractors mobilize. Quality has supported in the development of this Handbook and it is the Construction Management Teams prime responsibility to monitor work, with support from the Quality Team, as required.

#### **17.4 QUALITY ASSURANCE AND QUALITY CONTROL ACTIVITIES**

The above documents can be referenced to provide the details of Quality Management specific to MFG. In general, the Quality Assurance and Quality Control Activities performed at the Muskrat Falls Site include but are not limited to the following.

- Contractor document review process.
- Quality Plan review.
- Inspection and Test Plan review.
- Inspection of the work – in support of the Construction Management Team.
- Survey Surveillance.
- Laboratory testing of materials.
- Quality records review.
- Contractor Meetings.
- Quality Audits.
- Non-conformance, Corrective and Preventive Action issuance.
- Handling of contractor generated non-conformances.

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- Issuance of Daily Construction Reports.
- Issue of weekly construction surveillance report.

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## **18 ENVIRONMENTAL MANAGEMENT AND REGULATORY COMPLIANCE**

### **18.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Plan depict the positions and reporting lines for MFG. The following environmental management and regulatory compliance site roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- MF Site Environmental Manager
- Environmental Monitors

Environmental Management and Regulatory Compliance at MF Site will be managed by the Site Environmental Lead, with Environmental Monitors reporting to this position. This person will report to the MFG Environmental Engineering Lead who in turn reports to the MFG Project Manager, with a soft functional reporting relationship to the LCP ERC Manager. Although with other functional areas, due to the geographical nature of the MF and North Spur sites, North Spur did not report to the MF site, in this case it does. Based on distribution of resources within the overall environmental management and regulatory compliance team, both the MF and North Spur sites can be managed by the MF site resources. This team also supports the environmental monitoring needs of the Reservoir Clearing Team, which is managed within the OTL Component 4 scope.

LCP operates under an Environmental Management Plan (EMP), document no. LCP-PT-MD-0000-EV-PL-0002-01, which has been approved by the project stakeholders, including the various Regulatory bodies. MFG ERC personnel are responsible for conducting regular environmental monitoring and audits to verify that Contractors are conducting their work activities in compliance with the Agreement, EPP, permits/approval, environmental legislation, etc. MFG ERC personnel will also provide support and guidance to Project Delivery Team and Contractors, as required. MFG ERC personnel will complete regulator environmental monitoring and audits.

### **18.2 CONTRACTORS**

The Contractor will carry the prime responsibility for environment protection and regulatory compliance for the work for which they are responsible. All work practices will be governed in accordance with the applicable law and by-laws, conditions in permits/approvals and the EPP and any associated documentation. The Contractor shall provide environmental representative resources, as required, to ensure the applicable environmental legislation, conditions in permits/approvals and requirements in the EPP are implemented effectively.

The Contractors shall identify a designated contact person responsible for coordinating and communicating the Company's instructions to the Contractor's management and personnel. This person shall be a dedicated environmental resource with experience implementing EPPs on similar construction operations.

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All Contractors and Subcontractors are responsible for conducting work in accordance with applicable environmental legislation, conditions in permits/approvals and EPP. Contractors are responsible for keeping MFG environmental personnel and construction coordinators informed of all environmental aspects. The Contractor is responsible for environmental monitoring, inspection, reporting and auditing.

### **18.3 ENVIRONMENTAL PROTECTION PLAN**

The Environmental Protection Plan (EPP) that applies to MFG is document no. LCP-PT-MD-0000-EV-PL-0011-01. This is a subordinate document of the EMP and relates most directly to project execution. There are various subordinate documents to the EPP, such as the Master Spill Response Plan, Waste Management Plan, Regulatory Compliance Plan, Avifauna Management Plan, etc. The EPP contains standard environmental protection procedures, or mitigation measures, for activities commonly associated with the construction phase of the Project. The objectives of the EPPs are to:

- anticipate potential negative environmental effects associated with construction; and
- implement appropriate mitigation measures to minimize or avoid negative effects where practical.

Negative effects include impacts to air quality and climate, groundwater and surface water resources, soil, biota and their habitats, human health and communities, and natural and historic resources. As per Exhibit 6 of each Agreement, Contractors are required to prepare a Contract-Specific Environmental Protection Plan (C-SEPP) and submit to Company for review and approval.

### **18.4 REGULATORY PERMITS**

The Contractor is responsible for reviewing the scope of work to identify all permits, authorizations and certificates that are required for all the Contractor's facilities and the Work. The Contractor is responsible for preparing the permit applications and submission to the Company for review and regulatory submission. Project related permits have been obtained by the Company and will be provided to the Contractor, as applicable. Contractor is responsible for complying with conditions in permits, authorizations, certificates, etc. regardless if obtained by Company or Contractor.

### **18.5 SITE VISITS AND INSPECTIONS – ENVIRONMENTAL REGULATORY AGENCIES**

Environmental regulatory agencies (e.g. Department of Environment and Conservation, Department of Fisheries and Oceans, etc.) are permitted to conduct site visits and inspections at their discretion. These site visits and inspections may be communicated to Company in advance, however, regulatory agencies are permitted to conduct the site visit and inspections without advanced notice. In the event that advanced notice is provided, the Site Tour process in Section 15.5 will be followed. The Site Environmental Lead, or designee, will typically conduct the site visit and inspection with the environmental regulatory agency. Contractors do not participate in site visits and inspections from environmental regulatory agencies, unless requested by Company Site Environmental Lead.



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## **18.6 ENVIRONMENTAL MONITORING**

Environmental Monitoring Field Reports (LCP-PT-MD-0000-EV-FR-0001-01) are prepared by the Environmental Monitors, approved by the Site Environmental Lead, reviewed by the Environmental Engineering Lead and distributed to appropriate Project Delivery Team members. Environmental Monitoring Field Reports are completed at a frequency deemed appropriate by the Site Environmental Lead and will be weekly, at a minimum. The Reports include a description of work being undertaken by the Contractors, locations and results of inspections and document positive observations, opportunities for improvement and non-conformances. Findings from environmental monitoring reports are communicated to Contractors either in the field, via Aconex or in regular meetings.

The Environmental Engineering Lead prepares weekly summary reports that are transmitted to various federal and provincial regulatory agencies by the LCP Regulatory Compliance Lead. Contractors are also responsible for completing daily environmental inspections at their work sites.

## **18.7 ENVIRONMENTAL AUDITS**

Environmental Engineering Lead is responsible for completing regular environmental audits on Contractors. Site Environmental Lead and Environmental Monitors will participate in audits, if requested by Environmental Engineering Lead. The frequency of audits will be determined by the Environmental Engineering Lead and will typically be on a yearly basis, however, more frequent audits could be conducted based on risk, ERC performance, etc.

Prior to an audit being conducted, the Environmental Engineering Lead prepares and submits an Audit Notification (LCP-PT-MD-0000-QM-FR-0006-01) to the Contractor outlining the scope and purpose of the audit. The purpose of environmental audits is to verify that Contractors are conducting their work activities in compliance with the Agreement, EPP, permits/approvals, environmental legislation, etc. Environmental audits are more robust than environmental monitoring discussed in Section 18.5 and typically consist of conducting interviews with select Contractor personnel, reviewing requested documentation and conducting a robust site inspection.

An Audit Summary Report (ARS) (LCP-PT-MD-0000-QM-FR-0009-01) is generated and documents all positive and compliant observations, opportunities for improvement and non-conformances. These ARSs will be transmitted to select personnel within the Project Delivery Team and Contractor's organization.

Based on findings from environmental monitoring and audits, the Site Environmental Lead and Environmental Engineering Lead will use their discretion when Corrective Action Reports (CARs) and/or Non-Conformance Reports (NCRs) will be issued to the Contractor. The Non-Conformance Procedure (LCP-PT-MD-0000-QM-PR-0007-01) will be followed.

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## **18.8 MONTHLY ENVIRONMENTAL PERFORMANCE REPORTING**

As per Exhibit 6 of the Agreement, Contractors are required to submit Monthly Environmental Performance Reports to Company for review and approval. These reports can be standalone or incorporated into the overall monthly progress report. There are a number of statistics required to be reported, which are outlined in Exhibit 6. Contractors are also required to report select parameters required for permits/approvals, such as, but not limited to, quarry quantities and water use quantities.

## **18.9 ANNUAL REVIEW OF ERC PERFORMANCE**

Annual review meetings are held at the discretion of the Project Manager. From an ERC perspective the information listed is presented to Project Delivery Team. Environmental Engineering Lead will continue to compile similar data on an annual basis, however, information may be added or removed to support continual improvement.

- Number of environmental monitoring reports completed.
- Number of environmental audits completed.
- Number of site visits and inspections completed by environmental regulatory agencies.
- Number of CARs and NCRs issued, and their status (i.e. open, closed).
- Robust spill analysis.
- Annual achievements.
- Look ahead for next construction year.

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## **19 HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE MANAGEMENT**

### **19.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Management Plan depicts the positions and reporting lines for MFG. The following health, safety, security and emergency response management site roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- MF Site HSS and ER Lead.
- Deputy MF Site HSS and ER Lead.
- Health and Safety Advisors.
- Emergency Response and Security Coordinator.

Health, Safety, Security and Emergency Response Management at MF site will be managed by the MF Site HSS and ER Lead. This person will report to the MFG H&S Lead who in turn reports to the MFG Project Manager, with a soft functional reporting relationship to the LCP HSS&ER Manager. Due to the geographical nature of the MF and North Spur sites, Health and Safety management for the North Spur will report to the MFG H&S Lead.

The following information has been prepared to provide an overview of health, safety, security and emergency response management at the MFG construction site. This information is a general overview only and is not to be viewed as the health, safety, security and emergency response plan for the MFG construction site. Health, Safety, Security and Emergency Response Management at Muskrat Falls is governed by the Lower Churchill Project (LCP) Health and Safety Management Plan (document no. LCP-PT-MD-0000-HS-PL-0001-01).

### **19.2 GENERAL APPROACH**

Nalcor Energy is committed to developing the LCP with complete dedication to minimizing personal injury and ill health risks to as low as reasonably practicable/achievable (ALARP/A). Nalcor Energy believes that sound Health and Safety performance is fundamental to the achievement of project success including its overall business and project objectives. It is therefore the MFG Project Delivery Team's expectation and requirement that all personnel associated with MFG play an integral role in the implementation and management of proactive health and safety strategies and perform at the highest possible levels while fostering continuous improvement in the areas of health and safety.

In alignment with Nalcor's core values, the LCP vision for health and safety management is simply:

***“Relentless pursuit of an injury and illness free workplace where nobody gets hurt”***

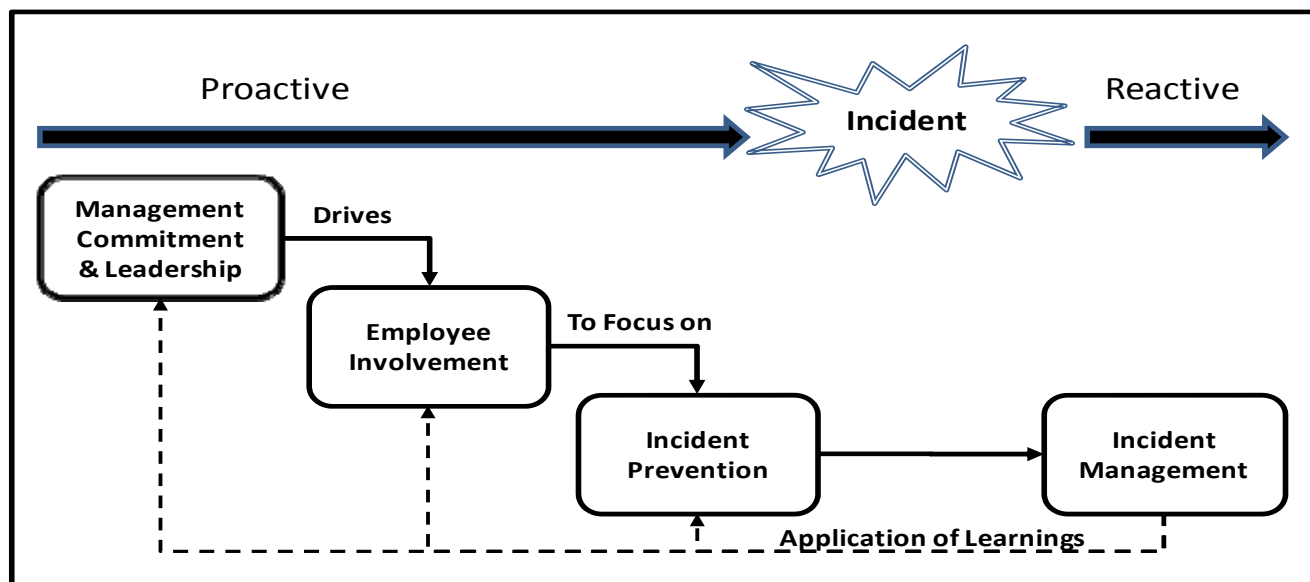
LCP has developed a health and safety management system that is consistent with Nalcor's corporate health and safety philosophies and conforms to the fundamental health and safety principles of the internationally recognized Occupational Health and Safety Management System, OHSAS 18001. At the

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core of this management system is a comprehensive Health and Safety Management Plan (document no. LCP-PT-MD-0000-HS-PL-0001-01). This Plan details the strategies and tactics that will be implemented by LCP to achieve our vision, while reflecting the delivery strategy chosen for the Project as detailed in the Project Execution Plan (document no. LCP-PT-MD-0000-PM-PL-0001-01).

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. This approach is illustrated in Figure 19-1.

**Figure 19-1 – LCP’s Fundamental Approach to Health and Safety Management**



The key factors influencing the success of this approach include the following.

- 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.
- Dedication and persistence.

In addition to the foregoing, each Muskrat Falls site contractor has the primary responsibility for the Health and Safety of its own employees – the Project Execution Plan (the execution model for the Project) details this contractor responsibility. To fulfill this responsibility, each contractor has the obligation to implement their own health and safety management plans/systems at the Muskrat Falls worksite. All site work practices and activities will be governed in accordance with applicable Laws/by-laws in concert with the requirements of the site/project Health and Safety Plan. As well, LCP have the

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obligation to review, comment and eventually accept the contractor's document before field work commences and conduct periodic/intermittent reviews of contractor safety management performance in the field.

Once field activities commence, LCP has the responsibility for supervising contractors and verifying contractor activities relative to implementation and adherence to Health and Safety plans approved by LCP. This oversight process is conducted to ensure that all contractor activities are performed in accordance with LCP's standards/specifications, and in accordance with provincial legislative requirements as well as contract terms and conditions. **Achieving the desired states requires that LCP adopt a "coaching and guiding" approach with the contractor's staff, versus a prescriptive or confrontational approach.**

All MFG Project Delivery Team personnel will be provided the tools and support necessary to maintain a safe and incident free worksite while ensuring the highest level of health and safety.

### 19.3 ROLES AND RESPONSIBILITIES OF MFG HSS&ER AND MANAGEMENT PERSONNEL

Health & Safety is a line management responsibility and it extends from the Project Manager down to the ACMs, shift engineers, and construction monitors within each area, as well as to all levels of contractors' organization. The Project Manager will have the overall responsibility of managing the requirements of the Project's Health and Safety Plan and will ensure adequate resources are available.

In an effort to ensure clarity regarding individual responsibilities for contractor health and safety performance, LCP has developed a prescriptive document entitled Contractor Health and Safety Performance Management Roles and Responsibilities, document no. LCP-PT-MD-0000-HS-PL-0009-01. **All MFG site personnel must be fully versed in the contents of this document and are expected to fulfill their obligations as contained therein. For clarifications, refer to the relevant line manager or Muskrat Falls site HSS&ER Lead.**

The provision of HSS & ER functional expertise within the Project Delivery Team will be led by the Muskrat Falls Site HSS&ER Lead. The HSS&ER Lead has the responsibility to provide HSS&ER expertise across the MFG Site. The HSS&ER Lead will report on a day-to-day basis to the MFG H&S Lead for priority setting and guidance.

The Muskrat Falls worksite has a number of health and safety professionals (HSS&ER Advisors) who report directly to the Site HSS&ER Lead. The HSS&ER Advisors have the direct responsibility to provide expert advice and opinions on matters related to health and safety performance at site. The HSS&ER Advisors also take the lead when incidents occur, in particular incident investigation, management and follow-up.

To ensure all site field personnel fulfill their respective obligations relative to contractor health and safety performance, site specific training will be co-ordinated by the site HSS&ER Lead in concert with the LCP Training Department. Specific training will include overview of the project HSS&ER

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requirements, behavioral based safety interventions, incident reporting, workplace inspections, emergency response, etc..

Additional roles and responsibilities of site HSS&ER personnel include, but are not limited to:

- conducting health and safety audits of contractors;
- conducting site safety inspections on a daily basis;
- identifying and correcting unsafe conditions and actions;
- identify concerning trends that need to be corrected;
- participating and reviewing contractor JSAs or SWPs;
- chairing and/or participating in Safety Absolute review meetings;
- participating in weekly contractor safety meetings;
- participating in management safety training and meetings;
- verifying contractor’s work methods and equipment are suitable for site work;
- assist with/or conduct incident investigations and ensuring remedial/corrective actions are effectively addressed;
- establish and maintain a site specific OHS Committee as per provincial legislation;
- preparing and issuing regular Safety Alerts;
- testing contractor’s site specific emergency response plans;
- participating in Safety Talks with all site contractors; and
- document retention, supplies, inspections, permitting, claims management, trending analysis and communication, as well as support of site supervision and management.

Each Contractor shall designate an on-site Health & Safety Representative who is charged with the responsibility of on-site Health & Safety management and will be the point of contact for Health & Safety matters. Site Safety Personnel shall meet on a regular basis to focus on continuous improvement in safety management and performance on site, areas to be discussed but not limited to, are:

- contractor safety performance;
- leading indicators;
- audit results;
- incident reports;
- corrective action closure; and
- focus on safety culture.

#### **19.4 CONTRACTOR SURVEILLANCE AND SAFETY CULTURE ENHANCEMENT**

Site contractors and their employees shall comply with the health and safety requirements of their pre-approved Health and Safety plan for the worksite. In addition, contractors and their employees must adhere to all LCP site specific health and safety requirements as well as provincial OHS legislative requirements. All site work shall be performed in a safe manner to ensure the overall health, safety



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and well-being of personnel and the public. Employee training, orientation, incident investigations, and health and safety process implementation shall be performed by all contractors. Compliance to these requirements will be verified by site HSS&ER personnel through day-to-day field interaction and auditing processes using SafetyNet, mini-audits, and behavioral based programs. Issues relating to non-compliance from individual contractors will be shared to the Muskrat Falls Site and Construction Management Teams for appropriate action.

Safety and health records, statistics, and trends shall be analyzed by HSS&ER personnel to continuously improve contractor safety performance. Tracking and trending data provided by internal auditing metrics, lessons learned tracking, daily interactions and corrective action logs based upon previous incident reporting.

All MFG site team members will ensure a Safety Culture is established and maintained by building professional relationships with contractor's management teams. As new personnel are brought onto the project a clear and precise list of expectations should be provided, taking into account the individual's level of experience and construction knowledge. When health and safety matters arise at the Muskrat Falls site, the site HSS&ER Lead, together with the Construction Manager and contractor representative will collectively work through all issues in a timely fashion.

MFG site personnel will act as "LEADERS" in health and safety and will lead by example on a daily basis. MFG site personnel will take all available opportunities to coach, teach, mentor, and instruct those that might need the additional support, guidance or direction. In an effort to promote safe work behaviors, MFG site personnel will consistently practice positive reaffirmation during interactions with contractor personnel, when conducting program audits, in weekly meetings, and during health and safety awards ceremonies.

## **19.5 WEEKLY HEALTH AND SAFETY MEETING**

Each week, the site HSS&ER Lead or alternate will participate in meetings with the health and safety representatives from each of the contractors currently engaged at the Muskrat Falls worksite. The focus of this meeting is to share learnings, discuss incident trends, review/discuss recent or ongoing issues and concerns, provide updates on health and safety status, assess health and safety training and impart health and safety information amongst all parties in an effort to keep the site's workforce safe.

## **19.6 CONTRACTOR JOB SAFETY ANALYSIS (JSA) AND SAFE WORK PRACTICES (SWP)**

Risk evaluations and assessments shall be performed with all activities associated with the construction of the Muskrat Falls project. All contractor risk assessments, Job Safety Analysis or Safe Work Practices will be reviewed by MFG health and safety personnel prior to site mobilization. A continued review (continued improvement approach) of contractor JSA's, SWP's and hazard identification/control programs will be performed as construction is executed. As well, all daily JSA's completed during the various phases of Muskrat Falls site construction are subject to review based on requests from the MF Site HSS&ER Lead.

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## **19.7 SAFETYNET**

SafetyNet is the leading safety management system for predicting potential workplace safety events. As such, it affords MFG the ability to measure the effectiveness of its safety programs, policies, and procedures by determining leading indicators of risk. Through the utilization of observable indicators inputted from field level workplace inspections and assessments, SafetyNet is able to trend that information into reliable predictors of corrective items requiring attention before an incident occurs. Through this proactive means, it functions as a real-time tool to prevent workplace injuries and other incidents.

SafetyNet users, using iPads, input leading and lagging indicator data with company/contractor related information already pre-installed. However, through assigned program Administrators, new information can be inputted specific to the users' actual inspection/assessment. Users simply select inspection category items which are identified as either safe or unsafe, then sync the inspection to a main database server once cellular connection is attained. Summary reports are generated weekly and manageable corrective items are displayed for follow-up closure with the pertinent contractor.

MFG site HSS&ER staff are trained in SafetyNet usage, and "Safety Bulletins/Alerts" can be generated for sharing of pertinent information will ALL on site personnel. It should also be noted that all MFG site staff working at the construction site have assigned iPad's and training in SafetyNet.

## **19.8 TRAINING MATRIX**

A MFG-specific Training Matrix will be created and posted. This matrix will describe training requirements of each employee, including confined space, fall protection, WHMIS, lock-out/tag-out, power line hazards, OHS committee training, standard first aid, defensive driving, alcohol and drug training, BE-SAFE, SWOP, ATV/snowmobile, wilderness survival, and any other relevant training requirements as they are identified.

MFG site team member training log will be updated and tracked by the MFG Training Department. This log will be reviewed during the weekly Health and Safety meetings and any upcoming training opportunities or training deficiencies will be review/discussed with the site HSS&ER Lead. The MF Site HSS&ER Lead will co-ordinate required training with the MFG Training Department.

## **19.9 REAL-TIME FIELD FEEDBACK**

In addition to SafetyNet discussed above, the Project team will utilize both the Daily Construction Report and the Field Focus Checklists as means to receive real-time feedback from the field on various items of safety concern. These tools are designed with recognition of the remote work locations and distribution of surveillance activities, which makes it challenging for H&S to have day-to-day interactions with all field personnel.

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The HSS&ER Lead and designates will regularly review completed Field Focus Checklists for structural H&S issues or trends that need to be actioned.

### 19.10 H&S AUDITS

Regular health and safety audits will be carried out by MFG HSS&ER staff as well as Contractor personnel and findings will be reported to management on a regular basis. MFG HSS&ER audits will be conducted at the Muskrat Falls worksite in accordance with the LCP Health and safety audit plan/schedule.

These audits will be an essential “Lagging Indicator” of LCP’s H&S performance – as continuous improvement will be linked to the success of these audits.

In addition to the regular audits, special (e.g. focused) audits will be undertaken on an “as needed” basis to:

- determine if H&S plans have been implemented and if targets and objectives have been achieved;
- confirm that risk controls have been implemented and that they are effective;
- learn from system failures through incident investigations;
- provide information that can be used to review and improve the system; and
- record and rate the overall performance of Contractors.

Poor Health & Safety performance by a contractor will result in a contract notice being issued to the contractor and the contractor will be required to develop and present an intervention plan. The contractor will have to implement this plan, in an agreed timeframe, incorporating any comments from MFG. Closeout actions to record corrective measures will be documented.

### 19.11 PERSONAL PROTECTIVE EQUIPMENT FOR MUSKRAT FALLS WORKSITE

The following personal protective equipment (PPE) is required to be worn at site at all times except in designated “No PPE required” areas.

- Protective Headwear – all site personnel shall be fitted with industrial protective headwear that meets the design standards set out in CSA Z94.1-05 (R2013). All hard hats must be provided with side impact protection. **Note:** Hard hats that meet the noted CSA standard are fitted with side impact protection. When wearing a CSA approved safety hardhat, it shall be worn with the brim facing forward. CSA approved reversible headwear can be selected and worn if the job, task, or work environment necessitates wearing headwear backward (e.g., for welding operations).
- Protective Footwear – all site personnel shall be fitted with protective footwear that meets the design standards set out in CSA Z195-14 (green triangle). Safety boots must have Grade 1 toe

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protection and sole puncture protection – safety boots with the green triangle meet this requirement. Personnel working in electrical hazard locations must wear safety boots with soles that provide electric shock resistance (Safety boots with the white rectangle bearing the orange Omega symbol meet this requirement). For site locations with rough terrain conditions posing a risk of ankle injury or falls, safety boots with ankle support (8 inch boot height) and aggressive threads must be worn.

- Eye/Face Protection – all site personnel shall be fitted with eye protection (safety glasses) that meet the standards set out in CSA Z94.3-07. Where hazards exist to the face, ears, or front of the neck, CSA Z94.3 approved face shields shall be worn over the safety glasses.
- High-Visibility Safety Apparel – all site personnel must be fitted with Class 2, Level 2 High Visibility Safety Apparel that meets the standards set out in CSA Z96.09.
- Hand Protection – all site personnel shall wear gloves that are suitable for the assigned tasks. Cut resistant gloves must be worn at all times when handling knives or other tools with exposed blades as well as equipment with sharp surfaces.
- Protective Clothing – all site personnel must be fitted with protective clothing that is adequate to protect against general site conditions and weather. Long shirt sleeves and long pants are mandatory for site.

Excluding PPE free zones, all personnel working at the Muskrat Falls worksite (including visitors) will be required to use the above referenced Personal Protective equipment. No person will be permitted to enter an area or perform any work where personal protection is required unless the person is correctly fitted with the mandatory site required personal protective clothing/equipment.

Note: The above references the mandatory personal protective for site and does not include specialized PPE for various tasks/operations (e.g. Working near water, working at height, working with chemicals, working in cold weather conditions, etc....). Refer to the LCP master health and safety management plan (document no. LCP-PT-MD-0000-HS-PL-0001-01) for additional information on specialized PPE requirements.

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## **19.12 MUSKRAT FALLS SITE SECURITY**

MFG provides site security services for the control, protection, and security of the Muskrat Falls and North Spur Worksites. The Security Service Contractors provides security to the site 24 hours per day, 7 days per week. The Security Service Contractor will:

1. Ensure the protection of site personnel, assets and operations are protected against the risks of:
  - Unauthorized access
  - Personnel Injury
  - Entry of contraband to site
  - Theft, mischief or unlawful damage of property
2. Maintain a record keeping system to provide statistical information in relation to specific compliance/enforcement activities i.e. Traffic Violations, Security Incidents, searches etc.
3. Conduct Security Incident investigations and submit reports
4. Maintain, review and manage access card database system for site
5. Distribute reports to Company as required/requested
6. Conduct Site Patrols and foot patrols on site and keep a record of same
7. Conduct Visitor Site Orientations and maintain records
8. Print and distribute access cards for site

### **19.12.1 Patrols – 24 Hours**

Contractor employed site security personnel conduct regular site security patrols with particular focus on conducting such patrols after normal working hours. Such patrols are conducted by 2 person teams that visually inspect areas containing equipment and materials, and those site support areas susceptible to unauthorized entry. Security personnel report any unauthorized entries and persons demonstrating suspicious behaviour to project management utilizing the project reporting protocol. Additionally, Security personnel monitor vehicle speed and driving activity and report any violations to the Emergency Response and Security Coordinator for appropriate action.

### **19.12.2 Muskrat Falls Site Orientation/Site Access Protocol**

Prior to being permitted access to the Muskrat Falls construction site, all contract personnel will be required to:

- provide a pre-access Alcohol and Drug (A&D) clearance
- provide a pre-access medical clearance, and

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- attend a site orientation course provided by LCP (followed by the Contractors' internal orientation process).

Site orientations will be conducted on a schedule only, five days per week, Monday, Wednesday and Friday on site and Tuesday and Thursday in Happy Valley-Goose Bay. Upon completion of the site orientation, participants will be issued an orientation handbook, which they must sign and acknowledge, outlining all information pertinent to the LCP.

All workers accessing the MFG site must be affiliated with a union in conjunction with the Resource Development Trades Council of Newfoundland and Labrador unless their work is considered specialty work that cannot be completed by a unionized worker. Specialty work would be considered any work outside the qualifications of a unionized trade's person or warranty work. If this is the case, permission to mobilize specialty workers must be obtained from the Labor Relations department.

If the contractor terminates an individual's employment at any time they are responsible to ensure that a demobilization form is sent to [lcpsiteorientation@lowerchurchillproject.ca](mailto:lcpsiteorientation@lowerchurchillproject.ca) to terminate individual's access. LCP has provided a demobilization form template specifically for this process, reference document no. LCP-PT-MD-0000-HR-FR-0004-01.

If an individual has been demobilized from site for more than 90 days and is being remobilized to the site, whether it is with the same contractor or a different contractor, they will be expected to complete a new pre-access A&D test, medical and attend site orientation. If it is less than 90 days the contractor will just need to notify the Training Department and a new mobilization form completed. For individuals accessing the site(s) for the purpose of a meeting or purposes that do not include hands on work, they will be expected to complete a visitor orientation and be escorted at all times by a person(s) that has completed full orientation for the site. At that time they will be asked to sign in. Upon leaving the site they will be expected to sign out.

Individuals returning to site with a different contractor, and within 90 days of demobilization, will require pre-access testing again.

### **19.12.3 Site Access and Random Checks**

All authorized site personnel and contractors will be issued a readable identification badge which is scanned at the entry gate by site security upon entry and exit from the site. Personnel entering the site via bus or van will also be required to have their identification badges scanned prior to entry and exit from the site. The identification badge will allow for an accurate accounting of all personnel on the Muskrat Falls site at any given time during the day or night. Personnel arriving at the site without their badge may be issued a temporary identification badge after presenting appropriate identification. The temporary badge must be returned to security upon leaving the site. On a random basis, security checks of personnel entering and leaving the site will be conducted by the Security Contractor. Individuals, who possess an unauthorized badge; or no badge, shall be denied access to the Muskrat Falls site. An unauthorized badge may include, but is not limited to the following.

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- Photograph of bearer does not match the individual trying to gain site access.
- Scan indicates expired training and/or other credentials.
- Attempted access by authorized person at wrong gate.
- Unauthorized contractor to the LCP.

Random checks of vehicles, knapsacks, plastic bags, luggage, tool boxes, lunch boxes, and other containers will be completed to verify that personnel are in possession of only personal property. All materials, tools or equipment may also be checked by security personnel. Submission to random security checks are a condition of employment on the LCP. Reasonable suspicion of security breaches may lead to a search of an individual's site accommodations, breaches may include, but not limited to, the following.

- Theft.
- Property Damage.
- Suspicion of Drugs and Alcohol Possession or use/intoxication/impairment.

#### **19.12.4 Security involvement in Emergency/Incident Response**

Security personnel will be involved as a key point of contact in emergency response activities, journey management and other general communications on site 24 hours per day. During evening hours, the Security Office will be the contact point for reporting any incident/ emergency. The on-duty Security Officer will be responsible for making contact with the Muskrat Falls Site Manager to initiate Emergency Response as prescribed in the Emergency Response Plan (LCP-PT-MD-0000-HS-PL-0004-01) Coordinating with the Project Security Coordinator, security personnel will potentially be required to interface with local law enforcement. Security personnel will also assist in with the incident investigation process that might include, but not limited to; securing incident scenes, accompanying and escorting personnel from the project property, etc.

#### **19.13 SITE EMERGENCY RESPONSE**

The Muskrat Falls construction site conforms to the requirements of the LCP Project wide Emergency Response Plan (Doc # LCP-PT-MD-0000-HS-PL-0004-01) for site specific emergencies and evacuations. The Project-Wide Emergency Response Plan clearly addresses and defines roles and responsibilities of key emergency response personnel, as well as procedures for initiating and execution of reasonable, expedient and effective mitigating actions targeted at the stabilization and seamless recovery from incidents occurring at site.

Site emergency response support will be provided from within the LCP Emergency Operations Centre Network, which includes the LCP Emergency Operations Centre (Torbay Road Office), the Corporate Emergency Operations Centre (CEOC- Hydro Place), by utilizing the procedures as defined within the LCP Project-Wide Emergency Response Plan with assigned team members able to: Mobilize an effective and efficient response to all emergency situations and execute all necessary emergency



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support actions in direct response to requests/needs of field operations or directly to the Incident Commander (IC) should support be required within Labrador or Newfoundland.

#### 19.14 FUNCTION OF MUSKRAT FALLS SITE-EOC

In the event of an emergency at the Muskrat Falls Site, the Site Emergency Operations Centre will be located in the main conference room at the Muskrat Falls construction camp. Circumstances requiring the support of the Muskrat Falls Emergency Operations Centre may include, but not limited to, the following.

1. Assisting the on-scene ERT by obtaining support personnel and equipment resources, as required.
2. Liaising with government and regulatory authorities and NGO's.
3. Addressing engineering, logistics, procurement, family, media, financial, safety and environmental issues on behalf of the field ERT, when appropriate.

#### 19.15 ALERTS AND RESPONSE LEVELS (1, 2, 3)

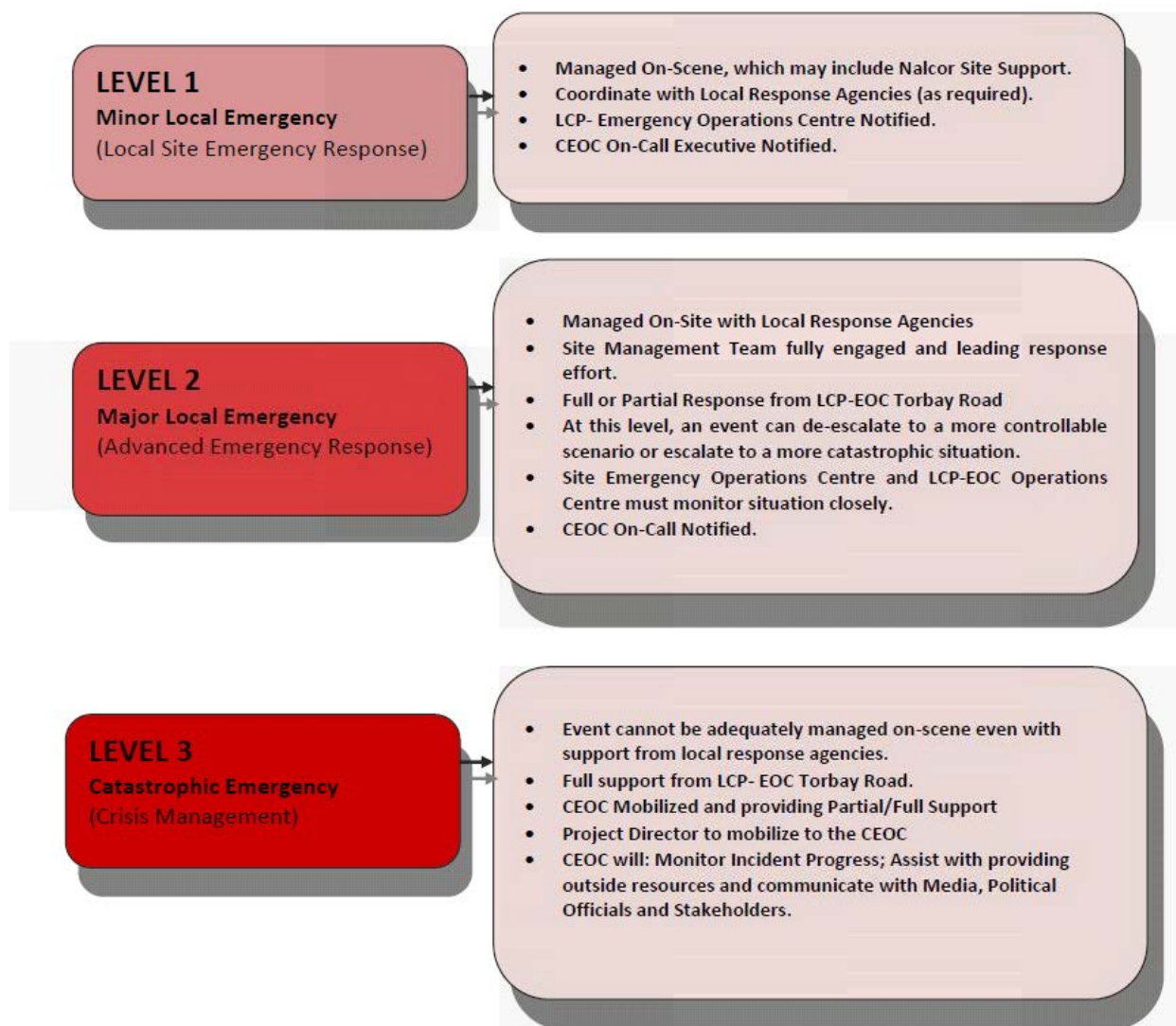
LCP has adopted a three-tiered escalation approach designed to respond to or support emergency situations as shown in Figure 19-2. This approach is fully aligned with Nalcor's emergency response structure to ensure a seamless transition in the event that Corporate-Wide Support is required. In a summarized notation, these are as follows.

- **LEVEL 1** incidents are operational in nature and managed by the incident facility/site.
- **LEVEL 2** incidents are managed by the incident facility/site with support of the LCP-EOC and CEOC as required. The Level 2 response may involve issues such as Public Relations, Human Resources, Legal, Stakeholder relations, etc., which would be addressed by the LCP EOC and the CEOC, again, as appropriate.
- **LEVEL 3** incidents are crisis incidents, which are managed by Nalcor's CEOC from their command Centre at Hydro Place.

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Figure 19-2 – Emergency Response Event Levels (1,2,3)

Figure 1 - EMERGENCY RESPONSE EVENT LEVELS (1, 2, 3)



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### **19.16 SITE SPECIFIC RESPONSES**

In conjunction with the Project wide Emergency Response Plan, site specific plans have been developed for specific areas as follows.

- Fire at Camp – Emergency Response Plan applies to permanent and temporary camps.
- Forest Fire and Evacuation.
- Site Medical Emergency Response Plan.
- North Spur Medical Emergency Response Plan.

### **19.17 SITE ABSOLUTE PROCESS**

To align with our core values of “Relentless pursuit of an injury and illness free workplace where nobody gets hurt.”, LCP has established Safety Absolute requirements that personnel have to comply with to ensure their safety while working on site at Muskrat Falls Generation. The safety absolutes are as follows.

- Tampering with, bypassing or disabling safety devices or emergency response equipment.
- Operating equipment or vehicles without proper licensing, authority or training/qualifications.
- Willful damage to property &/or equipment.
- Must not enter unidentified zones of imminent danger (e.g. red flagging, signs, barriers, safe zones as identified on the FLRA or the Stepback card) without proper authorization.
- Falsification or reports, statements or records.
- Energy isolation (e.g. mechanical, electrical, pneumatic) procedures must be followed.
- Unauthorized modification of scaffolding or other work platform leading edges, unauthorized use of scaffolding prior to inspection by a qualified person.
- Working without a permit as specified on the Field Level Risk Assessment (FLRA) or the Stepback card.
- Failure to conduct a FLRA or Stepback card prior to starting every assigned task &/or task change.
- Failure to comply with all requirements of the Lower Churchill Project Drug and Alcohol standard when entering company premises.
- Must not enter a “confined space” without proper authorization and in receipt of approved training as specified by Workplace NL.
- Must report all incidents immediately, ensure incident management protocol is followed (e.g. freeze the scene) and cooperate /participate in incident investigation process.
- Must use fall protection when there is risk of falling more than 6 feet and be in receipt of approved training as specified by Workplace NL.
- Operating mobile machinery or equipment while using or texting on a cellular device or without the use of a seatbelt.
- Knowingly and willfully walking or working under a suspended load or within an established danger zone of heavy equipment (e.g. excavators, mulchers, cranes, angle booms, etc.).

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- Blatant physical or verbal harassment or others in the workplace.

Failure to comply with any of the above safety absolutes will result in denial or revocation of site access and potential termination following review of the violation by the Site Safety Absolute Committee.

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## **20 LABOUR RELATIONS MANAGEMENT**

### **20.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Management Plan depicts the positions and reporting lines for MFG. The following labour relations management site roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- MF Labour Relations Representative.
- NS Labour Relations Advisor.
- Sr. Innu Liaison Coordinator.
- Innu Liaison Coordinator

Labour Relations Management at MF site will be managed by the MF Labour Relations Representative. This person will report to the MFG Sr. Labour Relations Advisor who in turn reports to the MFG Project Manager, with a soft functional reporting relationship to the LCP Corporate Integrations Manager. Due to the geographical nature of the MF and North Spur sites, Labour Relations Management for the North Spur will report to the MFG Sr. Labour Relations Advisor.

### **20.2 MFG APPROACH TO LABOUR RELATIONS MANAGEMENT**

Labour relations shall be managed to ensure a cooperative approach with the labour unions and contractors in accordance with the Project Labour Agreement (PLA) implemented for the duration of the project. The primary responsibility of the Site Labour Relations Representative is to manage labour risks that were identified in the planning stages for the Project, which are labour availability, labour stability and labour productivity.

For MFG, a PLA has been established under which all work is governed. This agreement, specifically the *“Lower Churchill Hydroelectric Generation Project Collective Agreement Between Muskrat Falls Employers’ Association Inc. and Resource Development Trades Council of Newfoundland and Labrador,”* details the provisions under which all MFG construction works will be undertaken. The Site Labour Relations Representative will ensure that all Contractors abide by the PLA and other Project requirements. All Contractors must join the Muskrat Falls Employers’ Association and are bound to the PLA.

The Site Labour Relations Representative will liaise with health & safety and site management to insure that all workers are in compliance with the established site rules and regulations. The Site Labour Relations Representative will ensure that the Contractor Labour Relations Representatives work towards the same goal. During the construction phase the Site Labour Relations Representative will hold regular meetings with the Labour Relations Representatives of all Contractors. Site Labour Relations Representative will also do regular field interventions to proactively manage labour issues to ensure they are resolved in the early stages. The Site Labour Relations Representative will report on a

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daily basis to the Project Manager, Sr. Labour Relations Advisor and the LCP Corporate Integrations Manager as to any potential conflict.

The Project Manager, in concert with the Sr. Labour Relations Advisor and LCP Corporate Integrations Manager, and the support of the Site Labour Relations Representative, will lead negotiations with the Contractors' representatives to resolve any industrial disputes that may arise. Contractors, as members of the Muskrat Falls Employers' Association, are responsible for securing and managing labor under the terms of the PLA. To keep management well informed, bi-weekly, the Sr. Labour Relations Advisor will issue a Labor Relations Status Report for the relevant PLA which shall include hiring levels, grievances, disputes, and other issues of relevant under the PLA.

Underneath the PLA, a "Liaison Committee" will be used to facilitate both productive and safety management initiatives with union. The Liaison Committee will include both the local and national representatives from the RDTC as well as senior Contractor representatives of the Muskrat Falls Employers' Association. A separate terms of reference and standing agenda has been established for the Liaison Committee.

### **20.3 INNU LIAISON COORDINATION**

Specific for the MF Site, there will be Innu Liaison Coordinators available to serve as a source of advice for Innu workers on the MF Site that may have questions or be encountering problems in the workplace. The coordinators will assist Innu employees with resolving work-related issues, including direction on where and how to obtain required information and further assistance or counselling. The coordinators will provide the following.

- Information or refer Innu employees to appropriate sources to obtain answers to questions regarding the workplace.
- Conduct initiatives to enhance Innu employees' understanding of workplace policies and to facilitate their transition to the workplace.
- Assist the contractor's HR representative by being present at meetings between the contractor and Innu employees.
- Provide information about the resources, programs and services offered which may address the information and/or problem-solving needs of Innu employees.
- Identify appropriate interventions to assist individual Innu employees, and evaluate the effectiveness of the interventions.

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## **21 FOLLOW-ON ENGINEERING**

### **21.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Management Plan depicts the positions and reporting lines for MFG. The following follow-on engineering site roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- Resident Engineer.
- Lead Civil Engineer.
- Lead Mechanical Engineer.
- Lead Electrical Engineer.
- Geologist.
- Mechanical Engineer-in-Training.
- NS Geotechnical Engineer.

Engineering at MF site will be managed by the Resident Engineer. This person will report directly to the MFG Engineering Manager, who in turn reports directly to the MFG Project Manager. Due to the geographical nature and technically different scopes of the MF and North Spur sites, engineering for the North Spur will report directly to the MFG Engineering Manager.

The successful implementation of the designs produced at the Home Office during the construction phase is predicated upon having a well-organized engineering function ready, willing and able to respond to site queries from the contractor and MF site team, which will support the timely delivery of construction of the Muskrat Falls Generating Facility. Proactivity must be the mantra of this team and supported by the MFG Follow-on Engineering Manager.

All engineering has been completed for MFG scope. The engineer of record is SNC-Lavalin (SLI) and SLI will have a direct active participation of all construction activities related to engineering and engineering change.

### **21.2 KEY FOLLOW-ON ENGINEERING SCOPES**

There are a number of key scopes that the follow-on engineering team maintain in support of the overall execution of follow-on activities as discussed in the following sub-sections.

#### **21.2.1 CTR Process**

In addition to the MF Site and Home Office follow-on engineering team, off-site support to the team is provided primarily from the Montreal office of SLI. The use of these resources is carefully controlled and monitored using a “CTR Process” (Cost-Time-Resource). In this process, scope and estimated effort is identified, approved and cost codes opened for tracking. A reassessment of the budgets is done every six months, with a reforecast of the requirements prior to approval.



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### **21.2.2 Risk Based Review**

It is anticipated that there will be a very large number of contractor documents submitted for review. The contractors are responsible for their own quality control, so all documents should have been reviewed by the contractor for completeness and conformance prior to submission. However, to ensure contractor compliance, it is important that contractor submissions be reviewed. To optimize this effort and avoid having to review every drawing, a “Risk Based Review Process” has been implemented by the Follow-on Engineering Team. Under this process, a criticality review is first undertaken to identify documents and drawings which must be submitted for a detailed review and approval, with the remainder being submitted for information. The documents submitted for information are reviewed on an audit basis – with a target of 15 % to 25 % being reviewed. The level of review being adjusted based on the quality of the submissions.

### **21.2.3 Observational Method (North Spur)**

The construction of the stabilization works for the North Spur present a particular challenge due to the varied stratigraphy of the area. To address the potential for changed or unexpected conditions, the on-site team will include geotechnical engineers with direct experience in the design, and make use of a “Flexible Adaptive Design” approach to the construction (also called “Observational Method”). Under this approach, the design team has developed a number of pre-designs for possible situations which could be encountered and the site team is able to adapt these based on actual conditions, if required. Field engineering will have a direct line of communication to the MFG Engineering Manager to seek expert input and interpretation on drawings and specifications.

## **21.3 CONSTRUCTION MANAGEMENT SUPPORT**

In support of the MFG Construction Management Team, the MFG Project Delivery Team will have a field engineering contingent reporting directly to the MFG Engineering Manager. Reporting to the MFG Engineering Manager, this on-site engineering team is led by the MFG Resident Engineer whose role is to ensure that the field engineering staff are on-site to facilitate the interpretation of drawings, specifications and site geotechnical and material conditions required to be promptly addressed for the construction work to progress as intended.

A number of site processes have been developed to facilitate and document the interactions undertaken in support of construction. These documents are available through Aconex and explain the responsibilities and applicability of each of the processes. The processes supported by the follow-on engineering team are as follows.

- **Site Query:** A technical query used by Contractor to facilitate the timely resolution of minor engineering and construction problems encountered at work sites. The site query is used to formally transmit and co-ordinate technical queries with Engineer and to document the resolution to the query.

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- **Concession Request:** A written authorization to use or release an item/items that do not conform to contractual/specified requirements.
- **Engineering Change Notice:** Is prepared by the engineering group and used by the contract administrator to notify release of documents for construction in the post contract award period.
- **Site Instruction:** Is used to instruct the contractor to undertake a task that will neither change the contract amount nor modify the contract in any way. It is only issued to ensure and facilitate management of contractual obligations.

Responding to these processes will be done at Home Office, with field personnel, package engineers, follow-on engineers, quality and construction teams will be involved in the process as dictated by the applicable procedures.

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## **22 COMMERCIAL MANAGEMENT AND CONTRACT ADMINISTRATION**

### **22.1 ORGANIZATION AND RESPONSIBILITIES**

MFG Organization Chart provided in Appendix A of this Management Plan depict the positions and reporting lines for MFG. The following commercial management and contract administration site roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- Disputes Resolutions Manager.
- Contracts Administrative Assistant.
- Contract Administrators.
- Contract Technicians.
- Buyer.

Commercial Management and Contract Administration at MF site will be managed by the Disputes Resolutions Manager who reports directly to the MFG Construction Manager. Although with other functional areas, due to the geographical nature of the MF and North Spur sites, North Spur does not report to the MF site, in this case it does. This is done to ensure consistency across the overall commercial management team and all commercial management residing under the Disputes Resolutions Manager.

As part of this team, there are dedicated contract administrators to the Site Management Team. Commercial management for the Site Services scope requires a cohesive project team. Given the significant number of service packages, service agreements and material procurement it is essential that both the procurement and service contracts be well managed to ensure a seamless delivery of services to the site. These Contract Administrators report directly to the Site Manager in execution of the Site Services scopes, but follow the procedures and instructions as provided from the Disputes Resolutions Manager.

### **22.2 CONTRACT ADMINISTRATOR RESPONSIBILITIES**

The Contract Administrator (CA) is the key role within the commercial management and contract administration team. The Disputes Resolutions Manager will work directly with the Project Manager, Construction Manager, and Site Manager in the commercial execution of specific packages, but will rely heavily on the CA for the day-to-day commercial execution of the site contract packages. The specific duties of the CA area as follows.

- Administers the Contract.
- Ensures procedures established for the Project are followed.

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- Understands MFG organizational structure, roles and responsibilities, and signing authorities assigned to the individuals overseeing the work.
- Uses the Aconex system as defined in related procedures.
- Provides interpretation and advice to other departments with respect to the Contract.
- Resolves any administrative and commercial issues related to the Contract.
- Keeps the Project Manager, Disputes Resolutions Manager, Site Manager, Construction Manager, and the Project Controls Department fully apprised of any commercial or contractual issues relative to the Contract which could have an impact on cost and/or schedule.
- Arranges the initial Coordination Meeting with the Contractor and establishes and/or maintains the registers for the Contract.
- Assists the Site and Construction Management Teams at site with progress meetings with the Contractor, provides the commercial input, and prepares and distributes the Minutes of Meeting (MoM) following established Information Management process.
- Assists the Site and Construction Management Teams at site with responses to correspondence.
- Drafts all correspondence to the Contractor regarding items which have a commercial or contractual impact including official Notices to the Contractor for signature by the Company Representative or the nominated deputy.
- Reviews, validates and processes Change Requests (CR) initiated by the Contractor or Company.
- Initiates Change Orders (CO) upon receipt of a validated and approved Change Request.
- Reviews and verifies that Contractor's Payment Certificate application is in accordance with Payment Certificate Procedure, document no. LCP-PT-MD-0000-CA-PR-0003-01.
- Identifies and prepares documentation related to Back-Charges to the Contractor in accordance with the Back-Charges Procedure, document no. LCP-PT-MD-0000-SC-PR-012-01.
- Consults with the Site and Construction Management Team to confirm Substantial Completion and Final Completion and recommends release of any holdbacks upon receipt and review of proper documentation and authorizations in accordance with the Contract.

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- Prepares for closing out and archiving the official Contract Documents and transfers the records to Project Home Office.

### **22.3 CHANGE MANAGEMENT**

Change Management processes were discussed earlier in this report, from a commercial management point of view the CA is the custodian of the Change Management Process in relation to a Contract. The CA will ensure that the policies and procedures (latest revision) developed for the Project are fully implemented and followed by Site and Construction Management Teams. It is the responsibility of the CA to ensure that they are fully versed in the procedures and that all Parties identified within the procedure are in compliance.

To initiate changes to any of the Articles of the Agreement of the Contract, an Amendment to the Agreement must be prepared.

### **22.4 INFORMATION MANAGEMENT**

For the purpose of Information Management, the Aconex system serves as the electronic project mailroom and archive. This system is to be used as the official repository for all documents pertaining to the specific contracts that require formal archiving.

The CA will maintain original hard copies and electronic copies of all post award documentation. The Aconex system will be used for storing and transferring key Contract documents and correspondence to and from the Contractor and Company. The CA will ensure the following documents are uploaded into the Construction Management Instance of the Aconex system.

- Contract
- Back Charges (BAC)
- Change Requests (CHR)
- Change Order Authorizations (CHA)
- Change Orders (CHO)
- Letters (LTR)
- Minutes of Meeting (MOM)
- Site Instructions (SI)
- Site Queries (SQ)
- Payment Certificates
- Field Work Orders (FWO)

The Contract Administrator will:

- ensure that e-mail communications to and from the Contractor regarding the Contract are through the Aconex Construction mail module (Construction Management Instance);

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- maintain a correspondence register within Aconex;
- ensure that all formal correspondence is by letter and that it is limited to one subject per letter. The subject line shall include reference to Contract numbering as well as the specific subject;
- review Aconex distribution matrices established for the Contract with the Area Construction Manager and establish sub matrixes to determine which project participants within the organization are copied on the post award Contract documents, taking into account confidentiality; and
- on a regular basis (at least weekly) update the status of correspondence as per the standard Contract Correspondence register to identify items which are closed or open. If open, identify the discipline and person responsible to close the item and the date by which it is to be done.

All team members are expected to become fully versed in its usage and ensure they use Aconex Mail for electronic communication with contractors.

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## 23 COMPLETIONS

### 23.1 ORGANIZATION AND RESPONSIBILITIES

MFG Organization Chart provided in Appendix A of this Management Plan depict the positions and reporting lines for MFG. The following completions site roles are identified and further described in greater detail in Appendix B (Scope Descriptions).

- MF Site Completions Coordinator.

It should be noted that at this point in the project, completions are being managed by the MFG Completions Lead with support at site from the Completions Coordinator and specific staff within the Site and Construction Management Teams. As work progresses, there will be a need to expand the completions team at site in support of completions and commissioning activities. There is a “network” of completions and commissioning staff in support of MFG that are not directly indicated on the Organization Chart. A description of specific roles and responsibilities within the “broader” LCP completions team follows.

**COMPLETIONS GROUP** – The team responsible for developing and administering all processes and procedures which are involved in the execution of Mechanical Completion, Preservation, Commissioning and Handover activities of Contractor work scopes.

**COMPLETIONS LEAD** – The Completions Lead is responsible for the implementation of Processes, Certificates and Forms required to successfully guide the project through to final completion. The Completions Lead works with the Project Delivery Team and Contractors to establish work scope definitions, assign Mechanical Completion and Pre-Commissioning checks to tagged items and define system limits in the Project Completion System.

**LCP PACKAGE LEADER / ENGINEER** – The LCP Package Leader/ Engineer work with the Completions team to apply the identified Completions processes and procedures to the contract scopes they are responsible. The Package Leader/ Engineer reviews completed Temporary Infrastructure or Permanent work scopes; signing for Mechanical Completion acceptance on Mechanical Completion Certificates, agreeing to deficiencies on Punchlist forms, and accepting Handover of work scopes to company if deemed appropriate.

**PROJECT COMPLETIONS SYSTEM (PCS) COORDINATOR** – The Completions team representative charged with working with the Completions Leads and Company’s contractors to represent all Temporary Infrastructure and Permanent scopes of work as Work Scope Definitions in the PCS. The PCS Coordinator provides training in implementation and use of the PCS system to the Completions Leads and Company’s contractors. Working with the Completions Leads and Company’s contractors, the PCS Coordinator organizes the work scope definitions in the PCS to facilitate Handover from Contractor to Company and Turnover from Company to Operations, while reporting on the status of Mechanical Completion, Handover and Turnover to Management.



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**READY FOR OPERATIONS (RFO)** – A team consisting of qualified personnel from Nalcor Energy staff, project hire, component delivery teams, specialist consultants and contractors and suppliers. This team manages the assets transition from Project to Operations.

**SITE COMPLETIONS COORDINATOR** – The Site Completions Coordinator is responsible for overseeing the implementation of Completions processes and plans at site.

## **23.2 PURPOSE**

Detailed descriptions of the processes and procedures utilized within MFG pertaining to completions and operational readiness for Lower Churchill Project (LCP) are available in the overall project Completion Implementation Plan – LCP-PT-MD-0000-CM-PL-0001-01. Completions processes and procedures are used to transition from installation and mechanical completion thru to commissioning and from commissioning to handover to Company.

The Completions processes and procedures utilized on MFG provide the following.

- Organization of package scopes into Work Scope Definitions (WSDs) across the entire Component geared towards building the project as a whole.
- Progressive documented completion of construction and commissioning scopes through construction to Mechanical Completion and on to Handover, including the documenting and closing-out of agreed deficiencies.
- Establishment of clear boundaries and deliverables for package scope Contractors supporting close-out.
- Oversight of the project Completion status for management.

## **23.3 DEFINITIONS**

**DYNAMIC COMMISSIONING / SYSTEM COMMISSIONING**: commissioning activities which verify operation of a complete system or partial system. These tests shall, as near as possible, be at full operating conditions to carry out operational performance tests to verify that the system/ equipment performs in accordance with the design criteria, together with the recording of such tests. Such Dynamic Commissioning / Systems Commissioning shall be sufficient to allow systems, partial system and/or equipment to be certified, turned over to Operations by the RFO team and rapidly brought into operational service by Operations, if not already operational. Dynamic commissioning involving energization via the grid will be carried out under the jurisdiction and control of the operations teams.

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**HANDOVER:** The transfer of care, custody and control of a compilation of work scopes, as defined by the Completions Register and/ or PCS, from Company’s Contractor(s) to Company once all related Mechanical Completion/ Static Commissioning and Single Contractor Dynamic Commissioning activities assigned to work scopes are achieved.

**HANDOVER CERTIFICATE (HOC):** A certificate issued by the Completions group which formalizes the transfer of care, custody and control for scopes of work defined in the PCS database from the Contractor(s) responsible for executing the work to Company. The Handover Certificate verifies Company acceptance of all Mechanical Completion Certificates, Static Commissioning Certificates and Single Contractor Dynamic commissioning procedures allocated to the Handover Certificate.

**MECHANICAL COMPLETION:** Non-live / non-energized completion of specified scopes of work during installation/ construction to the latest design drawings, specifications and standards.

**MECHANICAL COMPLETION CERTIFICATE (MCC):** A certificate assigned to a scope definition/ sub-system in the PCS. The MCC provides signed assurance from Contractor, with acceptance from Company that constructed scope definitions/ sub-systems are in adherence to Company standards and specifications.

**PROJECT COMPLETION SYSTEM (PCS):** A computerized system for tracking status of mechanical completion and commissioning of agreed scope definitions/ sub-systems. This system is used to verify mechanical completion and commissioning of all project equipment at suppliers facilities and/ or MF Site. Unless contractors have their own acceptable PCS, the project completion system operating software shall be provided by Company and it shall be the responsibility of each contractor/ supplier to supply engineering data. This data shall be updated by the responsible contractor and/ or supplier on an ongoing basis.

**PUNCH LIST:** a list of incomplete/ outstanding works agreed between Contractor and Company. The category of a punch list shall be “A” or “B” depending on criticality as per the following definition:

PUNCH LIST “A” ITEM – means that the deficiency noted is significant and is preventing the acceptance of the Mechanical Completion Certificate by Company.

PUNCH LIST “B” ITEM – means that the deficiency is minor in nature and is not preventing the acceptance of the Mechanical Completion Certificate by Company.

**PUNCH LIST FORM:** A form used during the walk-down of a mechanically complete scope definition/ sub-system to document agreed deficiencies in the work scope being reviewed.

**STATIC COMMISSIONING:** All live/energized tests that are carried out after a section of work has reached mechanical completion. Static Commissioning of assets assigned to a scope definition/ sub-system can only commence once the associated MCC has been accepted by Company.

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**STATIC COMMISSIONING CERTIFICATE (SCC)**: A certificate issued by the Completions group which declares that all the Static Commissioning activities associated with the scope definition/ sub-system allocated to the certificate have been successfully completed. This certificate provides release for any subsequent single contractor dynamic commissioning procedures to commence given that any other identified prerequisites for said dynamic commissioning procedures are also complete.

**WALK-DOWN**: The coordinated review of a completed work scope as defined on the Completions Register between Contractor and Company to verify Company’s acceptance of the reviewed scope as mechanically complete and to determine if there are outstanding deficiencies within the reviewed scope that remain the duty of the Contractor to resolve to Company’s satisfaction. Walk-down’s typically take place once construction of the scope is ~90% complete, but the timing of the walk-down is determined by MF Site.

## 23.4 COMPLETIONS STRATEGY

### 23.4.1 General

The Completions approach used within MFG is aligned with the project guiding documents listed above. The approach is flexible and is applied to each of the various packages which comprise the MFG Scope of Work. The goal of the Completions group is to ensure that while being flexible within each package, the approach adopted within each of the major packages consistently meets the Completions expectations of the project overall. This is to ensure that the work executed as part of the Mechanical Completion and Commissioning effort, at factory and site, is performed and documented in a manner consistent with the standards and specifications of the project, and reported consistently.

### 23.4.2 Package Completion Approach

Each of the packages within MFG require a planned approach for how they will administer a Completions regime. The Completions group works with the Project Delivery Team to determine a viable approach for a successful Completions process. This process must be flexible enough to align with the provisions of the packages contract, but still cover the following major points.

- Scope Definition.
- Mechanical Completion.
- Commissioning.
- Preservation.
- Handover.
- Project Completion System.

### 23.4.3 Scope Definition

Each of the package scopes will have its Scope of Work sub-divided into meaningful scope definitions which will be aligned with the Work Breakdown Structure (WBS). The Completions group works with the Project Delivery Team to develop preliminary scope definitions. These scope definitions are

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allocated as sub-systems to the WBS. These scope definitions are intended to encompass significant portions of the work scope, yet are intended to be discrete enough to progress individually and provide flexibility to the field in the execution of construction activities. These scopes will be aligned with contractor's schedules and work to form the milestones Company has determined for the Contractor.

The Completions group initiates workshops with Contractors to review any preliminary scope definitions and seek agreement with the Contractor on the amount of scope captured within a sub-system. It is essential that the Contractor agrees the scope definitions are an accurate reflection of their overall scope and can commit to achieving Mechanical Completion at the level of the scope definitions/ sub-systems identified.

The scope definitions/ sub-systems agreed with Contractors require alignment with the project Transition To Operation (TTO) Priorities. The TTO priorities are strategic objectives for the overall LCP and are reported to project management. The Project Delivery Team and Contractors must agree on any assignment of the TTO priorities to the identified scope definitions/ sub-systems.

The Transition To Operations Priorities include.

- P1A - Ready for River Closure Diverting entire river flow through the spillway.
- P1B - Ready for Winter Headpond (25 m) Impounding reservoir to 25 m to create ice cover.
- P1C - Ready for Full Impoundment (39 m) Impounding reservoir to Full Supply Level (FSL) at 39 m.
- P2 -Ready to Energize LTA Energize CF and MF switchyards via two HVac lines.
- P3 - Ready to Energize LITL 1st Power transfer from Labrador to Newfoundland including energizing MF and Soldiers Pond (SOP) converters via HVdc link as well as SOP switchyard, SOP Synchronous Condensers, Transition Compounds, SOBI undersea cables, Electrode Lines and Grounding Stations.
- P4 - Ready for first MF Generator Grid Connection MF Generation Unit 1 Ready to Turn (prior to start of wet tests).
- P5 - Ready for Max Allowable Power LITL Testing MF and SOP Converter low load testing complete and Lab Reactive Support Available (3 Units at MF).
- P6 - Ready for Commercial Power Four Units Available at MF.
- P7 - Ready to Dispatch Maritime Link Three units available at MF.
- P8 - Ready for Project Acceptance Completion Certification Issued.

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Proper allocation of scope definitions/ sub-systems is crucial for a successful Completions program. Once the initial set of scope definitions/ sub-systems are agreed, a process needs to be enacted to monitor any editing of the list including addition of more scope definitions/ sub-systems, reallocation of assets within scope definitions/ sub-systems, or deletion of scope definitions/ sub-systems.

The set of scope definition allocated to a package is represented in the Project Completions System (PCS). Any modifications need to be agreed with the Completions group and approved by the respective Package Leader.

#### **23.4.4 Scope Execution – Mechanical Completion**

Each scope definition/ sub-system is allocated in the PCS and assigned a Mechanical Completion Certificate. Acceptance of these MCC's indicate that the works constructed are in accordance with the standards and specifications associated with the package for which the scope definition/ sub-system was allocated. For Company to accept the Mechanical Completion status of a scope definition/ sub-system the contractor has to have a process in place whereby the status is confirmed in the field.

Verification of a scope definition/ sub-system as being Mechanically Complete requires a review of both the physical work performed during construction and the associated field records. The records which are maintained document adherence to the agreed procedures/ processes which ensure compliance with the approved standards and specifications, and are therefore essential.

For Mechanical Completion, the Completions group works closely with Company's Quality and Engineering at site to ensure progressive oversight of the physical status of the scope definition/ sub-system as well as the associated field records.

The Completions group strives to create an atmosphere where progressive completions is enabled. Progressive completion of the agreed scope definitions/ sub-systems is desirable as it provides for more accurate estimates on the level of Mechanical Completion for systems. To enable progressive Completions the Completions group works with the Package Leaders and the Contractors to ensure processes are in place for the following.

- Creating a repository for the records supporting the Mechanical Completion of each scope definition/ sub-system (typically using the R02 – Manufacturers Record Book SDRL code).
- Providing notification to Company (typically the Quality/ Engineering group) when record sets are available for initial review.
- Providing notification to Company when a scope definition/ sub-system is ready for an initial walkdown.
- Capturing any deficiencies associated with the completed scope definition/ sub-system as punch list items.

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- Uploading the agreed punchlist items in the Project Completions System (PCS).
- Tracking the resolution of deficiencies in the PCS.
- Evaluating the status of Mechanical Completion of a scope definition/ sub-system.
- Completing the Mechanical Completion Certificate once the status is agreed between the Contractor and Company.
- Submitting all relevant documentation at the appropriate time.

These processes apply across all package scopes, but implementation of the processes may differ from package to package. The end result is that each scope definition/ sub-system has its Mechanical Completion status documented with the project approved Mechanical Completion Certificate (MCC) with any agreed deficiencies documented on a punchlist form. While the physical MCC and punchlist form may reside in the R02 document, the MCC will be scanned into the PCS and the punchlist items will be inputted into the PCS and tracked through to completion. This ensures a complete record of the scope definition/ sub-systems completion status is available for reporting.

#### **23.4.5 Scope Execution – Commissioning**

Once a scope definition/ sub-system has successfully achieved Mechanical Completion (as documented by acceptance of the MCC), any static commissioning activities allocated to assets within the scope definition/ sub-system may commence, as follows.

##### **STATIC COMMISSIONING**

There are several considerations/ processes which need to be developed in conjunction with the Completions group, the Package Leader and the Contractor prior to initiation of Static Commissioning activities. These include but are not limited to the following.

- Static Commissioning activities must be documented with records maintained by the Contractor and be included as part of the Contractor's R01 – Installation, Commissioning, Operation and Maintenance Manual.
- Contractors must have processes and protocols in place that deal with Livening Up Notices, Control of Work Procedures and have provided training to their personnel in the administration of these processes/ protocols.
- Prior to initiating any energized Static Commissioning on a scope definition/ sub-system, a Livening Up Notice must be issued informing Company and any other Contractors working the area that the equipment associated with the scope definition/ sub-system is or may be energized.

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- Control of Work processes must be used with Contractors personnel engaged in their use when working around any energized equipment or equipment that may become energized (electrically or mechanically).
- Company must be involved in the daily coordination of Static Commissioning activities and notification must be given prior to start so as to provide Company with opportunity to witness Static Commissioning activities.
- Static Commissioning activities will be identified and progressed in the PCS.
- Once all Static Commissioning activities associated with a scope definition/ sub-system are complete a Static Commissioning Certificate (SCC) can be produced for Company to review and accept
- Procedural based Dynamic Commissioning activities cannot be initiated until all identified pre-requisite MCCs and SCCs have been accepted.

#### **DYNAMIC COMMISSIONING**

As with Static Commissioning, there are some considerations to make/ processes to enact prior to initiation of Dynamic Commissioning activities. These include, but are not limited to the following.

- Dynamic Commissioning will be performed through the execution of Dynamic Commissioning procedures which will be developed by the Contractors and reviewed/ approved by Company.
- Dynamic Commissioning procedures will clearly identify the pre-requisites required for successful execution including which scope definitions/ sub-systems are to be Mechanically Complete and Statically Commissioned (as evidenced by acceptance of the applicable completion certificate).
- Company must be involved in the daily coordination of Dynamic Commissioning activities and provide acceptance of results.
- Control of Work processes will be utilized to coordinate the daily execution of Dynamic Commissioning activities.
- Results from completed Dynamic Commissioning procedures will be submitted as per the SDRL with the copies being stored in the R01 – Installation, Commissioning, Operation and Maintenance Manual.



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#### **23.4.6 Scope Execution – Preservation**

For each package scope, the Contractor is required to develop and maintain a comprehensive Preservation program. This program must fulfill the Preservation requirements from Factory to Site installation up until the point of Handover of Mechanically Complete and Commissioned works to Company.

##### ***23.4.6.1 Preservation Procedures***

Contractor shall prepare preservation procedures for all phases of the Work, including: Equipment shipping and storage; and Installed at Site and up to handover for Dynamic Commissioning. Procedures shall, by equipment number and type, provide detailed instruction, compounds to be used and durations between preservation inspections. Material safety data sheets (MSDS) shall be provided for all preservation compounds.

##### ***23.4.6.2 Preservation Records and Reports***

Contractor shall maintain auditable records of completed preservation for each piece of equipment. The record shall include, as a minimum, the name, date, preservation method and a supervisory signature. At the point of Mechanical Completions prior to commissioning all equipment involved shall have a report which provides historical detail of completed preservation.

##### ***23.4.6.3 Preservation at Contractor's Supplier Facilities***

The preservation requirements at Contractor's suppliers' facilities shall be in accordance with the applicable Accepted supplier preservation procedure. The preservation requirements shall include but not be limited to all of the following.

- All equipment and devices shall be protected for shipment.
- The applicable supplier shall perform the initial preservation and document the preservation completed.
- The type of storage facility and conditions required for the equipment shall be identified by the applicable supplier, e.g. outside storage, unheated warehouse, heated warehouse, air conditioned, etc.
- The preservation documentation, MSDS, procedure and records shall be included in the dispatch dossier and shall accompany the shipment of equipment to Site.

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#### **23.4.6.4 Preservation at Site**

The preservation activities at Site shall be completed in accordance with the Accepted Site preservation procedure. The preservation requirements shall include but not be limited to all of the following.

- Contractor shall be responsible for the preservation and protection of all free issue and supplier provided skid packages, equipment, material and devices.
- Preservation procedures provided by the equipment suppliers shall be followed.
- Preservation documentation and records of preservation maintenance carried out shall be kept by Contractor and be available for review by LCP.
- Contractor shall energize any space heaters on receipt of equipment.
- Contractor shall establish a preservation team to carry out the preservation requirement and to establish the preservation program up to the Mechanical Completion of the equipment or system to commissioning. Should Company require continuation of the preservation, then this will be noted and a request made to reinstate the preservation by Contractor.
- An inspection/ check of preservation damage shall be carried out by Contractor on receipt of equipment, materials, skid packages, fabricated elements and sub-assemblies. Deficiencies shall be noted by Contractor and brought to the attention of LCP for resolution.
- Contractor shall store the equipment and material in accordance with the Accepted preservation procedure as stipulated by the applicable warehouse facility until ready for installation.

#### **23.4.6.5 Preservation Within The Project Completion System (PCS)**

- The PCS is fully functional and can be utilized to manage all Contractor Preservation Activities.
- The PCS is utilized across the project and can be made available to the Contractor via Company.
- It is Company's expectation that the PCS will be utilized for managing and reporting on Preservation activities wherever possible.

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### **23.4.7 Project Completions System (PCS)**

LCP has deployed Continuum Edge by Industrial Business Solutions to be the Project Completions System (PCS) for the project. The use of the PCS will be maintained throughout MFG, for all packages. The implementation of the PCS within each package will differ slightly from package to package, but the overall goal is as follows.

- Ensure all agreed scope definitions/ sub-systems are represented.
- Ensure the field processes agreed with Contractors to determine the status of the Mechanical Completion and/ or Static Commissioning activities are also used to progress those activities in the PCS.
- Ensure all scope definitions/ sub-systems have any applicable Transition To Operations priorities correctly identified.
- Ensure all deficiencies reported from field processes are assigned to the applicable scope definition/ sub-system, progressed in as close to real time as possible and reported on routinely.
- Promote the use of the PCS to track package Preservation activities and maintain records.
- Correctly identify the Mechanical Completion and Commissioning status of a scope definition/ sub-system to ensure safe energized testing.
- Correctly identify the scope definitions/ sub-systems allocated to agreed Handovers and signal when these Handovers are available.

To achieve these goals with the PCS, the Completions group works with the Project PCS Coordinator to do the following.

- Determine level of direct involvement individual Contractors will have with the PCS.
- For packages where the Contractor does not have direct engagement in the PCS, ensure the package scope is accurately depicted and regularly progressed.
- Provide training on the use of the PCS for Contractor personnel where required.
- Work with Contractors where applicable to ensure agreed sub-systems are defined in detail in the PCS at the tag level where feasible.
- Ensure there is agreement on the inspection check records to be assigned in the PCS to assets in agreed scope definitions/ sub-systems for Mechanical Completion and Static Commissioning.

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- If required, develop generic checks to be assigned to assets in the PCS which reference the Quality procedures/ checks/ ITPs that will serve as verification documents.
- Ensure mechanisms are in place for maintaining data integrity in the PCS accounting for any Change Management processes that may be enacted within the Contract scope.
- Ensure installation activities in the field are updated on as close to real time as possible in the PCS.
- Initiate regular reporting of MC/ SC and Punchlist status from the PCS.

## **23.5 PACKAGE SPECIFIC SUMMARY**

### **23.5.1 Major MFG Packages**

Major Packages included in MFG include the following.

- CH0007 – Intake & Powerhouse, Spillway and Transition Dams
- CH0008 – North Spur Stabilization Works
- CH0009 – RCC Dams - North & South Construction
- CH0030 – Turbines and Generators
- CH0031 – Mechanical and Electrical Auxiliaries
- CH0032 – Powerhouse Intake and Spillway Gates
- CH0033 – Powerhouse Crane
- CH0034 – Powerhouse Elevator

These major packages have differences regarding the amount and types of completions activities involved in awarded scopes of work. All packages will have the overall scope of work broken down into scope definitions/ sub-systems and each of these will be assigned a Mechanical Completion Certificate. Not all packages will have Commissioning activities, however, and those that do not will not have a Static Commissioning Certificate assigned to any of their scope definitions/ sub-systems.

While all packages will have the scope represented and progressed in the PCS, some packages do not specifically require the Contractor to operate the PCS and for those the Completions group will be responsible for ensuring the PCS is representative of the package scope and progressed accordingly.

### **23.5.2 Major Package Completions Synopsis**

The following is a brief synopsis of the scope associated with the various major packages that constitute MFG while identifying the primary disciplines involved, the types of Completions activities planned for and the level of engagement from the contractor with respect to PCS operation.

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#### **CH-0007: Intake and Powerhouse, Spillway and Transition Dams**

- Primarily Civil scope (concrete), with steel erection
- Some static commissioning expected with high bay lighting scope during Powerhouse erection
- Contractor does not operate PCS for their SOW

#### **CH-0008: North Spur Stabilization Works**

- Primarily Civil scope (earthworks)
- Primarily Mechanical Completion activities
- Contractor does not operate PCS for their SOW

#### **CH-0009: North and South Dams**

- Primarily Civil scope (concrete & earthworks),
- Primarily Mechanical Completion activities
- Contractor does not operate PCS for their SOW

#### **CH-0030: Turbines and Generators**

- Contains Civil, Mechanical, Electrical and Instrumentation scopes of work
- All variations of Completion activities included from Mechanical Completion, Static Commissioning, Dynamic Commissioning and Integrated Commissioning between other MFG Packages and the ECC
- Currently not in Contractors scope to use PCS but plan to align with CH0032 package (also Andritz) and seek synergy
- Protection and Control system interfaces with other plant systems and relays information back to the ECC through the Optical Transport Network (OTN)

#### **CH-0031: Mechanical and Electrical Auxiliaries**

- Contains primarily Mechanical, Electrical and Instrumentation scopes of work
- All variations of Completion activities included from Mechanical Completion, Static Commissioning, Dynamic Commissioning and Integrated Commissioning between other MFG Packages and the ECC
- Operation of the PCS to will be Contractors responsibility for their scope of work
- Expect full implementation of PCS including establishment of Preservation activities and monitoring of those activities
- Company to provide training and make access to software available

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### **CH-0032: Powerhouse Intake and Spillway Gates**

- Contains Civil, Mechanical, Electrical and Instrumentation scopes of work
- All variations of Completion activities included from Mechanical Completion, Static Commissioning, Dynamic Commissioning and Integrated Commissioning between other MFG Packages and the ECC
- Operation of the PCS will be Contractors responsibility for their scope of work
- Company to provide training and make access to software available
- Plan to seek alignment between package CH0032 and CH0030 with respect to Completions program to be implemented
- Completion of the spillway gates will be one of the major pre-requisites for TTO Priorities P1A and P1B

### **CH-0033: Powerhouse Crane**

- Contains primarily Mechanical and Electrical scopes of work
- Crane will be installed and tested at different capacities for use throughout the construction of the Turbines and Generators
- Completions activities include Mechanical Completion , Static and Dynamic Commissioning (load tests)
- Will be operated by package CH0030 and certified for various ratings depending on limits of load tests to be performed
- Will be returned to “As-New” condition prior to Turnover to Operations
- Maintenance will be performed as required throughout the construction period prior to Turnover based on a service contract with the crane provided

### **CH-0034: Powerhouse Elevator**

- Contains primarily Mechanical and Electrical scopes of work
- Completions activities include Mechanical Completion, Static and Dynamic Commissioning (load tests)
- Will be utilized throughout the construction program once certified
- Will be maintained regularly throughout use as per manufacturer’s recommendations

## **23.6 ADDITIONAL SCOPES**

MFG has various types of work scopes awarded as major contracts with their classification being either Early Civil Works, Temporary Infrastructure Works or Permanent Works. The Completions Team use standard processes and procedures to guide/ report on the status of completion for all classifications of work.

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### **23.6.1 Early Civil Works**

The Early Civil works consisted largely of Bulk Excavation Activities including but not limited to the following.

- Construction Roads
- Dewatering
- Cofferdam construction
- Powerhouse and Spillway Excavation

The scope of work was divided into scope definitions aligning with the major work sites. The Early Civil Works contractor(s) documented construction activities under SDRL code R02 - Manufacturing Record Books which were reviewed and accepted by LCP Quality and the applicable Package Leader/ Engineer.

As work reached construction completion a walk-down was held between Company and Contractor where the scope was reviewed by construction, quality and engineering to ensure the scope was completed to the satisfaction of Company. Any deficiencies noted were captured on a Punchlist form and subsequently closed out as they were resolved.

Infrastructure Handover Certificates were used to document completion of the scope definitions and provide for the transfer of Care Custody and Control to Company. These scope definitions as well as the Infrastructure Handover Certificates have been uploaded into the PCS to document historical acceptance.

### **23.6.2 Temporary Infrastructure Works**

The Temporary Infrastructure Works refer to work scopes completed to support the project but which will not be maintained post project completion. The Temporary Infrastructure works include but are not limited to the following.

- Administration Buildings, supporting facilities and services
- The Construction Camp complex with supporting facilities and services
- The Concrete Testing Lab
- Construction Power distribution around site for Company's Contractors

The majority of these scopes are complete with the exception of package CH0068 – Muskrat Falls Construction Power – Remaining Works, which will be ongoing until all contractors are successfully mobilized to site.

For the various packages of Temporary Infrastructure scope, the scope of work was/ is divided into scope definitions and allocated an Infrastructure Handover Certificate in the PCS. The Temporary Infrastructure Works contractor(s) documented construction and commissioning activities under SDRL code R02 - Manufacturing Record Books and R01 - Installation, Commissioning, Operation and



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Maintenance Manuals which are reviewed and accepted by LCP Quality and the applicable Package Leader/ Engineer.

As scope definitions reach construction and commissioning (if applicable) completion a walk-down is scheduled between Company and Contractor where the scope was reviewed by construction, quality and engineering to ensure the scope has been completed to the satisfaction of Company. Any deficiencies noted were captured on a Punchlist form and the punchlist items were assigned to the appropriate scope definition in the PCS.

Once no category “A” deficiencies remain, an Infrastructure Handover Certificate is drafted by the Contractor to document acceptance and Handover to Company of completed work, with any remaining deficiencies being noted through to completion in the PCS. Once accepted the Infrastructure Handover Certificate is scanned into the PCS with the hard copy forming part of the R02 – Manufacturers Record Book allocated to the scope definition.

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## **24 COMMUNICATIONS**

Nalcor has developed an extensive communications plan to engage with stakeholders during the construction activities for the Muskrat Falls Project. These plans are living documents that are updated regularly. The activities in these plans are implemented by the Corporate Communications and Stakeholder Relations teams. The goal of the Muskrat Falls Project public engagement communications plan is to outline a broad communications strategy to effectively deliver information about the project and engage in two-way communication directly with key audiences.

### **24.1 OBJECTIVES**

The broad objectives to achieve through the execution of the public engagement plan are as follows.

- Encourage public interest, and stakeholder engagement and dialogue and participation, in the project, as evidenced through enquiries received through the project email address and toll-free number, visits to the Muskrat Falls Project and muskratfallsjobs websites, visits to the project information office in Happy Valley-Goose Bay, and attendance at open houses and public events.
- Be transparent and accessible to all stakeholders; providing timely and up to date information and responding to all enquiries within Nalcor’s established standard.
- Continue to build, maintain and utilize the support and confidence of project stakeholders.
- Continue to inform local, provincial and national stakeholders on construction progress, benefits, and employment, opportunities and provide updates on key components of the project.
- Build employee, contractor and public advocacy through events, messaging, collateral material, media and social media.

### **24.2 STAKEHOLDER ENGAGEMENT STRATEGY**

As the Muskrat Falls Project moves from planning through project execution and construction following the sanction decision from the Government of Newfoundland and Labrador in December 2012, there has been a natural shift in Nalcor’s stakeholder relations strategy, from a consultation focus to an ongoing focus on stakeholder communication. The relationships built during the consultation process have laid the foundation for ongoing Nalcor’s communication during project construction.

To support the communications and stakeholder engagement and relations objectives of the project, Nalcor Energy – Lower Churchill Project has established four principles that are used to guide

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engagement efforts with stakeholders. These principles are grounded by some of Nalcor’s core values and are as follows:

*Honesty and Trust* – we will be factual and sincere when sharing project information and addressing priorities, interests and concerns.

*Open Communication* – we will encourage the public to express opinions and foster a supportive environment where all ideas can be shared respectfully.

*Respect and Dignity* – we will uphold the highest level of integrity throughout the consultation process, recognizing and respecting the opinion, knowledge, culture and abilities of individuals and communities.

*Teamwork* – we will collaborate with individuals and communities in an effort to ensure balanced perspectives are integrated into project planning and mutual understanding is achieved.

### **24.3 COMMUNICATIONS STRATEGY**

Nalcor continues to have ongoing dialogue through various mediums with a variety of stakeholders. It is important that Nalcor let the public know that this ongoing dialogue and information sharing is taking place on a regular basis. It is also important that the public know they can ask Nalcor questions about any component of the project and that we will respond.

Given the complexity and amount of information (and misinformation) in the public domain on the project, building relationships and educating key stakeholders and media personnel on the project operations, schedule, and priorities is important.

Now that Muskrat Falls is under construction, it’s more important than ever for Nalcor to move from reactive communications around the project, to proactive. The project has become so high-profile that updates are often viewed as newsworthy. It’s an opportunity for Nalcor to communicate positive news and information about the operations of the project, instead of allowing the critics and opponents to continue to dominate the airwaves with negative opinions and accusations.

Over the course of construction there will be a number of milestones that Nalcor can promote and communicate about with stakeholders. In addition to “firsts” Nalcor will look for opportunities to discuss and profile interesting stories, work and facts about the project with relevant stakeholders.

Nalcor’s efforts no longer need to focus on explaining to Newfoundlanders and Labradorians that Muskrat Falls is necessary; however, we expect there will still be questions related to this and we will continue to answer those questions. Nalcor’s view to communications through an operational lens, understanding that there will always be more debate and politics around Muskrat Falls, and likely the future development of Gull Island, than most developments.

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Nalcor will show through its actions and its communication activities that this is a complicated project and subject to the same major influences impacting other major projects in the province, including mining developments in Labrador West, and Voisey's Bay and Long Harbour as well as construction of offshore infrastructure developments at Bull Arm and Argentia. The influences on all projects include unexpected changes of world markets, labour force availability and actions, financing, and then during construction, conditions that emerge from physical site dynamics, materials supply and contractor relations. Consistent communications will be important to provide updates on project progress, budget and that the economic benefits.

Communication will often have a Labrador-centered element as it is important to further establish the project's presence, benefits and community involvement in the region.

#### **24.4 TARGET AUDIENCES**

Nalcor has three distinct audiences to consider:

- *External stakeholders with a vested interest*: these individuals and groups are direct beneficiaries of Nalcor's activities and of the project. If they are well informed and engaged they can be ambassadors for the organization. They seek to maintain a close connection with Nalcor and can be influential in persuading others to support and engage with the company.
- *External stakeholders who are less informed and vested*: Nalcor desires to communicate with those who are uninformed or ill-equipped to understand the benefits of the project and support Nalcor's efforts. Today, these groups may have no or little connection to Nalcor. They are concerned about the energy sector, the economy, our ability to manage the project, and the well-being of their fellow citizens in the province.
- *Nalcor's internal audience*: these leaders are ambassadors for Nalcor, their words and deeds are the strongest driver of credibility and reputation and in defining what is important to the organization. They have the best opportunity to help communicate with and engage those outside the organization.

Following are lists of some of the stakeholders.

##### **External Stakeholders**

- NL General Public.
- Partners.
- Elected Representatives.
- Employees of Contractors.
- Neighbours Nearby (generation, transmission lines, converter, electrodes).
- Applicants for Employment.
- Sub-contractors and Suppliers.

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- Critics/Anti-Muskrat Falls.
- Third Party Influencers.
- Special Interest Groups.

### **Government Stakeholders**

- Premier’s Office, DNR and Cabinet.
- MHAs.
- Communications Staff.
- Senior Officials (DMs and ADMs)SDNR, MHAs, Senior Officials.
- Regulatory Departments.

### **Media Stakeholders**

#### **Primary**

- NL journalists currently engaged on Muskrat Falls Project.
- Special interest journalists
- Traditional NL media (journalists, columnists, commentators).
- Online local media (bloggers, social media participants)

#### **Secondary**

- Special interest trade and business publications in NL.
- Atlantic Region media (Dailies and broadcast media, trade publications).
- Special interest media (Atlantic and Canadian) – financial, energy, industrial, construction.
- National media.

### **Internal Stakeholders**

- Nalcor Energy Board of Directors.
- Leadership Team.
- Lower Churchill Project Team.
- Nalcor and Hydro employees.

## **24.5 MEDIA INQUIRIES**

Nalcor Energy has established a formal process to deal with media inquiries. All media inquiries should be directed to Lower Churchill Project Corporate Communications. All media inquiries should be directed to the Lower Churchill Project Communications Manager.

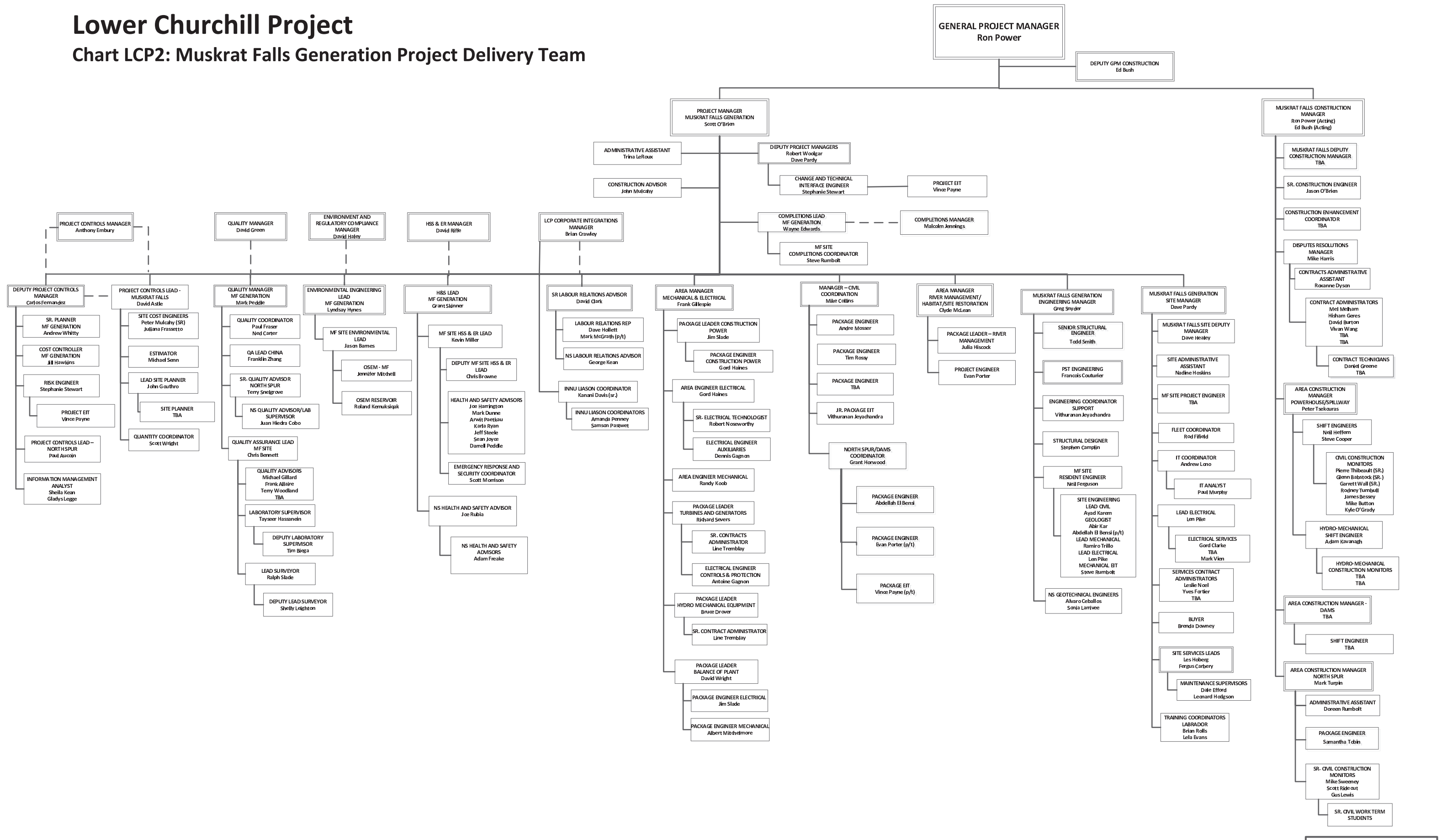


# Appendix A

## Organization Chart

# Lower Churchill Project

## Chart LCP2: Muskrat Falls Generation Project Delivery Team



Revised:12-Nov-2015  
Rev. B8

**REPORTING LEGEND**

———— Direct Reporting

- - - - In-Direct Reporting



# Appendix B

## Scope Descriptions



# Project Controls

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Project Control Lead - North Spur	<b>POSITION No.:</b> MFGN.3.024	<b>DATE PREPARED:</b> 06 JUL 2015
<b>DEPARTMENT:</b> MFG Project Controls	<b>LOCATION :</b> North Spur	
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <p>Under the authority of the Deputy LCP Project Controls Manager, the Project Control Lead - North Spur will provide a guiding role to assist in the development and implementation of processes, procedures and methods of work to fulfil the functional applications of project controls.</p> <p>In fulfilling this mandate, the Project Control Lead - North Spur is expected to work closely with the Area Construction Manager – North Spur and liaise closely with the North Spur Construction Team and Functional Managers to implement, monitor and control the functional applications of project controls and fulfilment of requirements during the construction of the North Spur.</p>		
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  <p>Reporting to the Deputy LCP Project Controls Manager and to the Area Construction Manager - North Spur (operationally), the Project Control Lead – North Spur is expected to interact extensively with the Construction Management Team located at the North Spur site, Package Engineers, and Contractor.</p> <p>The Project Control Lead – North Spur will be expected to work in a team environment as well as independently with direction from the Deputy LCP Project Controls Manager.</p>		
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  <p>Lead the development and implementation of effective Project Controls organization, processes and systems for the North Spur Site. The functional applications of the Project Controls discipline covers project cost estimating, planning, scheduling, cost/schedule risk analysis, cost / schedule control, progress measurement, change management, productivity, project performance reporting and benchmarking. Project Controls is accountable for accurate and timely forecasts of project costs and completion dates. The purpose is to provide enough early warning of negative outcomes to allow mitigation-corrective actions to be taken by MFG Management Team during construction activities.</p>		



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Project Control Lead - North Spur shall include, but are not limited to, the following:

- Provide guidance for appropriate implementation of the project controls functions for the North Spur Site location including all planning/scheduling, cost estimating, cost budgeting, cost control, change management and progress and performance management.
- Provide North Spur construction status awareness and analysis to the North Spur Construction Management Team through determination of control baselines and progress measurement in relation to cost, schedule, quantities, progress/performance and risk.
- Integrate and consolidate project controls inputs from construction contractors, suppliers and North Spur Construction Management Team so as to ensure that timely and accurate cost, schedule, progress, trend and forecast data is available.
- Develop and steward Change Management and Trend identification and management process.
- Perform reviews on control output data and information (cost, schedule, progress, changes, trends and forecasts) received from engineering, construction contractors, suppliers and site team to validate accuracy. Where gaps exist, make appropriate gap closure recommendation and implement such recommendations.
- Prepare North Spur construction packages plan capital budget/cash flow; provide accurate forecast and stewardship reporting.
- Prepare North Spur construction monthly report; receive/review input, coordinate with construction management team and leads for commentary, progress and statistics.
- Ensure functional applications of project controls are practiced effectively by all organizations involved in the North Spur construction activities.
- Provide advice regarding contracting, sub-contracting and execution strategies as well as maintaining procedures for the execution of the scope of work as part of construction activities.
- Identify opportunities for improvement in relation to the functional applications of project control to support North Spur construction activities.

*"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."*

*"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."*

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>University degree in engineering or an equivalent combination of education, training and experience. A membership of the PMI and/or AACEI is advantageous.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <p>A minimum 15 years of experience in the project controls function of large EPC projects including construction sites, including at least one (1) mega-project. Exposure to project management from both an owner and contractor prospective, and knowledge of project controls approaches used by best-in-class companies.</p> <ul style="list-style-type: none"> <li>• Well-rounded project controls management skills.</li> <li>• Excellent leadership and communication skills.</li> <li>• Able to do hands-on project controls work.</li> <li>• Working knowledge of project controls software and interrelationships.</li> <li>• Commercially astute individual with a strong background in cost analysis.</li> <li>• Experience in claims management and productivity analysis is an asset.</li> <li>• Excellent written and verbal communication skills (English).</li> <li>• Experience working with (or for) large national and international construction contractors.</li> <li>• Experience with multiple contracting models and compensation terms including unit rate, lump sum and reimbursable.</li> <li>• Adaptability to perform in demanding work environments.</li> <li>• Develop programs and objectives to meet general objectives outlined by the Component.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Demonstrated awareness and sensitivity to safety, health and environmental issues.</li> <li>• Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task</li> <li>• Possess strong interpersonal skills with the ability to interact and communicate with team members.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Demonstrate a willingness to adhere to Nalcor’s vision and values.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative and supportive manner with stakeholders.</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><u>Carlos Fernandez</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>R. Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>06 July 2015</u></p>	<p><b>DATE:</b></p>	<p><u>06 July 2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Site Information Management Analyst	<b>POSITION NO.:</b> INFM.3.001	<b>DATE PREPARED:</b> 06   Jul   2015	
<b>DEPARTMENT:</b> MFG Project Controls	<b>LOCATION :</b> Muskrat Falls Site		
<b>DIRECTION EXERCISED AND AUTHORITY:</b> Reporting to the Deputy LCP Project Controls Manager, the LCP Information Management Lead (Functionally); the Site Information Management Analyst, as a member of the MF Site Project Controls Team, is accountable for providing the day to day processing of all Documents and Administrative Records to support construction activities at the Muskrat Falls Generation Site.			
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> This position interacts daily with all levels of the Construction Management Team, staff and external submitters of Documents and Administrative Records (external & internal) through the provision of registration, distributing, tracking, system input, and hard copy filing if required.			
<b>PURPOSE AND SUMMARY OF SCOPE:</b> Responsible to provide Information Management functions to support Construction activities at MF Site and for the handling of Documents and Administrative Records- internal and external with a view of providing a dedicated focus on fulfilling the commitment to “providing an environment where people can work safely and collaboratively with a confidence that information, and the systems that manage it, are accessible, accurate, reliable, and timely throughout the full life cycle of the asset”.			





## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Site Information Management Analyst shall generally include, but are not limited to, the following:

- Implement the Information Management (IM) plan, procedures and work instructions to support Construction activities. Provide input when requested.
- Maintain the structural framework for content organization (revision controlled documents and administrative records) within the Electronic Document Management System (EDMS).
- Provide feedback on the use of EDMS tools, folder creation within EDMS, perform regular quality checks in EDMS as directed, and provide assistance where required on available reports in EDMS.
- Receive and also provide training to other members of the Muskrat Falls Generation Team at site requested in use of Information Management plans, requirements, procedures, work instructions, and the use of EDMS. Will require the use of training material for reference.
- Perform and coordinate the process activities associated with the day to day processing and managing of documents and administrative records (copy, distribute, numbering, coding, filling requests, registration, tracking, system inputs, hard copy filing, etc).
- Interfacing with internal /external submitters of documentation and requesting any third party resources required to perform IM functions.
- Implement document re-production and retention schedules.
- Maintain and implement the LCP File Code Index coding standard.
- Check quality of documentation and electronic documents.
- Other IM related duties as required.

*"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."*

*"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."*



	<b>SCOPE / ROLE DESCRIPTION</b>	
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**ACADEMIC QUALIFICATIONS:**

A college diploma in a related subject area is highly desirable for this position, including specialized course work in Records and Information Management (RIM) practices. This degree will be complemented through continuous educational courses in RIM, and interpersonal development.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

This position requires three 3-5 years' experience in a project (site location) setting working with Project Technical and Administrative records including 3-5 years' experience working with computerized document control systems (EDMS).

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Excellent interpersonal and communications skills.
- Ability to work under pressure in an environment which expects the highest levels of customer services, confidentiality and ethical behaviour.
- Ability to work effectively in a team setting.
- Must be able to work in a collaborative and supportive manner with stakeholders.
- Ability to work 14/7 or 20/8 shift rotation in a site based environment.

<b>PREPARED BY:</b>	<u>Carlos Fernandez</u>	<b>APPROVED BY:</b>	<u>R. Woolgar</u>
<b>DATE:</b>	<u>06 July 2015</u>	<b>DATE:</b>	<u>06 July 2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>Project Controls Lead – Muskrat Falls Site</b>	<b>POSITION No.:</b> <b>MFGN.1.133</b>	<b>DATE PREPARED:</b> <b>06 JUL 2015</b>
<b>DEPARTMENT:</b> <b>MFG Project Controls</b>	<b>LOCATION :</b> <b>Muskrat Falls Site</b>	
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <p>Under the authority of the MFG Project Manager, the Project Control Lead - MF Site will provide a guiding role to assist in the development and implementation of processes, procedures and methods of work to fulfil the functional applications of project controls to support construction activities including the supervision of the MF Site Project Controls team members.</p> <p>In fulfilling this mandate, the Project Control Lead – MF Site is expected to work closely with the Deputy LCP Project Controls Manager and liaise closely with the MF Site Construction Management Team and Functional Managers to implement, monitor and control the functional applications of project controls and fulfilment of requirements during the construction of the Muskrat Falls Generation Project.</p> <p>This position will have a number of direct reports to cover project controls functional applications at MF Site (excluding the North Spur location).</p>		
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  <p>Reporting to the MF Project Manager, the Project Control Lead – MF Site is expected to interact extensively with the MFG Project Delivery Team, Construction and Area Construction Managers, Contract Administration, Package Engineers, Site Manager and Contractors.</p> <p>The Project Control Lead – MF Site will be expected to work in a team environment as well as independently with direction from the MF Project Manager.</p>		
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  <p>Lead the development and implementation of effective Project Controls organization, processes and systems for the MF Site. The functional applications of the Project Controls discipline covers project cost estimating, planning, scheduling, cost/schedule risk analysis, cost / schedule control, progress measurement, change management, productivity, project performance reporting and benchmarking. Project Controls is accountable for accurate and timely forecasts of project costs and completion dates. The purpose is to provide enough early warning of negative outcomes to allow mitigation-corrective actions to be taken by MF Management Team during construction activities.</p>		



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Project Controls Lead – MF Site shall include, but are not limited to, the following:

- Provide guidance for appropriate implementation of the project controls functions for the MF Site location including all planning/scheduling, cost estimating, cost budgeting, cost control, change management and progress and performance management.
- Provide MF construction status awareness and analysis to the MF Construction Management Team through determination of control baselines and progress measurement in relation to cost, schedule, quantities, progress/performance and risk.
- Integrate and consolidate project controls inputs from construction contractors, suppliers and MF Construction Site Teams so as to ensure that timely and accurate cost, schedule, progress, trend and forecast data is available.
- Develop and steward Change Management and Trend identification and management process.
- Perform reviews on control output data and information (cost, schedule, progress, changes, trends and forecasts) received from engineering, construction contractors, suppliers and MF site teams to validate accuracy. Where gaps exist, make appropriate gap closure recommendation and implement such recommendations.
- Prepare MF construction packages plan capital budget/cash flow; provide accurate forecast and stewardship reporting.
- Prepare MF construction monthly report; receive/review input, coordinate with MF construction management teams and leads for commentary, progress and statistics.
- Communicate key MF construction project control strategies, policies and requirements criteria to lead MF Site project controls personnel (site location) for implementation of processes and procedures.
- Ensure functional applications of project controls are practiced effectively by all organizations involved in the MF construction activities.
- Provide advice regarding contracting, sub-contracting and execution strategies as well as maintaining procedures for the execution of the MF scope of work as part of construction activities.
- Provide guidance to the project control personnel assigned to the MF location in relation to the functional applications of project control during construction activities.
- Lead, supervise and monitor performance of the project control personnel assigned to MF location during construction activities.
- Identify opportunities for improvement in relation to the functional applications of project control to support MF construction activities.

*"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."*

*"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."*

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>University degree in engineering or an equivalent combination of education, training and experience. A membership of the PMI and/or AACEI is advantageous.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <p>A minimum 15 years of experience in the project controls function of large EPC projects including construction sites, including at least one (1) mega-project. Exposure to project management from both an owner and contractor prospective, and knowledge of project controls approaches used by best-in-class companies.</p> <ul style="list-style-type: none"> <li>• Well-rounded project controls management skills.</li> <li>• Excellent leadership and communication skills.</li> <li>• Able to do hands-on project controls work.</li> <li>• Working knowledge of project controls software and interrelationships.</li> <li>• Commercially astute individual with a strong background in cost analysis.</li> <li>• Experience in claims management and productivity analysis is an asset.</li> <li>• Excellent written and verbal communication skills (English).</li> <li>• Experience working with (or for) large national and international construction contractors.</li> <li>• Experience with multiple contracting models and compensation terms including unit rate, lump sum and reimbursable.</li> <li>• Adaptability to perform in demanding work environments.</li> <li>• Develop programs and objectives to meet general objectives outlined by the Component.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Demonstrated awareness and sensitivity to safety, health and environmental issues.</li> <li>• Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task.</li> <li>• Possess strong interpersonal skills with the ability to interact and communicate with team members.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Demonstrate a willingness to adhere to Nalcor’s vision and values.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative and supportive manner with stakeholders.</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><u>Carlos Fernandez</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>R. Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>06 July 2015</u></p>	<p><b>DATE:</b></p>	<p><u>06 July 2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>Site Cost Engineer - MF Generation</b>	<b>POSITION No.:</b> <b>MFGN.2.017</b>	<b>DATE PREPARED:</b> <b>06-JUL-2015</b>
<b>DEPARTMENT:</b> <b>MFG Project Controls</b>	<b>LOCATION :</b> <b>Muskrat Falls</b>	
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <p>Under the authority of the Project Controls Lead – MF Site, the Site Cost Engineer will provide a supporting role to assist in the fulfilment of the MF overall cost and schedule delivery targets and objectives.</p> <p>In fulfilling this mandate, the Site Cost Engineer is expected to work closely with the Project Controls Lead – MF Site, and liaise closely with the execution teams and functional managers to implement cost management processes and fulfilment of requirements.</p> <p>The Site Cost Engineer will not have any direct reports.</p>		
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  <p>Reporting directly to Project Controls Lead – MF Site the Site Cost Engineer is expected to interact extensively with the Project Controls Team (site and home office), Project and Area Managers, Construction and Area Construction Managers, Package Engineers, Contract Administrators, Site Manager and Contractors.</p> <p>The Site Cost Engineer will be expected to work in a team environment as well as independently with direction from the Project Controls Lead – MF Site.</p>		
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  <p>As a member of the Project Delivery Team, the Site Cost Engineer is a support resource to the Project Controls Lead – MF Site in providing support and providing project controls services to ensure cost management targets and objectives are fulfilled.</p> <p>The Site Cost Engineer will support the Project Controls Lead – MF Site in execution of established processes and systems to ensure that accurate cost control information is provided on a timely basis.</p> <p>The Site Cost Engineer will be performing cost management functions related to the construction of the Muskrat Falls Generation Facility, the general scope of which includes: the Powerhouse and Intake, Spillway, Transition Dams, North and South Dams.</p>		



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Site Cost Engineer shall include, but are not limited to, the following:

- Reviews all site issued purchase requisitions for goods and services to ensure that they are within the project scope, the approved budget, and that the correct cost coding has been assigned.
- Reviews Change Requests, Change Orders and potential changes with Package Engineer, Contract Administrator and Area Manager as applicable and recommends appropriate actions to the Project Controls Lead – MF Site.
- Prepares regular periodic and ad-hoc cost reports for assigned commitment packages.
- Reviews payment certificates for approval.
- Performs analysis and initiates trends for all potential variations or risks related to assigned commitment packages.
- Performs incurred cost functions and analysis for assigned commitment packages.
- Prepares cost flows for assigned commitment packages.
- Reviews and performs analysis on the DANs, PCNs of the Change Management process.
- Performs detailed analysis to estimate trends and forecast final cost for assigned commitment packages.
- Reviews Commitment Package reports (weekly, monthly, ad-hoc, etc.).
- Ensures system data and integrity maintained and up to date.
- Other duties as assigned by the Project Controls Lead – MF Site.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

### ACADEMIC QUALIFICATIONS:

University degree in engineering/business administration or an equivalent combination of education, training and experience.

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Minimum (5) years of experience in cost management on large engineering and construction projects with a focus on heavy civil and industrial projects. Site experience an asset.
- Additional years in other disciplines on Construction or Large Projects an asset.
- Knowledge of Cost Management best practices (AACEI, PMI, etc.).
- Ability to work independently as well as part of a diverse work team.
- Experience in the use and application of cost management systems. Experience in PM+ or Prism is an asset.
- Demonstrated proficiency in the use of MS Excel and MS Access.
- Commercially astute individual with a strong background in cost analysis.
- Experience in claims management and productivity analysis is an asset.
- Excellent written and verbal communication skills (English).
- Experience working with (or for) large national and international construction contractors.
- Experience with multiple contracting models and compensation terms including unit rate, lump sum and reimbursable.
- Adaptability to perform in demanding work environments.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Safety oriented.
- Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task.
- Possess strong interpersonal skills with the ability to interact and communicate with team members.
- Excellent problem solving skills.
- Ability to plan work well, and to be well-organized.
- Demonstrate a willingness to adhere to Nalcor’s vision and values.
- Solution oriented.
- Must be able to work in a collaborative and supportive manner with stakeholders.
- Ability to work 14/7 or 20/8 shift rotation in a site based environment.

<p><b>PREPARED BY:</b></p>	<p><u>                  C. Fernandez                  </u></p>	<p><b>APPROVED BY:</b></p>	<p><u>                  R. Woolgar                  </u></p>
<p><b>DATE:</b></p>	<p><u>                  06-Jul-2015                  </u></p>	<p><b>DATE:</b></p>	<p><u>                  06-Jul-2015                  </u></p>



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Site Estimator - Muskrat Falls Generation	<b>POSITION No.:</b> MFGN.3.030	<b>DATE PREPARED:</b> 06 JUL 2015
<b>DEPARTMENT:</b> MFG Project Controls	<b>LOCATION :</b> Muskrat Falls Site	
<b>DIRECTION EXERCISED AND AUTHORITY:</b> <p>Reporting to the Project Control Lead – MF Site the Site Estimator should be capable of day to day estimate functions with minimal supervision and direction to support construction activities.</p>		
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <p>This position shall be responsible for leading the preparation of estimates to support the MFG Project control and Construction teams during construction activities for MFG commitment packages. Provide guidance and support to the contract administration team in reviewing and validating MFG Contractors/Suppliers estimates related to change notices.</p>		
<b>PURPOSE AND SUMMARY OF SCOPE:</b> <p>As a member of the MFG Project Controls Team located at MF Site, the Site Estimator is a support resource to the MFG Site Project Controls, Construction Management and Contract Administration teams in providing support for, review and validation of Contractors/Suppliers estimates as part of their changes notices. It includes as well preparation of estimates for additional scope of work intended to be performed with existing MFG Contractors/suppliers.</p>		



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Site Estimator shall generally include, but are not limited to, the following:

In respect to Contractors/Suppliers:

- Assist with review and validation of Contractors/Suppliers estimates as required by project coordination procedures for each site managed commitment package in relation to change notices.
- Verify that estimate rates used by Contractors/Suppliers for utilization of resources indicated in their changes notices compliance with commercial requirements indicated in the Agreements.
- Develop and implement a routine to undertake selective quantity verification for MFG construction activities.
- Assist with facilitating coordination between Contractors and between Contractor and the Project Management Team in regards to estimate requirements.
- Review and validate construction key estimates parameters recommended by Contractors/Suppliers as part of reimbursable agreements like: construction fleet, productivity rates, materials price, etc.
- Participate in construction coordination meetings as the need arises.

In respect to Muskrat Fall Generation (MFG) Delivery Team:

- Assist the MFG Project Controls, Construction Management and Contract Administration teams in the preparation of estimates for additional scope of work or changes to the MFG commitment package strategy.
- Assist the Site Project Controls Lead in providing estimating support relating to mitigation and analysis of construction claims.
- Work with MFG Engineering, Planning and Construction teams to review and validate construction sequence and methodology proposed by Contractors in relation to cost estimates.
- Understand the Capital Cost Base Estimate developed for MFG to identify deviations in terms of cost related to scope definition, construction methodology and schedule and price changes.
- Other estimating and MFG planning duties as required.

*"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."*

*"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."*

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>University degree in engineering or an equivalent combination of education, training and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Estimating experience (5+ years) on large engineering and construction projects with a focus on heavy civil and industrial projects. Site experience is an asset.</li> <li>• Ability to work independently and as well as part of a diverse work team.</li> <li>• Demonstrated proficiency in the use estimating tools.</li> <li>• Proficiency in the use of MS Excel and MS Access.</li> <li>• Experience in productivity analysis is an asset.</li> <li>• Excellent written and verbal communication skills (English).</li> <li>• Experience working with (or for) large national and international construction contractors.</li> <li>• Experience with multiple contracting models and compensation terms including unit rate, lump sum and reimbursable.</li> <li>• Adaptability to perform in demanding work environments.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task.</li> <li>• Possess strong interpersonal skills with the ability to interact and communicate with team members.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Demonstrate a willingness to adhere to Nalcor’s vision and values.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative and supportive manner with stakeholders.</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><b>Carlos Fernandez</b></p>	<p><b>APPROVED BY:</b></p>	<p><b>R. Woolgar</b></p>
<p><b>DATE:</b></p>	<p><b>06 July 2015</b></p>	<p><b>DATE:</b></p>	<p><b>06 July 2015</b></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>Lead Site Planner Muskrat Falls Generation</b>	<b>POSITION No.:</b> <b>MFGN.2.018</b>	<b>DATE PREPARED:</b> <b>06 Jul 2015</b>
<b>DEPARTMENT:</b> <b>MFG Project Controls</b>	<b>LOCATION :</b> <b>Muskrat Falls</b>	
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <p>Under the authority of the Project Controls Lead – MF Site, the Lead Site Planner will provide a supporting role to assist in the fulfilment of overall cost and schedule delivery targets and objectives.</p> <p>In fulfilling this mandate, the Lead Site Planner is expected to work closely with the Project Controls Lead – Site, and liaise closely with the execution teams and functional managers to implement, monitor and control schedule management processes and fulfilment of requirements during the execution of the Muskrat Falls Generation Project.</p> <p>The Lead Site Planner will have direct reports.</p>		
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  <p>Reporting directly to the Project Controls Lead – MF Site, the Lead Site Planner is expected to interact extensively with the Project Controls Team (site and home office), Project and Area Managers, Construction and Area Construction Managers, Site Manager and Contractors.</p> <p>The Lead Site Planner will be expected to work in a team environment as well as independently with direction from the Project Controls Lead – MF Site.</p>		
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  <p>As a member of the MFG Project Controls Team, the Lead Site Planner is a support resource to the MF Site Planning Team and Project Controls Lead – MF Site in providing support and providing project controls services to ensure schedule management targets and objectives are fulfilled.</p> <p>The Lead Site Planner will be responsible to support the MFG Project Controls Team with planning and scheduling functions related to the construction the Muskrat Falls Generation Project, the general scope of which includes: the Powerhouse and Intake, Spillway, Transition Dams, North and South Dams and Mechanical and Electrical scopes.</p>		



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Lead Site Planner shall generally include, but are not limited to, the following:

In respect to Contractors:

- Assist with review of Contractor's planning and scheduling deliverables as required by project coordination procedures for each site managed commitment package including the Schedule Development and Control Plan, Control Schedule Baseline Document and the Control Schedule.
- Assist with review of monthly contractor schedule deliverables and progress highlighting any trends, areas of concern and requirements for corrective action.
- Assist with evaluation and assessment of Company and Contractor's Change Requests impacts on overall project schedule.
- Progress monitoring and reporting, including evaluation of progress in the field.
- Assist with facilitating coordination between Contractors and between Contractor and the Project Management Team in regards to near and long term planning (Two week and two month look ahead schedules).
- Participate in construction coordination meetings as the need arises.

In respect to Lower Churchill Project (LCP):

- Assist the MFG Project Controls Team in assessing Contractor's schedule performance.
- Assist with the development and implementation of "work-arounds" and contingency planning.
- Assist the Site Project Controls Lead in providing planning support relating to mitigation and analysis of construction claims.
- Assist in building the Muskrat Falls Generation Interface Schedule (Level III Construction Schedule).
- Assist in maintaining, updating and analysis of the Muskrat Falls Generation (C1) Interface Schedule.
- Assist in providing monthly status updates of the Integrated Project Schedule (IPS).
- Assist in providing input to weekly and monthly progress reports including qualitative and quantitative data and analysis.

In respect to Other Components:

- Interfacing with other component planners with respect to operations affecting the Muskrat Falls site.

Other duties as assigned by the LCP Deputy Project Control Manager and Project Controls Lead – MF Site.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>University degree in engineering or an equivalent combination of education, training and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Planning experience (15+ years) on large engineering and construction projects with a focus on heavy civil and industrial projects. Site experience is an asset.</li> <li>• Ability to work independently and as well as part of a diverse work team.</li> <li>• Demonstrated proficiency in the use Primavera P6.</li> <li>• Proficiency in the use of MS Excel and MS Access.</li> <li>• Experience in productivity analysis is an asset.</li> <li>• Excellent written and verbal communication skills (English).</li> <li>• Experience working with (or for) large national and international construction contractors.</li> <li>• Experience with multiple contracting models and compensation terms including unit rate, lump sum and reimbursable.</li> <li>• Adaptability to perform in demanding work environments.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task.</li> <li>• Possess strong interpersonal skills with the ability to interact and communicate with team members.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Demonstrate a willingness to adhere to Nalcor’s vision and values.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative and supportive manner with stakeholders.</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><b>Carlos Fernandez</b></p>	<p><b>APPROVED BY:</b></p>	<p><b>R. Woolgar</b></p>
<p><b>DATE:</b></p>	<p><b>06 July 2015</b></p>	<p><b>DATE:</b></p>	<p><b>06 July 2015</b></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>Site Planner Muskrat Falls Generation - MFG (Component 1)</b>	<b>POSITION No.:</b>	<b>DATE PREPARED:</b> <b>06 Jul 2015</b>
<b>DEPARTMENT:</b> <b>MFG Project Controls</b>	<b>LOCATION :</b> <b>Muskrat Falls</b>	
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <p>Under the authority of the MFG Project Controls Lead – MF Site and the MF Lead Site Planner, the Site Planner will provide a supporting role to assist in the fulfilment of MFG Sub-Project overall cost and schedule delivery targets and objectives.</p> <p>In fulfilling this mandate, the Site Planner is expected to work closely with the Site Project Controls Lead, and liaise closely with the execution teams and functional managers to implement, monitor and control schedule management processes and fulfilment of requirements during the execution of the MFG Sub-Project.</p> <p>The Site Planner will not have any direct reports.</p>		
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  <p>Reporting directly to the MF Lead Site Planner, the Site Planner is expected to interact extensively with the Project Controls Team (site and home office), Project and Area Managers, Construction and Area Construction Managers, Site Manager and Contractors.</p> <p>The Site Planner will be expected to work in a team environment as well as independently with direction from the MF Lead Site Planner and the Project Controls Lead – MF Site.</p>		
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  <p>As a member of the MFG Project Controls Team, the Site Planner is a support resource to the MFG Site Planning Team and Site Project Controls Lead in providing support and providing project controls services to ensure that MFG Sub-Project schedule management targets and objectives are fulfilled.</p> <p>The Site Planner will be responsible to support the MFG Project Controls Team with planning and scheduling functions related to the construction of the MFG Sub-Project, the general scope of which includes: the Powerhouse and Intake, Spillway, Transition Dams, North and South Dams and the North Spur. The Site Planner must have a strong knowledge, understanding and experience in the use of Scheduling tools to perform monitoring and progress of constructions activities with preference to Oracle – Primavera P6.</p>		





## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

The duties and job functions of the Site Planner shall generally include, but are not limited to, the following:

In respect to Contractors:

- Assist with review of Contractor's planning and scheduling deliverables as required by project coordination procedures for each site managed commitment package including the Schedule Development and Control Plan, Control Schedule Baseline Document and the Control Schedule.
- Assist with review of monthly contractor schedule deliverables and progress highlighting any trends, areas of concern and requirements for corrective action.
- Assist with evaluation and assessment of Company and Contractor's Change Requests impacts on overall project schedule.
- Progress monitoring and reporting, including evaluation of progress in the field.
- Assist with facilitating coordination between Contractors and between Contractor and the Project Management Team in regards to near and long term planning (Two week and two month look ahead schedules).
- Participate in construction coordination meetings as the need arises.

In respect to Lower Churchill Project (LCP):

- Assist the MFG Project Controls Team in assessing Contractor's schedule performance.
- Assist with the development and implementation of "work-arounds" and contingency planning.
- Assist the Site Project Controls Lead in providing planning support relating to mitigation and analysis of construction claims.
- Assist in building the MFG Sub-Project (C1) Interface Schedule (Level III Construction Schedule).
- Assist in maintaining, updating and analysis of the MFG Sub-Project (C1) Interface Schedule.
- Assist in providing monthly status updates of the Integrated Project Schedule (IPS).
- Assist in providing input to weekly and monthly progress reports including qualitative and quantitative data and analysis.

In respect to Other Components:

- Interfacing with other component planners with respect to operations affecting the Muskrat Falls site.

Other duties as assigned by the MFG Project Controls Manager and Site Lead Project Controls.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>University degree in engineering or an equivalent combination of education, training and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Planning experience (5+ years) on large engineering and construction projects with a focus on heavy civil and industrial projects. Site experience is an asset.</li> <li>• Ability to work independently and as well as part of a diverse work team.</li> <li>• Demonstrated proficiency in the use Primavera P6.</li> <li>• Proficiency in the use of MS Excel and MS Access.</li> <li>• Experience in productivity analysis is an asset.</li> <li>• Excellent written and verbal communication skills (English).</li> <li>• Experience working with (or for) large national and international construction contractors.</li> <li>• Experience with multiple contracting models and compensation terms including unit rate, lump sum and reimbursable.</li> <li>• Adaptability to perform in demanding work environments.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task.</li> <li>• Possess strong interpersonal skills with the ability to interact and communicate with team members.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Demonstrate a willingness to adhere to Nalcor’s vision and values.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative and supportive manner with stakeholders.</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><b>Carlos Fernandez</b></p>	<p><b>APPROVED BY:</b></p>	<p><b>R. Woolgar</b></p>
<p><b>DATE:</b></p>	<p><b>06 July 2015</b></p>	<p><b>DATE:</b></p>	<p><b>06 July 2015</b></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Quantity Coordinator	<b>POSITION NO.:</b> MFGN.3.029	<b>DATE PREPARED:</b> 06-Jul-2015
<b>DEPARTMENT:</b> MFG Project Controls	<b>LOCATION :</b> Muskrat Falls Site	

**DIRECTION EXERCISED AND AUTHORITY:**

Under the authority of the Project Controls Lead – MF Site, the Quantity Coordinator will provide a supporting role to assist in the fulfilment of Nalcor’s overall cost and schedule delivery targets and objectives.

In fulfilling this mandate, the Quantity Coordinator is expected to work closely with the Project Controls Lead – MF Site, and liaise closely with the execution teams and functional managers to implement cost management processes and fulfilment of requirements.

The Quantity Coordinator will not have any direct reports.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting directly to Project Controls Lead – MF Site, the Quantity Coordinator is expected to interact extensively with the Project Controls Team (site and home office), Project and Area Managers, Construction and Area Construction Managers, Site Manager, Contract Administrators and Contractors.

The Quantity Coordinator will be expected to work in a team environment as well as independently with direction from the Project Controls Lead – MF Site.

**PURPOSE AND SUMMARY OF SCOPE:**

As a member of the Project Management Team, the Quantity Coordinator is a support resource to the Project Controls Lead – MF Site in providing support and providing project controls services to ensure Nalcor’s cost and schedule management targets and objectives are fulfilled.

The Quantity Coordinator will support the Project Controls Lead – MF Site in execution of established processes and systems to ensure that accurate progress and cost information is provided on a timely basis.

The Quantity Coordinator will be responsible to support the Project Controls Lead – MF Site with functions related to the Construction of the Muskrat Falls Generation Facility, the general scope of which includes: the Powerhouse and Intake, Spillway, Transition Dams, North and South Dams, and Mechanical and Electrical Scopes.



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Quantity Coordinator shall include, but are not limited to, the following:

- Track and verify the progress of all work on the Muskrat Falls Site, in particular work performed on a unit price basis.
- Maintain up to date progress files and quantity databases for all construction commitment packages.
- Review and perform quantity take-offs from IFC drawings to confirm quantities provided by Contractors.
- Perform quantity take-offs for Change Requests and Change Orders.
- Perform weekly measure, analysis and verification of actual field progress by the Contractor.
- Resolve variations in measured quantity information with the Contractor.
- Review, verification and recommendation of approval of Contractor's payment certificates.
- Coordinate with other departments (including survey service providers) to quantify work that must be field measured or surveyed.
- Maintain records for all field measured quantities.
- Provide input and assist in the preparation of weekly and monthly site progress reports.
- Other duties as assigned by the Project Controls Lead – MF Site.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

### ACADEMIC QUALIFICATIONS:

University degree in engineering or quantity surveying with designation as a Professional Quantity Surveying Coordinator(PQS), or equivalent combination of education and experience.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- Demonstrated experience on large engineering and construction projects with a focus on heavy civil and industrial projects with a quantity surveying or cost control background. Site experience is an asset.
- Ability to work independently as well as part of a diverse work team.
- Advanced proficiency in the use of MS Excel.
- Proficiency in the use of MS Word and MS Powerpoint. Proficiency in MS Access would be an asset.
- Excellent written and verbal communication skills (English).
- Exposure to commercial requirements an asset.
- Experience working with (or for) large national or international construction contractors.
- Experience with multiple contracting models and compensation terms including unit rate, lump sum and reimbursable.
- Adaptability to perform in demanding work environments.
- Ability to analyse and interpret complex data.
- Quality focused with acute attention to detail.
- Strong customer service orientation.

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task.</li> <li>• Possess strong interpersonal skills with the ability to interact and communicate with team members.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well organized.</li> <li>• Demonstrate a willingness to adhere to Nalcor’s vision and values.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative and supportive manner with stakeholders.</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>
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<p><b>PREPARED BY:</b></p>	<p><u>Carlos Fernandez</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>R. Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>06 July 2015</u></p>	<p><b>DATE:</b></p>	<p><u>06 July 2015</u></p>



Quality

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>Senior QA Advisor - North Spur</b>	<b>POSITION NO.:</b> <b>MFGN.1.121</b>	<b>DATE PREPARED:</b> 16    Feb    2015		
<b>DEPARTMENT:</b> <b>MFG Quality Assurance</b>	<b>LOCATION :</b> <b>North Spur</b>			
<b>DIRECTION EXERCISED AND AUTHORITY:</b> <p>The incumbent is responsible for QA/QC oversight, monitoring, surveillance and inspection of all construction/civil activities related to CH0008 North Spur Stabilization work for the Lower Churchill Project.</p> <p>This position will have direct reports and be responsible to provide management and guidance to North Spur Lab operations.</p>				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <p>Reporting to Quality Manager – MF Generation and functionally reporting to the Area Construction Manager – North Spur. Direction and guidance will be provided, however, the incumbent should be capable of functioning with a limited level of supervision.</p>				
<b>PURPOSE AND SUMMARY OF SCOPE:</b> <p>Working within the Project Delivery Team responsible for QA/QC oversight, monitoring, surveillance and inspection of the North Spur Stabilization work, the <b>Senior QA Advisor</b> will:</p> <ul style="list-style-type: none"> <li>• Develop and manage the implementation of QA/QC oversight, monitoring, surveillance and inspection programs for site contractors and sub-contractors ;</li> <li>• Ensure contractors and sub-contractors construction programs are implemented and effective;</li> <li>• Verify and assure satisfactory quality performance of the work of contractors and sub-contractors; and</li> <li>• Provide overall management to the Lab Operations at the North Spur Site.</li> </ul>				





## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** (Note: The following is being executed as a contract scope of work.)

The duties and job functions of the **Senior QA Advisor** shall include, but are not limited to, the following:

- Manage the applicable QA/QC oversight, monitoring, surveillance and inspection plans, procedures and checklists for inspecting and reporting of the work activities at the North Spur construction site including:
- clearing and grubbing, construction of roads, dewatering and water management, source of materials, overburden excavation, foundation prep, drilling and blasting, grouting, embankment construction, geotechnical for earthworks and instrumentation, cement bentonite cut off walls, relief wells, hydro-seeding, testing-compaction, sieve analysis, moisture content, in situ dry density etc.), to ensure contractors' and sub-contractors quality programs are fully implemented and effective through review and acceptance of contractors' quality documentation (including inspection and test plans, procedures, quality records, final documentation, etc.).
- Ensure contractor compliance with the regulatory requirements, technical specifications, drawings and any special contractor installation procedures as defined in contractor's inspection and test plans.
- Provide weekly and monthly reports and maintain quality files of all on-going construction work.
- Implement the quality audit and surveillance plan and issue reports such as corrective actions, non-conformances, and observations.
- Work with contractors and sub-contractors quality managers to ensure clarity in understanding project and technical requirements.
- Review documentation received from contractor (material specification, method statements, Inspection and Test Plans, drawings, test results, other technical documentation, etc.) for implementation and compliance.
- Provide overall management and guidance in support of Lab operations at the North Spur Site.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

Professional Engineer / Geologist or Technical Diploma in Engineering or Geology or a related discipline, supplemented by experience in QA/QC oversight, monitoring, surveillance and inspection activities for large civil projects, or an equivalent combination of education and experience.

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Minimum 15 years of field experience in performing QA/QC oversight, monitoring, surveillance and inspection activities on large construction projects.</li> <li>• Experience with implementing quality programs for large capital projects, with a good exposure to civil works.</li> <li>• Experience with civil works, specifically bulk excavation, geotechnical for earthworks and instrumentation, cement bentonite cut off walls, relief wells, hydro-seeding, including site investigation, overburden and rock excavation, backfilling, compaction, piling, road construction, etc.</li> <li>• Experience in execution of inspection and test plans.</li> <li>• Previous experience with auditing construction QA programs.</li> <li>• Working knowledge of incident investigation / root cause analysis.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety Oriented;</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values</li> <li>• Good knowledge of civil engineering principles, standards and regulations relating to construction, inspection and safety standards;</li> <li>• Strong technical and communication skills to effectively interact with contractor, consultant and owner teams;</li> <li>• Must be a team player but maintain the ability to work independently;</li> <li>• Strong knowledge of Quality Management principles and ISO 9001 standard;</li> <li>• Demonstrated commitment to Quality Assurance issues;</li> <li>• Basic understanding of Microsoft Word and Excel is preferred; and</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><u>Mark Peddle</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Robert Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>29-July-2015</u></p>	<p><b>DATE:</b></p>	<p><u>29-July-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> North Spur - Laboratory Supervisor	<b>POSITION NO.:</b> QUAL.1.081	<b>DATE PREPARED:</b>		
		29	JUL	2015
<b>DEPARTMENT:</b> MFG Quality Assurance	<b>LOCATION:</b> North Spur			

**DIRECTION EXERCISED AND AUTHORITY:**

This position will have direct reports. The Work involves planning and directing the Laboratory Services at the North Spur site to perform materials testing, monitoring and assuring that the services provided address the technical scopes and standards to perform field and lab testing accordingly with dam construction industry standards. This position will interface with engineering, construction and contractor groups.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the Senior Quality Advisor – North Spur, the Laboratory Supervisor will ensure that all testing done on the North Spur construction site (field and lab) will be done by skilled personnel using techniques, equipment and standards approved by the engineering team. The Muskrat Falls Laboratory Manager will provide function support to the North Spur - Laboratory Supervisor, as required.

**PURPOSE AND SUMMARY OF SCOPE:**

Working within the North Spur Site team, the **Laboratory Supervisor** is responsible to:

- Provide direction for the laboratory staff related to technical specifications and standards; Quality Control and Quality Assurance; Health and Safety, Environment, and in accordance with the project's general goals and objectives;
- Participate in QA/QC oversight, monitoring, surveillance and inspection programs and activities for concrete, material and soils testing and inspection activities at North Spur;



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The following is being executed as a contract scope of work:

- Participate in continuous improvement efforts;
- Review reports of materials testing prepared by laboratory personnel and advise Construction and Engineering of trends or anomalies which indicate a non-conformance of the materials with the construction specifications;
- Ensure standards, procedures, processes and checklists for inspecting and testing of concrete, materials and soils at North Spur;
- Ensure Laboratory documentation and resolution of non-conformance, corrective action and preventative action;
- Ensure full compliance with technical specifications, drawings and any special supplier installation procedures as defined in contractors and inspection and test plans;
- Perform monitoring, surveillance and inspection of material and soils used to support the stabilization of North Spur
- Attend construction meetings as required;
- Ensure technical turnover documentation is complete;
- Prepare and adapt equipment manual to perform testing program
- Teach specific testing method to technicians and ensure that test was done accordingly with adapted standards
- Manage test results in the project database
- Use adaptive software tools to do calculations, calibration and report for all test results

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <ul style="list-style-type: none"> <li>• Technical Diploma or Bachelor’s Degree in Civil Engineering or a related discipline, supplemented by experience in construction QA/QC oversight, monitoring, surveillance and inspection activities for large dam construction projects, with focus on soil and material use in earth fill, and dam construction</li> <li>• Registration with the Association of Engineering Technicians and Technologists of Newfoundland and Labrador (AETTNL) is desirable.</li> </ul>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Minimum of 20 years of progressively responsible experience in laboratory testing related to dam construction industry including field experience in performing QA/QC oversight, monitoring, surveillance and inspection activities on large earth fill dam construction projects;</li> <li>• Considerable experience in concrete testing including roller compacted concrete (RCC), materials and soils testing and inspection including experience in a coordination capacity; Should be an advantage</li> <li>• Experience with construction of hydroelectric projects, specifically earth fill dam construction and other related civil works</li> <li>• Knowledge of the construction materials standards and approved testing methodologies established by the Canadian Standards Association (CSA) and other standards organization;</li> <li>• Knowledge of engineering theory, principles and practices as they relate to materials testing, applications and manufacture;</li> <li>• Knowledge of the operation of a Materials Laboratory to provide quality control of materials used for large civil projects; mainly earth fill dam construction</li> <li>• Ability to supervise technicians involved in the testing of infrastructure materials, product evaluation or failure evaluation;</li> <li>• Ability to establish and maintain effective relationships with project ;</li> <li>• Candidate must have strong technical skills to effectively interact with Contractor, Laboratory Contractor and owner teams;</li> <li>• Must be a team player but maintain the ability to work independently;</li> <li>• Demonstrated commitment to Quality Assurance issues;</li> <li>• Basic understanding of Microsoft Word , Excel, specialized software (soil testing management); and</li> <li>• Ability to maintain effective working relationships.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Incumbent must be willing to work at site.</li> <li>• The incumbent will work primarily at the North Spur site. It is anticipated that while working in construction environments the incumbent may be exposed to environments that are dirty, noisy, and potentially hazardous.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><u>Mark Peddle</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Robert Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>29-July-2015</u></p>	<p><b>DATE:</b></p>	<p><u>29-July-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Quality Assurance Lead – Muskrat Falls Site	<b>POSITION NO.:</b> QUAL.2.001	<b>DATE PREPARED:</b>		
		15	Dec	2014
<b>DEPARTMENT:</b> MFG Quality Assurance	<b>LOCATION :</b> Muskrat Falls			

**DIRECTION EXERCISED AND AUTHORITY:**

Candidate should be capable of functioning with a limited level of supervision. Reporting to the Quality Manager – Muskrat Falls Generation, general direction and guidance will be provided.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

This position will report to and take direction from the Quality Manager – Muskrat Falls Generation within the LCP Quality Team, but shall maintain a day to day relationship with the Muskrat Falls Site Construction and Engineering groups for site activities.

The Quality Assurance Lead – Muskrat Falls Site will support the Quality Manager – Muskrat Falls Generation in developing and implementing all Quality Assurance oversight, monitoring and surveillance programs and activities for construction management at Muskrat Falls construction site. This position provides direction to the site quality assurance team.

**PURPOSE AND SUMMARY OF SCOPE:**

The position will work closely with the Quality Manager – Muskrat Falls Generation to develop the Client’s Quality Assurance oversight, monitoring and surveillance programs for all construction activities at Muskrat Falls, and ensure continual and effective implementation of these programs. The positional is rotational.

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:</b></p> <ul style="list-style-type: none"> <li>• Lead the development and implementation of a QA oversight, monitoring and surveillance programs to ensure delivery of Muskrat Falls Generation, which includes site infrastructure, dams and spillway, reservoir, intake, powerhouse, turbines and generators, balance of plant, etc.;</li> <li>• Assist with development of all applicable plans, procedures and checklists for conducting QA oversight, monitoring and surveillance</li> <li>• Ensure contractors’ and suppliers’ quality programs are fully implemented and effective through review and acceptance of contractors’ quality documentation (including inspection and test plans, procedures, quality records, final documentation, etc.)</li> <li>• Develop and implement a comprehensive risk-based audit program for all Muskrat Falls site activities</li> <li>• Monitor and ensure regulatory requirements, technical specifications, drawings and any special supplier installation procedures as defined in contractors and suppliers’ inspection and test plans are fulfilled;</li> <li>• Review and approve quality reports such as corrective actions, nonconformances, and observations;</li> <li>• Review project technical specifications and drawings to determine quality requirements;</li> <li>• Review and endorse documentation received from contractor (material specification, method statements, Inspection and Test Plans, drawings, test results, other technical documentation, etc.) for implementation and compliance;</li> <li>• Attend all construction meetings as required;</li> <li>• Ensure turnover documentation requirements are realized ;</li> <li>• Ensure adequate closure of all site audit findings, NCRs, etc.;</li> <li>• Contribute to quality progress reports including quality metrics;</li> <li>• Ensure oversight, monitoring and surveillance activities are complete</li> <li>• Ensure comprehensive and detailed reporting to Quality Manager – Muskrat Falls Generation at home office</li> </ul> <p>“Individual shall work in accordance with the Health and Safety Policies &amp; Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness.”</p> <p>"Individual shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."</p> <p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Bachelor’s degree or technical diploma in civil engineering or science preferred; minimum post-secondary graduation from a recognized technical program or a related discipline, supplemented by additional training in quality assurance quality control, or an equivalent combination of education and experience.</p>
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	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Must have minimum 20 years of experience associated with the development and coordination of quality assurance activities for construction, mechanical completions, commissioning, handover and start-up;</li> <li>• Experience working with contractors, in particular those involved in the construction of large civil and hydroelectric projects, specifically intake, powerhouse, spillway and transition dams;</li> <li>• Experience with civil works, specifically bulk excavation including site investigation, overburden and rock excavation, backfilling, compaction, road construction, concrete pouring, construction of cofferdams, rock filled dams and sediment ponds, rock bolting, rock dowels, welded wire mesh, shotcrete, etc.;</li> <li>• Experience with installation, connection and commissioning of all site infrastructure including, but not limited to accommodations and administrative buildings, water treatment and distribution systems including valves, hydrants, and service connections, sewage treatment plant and distribution system, etc.;</li> <li>• Previous experience with auditing contractor QC programs;</li> <li>• Experience with project completions and document for operations turnover;</li> <li>• Experience working in a team environment; and</li> <li>• Working knowledge of incident investigation / root cause analysis.</li> </ul>
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<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Self-starter, who identifies priority tasks, puts plans in place to complete, and delivers;</li> <li>• Strong management skills to effectively manage a team of quality assurance personnel</li> <li>• Strong interpersonal and communication skills to effectively interact with a variety of personnel, and other industry participants, both internal and external;</li> <li>• Thrives to be an active team player, but can effectively work independently;</li> <li>• Proven skills in effectively managing multiple tasks, often under pressure and within time constraints;</li> <li>• Advanced written and verbal communication skills required to effectively interact with a variety of Industry personnel;</li> <li>• Strong knowledge of Quality Management principles and ISO 9001 standard;</li> <li>• Ability to develop processes and articulate within the project organization;</li> <li>• Demonstrated commitment and leadership to Quality Assurance issues;</li> <li>• Ability to quickly assimilate new data, including highly technical information;</li> <li>• Strong ability to use Microsoft applications such as word, excel, outlook, power point, etc. ; and</li> <li>• Incumbent must be willing to work at site as required by the Quality Manager - Muskrat Falls Generation</li> </ul>
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<p><b>PREPARED BY:</b> <u>Mark Peddle</u></p>	<p><b>APPROVED BY:</b> <u>Robert Woolgar</u></p>
<p><b>DATE:</b> <u>29-July-2015</u></p>	<p><b>DATE:</b> <u>29-July-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> QA Advisor	<b>POSITION NO.:</b> QUAL.3.003	<b>DATE PREPARED:</b> 20      Dec      2013		
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<b>DEPARTMENT:</b> Quality Assurance	<b>LOCATION :</b> Muskrat Falls
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**DIRECTION EXERCISED AND AUTHORITY:**

This position has no direct reports; however the incumbent is responsible for QA/QC oversight, monitoring, surveillance and inspection of all construction activities of Muskrat Falls Generation of the Lower Churchill Project.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to Quality Manager MF Site or designate. Direction and guidance will be provided, however the incumbent should be capable of functioning with a limited level of supervision.

**PURPOSE AND SUMMARY OF SCOPE:**

Working within the Integrated Project Delivery Team responsible for Site Construction Management, the **QA Advisor will:**

- Implement and participate in QA/QC oversight, monitoring, surveillance and inspection programs and activities for construction and installation activities of Contractors and Suppliers at Muskrat Falls.
- Ensure Contractors and Suppliers' QA/QC programs are implemented and effective.
- Verify and assure satisfactory quality performance of the work by Contractors and Supplier's at site.

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** (Note: The following is being executed as a contract scope of work.)

The duties and job functions of the **QA Advisor** shall include, but are not limited to, the following:

- Implement all applicable QA/QC oversight, monitoring, surveillance and inspection plans, procedures and checklists for inspecting and reporting of the work activities at Muskrat Falls.
- Perform monitoring, surveillance and QA audits of the work (bulk excavation, site infrastructure, dams and spillway, reservoir, intake, powerhouse, turbine generator and balance of plant), on behalf of Nalcor Energy, to ensure contractors' and suppliers' quality programs are fully implemented and effective through review and acceptance of contractors' quality documentation (including inspection and test plans, procedures, quality records, final turnover documentation, etc.).
- Ensure full compliance with the regulatory requirements, technical specifications, drawings and any special supplier installation procedures as defined in contractors and suppliers' inspection and test plans.
- Provide daily, weekly and monthly reports and maintain quality assurance files of all on-going construction work.
- Implement the quality audit and surveillance plan and issue reports such as corrective actions, non-conformances, and observations.
- Work with contractors and suppliers to ensure clarity in understanding project and technical requirements.
- Interface daily with the engineering team to ensure compliance to all technical specifications and drawings for selected scopes.
- Review documentation received from contractor (material specification, method statements, inspection and test plans, drawings, test results, other technical documentation, etc.) for implementation and compliance.
- Attend construction meetings as required.
- Ensure turnover documentation is complete.
- Work with contractors and suppliers to ensure all audit findings, NCR, etc. are closed.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

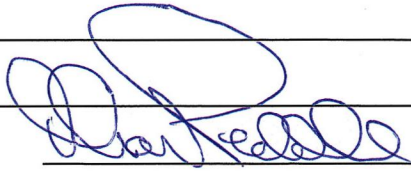



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**ACADEMIC QUALIFICATIONS:**  
 Technical Diploma in Civil Engineering or a related discipline, supplemented by experience in construction QA/QC oversight, monitoring, surveillance and inspection activities for large civil projects, or an equivalent combination of education and experience.

- RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**
- Minimum 10 years of field experience in performing QA/QC oversight, monitoring, surveillance and inspection activities on large construction projects.
  - Experience with implementing quality programs for large capital projects, with a good exposure to civil works.
  - Experience with civil works, specifically bulk excavation, including site investigation, overburden and rock excavation, backfilling, compaction, piling, road construction, concrete pouring, construction of cofferdams, rock filled dams and sediment ponds, rock bolting, rock dowels, welded wire mesh, shotcrete, etc.
  - Experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, turbine and generator and balance of plant considered an asset.
  - Experience in execution of inspection and test plans.
  - Previous experience with auditing construction QA programs.
  - Working knowledge of incident investigation / root cause analysis.

- JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**
- Good knowledge of civil engineering principles, standards and regulations relating to construction, inspection and safety standards.
  - Strong technical and communication skills to effectively interact with contractor, consultant and owner teams.
  - Must be a team player but maintain the ability to work independently.
  - Strong knowledge of Quality Management principles and ISO 9001 standard.
  - Demonstrated commitment to Quality Assurance issues.
  - Basic understanding of Microsoft Word and Excel is preferred.
  - Incumbent must be willing to work at site.

<p><b>PREPARED BY:</b> <u></u></p>	<p><b>APPROVED BY:</b> <u></u></p>
<p><b>DATE:</b> <u>27-Feb-2014</u></p>	<p><b>DATE:</b> <u>27 FEB 2014</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Laboratory Supervisor	<b>POSITION NO.:</b> Qual.3.018	<b>DATE PREPARED:</b> 6    NOV    2013		
<b>DEPARTMENT:</b> MFG Quality Assurance	<b>LOCATION :</b> Muskrat Falls			
<b>DIRECTION EXERCISED AND AUTHORITY:</b> <p>This position will have direct reports. The Work involves planning and directing the Laboratory Services at site to perform materials testing services, monitoring and assuring that the services provided address the stake holders needs and conform to the established budget. This position will interface with engineering, construction and contractor groups.</p>				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <p>Reporting to the Quality Assurance Lead – MF Site, the Laboratory Supervisor will manage and supervise the Laboratory Services team and the Muskrat Falls site materials testing laboratory.</p>				
<b>PURPOSE AND SUMMARY OF SCOPE:</b> <p>Working within the Quality Assurance Team, the <b>Laboratory Supervisor</b> is responsible to:</p> <ul style="list-style-type: none"> <li>• Participate in the establishment of and responsible to control the annual budget for the laboratory operations including the Contract for the provision of Laboratory Services support;</li> <li>• Provide direction for the Contractors laboratory staff related to project efficiency; Quality Control and Quality Assurance; Health and Safety; Environmental Stewardship and in accordance with the Project's general goals and objectives;</li> <li>• Manage resource planning to ensure sufficient trained manpower and equipment is in-place to fully address the project testing requirements;</li> <li>• Act as a critical interface between Contractor(s) and Primary Laboratory at Muskrat Falls, with respect to coordination of all laboratory testing, inspection and subsequent test results;</li> <li>• Implement and participate in QA/QC oversight, monitoring, surveillance and inspection programs and activities for concrete, material and soils testing and inspection activities at Muskrat Falls; and</li> <li>• Ensure Primary Laboratory Services Contractor's QA/QC programs are implemented and effective.</li> </ul>				



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The following is being executed as a contract scope of work:

- Participate in stakeholder meetings to establish Construction Project's Quality Assurance objectives for the materials testing services;
- Management of the laboratory services Contract budget and other costs associated with those services to meet or exceed budget expectations;
- Monitor QC/QA performance of the laboratory Services Contractor to verify that all stakeholders' needs are addressed;
- Provide oversight to Laboratory Services Contractor on matters of Information Management (Document Control).
- Participate in Laboratory Services Contractor driven continuous improvement efforts;
- Monitor Health and Safety performance and report to Company's H&S group including participation Health and safety meetings;
- Review reports of materials testing prepared by laboratory services contractor with Contractor's senior laboratory personnel and advise Construction Management and Engineering of trends or anomalies which indicate a non-conformance of the materials with the construction specifications;
- Coordinate between Contractor(s) and Primary Laboratory Services Contractor, inspection and testing of concrete, compaction testing, aggregates, materials and soils produced at Muskrat Falls;
- Ensure QHSE plans, standards, procedures, processes and checklists for inspecting and testing of concrete, materials and soils at Muskrat Falls;
- Ensure Contractor's concrete mix design(s) are submitted to the Primary Laboratory Contractor for testing and approval;
- Ensure concrete batch plant inspection and testing is coordinated between contractor and laboratory;
- Ensure Laboratory Services Contractor implementation and maintenance of laboratory accreditation;
- Ensure Primary Laboratory Contractor documentation and resolution of non-conformance, corrective action and preventative action;
- Ensure full compliance with technical specifications, drawings and any special supplier installation procedures as defined in contractors and inspection and test plans;
- Perform monitoring, surveillance and inspection of concrete, aggregate, material and soils used to support the following work (bulk excavation, site infrastructure, dams and spillway, reservoir, intake, powerhouse);
- Ensure contractors' quality programs and controls are fully implemented and effective through review and acceptance of contractors' quality documentation (including inspection and test plans, procedures, quality records, final documentation, etc.);
- Attend construction meetings as required;
- Ensure turnover documentation is complete;
- Approve time and materials requests for contractor and associated time and material reports for contractor;
- Review and endorse all laboratory service contractor payment certificates and invoices; and
- Work with contractors and suppliers to ensure all audit findings and NCR's, etc. are closed.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



## SCOPE / ROLE DESCRIPTION



### ACADEMIC QUALIFICATIONS:

- Technical Diploma or Bachelor's Degree in Civil Engineering or a related discipline, supplemented by experience in construction QA/QC oversight, monitoring, surveillance and inspection activities for large civil projects, with focus on concrete, material and soils testing and compliance.
- Registration with the Association of Engineering Technicians and Technologists of Newfoundland and Labrador (AETTNL) is desirable.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- Minimum of 10 years of progressively responsible experience in laboratory testing related to large civil projects including field experience in performing QA/QC oversight, monitoring, surveillance and inspection activities on large construction projects;
- Considerable experience in concrete testing including roller compacted concrete (RCC), materials and soils testing and inspection including experience in a coordination capacity;
- Experience in engineering projects development and techniques, administration of contracts as well as budget preparation and cost control;
- Experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, turbine and generator and balance of plant considered an asset;
- Knowledge of the construction materials standards and approved testing methodologies established by the Canadian Standards Association (CSA), Canadian Council of Independent Laboratories (CCIL) and other standards organizations;
- Knowledge of civil engineering principles, standards and regulations relating to construction, inspection and safety standards including Quality Control and Quality Assurance procedures, Canadian Standards Association CSA A283 certification and Quality Management principles and ISO 9001 standard;
- Knowledge of engineering theory, principles and practices as they relate to materials testing, applications and manufacture;
- Knowledge of the operation of a Materials Laboratory to provide quality control of materials used for large civil projects;
- Ability to supervise technicians involved in the testing of infrastructure materials, product evaluation or failure evaluation;
- Ability to establish and maintain effective relationships with project stakeholders including the Laboratory Services Contractor;
- Candidate must have strong technical and communication skills to effectively interact with Contractor, Laboratory Contractor and owner teams;
- Must be a team player but maintain the ability to work independently;
- Demonstrated commitment to Quality Assurance issues;
- Basic understanding of Microsoft Word and Excel;
- Ability to maintain effective working relationships; and
- Internal Quality Auditing Certification would be an asset.





	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Incumbent must be willing to work at site.
- The incumbent will work primarily at the Muskrat Falls site. It is anticipated that while working in construction environments the incumbent may be exposed to environments that are dirty, noisy, and potentially hazardous.

<p><b>PREPARED BY:</b></p>	<p><u>Mark Peddle</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Robert Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>29-July-2015</u></p>	<p><b>DATE:</b></p>	<p><u>29-July-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Laboratory Services Supervisor	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b> 11    Sep    2014		
<b>DEPARTMENT:</b> Quality Management	<b>LOCATION :</b> Muskrat Falls Site, Labrador			
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  Working with the Laboratory Services Manager and contractors at Muskrat Falls, the incumbent to assist the Laboratory Services Manager with coordinating and monitoring all field and laboratory inspection, sampling and testing of concrete, materials and soils used at Muskrat Falls. This position will have laboratory technicians as direct reports when Laboratory Services Manager is on rotation.				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  Reporting to the Laboratory Services Manager, direction and guidance will be provided, however the incumbent should be capable of functioning with a limited level of supervision. This position will interface with engineering and construction groups.				
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  Working within the Muskrat Falls Laboratory Team, the <b>Laboratory Services Supervisor</b> will: <ul style="list-style-type: none"> <li>• Interface between Contractor(s) and Site Laboratory with respect to coordination of all laboratory testing, inspection and subsequent test results;</li> <li>• Participate in QA/QC oversight, monitoring, surveillance and inspection programs and activities for concrete, material and soils testing and inspection activities at Muskrat Falls;</li> <li>• Ensure Site Laboratory Services QA/QC programs are implemented and effective.</li> </ul>				


**SCOPE / ROLE DESCRIPTION**

**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:**

- Act as Laboratory Services Manager when Laboratory Services Manager is on rotation
- Assist the Laboratory Services Manager with coordination between Contractor(s) and Site Laboratory Services, inspection and testing of concrete, compaction testing, aggregates, materials and soils produced at Muskrat Falls;
- Assist the Laboratory Services Manager in providing training and assigning laboratory and field tasks to laboratory technicians.
- Assist the Laboratory Services Manager in ensuring the compliance of the Site laboratory with OH&S requirements.
- Ensure QHSE plans, standards, procedures, processes and checklists for inspecting and testing of concrete, materials and soils at Muskrat Falls.
- Assist with ensuring material compliance with technical specifications, drawings and any special supplier installation procedures as defined in contractors and inspection and test plans
- Perform monitoring, surveillance and inspection of concrete, aggregate, material and soils used to support all Muskrat Falls site work (powerhouse, spillway, dams, etc.);
- Interface with the engineering and construction teams to ensure compliance of all materials testing to all technical specifications and drawings for selected scopes;
- Maintain test records in Company's database
- Attend construction meetings as required;
- Monitor QC/QA performance of laboratory technicians to verify that all stakeholders' needs are addressed
- Ensure Contractor's concrete mix design(s) are approved prior to use
- Ensure concrete batch plant inspection and testing is coordinated between contractor and laboratory.
- Ensure Laboratory accreditation is maintained
- Approve time sheets for laboratory technicians

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

- Technical Diploma in Civil Engineering or a related discipline, supplemented by experience in construction QA/QC oversight, monitoring, surveillance and inspection activities for large civil projects, with focus on concrete, material and soils testing and compliance.
- Registration with the Association of Engineering Technicians and Technologists of Newfoundland and Labrador (AETTNL), or equivalent, is desirable.





**SCOPE / ROLE DESCRIPTION**



**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Minimum 7 years of materials laboratory testing including field experience in performing testing on concrete, aggregate, soils, etc. on large construction projects.
- Knowledge of the construction materials standards and approved testing methodologies established by the Canadian Standards Association (CSA), Canadian Council of Independent Laboratories (CCIL) and other standards organizations.
- Considerable experience in concrete testing including roller compacted concrete (RCC), materials and soils testing and inspection including experience in a coordination capacity.
- Knowledge of the operation of a Materials testing Laboratory, providing quality control of materials used on large civil projects
- Knowledgeable of Portland cement concrete and its components (aggregates and cement),
- Experience with civil works, including site investigation, backfilling, compaction, piling, road construction, concrete pouring, construction of cofferdams, rock filled dams and sediment ponds, rock bolting, rock dowels, welded wire mesh, shotcrete, etc.
- Good knowledge of civil engineering principles, standards and regulations relating to hydroelectric projects, specifically intake, powerhouse, spillway and transition dams
- Demonstrated commitment to Quality Assurance issues.
- Internal Quality Auditing Certification would be an asset.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Incumbent must be willing to work at Muskrat Falls construction site on a rotational basis.
- It is anticipated that while working in construction environments the incumbent may be exposed to environments that are dirty, noisy, and potentially hazardous.
- Ability to coordinate testing requirements between contractor(s) and the Laboratory
- Candidate must have strong technical and communication skills to effectively interact with Contractor and owner teams;
- Must be a team player but maintain the ability to work independently;
- Demonstrated commitment to Quality Assurance issues;
- Basic understanding of Microsoft Word and Excel is required; and
- Incumbent must be willing to work at site.
- Maintaining effective working relationships.

PREPARED BY: Mark Peddle

APPROVED BY: 

DATE: 11.09.2014

DATE: 11 SEP 2014

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Lead Surveyor – Muskrat Falls Site	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		19	Dec	2014

<b>DEPARTMENT:</b> Quality Assurance	<b>LOCATION :</b> Muskrat Falls - Labrador
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**DIRECTION EXERCISED AND AUTHORITY:**

The incumbent will work closely with the Owners quality, construction management and engineering teams to develop and implement oversight, monitoring and surveillance programs for all owner and contractor survey activities at Muskrat Falls and ensure continual and effective implementation of these programs. General direction and guidance will be provided. The position is rotational.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the Quality Assurance Lead – Muskrat Falls Generation, candidate should be capable of functioning with a limited level of supervision. The incumbent shall maintain a day to day working relationship with the Muskrat Falls site construction management and engineering teams. Incumbent to interface with LCP land surveying team as needed.

**PURPOSE AND SUMMARY OF SCOPE:**

Develop and implement oversight, monitoring and surveillance programs for all owner and contractor surveying activities. To verify and assure satisfactory quality performance and effective implementation of all Muskrat Falls surveying programs and ensure that all survey activities meet technical specification and Owner requirements.



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:**

- Ensure Contractor’s survey plans are developed and implemented, including adherence to Survey Engineering Standards, Accuracies and methods of survey.
- Ensure contractors prepare detailed procedures for all survey activities, including calibration of survey equipment. The procedures shall describe all aspects of the survey activities including planning of operations, calibration, description and operation of all systems, checklists, survey works, processing of data and reporting.
- Ensure that all Contractors survey equipment required is registered and acceptable for use. Contractor’s survey equipment includes but not limited to: GPS survey grade instrumentation and software, total station and automatic data logging instrumentation including relevant software, automatic laser guided topographic scanning instrumentation and associated software, etc.
- Ensure all contractors have competent survey equipment and personnel necessary to complete their Work.
- Ensure contractor's survey equipment and systems are well maintained, calibrated and tested and utilize current technology.
- Responsible for oversight, monitoring and surveillance of all survey activities performed by site Contractors for accuracy, completeness and compliance to specified requirements.
- Review various survey markers (theoretical lines, pay lines and penalty lines) set by site contractors for quantity measurements.
- Ensure contractor survey conformance to technical specification
- Maintain and periodically check the primary control points and document report any disturbance or errors
- Monitor all site contractor’s works, through identification of witness and hold points on Inspection and Test Plans.
- Identify any errors, problems or potential problems that may result in delays or non- acceptance of works, or jeopardize another contractor’s work. Document any non-conformances.
- Review of the contractor’s electronic data, survey reports, field logbook entries; “As-built” survey mark-ups on drawings and Contractor’s records.
- Witness and review contractor’s surveyor work for installation of mechanical equipment and generation systems, including dimensional control survey services for checking the installation of these systems.
- Witness and review contractor establishment of a secondary survey control into localized construction zones
- Ensure all contractors plan and perform the survey and measurements activities in an optimal manner and in accordance with their agreements
- Witness and ensure contractor shall carry out pre-installation surveys of the Worksite(s).
- Ensure contractor submits the results of the pre-installation survey(s) to Engineer for review and Acceptance.
- Witness and ensure contractor performs as-built survey of the Work.

“Individual shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness.”

"Individual shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

- Bachelor Degree or Technical Diploma in Survey Engineering or Science is preferred;
- Minimum post-secondary graduation from a recognized technical program or a related discipline, supplemented by additional training in Quality Assurance / Quality Control and direct experience related to survey work on large construction projects.



**SCOPE / ROLE DESCRIPTION**



**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Must have a minimum of 20 years of experience as a Lead Surveyor or Survey Engineer
- Requires experience working on large civil construction mega projects;
- Must be experienced with all types of survey equipment and systems
- Previous experience with auditing survey QA programs;
- Experience working in a team environment; and
- Working knowledge of incident investigation / root cause analysis.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Self-starter, who identifies priority tasks, puts plans in place to complete, and delivers;
- Strong interpersonal and communication skills to effectively interact with a variety of personnel, and other both internal and external;
- Thrives to be an active team player, but can effectively work independently;
- Proven skills in effectively managing multiple tasks, often under pressure and within time constraints;
- Advanced written and verbal communication skills required to effectively interact with a variety of site teams;
- Knowledge of Quality Management principles and ISO 9001 standard;
- Ability to develop processes and articulate within the project organization;
- Demonstrated commitment and leadership to Quality Assurance issues;
- Ability to quickly assimilate new data, including highly technical information;
- Strong ability to use Microsoft applications such as word, excel, outlook, power point, etc.

PREPARED BY: Mark Peddle

APPROVED BY: David Green

DATE: 19.12.2014

19-Dec-2014

DATE:

19.12.2014



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Deputy Lead Surveyor	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b> 16    MAR    2015		
<b>DEPARTMENT:</b> Quality Assurance Team – Muskrat Falls	<b>LOCATION :</b> Muskrat Falls Site			
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  Under the general direction of the Lead Surveyor, the <i>Deputy Lead Surveyor</i> will work closely with the Owner’s quality, construction management and site engineering teams to aid in the implementation of oversight, monitoring and surveillance programs for all Owner and contractor survey activities at Muskrat Falls and ensure continual and effective implementation of these programs.				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  Reporting to the Lead Surveyor				
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  Aid in implementation of oversight, monitoring and surveillance programs for all Owner and contractor surveying activities. To verify and assure satisfactory quality performance and effective implementation of all Muskrat Falls surveying programs and ensure that all survey activities meet technical specification and Owner requirements,				

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:**

(Note: the following is being executed as a contract scope of work):

The duties and job functions of the **Deputy Lead Surveyor** shall include, but are not limited to, the following:

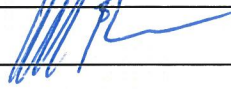
- Ensure contractors’ survey plans are developed and implemented, including adherence to Survey Engineering Standards, accuracies and methods of survey;
- Ensure contractors prepare detailed procedures for all survey activities, including calibration of survey equipment, description and operation of all systems, checklists, survey work, processing of data and reporting;
- Ensure contractors’ survey equipment and systems are well maintained, calibrated and tested, and utilize current technology;
- Responsible, in conjunction with the Lead Surveyor, for oversight, monitoring and surveillance of all survey activities performed by site contractors for accuracy, completeness and compliance to specified requirements.
- Maintain and periodically check the primary control points, and check secondary control points established by contractors;
- Review various survey markers (theoretical lines, pay lines and penalty lines) set by site contractors for quantity measurements.
- Monitor all site contractors’ works through identification of witness and hold points on Inspection and Test Plans.
- Identify any errors, problems or potential problems that may result in delays or non-acceptance of works, or jeopardize another contractor’s work. Document any non-conformances.
- Review of the contractors’ electronic data, survey reports, field logbook entries, “As-Built” survey mark-ups on drawings, and contractors’ records.
- Witness and review contractors’ survey work for installation of mechanical equipment and generation systems including dimensional control survey services for checking the installation of these systems;
- Witness and ensure contractor carries out pre-installation surveys of the worksite(s);
- Ensure contractors submits results of pre-installation survey(s) to Engineer for review and acceptance;
- Perform spot checks on electronic layout files using AutoCAD (and any other required tools) to verify compliance with Engineer’s drawings and models, and/or to establish independent layout check files.
- Participate in survey audits.

“Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness.”

“Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures.”

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Technical Diploma in Survey Engineering is preferred</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• 5 to 10 years of experience on civil construction projects in a survey capacity;</li> <li>• Experienced with survey equipment and systems normally utilized in heavy civil and mechanical construction;</li> <li>• Experience in performing survey-related QA/QC oversight, monitoring, and surveillance activities on civil construction projects.</li> <li>• Ability to read and interpret drawings, specifications, codes and standards.</li> <li>• Experience with construction of large hydroelectric projects considered an asset.</li> <li>• Previous experience with auditing survey QA programs considered an asset.</li> <li>• AutoCAD experience.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values;</li> <li>• Strong interpersonal skills and the ability to interact with all stakeholders;</li> <li>• Must demonstrate accountability and ownership for the assigned work area;</li> <li>• Solid knowledge of survey engineering principles, standards and regulations relating to construction;</li> <li>• Good communication skills;</li> <li>• Self-starter who identifies priority tasks and puts plans in place to complete;</li> <li>• Must be a team player but maintain the ability to work independently;</li> <li>• Demonstrated understanding of Quality Assurance principles;</li> <li>• Good AutoCAD use capability.</li> </ul>

<b>PREPARED BY:</b> <u>Ron Power</u>	<b>APPROVED BY:</b> <u>Ron Power</u> 
<b>DATE:</b> <u>16-Mar-2015</u>	<b>DATE:</b> <u>16-Mar-2015</u>



# Environment

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>Environmental Lead – Muskrat Falls Site</b>	<b>POSITION No.:</b> <b>ENRC.2.004</b>	<b>DATE PREPARED:</b> <b>06 Jul 2015</b>
<b>DEPARTMENT:</b> <b>MFG Environment and Regulatory Compliance</b>	<b>LOCATION :</b> <b>Muskrat Falls Site</b>	
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <p>Under the authority of the MFG Environmental Engineering Lead the Environmental Lead - MF Site will supervise environmental monitors and carry out field inspection and monitoring activities as appropriate during construction of the Muskrat Falls Generation Project. This position will assist in the successful implementation of the Project's Environmental Program during construction</p> <p>In fulfilling this mandate, the Environmental Lead – MF Site is expected to work closely with the Environmental Engineering Lead and liaise closely with the MF Site Construction Management Team and Functional Managers to implement, monitor and control the functional applications and fulfilment of requirements during the construction of the Muskrat Falls Generation Project.</p> <p>This position will have direct reports to cover functional applications at MF Site and the North Spur site.</p>		
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  <p>Reporting to the Environmental Engineering Lead - MF Generation the Environmental Lead – MF Site is expected to interact extensively with the MFG Project Delivery Team, Construction and Area Construction Managers, Package Engineers, Site Manager and Contractors.</p> <p>The Environmental Lead – MF Site will be expected to work in a team environment as well as independently with direction from the Environmental Engineering Lead – MF Generation.</p>		
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  <p>This position will be responsible for ensuring that on-site inspection and monitoring of construction activity is undertaken in accordance with Project Environmental documentation, conditions of approval and the pertinent legislation and regulations.</p>		



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Environmental Lead – MF Site shall include, but are not limited to, the following:

- Ensure construction activities abide by established environmental plans which include: Regulatory Compliance Plan, Waste Management Plan, Environmental Management Plan, Environmental Protection Plan, Master Spill Response Plan, Rehabilitation Plan, and any additional plans and procedures prepared.
- Ensure that contractors have the required environmental plans and personnel in place before the start of activities to which the plans refer.
- Carry out monitoring and inspections to assess adherence to environmental regulations and conditions of approvals and ensure mitigation measures are functioning as specified.
- When required, complete sampling of various media in the field, carry-out proper laboratory submission procedures and interpret analytical results against applicable regulatory criteria.
- Complete and oversee the completion of site Environmental Site Inspections and incident Report forms.
- Provide updates as required to the Environmental Engineering Lead and Site Construction Management Team.
- Attend meetings with contractors as appropriate.
- Ensure that pre and post site conditions are properly documented through photographs and reports.

*"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."*

*"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."*



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>University or Diploma in engineering or Environmental Studies or an equivalent combination of education, training and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <p>A minimum 10 years of experience in environmental management and regulatory compliance.</p> <ul style="list-style-type: none"> <li>• Well-rounded management skills.</li> <li>• Excellent leadership and communication skills.</li> <li>• Able to do hands-on monitoring work.</li> <li>• Excellent written and verbal communication skills (English).</li> <li>• Experience working with (or for) large national and international construction contractors.</li> <li>• Adaptability to perform in demanding work environments.</li> <li>• Develop programs and objectives to meet general objectives outlined by the Component.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Demonstrated awareness and sensitivity to safety, health and environmental issues.</li> <li>• Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task.</li> <li>• Possess strong interpersonal skills with the ability to interact and communicate with team members.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Demonstrate a willingness to adhere to Nalcor’s vision and values.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative and supportive manner with stakeholders.</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>

<p><b>PREPARED BY:</b> <u>Lyndsay Haynes</u></p>	<p><b>APPROVED BY:</b> <u>Robert Woolgar</u></p>
<p><b>DATE:</b> <u>29-July-2015</u></p>	<p><b>DATE:</b> <u>29-July-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>Environmental Monitor – Muskrat Falls Site</b>	<b>POSITION No.:</b> <b>MFGN.1.041</b>	<b>DATE PREPARED:</b> <b>29 JUL 2015</b>
<b>DEPARTMENT:</b> <b>MFG Environment and Regulatory Compliance</b>	<b>LOCATION :</b> <b>Muskrat Falls Site</b>	
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <p>Under the authority of the Environmental Manager - MF Site the Environmental Monitor will be responsible for providing on-site inspection and monitoring of construction activity in accordance with the Project's Environmental Program.</p> <p>This position will not have direct reports and will cover functional applications at MF Site and the North Spur site.</p>		
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  <p>Reporting to the Environmental Manager – MF Site and in consultation with the Environmental Engineering Lead – MF Generation and liaises with the Site Construction Management Team.</p> <p>The Environmental Monitor – MF Site will be expected to work in a team environment as well as independently with direction from the Environmental Manager – MF Site.</p>		
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  <p>This position will be responsible to carry-out field inspection and monitoring activities during construction of the Muskrat Falls Generation Project (including the North Spur). The position will assist in the successful implementation of the Project's Environmental Management Program during construction.</p>		



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

This position will be responsible for providing on-site inspection and monitoring of construction activity in accordance with the Project's Environmental Program. Duties of the position include but are not limited to:

- Ensure construction activities abide by established environmental plans which include: Regulatory Compliance Plan, Waste Management Plan, Environmental Management Plan, Environmental Protection Plan, Master Spill Response Plan, Rehabilitation Plan, and any additional plans and procedures prepared.
- Carry out monitoring and inspections to assess adherence to environmental regulations and conditions of approvals and ensure mitigation measures are functioning as specified.
- When required, complete sampling of various media in the field, carry-out proper laboratory submission procedures and interpret analytical results against applicable regulatory criteria.
- Regular inspections of site works and completion of standard Environmental Site Inspection Forms.
- Provide daily updates, as required, to the Environmental Manager – MF Site and Site Construction Management Team.
- Complete and oversee the completion of site Environmental Site Inspections and incident Report forms.

*"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."*

*"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."*

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Environmental Technologist Diploma or equivalent experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <p>A minimum 3-5 years of experience in environmental management and regulatory compliance.</p> <ul style="list-style-type: none"> <li>• Well-rounded management skills.</li> <li>• Excellent leadership and communication skills.</li> <li>• Able to do hands-on monitoring work.</li> <li>• Excellent written and verbal communication skills (English).</li> <li>• Experience working with (or for) large national and international construction contractors.</li> <li>• Adaptability to perform in demanding work environments.</li> <li>• Develop programs and objectives to meet general objectives outlined by the Component.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Demonstrated awareness and sensitivity to safety, health and environmental issues.</li> <li>• Be an active member in a highly dynamic team environment that has tight deadlines, high pressure and visibility, requiring accuracy, initiative and ability to multi-task.</li> <li>• Possess strong interpersonal skills with the ability to interact and communicate with team members.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Demonstrate a willingness to adhere to Nalcor’s vision and values.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative and supportive manner with stakeholders.</li> <li>• Ability to work 14/7 or 20/8 shift rotation in a site based environment.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><u>Lyndsay Haynes</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Robert Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>29-July-2015</u></p>	<p><b>DATE:</b></p>	<p><u>29-July-2015</u></p>

# Health & Safety

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Site Health, Safety, Security and Emergency Response Lead	<b>POSITION NO.:</b> HSSE.2.001	<b>DATE PREPARED:</b> 29      Jul      2015		
<b>DEPARTMENT:</b> MFG Health and Safety	<b>LOCATION :</b> Muskrat Falls Site			

**DIRECTION EXERCISED AND AUTHORITY:**

Reporting to the Health and Safety Lead – MF Generation, this position will provide project level health and safety expertise, management and support (as required) during construction of the Muskrat Falls Generation Project (not including North Spur). The successful candidate will be responsible to support field operations pertaining to the implementation, oversight and maintenance of the Health and Safety Management System and regulatory compliance at the site level within the broader framework of Nalcor Energy’s guiding policies and principles.

The Site Health, Safety, Security and Emergency Response Lead is expected to incorporate industry best practices and strive for world-class performance in Health and Safety execution and full support of all construction site related initiatives. The Site Health, Safety, Security and Emergency Response Lead will periodically monitor operations and activities at all construction sites to ensure that all such activities are fully compliant within established policies, procedures and plans and advise the Health and Safety Lead – MF Generation, Project Health, Safety, Security and Emergency Response Manager and Muskrat Falls Generation Project Manager any exceptions noted.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reports directly to the Health and Safety Lead - Muskrat Falls Generation with technical support from Nalcor Energy – Lower Churchill Project (NE-LCP) Health, Safety, Security and Emergency Response Manager.

**PURPOSE AND SUMMARY OF SCOPE:**

Working within the LCP parameters, this position is required to review and monitor the application, the development, implementation and maintenance of a project-specific H&S management system within the existing Integrated Management System framework at Muskrat Falls construction sites and any associated work activities. This position will ensure a strategic alignment is in place at the field level with respect to LCP Project Management system’s policies, goals and guiding principles.

The Site Health, Safety, Security and Emergency Response Lead shall assist field management and personnel with fostering a culture in support of a “Zero Incident Mindset”, whereby all accidents are considered to be preventable, by working with LCP site management, personnel and its contractors to strive for Zero harm to personnel, material and non-material assets. The Site Health, Safety, Security and Emergency Response Manager will reinforce and foster a belief that sound H&S performance and best practice are fundamental to meeting the project’s overall objectives and success criteria.





## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

- Provide effective management of and direction to Site Safety, Health, Security and Emergency Response Personnel at the Muskrat Falls Site. Responsible for establishing and setting direction for the Site Team and monitoring progress periodically;
- Routinely monitor the implementation and maintenance of the NE-LCP H&S management system with respect to field level compliance at all working and planned construction sites at Muskrat Falls Site with local statutory and corporate requirements through support within the H&S organization, processes, procedures and tools;
- Provide support and guidance to Health, Safety, Security and Emergency Response Managers and Advisors, as well as field personnel to achieve total regulatory compliance in all facets of construction;
- Coordinate with the Emergency Response and Security Advisor to monitor the functionality and overall quality of the site Emergency Response function at all site levels, including the periodic observation and monitoring of site drills to evaluate NE-LCP Emergency Management Capability and document, compile and provide an assessment of actions taken in an actual response. Mitigating actions, where identified, must be assigned to key individuals and tracked to completion;
- Monitor H&S performance of all construction activities at the Muskrat Falls sites within the LCP to ensure consistency and continuity. Identify gaps and identify effective solutions for mitigating these. These solutions must be effectively documented, communicated to and coordinated with construction site workforce, including contractors. Any gaps or significant breaches in performance must be communicated to the contractor verbally and in writing and periodically monitored to a point where corrections have been implemented/undertaken;
- Coordinate and Advise the Site Training Coordinator and Health and Safety Advisors with execution of the NE-LCP Health and Safety Training at the site level;
- Periodically review Site Medical Services (clinic, vehicles, personnel, equipment and supplies) for overall capability, completeness, compliance and functionality along with the Site Medical Supervisor. Ascertain action/activities/materials for any gaps noted;
- Lead and/or participate in site Risk Assessments, as warranted and ensure that all identified mitigating measures are fully implemented;
- Provide assistance and support in the compliance assessment and completion of Federal and Provincial OHS orders, issuances and variance applications, as warranted/required;
- Provide input into Muskrat Falls Site contractor's construction safety execution plans, health and safety management systems, emergency response plans and safe work practices;
- Periodically review H&S performance metrics, as well as trending analyses, including all leading and lagging indicators to ascertain key focus areas for achievement of safety performance excellence;
- Review Health and Safety reporting from the site for completeness and maintain a current awareness of site activities and issues;
- Assist the Muskrat Falls Site Training Coordinator and Health and Safety Coordinator with the development and/or delivery of in-house Health and Safety Presentations as and when warranted/required;
- Provide assistance and direction for the conduct of a formal incident investigation / root cause analysis, as required. Review incident investigation reports for accuracy and completeness;
- Ensure any and all Lessons Learned from and Health, Safety, Security and Emergency Response Perspectives are captured and reflected in ongoing work as appropriate in order to deliver upon the continuous improvement mindset;
- Coordinate, assist and participate, as warranted, in periodic audits of LCP and Contractor work activities at the various construction sites to ensure overall compliance with the NE-LCP H&S management system (policies, standards, safe work practices and safe work procedures) and issue formal auditing reports. Communicate any significant issues pertaining to Health, Safety, Security and Emergency Response to the NE-LCP Project Health, Safety, Security and Emergency Response Manager.

	<b>SCOPE / ROLE DESCRIPTION</b>	
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"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

- University graduation with a Bachelor degree in a Science or Engineering related discipline, supplemented by additional training in Health and Safety Management, or an equivalent combination of education and experience;
- Certified Auditor training in ISO 9001 or ISO 14001 or ISO 18001 are desirable;
- CRSP, CSP or equivalent designation or experience is an asset.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Minimum of 15 to 20 years' experience developing, implementing Health, Safety, Security and Emergency Response plans/programs for significant construction projects;
- Significant experience with contractors, in particular those involved in the construction of mega projects within a union work force environment;
- Candidate should have loss prevention experience and working knowledge in areas such as: process safety management, safety management system development and implementation, incident/injury prevention, safety in plant designs, hazard identification, qualitative and quantitative risk analysis, consequence modeling, safe operating procedures and standards, behavioral safety programs, and incident investigation;
- Experience working with contractors to ensure their health and Safety Systems Application meets or exceeds client's minimum requirements;
- Proficient in conducting H&S Management System Auditing;
- Detailed knowledge of Health and Safety Regulatory Requirements and Construction Industry Best Practices;
- Competent in conducting and/or supporting risk assessments on site.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Demonstrated safety leadership;
- Strong interpersonal and communication skills to effectively interact with a variety of personnel, and other industry participants, both internal and external;
- Ability to arrive at multiple conventional and creative solutions to address unsafe conditions, procedures and/or practices;
- Demonstrated commitment to the support of health and Safety Initiatives and issues;
- Strong organizational, analytical and decision-making skills;
- Must possess a thorough knowledge of relevant Legislation and Regulations e.g. OH&S Act, Canada Labour Code, Workplace Health, Safety and Compensation Act, as well as the application of each to the Office and worksite;
- Strong technical competence in Construction Safety Best Practices and Procedures;
- Experienced working in and around heavy construction field conditions;
- Ability to conduct effective H&S training in an office or construction site setting;
- Strong written/verbal communication and analytical skills.

<b>PREPARED BY:</b>	<u>Glen O'Neill</u>	<b>APPROVED BY:</b>	<u>Robert Woolgar</u>
<b>DATE:</b>	<u>29-Jul-2015</u>	<b>DATE:</b>	<u>29-Jul-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Deputy Site Health, Safety, Security and Emergency Response Lead	<b>POSITION NO.:</b> HSSE.2.004	<b>DATE PREPARED:</b> 29    Jul    2015		
<b>DEPARTMENT:</b> MFG Health and Safety	<b>LOCATION :</b> Muskrat Falls Site			

**DIRECTION EXERCISED AND AUTHORITY:**

Reporting to the Site Health, Safety, Security and Emergency Response Lead this position will provide project level health and safety expertise, management and support (as required) during construction of the Muskrat Falls Generation Project (not including North Spur). The successful candidate will be responsible to support field operations pertaining to the implementation, oversight and maintenance of the Health and Safety Management System and regulatory compliance at the site level within the broader framework of Nalcor Energy’s guiding policies and principles.

The Deputy Site Health, Safety, Security and Emergency Response Lead is expected to incorporate industry best practices and strive for world-class performance in Health and Safety execution and full support of all construction site related initiatives. The Site Health and Safety Lead will periodically monitor operations and activities at all construction sites to ensure that all such activities are fully compliant within established policies, procedures and plans and advise the Site Health, Safety, Security and Emergency Response Lead, Health and Safety Lead – MF Generation, Project Health, Safety, Security and Emergency Response Manager and Muskrat Falls Generation Project Manager any exceptions noted.

This is a support position to the Site Health, Safety, Security and Emergency Response Lead with similar duties and roles as determined by the Site Health, Safety, Security and Emergency Response Lead.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reports directly to the Site Health, Safety, Security and Emergency Response Lead.

**PURPOSE AND SUMMARY OF SCOPE:**

The Deputy Site Health, Safety, Security and Emergency Response Lead shall assist field management and personnel with fostering a culture in support of a “Zero Incident Mindset”, whereby all accidents are considered to be preventable, by working with LCP site management, personnel and its contractors to strive for Zero harm to personnel, material and non-material assets. The Site Health and Safety Lead will reinforce and foster a belief that sound H&S performance and best practice are fundamental to meeting the project’s overall objectives and success criteria.



## SCOPE / ROLE DESCRIPTION

**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:**

- Provide effective management of and direction to Site Health and Safety Personnel at the Muskrat Falls Site. Responsible for establishing and setting direction for the Site Team and monitoring progress periodically;
- Routinely monitor the implementation and maintenance of the NE-LCP H&S management system with respect to field level compliance at all working and planned construction sites at Muskrat Falls Site with local statutory and corporate requirements through support within the H&S organization, processes, procedures and tools;
- Provide support and guidance to Health and Safety Advisors, as well as field personnel to achieve total regulatory compliance in all facets of construction;
- Monitor H&S performance of all construction activities at the Muskrat Falls sites within the LCP to ensure consistency and continuity. Identify gaps and identify effective solutions for mitigating these. These solutions must be effectively documented, communicated to and coordinated with construction site workforce, including contractors. Any gaps or significant breaches in performance must be communicated to the contractor verbally and in writing and periodically monitored to a point where corrections have been implemented/undertaken;
- Periodically review Site Medical Services (clinic, vehicles, personnel, equipment and supplies) for overall capability, completeness, compliance and functionality along with the Site Medical Supervisor. Ascertain action/activities/materials for any gaps noted;
- Lead and/or participate in site Risk Assessments, as warranted and ensure that all identified mitigating measures are fully implemented;
- Provide assistance and support in the compliance assessment and completion of Federal and Provincial OHS orders, issuances and variance applications, as warranted/required;
- Provide input into Muskrat Falls Site contractor's construction safety execution plans, health and safety management systems, emergency response plans and safe work practices;
- Periodically review H&S performance metrics, as well as trending analyses, including all leading and lagging indicators to ascertain key focus areas for achievement of safety performance excellence;
- Review Health and Safety reporting from the site for completeness and maintain a current awareness of site activities and issues;
- Provide assistance and direction for the conduct of a formal incident investigation / root cause analysis, as required. Review incident investigation reports for accuracy and completeness;
- Ensure any and all Lessons Learned from and Health, Safety, Security and Emergency Response Perspectives are captured and reflected in ongoing work as appropriate in order to deliver upon the continuous improvement mindset;
- Coordinate, assist and participate, as warranted, in periodic audits of LCP and Contractor work activities at the various construction sites to ensure overall compliance with the NE-LCP H&S management system (policies, standards, safe work practices and safe work procedures) and issue formal auditing reports.

	<b>SCOPE / ROLE DESCRIPTION</b>	
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"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

- University graduation with a Bachelor degree in a Science or Engineering related discipline, supplemented by additional training in Health and Safety Management, or an equivalent combination of education and experience;
- Certified Auditor training in ISO 9001 or ISO 14001 or ISO 18001 are desirable;
- CRSP, CSP or equivalent designation or experience is an asset.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Minimum of 15 to 20 years' experience developing, implementing Health and Safety plans/programs for significant construction projects;
- Significant experience with contractors, in particular those involved in the construction of mega projects within a union work force environment;
- Candidate should have loss prevention experience and working knowledge in areas such as: process safety management, safety management system development and implementation, incident/injury prevention, safety in plant designs, hazard identification, qualitative and quantitative risk analysis, consequence modeling, safe operating procedures and standards, behavioral safety programs, and incident investigation;
- Experience working with contractors to ensure their health and Safety Systems Application meets or exceeds client's minimum requirements;
- Proficient in conducting H&S Management System Auditing;
- Detailed knowledge of Health and Safety Regulatory Requirements and Construction Industry Best Practices;
- Competent in conducting and/or supporting risk assessments on site.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Demonstrated safety leadership;
- Strong interpersonal and communication skills to effectively interact with a variety of personnel, and other industry participants, both internal and external;
- Ability to arrive at multiple conventional and creative solutions to address unsafe conditions, procedures and/or practices;
- Demonstrated commitment to the support of health and Safety Initiatives and issues;
- Strong organizational, analytical and decision-making skills;
- Must possess a thorough knowledge of relevant Legislation and Regulations e.g. OH&S Act, Canada Labour Code, Workplace Health, Safety and Compensation Act, as well as the application of each to the Office and worksite;
- Strong technical competence in Construction Safety Best Practices and Procedures;
- Experienced working in and around heavy construction field conditions;
- Ability to conduct effective H&S training in an office or construction site setting;
- Strong written/verbal communication and analytical skills.

<b>PREPARED BY:</b>	<u>Glen O'Neill</u>	<b>APPROVED BY:</b>	<u>Robert Woolgar</u>
<b>DATE:</b>	<u>29-Jul-2015</u>	<b>DATE:</b>	<u>29-Jul-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> EMERGENCY RESPONSE AND SECURITY COORDINATOR	<b>POSITION NO.:</b> HSSE.2.002	<b>DATE PREPARED:</b> 29    JULY    2015		
<b>DEPARTMENT:</b> MFG Health and Safety	<b>LOCATION :</b> Muskrat Falls			

**DIRECTION EXERCISED AND AUTHORITY:**

Lead deployment of the Emergency Response Team under the direction of the Muskrat Falls Site Health, Safety, Security, and Emergency Response Coordinator and the Muskrat Falls Site Manager (with support from the site EOC).

Manage functional interfaces with LCP Emergency Operations, Coordination and Response Organization and Plan to establish/maintain full alignment with Contractor Emergency Response Plans for site. Forward and communicate project Security and Emergency Response strategies, training and processes at the field level with LCP site personnel and during site functional interface.

Ensure the functionality and overall quality of the site Emergency Response function is maintained at all times. Coordinate participation of site drills to evaluate LCMC Emergency Management Capability and document actions/lessons learned in an actual response. Assign mitigation actions to key individuals and track to completion.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Direct reporting to the Site Health, Safety, Security and Emergency Response (HSS&ER) Manager, with:

- Daily communication with the Muskrat Falls site leadership team.
- Field communications with all site contractors.
- Engagement in and working with project health and safety teams to define path forward for Security and Emergency Response planning/measures throughout the project.

**PURPOSE AND SUMMARY OF SCOPE:**

To provide a leadership resource in Security and Emergency Response planning and development for the Lower Churchill Project. Identifying security and emergency response gaps and deficiencies with LCP and contractor security and emergency response plans. Identify training and equipment requirements for security and emergency response for the LCMC.



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:</b> The following is being executed as a contract scope of work.</p> <ul style="list-style-type: none"> <li>• Identify required resources and equipment to support an effective emergency response and recovery program.</li> <li>• Oversee on-site security and emergency response capability including management of programs, operations, external representation and transition planning.</li> <li>• Oversee quality and consistency of security and emergency response operations throughout the project and periodically assess to ensure/enhance project security and emergency response effectiveness and quality.</li> <li>• Advocate with and/or advise peer agencies, local government and other stakeholders to influence responses to promote delivery of mutual support, as and where required</li> <li>• Lead deployment of the Emergency Response Team under the direction of the Muskrat Falls Site Manager (with support from Site EOC).</li> <li>• Lead , oversee and coordinate both security and emergency response needs assessments periodically at the Muskrat Falls site, as well as all LCP components.</li> <li>• Manage functional interfaces with LCP Emergency Response Organization and Plan to establish full alignment with contractor Emergency Response Plans. Forward and communicate project Security and Emergency Response strategies, training and process at the field level with LCP site personnel and during site functional interface.</li> <li>• Ensure the functionality and overall quality of the site Emergency Response function is maintained at all times. Coordinate the participation in site drills to evaluate LCP Emergency Management Capability and document actions in an actual response. Assign mitigating actions to key personnel and track actions to completion.</li> <li>• Assist the Project and Site Health, Safety, Security and Emergency Response Managers with execution of the LCP Emergency Response Training Program as the site level and within the various components of the Project.</li> <li>• Periodically review Site Medical Services (clinic, vehicles, personnel, equipment and supplies) for overall capability, completeness, functionality, as well as its integral relationship to Emergency Response.</li> <li>• Periodically review Site Security Services to ensure:             <ol style="list-style-type: none"> <li>① Security protocols are fully implemented and executed</li> <li>② Security personnel are fully aware of associated Emergency Response procedures/protocols</li> <li>③ Security personnel are performing as per the Site Security Plan and Emergency Response Plan and appropriate resources/equipment are maintained at a high level at all times.</li> </ol> </li> <li>• Ensure contractors have fully implemented their respective Emergency Response Plans and that they are conducting periodic drills and audits. Document any discrepancies and communicate these at the site level and with Project and Site HSSER Managers.</li> <li>• Communicate (along with the Component Health and Safety Lead) with Newfoundland Fire and Emergency Services (FES) as well as Forestry Department to ensure clear understanding of applicable requirements, communicate capabilities and conditions and advise of any conditions/activities requiring support.</li> <li>• Participate in site/component Security and emergency Response Risk assessments and ensure all mitigation measures are fully implemented.</li> <li>• Periodically review LCP Project Emergency Response Plan, Health and Safety Management Plan and security Plan to ensure that they accurately reflect current Project operations, strategies and approach. Communicate identified gaps to the LCP HSSER Manager for required action, as appropriate.</li> <li>• Periodically ascertain any threats through communications with local and provincial authorities that may have an adverse impact on Project/Site Operations, Security and/or Emergency Response Capabilities</li> <li>• Ensure any and all Lessons Learned from drills and actual Security/Emergency Response Events are captured and reflected in ongoing activities as appropriate in an effort to deliver upon continuous improvement mindset.</li> </ul> <p>"Incumbent shall work in accordance with the Health and Safety Policies &amp; Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."</p> <p>"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."</p>
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	<b>SCOPE / ROLE DESCRIPTION</b>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>UNIVERSITY GRADUATION WITH A BACHELOR DEGREE IN A RELATED DISCIPLINE, SUPPLEMENTED BY ADDITIONAL TRAINING IN SECURITY AND EMERGENCY RESPONSE PRACTICES, PROCEDURES AND STRATEGIES OR AN EQUIVALENT COMBINATION OF EDUCATION AND EXPERIENCE.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Minimum of 7 to 10 years of experience with Security and emergency Response related operations/activities/events.</li> <li>• Significant experience with Incident Command Systems and application of these.</li> <li>• Candidate should have a positive background and experience in Leadership roles, particularly those which have required him/her to work in high pressure environments.</li> <li>• Experience working in an remote site environment</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Demonstrated health and safety leadership and safety oriented.</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values.</li> <li>• Strong interpersonal and communication skills and the ability to effectively interact with a variety of personnel including project team members as well as internal and external personnel/agencies.</li> <li>• Ability to arrive at multiple conventional and creative solutions to address security and emergency response issues.</li> <li>• Strong organizational, analytical and decision-making skills</li> <li>• Experienced working in and around heavy construction field conditions</li> <li>• Ability to conduct effective training in the areas of Security and Emergency Response measures.</li> <li>• Strong written and verbal communication skills.</li> <li>• Willing to spend short rotations, as required at the Muskrat Falls construction site.</li> <li>• Demonstrated skills in effectively managing multiple tasks, often under pressure and within time constraints</li> </ul>

<b>PREPARED BY:</b>	<u>Glen O’Neill</u>	<b>APPROVED BY:</b>	<u>Robert Woolgar</u>
<b>DATE:</b>	<u>29-Jul-2015</u>	<b>DATE:</b>	<u>29-Jul-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>HEALTH AND SAFETY (H&amp;S) ADVISOR — MUSKRAT FALLS</b>	<b>POSITION NO.:</b> <b>Various</b>	<b>DATE PREPARED:</b> 29    JUL    2015		
<b>DEPARTMENT:</b> <b>MFG Health and Safety</b>	<b>LOCATION :</b> <b>Muskrat Falls</b>			

**DIRECTION EXERCISED AND AUTHORITY:**

Reporting to the **HSS&ER Manager – Muskrat Falls** this position will provide site H&S oversight and support (as required) for the construction of the Muskrat Falls Generation Project.

Working closely with the field-based Area Construction Management Team, the successful candidates will be responsible to ensure the implementation and maintenance of the Health and Safety Management System at the site level within the broader framework of Lower Churchill Management Corporations’ guiding policies and principles.

Working within the Muskrat Falls team, the H&S Advisor is expected to incorporate industry best practices and strive for world-class performance in Health and Safety execution and full support of all construction site related initiatives.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting directly to the HSS&ER Manager – Muskrat Falls who, along with the Site Manager and Construction Manager, will establish general priorities / focus areas as well as engagement approaches for the incumbent using the Project’s risk criticality assessment methodology. Day-to-day activities will be directed to areas requiring immediate focus and support by Area Construction Manager to address field issues.

**PURPOSE AND SUMMARY OF SCOPE:**

As part of the LCP Project Delivery Team, the **Health and Safety Advisor – Muskrat Falls**, working within the Project’s execution framework, is responsible for implementing the LCP’s Health, Safety, Security and Emergency Response strategies, management plan and tools for the Muskrat Falls construction scope for work undertaken by various contractors on the Muskrat Falls site.

The Health and Safety Advisor shall (at the workplace level) foster a culture in support of a "Zero Incident MindSet" whereby all accidents are considered to be preventable, by working with contractors to strive for Zero harm to personnel, material and non-material assets.

The Health and Safety Advisor will reinforce and foster at the site, a belief that sound H&S performance and best practice are fundamental to meeting the project's overall objectives and success criteria.



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Health and Safety Advisor – Muskrat Falls shall include, but are not limited to, the following:

- Support the implementation of the Project H&S Management System to reduce and / or eliminate incidents that may result in injuries, illnesses, deaths, equipment damage, environmental damage, and financial losses.
- Conduct routine audits of Contractor work activities to ensure overall compliance with the LCP H&S management system including policies, standards, safe work practices and safe work procedures, as well as applicable Provincial and Federal Regulations and Standards and issue formal auditing reports;
- Work with the construction management team in a coaching and guiding role to increase field level safety knowledge and presence.
- Conduct regular audits for compliance with the contractor's H&S Plan and Management System (policies, standards, regulatory requirements, safe work practices and safe work procedures) and issue audit reports. This includes monitoring and close-out of report recommendations and informing Area Construction / Site Manager whenever revisions to the contractor's activities are required.
- Maintain a good working knowledge of current applicable regulations, codes and industry best practices, and act as a resource to project management and construction line management.
- Ensure contractors are adhering to local statutory requirements (e.g. OHS Act and Regulations) and other provincial requirements with respect to health and safety. Provide assistance and support in the compliance assessment and completion of Federal and Provincial OHS orders, issuances and variance applications, as warranted/required.
- Support the implementation of LCP Safety Incentive Program within the Component.
- Coordinate the participation in site drills to evaluate LCP Emergency Management capability and document actions in an actual response. Mitigating actions must be assigned to key individuals and tracked to completion.
- Monitor H&S performance at each work site, site workforce, including contractors.
- Routinely monitor the application of drug and alcohol testing, including chain of custody and controls, pre-access and post incident testing ensuring all testing is in full compliance with the LCP Drug and Alcohol Policy.
- Periodically review work site security management activities to ensure compliance with approved security management plans.
- Ensure contractors at the work face have fully implemented all aspects of their Health and Safety Plan and Emergency Response Plan utilizing periodic audits.
- Participate in site Risk Assessments and ensure that all mitigation measures are fully implemented.
- Ensure all construction activities at each worksite are carried out safely.
- Assist with presenting H&S orientation programs for all LCMC team personnel and contractors prior to arrival at any worksite.
- Provide input into contractor's construction safety programs and safe work practices.
- Review H&S performance metrics, including all leading and lagging indicators.
- Generate Health and Safety reporting from the site, including input into the Site Daily report as appropriate.
- Assist with the conduct of a formal incident investigation / root cause analysis. Review contractor's incident investigation report for accuracy and completeness.
- Ensure any and all lessons learned are captured and reflected in ongoing work as appropriate in order to deliver upon the continuous improvement mind-set.
- Ensure records, files, and reports are maintained at the Site location until the end of the Project.



## SCOPE / ROLE DESCRIPTION



"Incumbent shall work in accordance with LCP Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the LCP Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

### ACADEMIC QUALIFICATIONS:

- University graduate with a bachelor degree in science or engineering related discipline, supplemented by additional training in health and safety management. An equivalent combination of education and work related experience will be accepted.
- Certified Auditor training in ISO 14001 or ISO 18001 are desirable.
- CRSP, CSP or equivalent designation is an asset.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- Minimum of 5 to 7 years of experience as an H&S Advisor implementing Health and Safety programs for significant construction projects.
- Candidate should have loss prevention experience and working knowledge in areas such as: working around energized systems, incident/injury prevention, hazard identification, qualitative and quantitative risk analysis, behavioural safety programs, and incident investigation.
- Experience working with contractors to ensure their Health and Safety Systems Application meets or exceeds client's minimum requirements.
- Good working knowledge of H&S Management System Auditing.
- Detailed knowledge of Health and Safety Regulatory Requirements and Construction Industry Best Practices.
- Competent in conducting and/or supporting risk assessments on site.

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Demonstrated safety leadership;</li> <li>• Strong interpersonal and communication skills to effectively interact with a variety of personnel, and other industry participants, both internal and external;</li> <li>• Ability to arrive at multiple conventional and creative solutions to address unsafe conditions, procedures and/or practices;</li> <li>• Must possess a thorough knowledge of relevant Legislation and Regulations e.g. OH&amp;S Act, , Workplace Health, Safety and Compensation Act, as well as the application of each to the worksite;</li> <li>• Strong technical competence in Construction Safety Best Practices and Procedures;</li> <li>• Ability to conduct effective H&amp;S training in a construction site setting;</li> <li>• Strong written/verbal communication skills;</li> <li>• Competent in the use of PowerPoint and remote communications software</li> <li>• Experience with living and working in remote camp and site locations and addressing associated issues;</li> <li>• Work rotational shifts in support of line construction activity</li> <li>• Must possess a valid driver’s license and be eligible to drive in Newfoundland and Canada;</li> <li>• Demonstrate a willingness to adhere to Nalcor Energy’s vision and values.</li> </ul>
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<p><b>PREPARED BY:</b></p>	<p><u>Glen O’Neill</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Robert Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>29-Jul- 2015</u></p>	<p><b>DATE:</b></p>	<p><u>29-Jul-2015</u></p>



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>HEALTH AND SAFETY (H&amp;S) ADVISOR — NORTH SPUR</b>	<b>POSITION NO.:</b> <b>Various</b>	<b>DATE PREPARED:</b>		
		29	JUL	2015
<b>DEPARTMENT:</b> <b>MFG Health and Safety</b>	<b>LOCATION :</b> <b>North Spur</b>			

**DIRECTION EXERCISED AND AUTHORITY:**

Reporting to the **Health and Safety Lead – MF Generation** (and support provided by HSS&ER Manager – Muskrat Falls, as required) this position will provide site H&S oversight and support (as required) for the construction of the North Spur Stabilization Works.

Working closely with the field-based Area Construction Management Team, the successful candidate will be responsible to ensure the implementation and maintenance of the Health and Safety Management System at the site level within the broader framework of Lower Churchill Management Corporations’ guiding policies and principles.

Working within the Muskrat Falls team, the H&S Advisor is expected to incorporate industry best practices and strive for world-class performance in Health and Safety execution and full support of all construction site related initiatives.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting directly to the Health and Safety Lead – MF Generation who along with the Area Construction Manager, will establish general priorities / focus areas as well as engagement approaches for the incumbent using the Project’s risk criticality assessment methodology. Day-to-day activities will be directed to areas requiring immediate focus and support by Area Construction Manager to address field issues.

**PURPOSE AND SUMMARY OF SCOPE:**

As part of the LCP Project Delivery Team, the **Health and Safety Advisor – North Spur**, working within the Project’s execution framework, is responsible for implementing the LCP’s Health, Safety, Security and Emergency Response strategies, management plan and tools for the North Spur construction scope for work undertaken by the North Spur Contractor.

The Health and Safety Advisor shall (at the workplace level) foster a culture in support of a "Zero Incident MindSet" whereby all accidents are considered to be preventable, by working with contractors to strive for Zero harm to personnel, material and non-material assets.

The Health and Safety Advisor will reinforce and foster at the site, a belief that sound H&S performance and best practice are fundamental to meeting the project's overall objectives and success criteria.



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The duties and job functions of the Health and Safety Advisor – North Spur shall include, but are not limited to, the following:

- Support the implementation of the Project H&S Management System to reduce and / or eliminate incidents that may result in injuries, illnesses, deaths, equipment damage, environmental damage, and financial losses.
- Conduct routine audits of Contractor work activities to ensure overall compliance with the LCP H&S management system including policies, standards, safe work practices and safe work procedures, as well as applicable Provincial and Federal Regulations and Standards and issue formal auditing reports;
- Work with the construction management team in a coaching and guiding role to increase field level safety knowledge and presence.
- Conduct regular audits for compliance with the contractor's H&S Plan and Management System (policies, standards, regulatory requirements, safe work practices and safe work procedures) and issue audit reports. This includes monitoring and close-out of report recommendations and informing Area Construction Manager whenever revisions to the contractor's activities are required.
- Maintain a good working knowledge of current applicable regulations, codes and industry best practices, and act as a resource to project management and construction line management.
- Ensure contractors are adhering to local statutory requirements (e.g. OHS Act and Regulations) and other provincial requirements with respect to health and safety. Provide assistance and support in the compliance assessment and completion of Federal and Provincial OHS orders, issuances and variance applications, as warranted/required.
- Support the implementation of LCP Safety Incentive Program within the Component.
- Coordinate the participation in site drills to evaluate LCP Emergency Management capability and document actions in an actual response. Mitigating actions must be assigned to key individuals and tracked to completion.
- Monitor H&S performance at each work site, site workforce, including contractors.
- Routinely monitor the application of drug and alcohol testing, including chain of custody and controls, pre-access and post incident testing ensuring all testing is in full compliance with the LCP Drug and Alcohol Policy.
- Periodically review work site security management activities to ensure compliance with approved security management plans.
- Ensure contractors at the work face have fully implemented all aspects of their Health and Safety Plan and Emergency Response Plan utilizing periodic audits.
- Participate in site Risk Assessments and ensure that all mitigation measures are fully implemented.
- Ensure all construction activities at each worksite are carried out safely.
- Assist with presenting H&S orientation programs for all LCMC team personnel and contractors prior to arrival at any worksite.
- Provide input into contractor's construction safety programs and safe work practices.
- Review H&S performance metrics, including all leading and lagging indicators.
- Generate Health and Safety reporting from the site, including input into the Site Daily report as appropriate.
- Assist with the conduct of a formal incident investigation / root cause analysis. Review contractor's incident investigation report for accuracy and completeness.
- Ensure any and all lessons learned are captured and reflected in ongoing work as appropriate in order to deliver upon the continuous improvement mind-set.
- Ensure records, files, and reports are maintained at the Site location until the end of the Project.



## SCOPE / ROLE DESCRIPTION



"Incumbent shall work in accordance with LCP Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the LCP Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

### ACADEMIC QUALIFICATIONS:

- University graduate with a bachelor degree in science or engineering related discipline, supplemented by additional training in health and safety management. An equivalent combination of education and work related experience will be accepted.
- Certified Auditor training in ISO 14001 or ISO 18001 are desirable.
- CRSP, CSP or equivalent designation is an asset.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- Minimum of 5 to 7 years of experience as an H&S Advisor implementing Health and Safety programs for significant construction projects.
- Candidate should have loss prevention experience and working knowledge in areas such as: working around energized systems, incident/injury prevention, hazard identification, qualitative and quantitative risk analysis, behavioural safety programs, and incident investigation.
- Experience working with contractors to ensure their Health and Safety Systems Application meets or exceeds client's minimum requirements.
- Good working knowledge of H&S Management System Auditing.
- Detailed knowledge of Health and Safety Regulatory Requirements and Construction Industry Best Practices.
- Competent in conducting and/or supporting risk assessments on site.

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Demonstrated safety leadership;</li> <li>• Strong interpersonal and communication skills to effectively interact with a variety of personnel, and other industry participants, both internal and external;</li> <li>• Ability to arrive at multiple conventional and creative solutions to address unsafe conditions, procedures and/or practices;</li> <li>• Must possess a thorough knowledge of relevant Legislation and Regulations e.g. OH&amp;S Act, , Workplace Health, Safety and Compensation Act, as well as the application of each to the worksite;</li> <li>• Strong technical competence in Construction Safety Best Practices and Procedures;</li> <li>• Ability to conduct effective H&amp;S training in a construction site setting;</li> <li>• Strong written/verbal communication skills;</li> <li>• Competent in the use of PowerPoint and remote communications software</li> <li>• Experience with living and working in remote camp and site locations and addressing associated issues;</li> <li>• Work rotational shifts in support of line construction activity</li> <li>• Must possess a valid driver’s license and be eligible to drive in Newfoundland and Canada;</li> <li>• Demonstrate a willingness to adhere to Nalcor Energy’s vision and values.</li> </ul>
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<b>PREPARED BY:</b>	<u>Glen O’Neill</u>	<b>APPROVED BY:</b>	<u>Robert Woolgar</u>
<b>DATE:</b>	<u>29-Jul- 2015</u>	<b>DATE:</b>	<u>29-Jul-2015</u>

Labour



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Labour Relations Representative	<b>POSITION NO.:</b> Various	<b>DATE PREPARED:</b> 19    MAR    2014		
<b>DEPARTMENT:</b> Business Services	<b>LOCATION:</b> Muskrat Falls/ North Spur Sites			

**DIRECTION EXERCISED AND AUTHORITY:**

The incumbent must exercise personal initiative and judgment in the organization, coordination and day to day activities of significant Labour requirements necessary for the effective operation of the Lower Churchill Project (LCP). This relates to matters at both the St. John`s office as well as at site locations in Labrador (Muskrat Falls and North Spur).

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Receive general direction from the Senior Labour Relations Advisor with LCP. Report to the Senior Labour Relations Advisor, and once orientated should be capable in assisting and managing all day-to-day labour relations functions with minimal direction.

**PURPOSE AND SUMMARY OF SCOPE:**

Accountable to the Senior Labour Relations Advisor, this incumbent has responsibility to assist in the day-to-day labour relations activities of all components of the LCP. The incumbent will assist in the implementation of the Labour Acquisition Plan and will coordinate the activities of other team leads in managing this plan. The incumbent will be the Site Representative for a component of the work covered under the major project Collective Agreement. The incumbent will assist with the implementation and management of all aspects of the labour relations strategies and policies for the LCP during the construction phase and eventual handover to the Owner.





## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The following is being executed as a contract scope of work:

- Assist in the implementation and administration of all the labour relations plans, including specific labour relations standards for the Project and labour Project Agreements;
- Coordinate the management of the Labour Acquisition Plan with other team leads of LCP;
- Assist in the development and implementation of Project standards, procedures and guidelines;
- Assist the Senior Labour Relations Advisor and other Labour Relations Reps in addressing labour relations matters by working with union and management to resolve grievances at an early stage; coordinating and supporting the grievance process; providing analysis and conducting research of legislation and arbitration cases as required; Scheduling and attending various meetings and where appropriate representing the Senior Labour Relations Advisor or other Labour Relations Site Representatives;
- Educate and advise Contractors and supervisors of the terms and conditions of the labour relations plan, associated Project Labour Agreements, and systems in place; and manage report on labour relations issues for the LCP;
- Provide Contractors with appropriate direction and advise to confirm job assignments to trades persons;
- Develop and maintain a constructive relationship with Site Manager, Shop Stewards, and Union Leaders;
- Provide labour relations advice and guidance on LCP job sites as required;
- Appear at grievance and arbitration meetings as required;
- Facilitate Employers' Association meetings as required and act as the LCP Representative;
- Attend at periodic construction management meetings;
- Facilitate as required meetings on labour productivity or labour productivity initiatives;
- Liaison and coordinate all labour matters among Owner, Contractors and Unions; and
- Liaison with appropriate managers, Contractors and suppliers to ensure the Project LR plan are incorporated into all contract documents and processes.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



## SCOPE / ROLE DESCRIPTION



### ACADEMIC QUALIFICATIONS:

Completion of a Bachelor of Business Administration/Commerce with specialization in Labour Relations and/or industrial relations is desirable. A Master's Degree would be a definite asset. An equivalent combination of education and experience may be considered.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- A minimum of 3 years of experience in Labour Relations on major projects.
- Must possess a good working knowledge of computers with appropriate awareness of various corporate applications as necessary. These may include but are not limited to the Microsoft Suite of applications and JD Edwards.
- Demonstrated ability to analyse and resolve complex issues.
- Excellent oral and written communication skills.
- Excellent interpersonal skills.
- Demonstrated high level of integrity, initiative, positive attitude and mutual respect.

### JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:

- Safety oriented.
- Demonstrated willingness to adhere to the Nalcor's vision and core values.
- Must be willing to travel to various site locations in Labrador and across the Island.
- Valid driver's license.
- Strong interpersonal skills and the ability to interact and communicate with other team members having a variety of backgrounds.

PREPARED BY:

David Clark

APPROVED BY:

Robert Woolgar

DATE:

06 February 2015

DATE:

29-July-2015

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>SENIOR INNU LIAISON COORDINATOR</b>	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		24	OCT	2014
<b>DEPARTMENT:</b> <b>BUSINESS SERVICES – HUMAN RESOURCES</b>	<b>LOCATION :</b> <b>MUSKRAT FALLS, LABRADOR</b>			
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  This position will not have direct reports. This position will provide guidance and mentoring to the Innu Liaison Coordinator(s).				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  Work performed under the direction of Site Labour Relations Representative with a reporting structure to the Human Resources Manager.				
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  The Innu Liaison Coordinator (ILC) will serve as a source of advice for Innu workers on the Lower Churchill Project employees who may have questions or be encountering problems in the workplace. The ILC will assist Innu employees with resolving work-related issues, including direction on where and how to obtain required information and/or further assistance or counselling.				



## SCOPE / ROLE DESCRIPTION


**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** (The following is being executed as a contract scope of work.)

The following position shall:

- Provide information or refer Innu employees to appropriate sources to obtain answers to questions regarding the workplace
- Conduct initiatives to enhance Innu employees' understanding of workplace policies and to facilitate their transition to the workplace, including providing information and advice on:
  - LCP Site Handbook
  - Innu cultural leave policy
  - Respectful Workplace Standard
  - Role of Innu Employee Advisory Committee.
- Provide advice to Innu employees on how to obtain assistance to resolve the following types of issues: problems with decision-making, depression, family issues, loneliness, loss and grief, relationship or self-esteem problems, stress and anxiety, anger issues, financial problems, racial or sexual harassment, workplace adaptation problems and co-worker conflict.
- Assist the contractor's HR representative by being present at meetings between the contractor and Innu employees.
- Provide information about the resources, programs and services offered by the following organizations which may address the information and/or problem-solving needs of Innu employees:
  - Nalcor, including the Innu Employment and Training Coordinator
  - Unions and contractors
  - Sheshatshiu Innu First Nation, Mushuau Innu First Nation and Innu Nation
  - Government departments and agencies, the private sector, and community-based organizations
- Liaise with the above organizations to obtain information and represent the interests of Innu employees
- Identify appropriate interventions to assist individual Innu employees, and evaluate the effectiveness of the interventions
- Use empathy and other interpersonal skills.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



## SCOPE / ROLE DESCRIPTION



### ACADEMIC QUALIFICATIONS:

Bachelor's degree in social work, psychology or an equivalent combination of education, training and experience. Training in the following areas would be considered an asset: non-violent crisis intervention; addictions counselling; NECHI training; peer counselling; client assessments.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

A minimum of ten (10) years' experience in the field of social work, counselling or human services. Experience in providing these types of services for Aboriginal people would be considered an asset.

### JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:

- Safety oriented.
- Demonstrated willingness to adhere to the Nalcor's vision and core values.
- Be a member of Innu Nation of Labrador
- Will be headquartered on-site at Muskrat Falls, but may be required to work at other LCP work sites.
- Excellent listening skills
- Be an effective communicator, with excellent written and oral communication skills
- Ability to speak Innu Aimun
- Ability to work with a wide variety of stakeholders, including employers, unions, community resource persons, Innu employees and representatives of the Innu Nation
- Must be willing to work on-site or other Nalcor work locations as required
- Must possess a valid driver's license
- Ability to work shifts in a project environment

PREPARED BY: Chantal McLean

APPROVED BY: Robert Woolgar

DATE: 24 October 2014

DATE: 29-Jul-2015

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>INNU LIAISON COORDINATOR</b>	<b>POSITION NO.:</b> <b>HUMR.1.004</b>	<b>DATE PREPARED:</b> 24    OCT    2014		
<b>DEPARTMENT:</b> <b>BUSINESS SERVICES – HUMAN RESOURCES</b>	<b>LOCATION :</b> <b>MUSKRAT FALLS, LABRADOR</b>			
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  This position will not have direct reports.				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  Work performed under the direction of Site Labour Relations Representative with a reporting structure to the Human Resources Manager.				
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  The Innu Liaison Coordinator will serve as a source of advice for Innu Lower Churchill Project employees who may have questions or be encountering problems in the workplace. The ILC will assist Innu employees with resolving work-related issues, including direction on where and how to obtain required information and/or further assistance or counselling.				





## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

The following position shall:

- Provide information or refer Innu employees to appropriate sources to obtain answers to questions regarding the workplace
- Conduct initiatives to enhance Innu employees' understanding of workplace policies and to facilitate their transition to the workplace, including providing information and advice on:
  - LCP Site Handbook
  - Innu cultural leave policy
  - Respectful Workplace Standard
  - Role of Innu Employee Advisory Committee.
- Provide advice to Innu employees on how to obtain assistance to resolve the following types of issues: problems with decision-making, depression, family issues, loneliness, loss and grief, relationship or self-esteem problems, stress and anxiety, anger issues, financial problems, racial or sexual harassment, workplace adaptation problems and co-worker conflict.
- Assist the contractor's HR representative by being present at meetings between the contractor and Innu employees.
- Provide information about the resources, programs and services offered by the following organizations which may address the information and/or problem-solving needs of Innu employees:
  - Nalcor, including the Innu Employment and Training Coordinator
  - Unions and contractors
  - Sheshatshiu Innu First Nation, Mushuau Innu First Nation and Innu Nation
  - Government departments and agencies, the private sector, and community-based organizations
- Liaise with the above organizations to obtain information and represent the interests of Innu employees
- Identify appropriate interventions to assist individual Innu employees, and evaluate the effectiveness of the interventions
- Use empathy and other interpersonal skills.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



## SCOPE / ROLE DESCRIPTION



### ACADEMIC QUALIFICATIONS:

Bachelor's degree in social work, psychology or an equivalent combination of education, training and experience. Training in the following areas would be considered an asset: non-violent crisis intervention; addictions counselling; NECHI training; peer counselling; client assessments.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

A minimum of two (2) years' experience in the field of social work, counselling or human services. Experience in providing these types of services for Aboriginal people would be considered an asset.

### JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:

- Safety oriented.
- Demonstrated willingness to adhere to the Nalcor's vision and core values.
- Be a member of Innu Nation of Labrador
- Will be headquartered on-site at the Lower Churchill Project
- Excellent listening skills
- Be an effective communicator, with excellent written and oral communication skills
- Ability to speak Innu Aimun
- Ability to work with a wide variety of stakeholders, including employers, unions, community resource persons, Innu employees and representatives of the Innu Nation
- Must be willing to work on-site or other Nalcor work locations as required
- Must possess a valid driver's license
- Ability to work shifts in a project environment

PREPARED BY: Chantal McLean

APPROVED BY: Robert Woolgar

DATE: 24 October 2014

DATE: 29-Jul-2015

# Engineering

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> MF Site - Resident Engineer	<b>POSITION NO.:</b> MFG.3.032	<b>DATE PREPARED:</b>		
		30	Jul	2015
<b>DEPARTMENT:</b> MFG Engineering	<b>LOCATION :</b> Muskrat Falls, Labrador			

**DIRECTION EXERCISED AND AUTHORITY:**

Under the authority of the Engineering Manager – Muskrat Falls Generation, the **Resident Engineer** will provide direction and supervision to the MF Site Engineering team. This position will require liaison with multiple site groups, including procurement, health and safety, environment, Area Construction Managers, and the Construction Manager for the various contracts active at site. This position will also be responsible to facilitate interpretation of NE-LCP policies and procedures in relation to follow-on engineering support conducted in the home office.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the Engineering Manager – Muskrat Falls Generation, the Resident Engineer should be capable of functioning with a limited level of supervision. This position will interface with, and provide support to other construction and engineering groups including Construction Management, Project Controls, Quality Assurance and Surveying.

**PURPOSE AND SUMMARY OF SCOPE:**

As a key member of the Site Team, the incumbent will work in support of the Engineering Manager – Muskrat Falls Generation to facilitate execution of the site engineering at site, and will work closely with Construction Management to ensure design related issues are communicated and understood.



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The following is being executed as a contract scope of work.

The duties and job functions of the **Resident Engineer** shall include, but are not limited to, the following:

- Work with Muskrat Falls Engineering Manager to establish necessary engineering supports for site team.
- Maintain a strong working interface with Area Construction Managers and Construction Manager to keep informed of ongoing site activities, issues, opportunities and risks.
- Member of the Site Emergency Response Team, in accordance to the Project-Wide ERP.
- Proactively identifying and working to resolve any site issues that may impede Project delivery.
- Report all safety and environmental incidents and accidents promptly in accordance with Project procedures.
- Liaise with the Home Engineering Office and interpret drawings and specifications;
- Studies drawings and specifications issued to the field and reports to Muskrat Falls Engineering Manager any ambiguities, interferences or errors found on drawings, specifications and assigned work;
- Assist in monitoring of Site Information Management;
- Participate in Review of Contractors Quality Control program;
- Assist QA in review of Contractors material certification, surveying and materials testing;
- Assist Home Office in preparation and conveyance of Engineering Change Notices;
- Work with QA, Construction and home office for timely resolution of disposition of construction NCRs.
- Participate in review of Contractor's submittals;
- Provide technical support to construction activities at the worksite;
- Advises Construction Manager and contractors on the interpretation of construction drawings and specifications and advises on additional details or clarifications required from project design;
- Reviews proposals for field changes and substitutions and recommends action to the Engineering Manager for approval;
- Obtains and supplies field representatives and QA/QC inspectors with applicable codes, manufacturer's instructions, vendor drawings and installation procedures required for field work;
- Work with team of Shift Engineers and Construction Monitors in problem recognition and resolution;
- Performs any other duties that may be requested by Muskrat Falls Engineering Manager; and
- Act as Engineering's representative on the construction site.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**ACADEMIC QUALIFICATIONS:**  
 Bachelor’s Degree in Engineering, P. Eng. registration in Province of Newfoundland and Labrador; 10 years of experience in a similar role is preferred.

- RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**
- Extensive experience working on large capital construction projects in a senior site management role.
  - Proven experience managing engineering resources at a construction site would be an asset.
  - Strong background in construction management.
  - Experience in stakeholder management and communications would be considered an asset.
  - Excellent and demonstrated safety and environmental record with aboriginal, diversity and cultural awareness.
  - Knowledge of the construction materials standards and approved testing methodologies established by the Canadian Standards Association (CSA) and other standards organizations;
  - Experience in engineering projects development and techniques;
  - Experience in administration of contracts;
  - Experience in budget preparation and cost control;
  - Working knowledge of Quality Control and Quality Assurance procedures;
  - Ability to read and interpret construction drawings;
  - Experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, turbine and generator and balance of plant considered an asset;
  - Good knowledge of engineering principles, standards and regulations relating to construction, inspection and safety standards;
  - Demonstrated experience with identification of construction problems and resolution through design change notice;
  - Demonstrated ability to verbally and graphically convey problem resolution to engineering and construction parties.

- JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**
- Minimum of 10 years of progressive responsibility work experience related to large civil projects;
  - Demonstrate a willingness to adhere to Nalcor Energy’s vision and values.
  - Willingness to work on a management-style turnaround arrangement.
  - Ensure the compliance of Health and Safety, Environmental, Regulatory, Benefits, Social/Community.
  - Fostering relationships with local stakeholders.
  - Candidate must have strong technical and communication skills to effectively interact with Contractor and owner teams;
  - Must be a team player but maintain the ability to work independently;
  - Basic understanding of Microsoft Word and Excel is preferred; and
  - Incumbent must be willing to work at site.

<p><b>PREPARED BY:</b></p>	<p><u>Greg Snyder</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Robert Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>30 Jul 2015</u></p>	<p><b>DATE:</b></p>	<p><u>4-August-2015</u></p>



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> MF Site Lead Civil/Structural Engineer	<b>POSITION NO.:</b> MFGN.3.033	<b>DATE PREPARED:</b>		
		30	JUL	2015
<b>DEPARTMENT:</b> MFG - Engineering	<b>LOCATION :</b> Muskrat Falls, Labrador			

**DIRECTION EXERCISED AND AUTHORITY:**

This position may have direct reports. The Work involves planning, directing and executing Civil/Structural Engineering in the field to support the construction of the Muskrat Falls Generating Station. As required, the successful candidate will interface and coordinate activities with Home Office engineering, field construction supervision, field Quality Assurance and field subcontractors (surveying and materials testing). Additionally, will support Field Procurement, Completions, and Commissioning.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the MF Site Resident Engineer, the MF Site Lead Civil/Structural Engineer should be capable of functioning with a limited level of supervision. This position will interface with, and provide support to other construction and engineering groups including Construction Management, Project Controls, Quality Assurance and Surveying.

**PURPOSE AND SUMMARY OF SCOPE:**

The Lead Civil/Structural Engineer will work closely with the Resident Engineer, Design Engineering, Construction Management and Contractors to contribute to and coordinate design information to support the project. This includes interpreting the technical requirements of the design documents to provide clear understanding of requirements and processing of Site Queries, Concession Requests and Change Requests including Engineering Change Notices.



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The following is being executed as a contract scope of work.

The duties and job functions of the Lead Civil/Structural Engineer shall include, but are not limited to, the following:

- Liaise with the Home Engineering Office and interpret drawings and specifications;
- Studies drawings and specifications issued to the field and reports to MF Site Resident Engineer any ambiguities, interferences or errors found on drawings, specifications and assigned work;
- Participate in Review of Contractors Quality Control program;
- Assist QA in review of Contractors material certification;
- Assist Home Office in preparation and conveyance of Engineering Change Notices;
- Participate in review of Contractor's submittals;
- Provide technical support to construction activities at the worksite, while expediting design changes for timely response to Site Queries;
- Advises Resident Engineer on the interpretation of structural concrete and structural steel drawings and specifications and advises on additional details or clarifications required from project design;
- Reviews proposals for field changes and substitutions and recommends action to the Engineering Manager and Resident Engineer for approval;
- Obtains and supplies field representatives and QA/QC inspectors with applicable codes, manufacturer's instructions, vendor drawings and installation procedures required for field work;
- Assists material control group when requested in inspection of equipment and material;
- Work with team of Shift Engineers and Construction Monitors in problem recognition and resolution;
- Performs any other duties that may be requested by MF Site Resident Engineer and Muskrat Falls Engineering Manager; and
- Act as Engineering's representative on the construction site, when the MF Site Resident Engineer delegates authority.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



## SCOPE / ROLE DESCRIPTION



### ACADEMIC QUALIFICATIONS:

Bachelor's Degree in Civil/Structural Engineering, P. Eng. registration in Province of Newfoundland and Labrador; 10 years of experience in a similar role is preferred.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- Knowledge of engineering theory, principles and practices as they relate to structure design;
- Knowledge of the construction materials standards and approved testing methodologies established by the Canadian Standards Association (CSA) and other standards organizations;
- Experience in engineering projects development and techniques;
- Experience in administration of contracts;
- Experience in budget preparation and cost control;
- Working knowledge of Quality Control and Quality Assurance procedures;
- Ability to read and interpret structural concrete and structural steel drawings;
- Experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, turbine and generator and balance of plant considered an asset;
- Understanding of design practices for temporary supports, formwork and other such structures;
- Experience with reviews of structural drawings identifying problems and resolutions;
- Demonstrated experience with identification of construction problems and resolution through design change notice; and
- Demonstrated ability to verbally and graphically convey problem resolution to engineering and construction parties.

### JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:

- Minimum of 10 years of progressive responsibility work experience related to large civil projects;
- Knowledge of analysis and design of reinforced concrete hydraulic structures;
- Knowledge of analysis and design of steel structures;
- Good knowledge of civil engineering principles, standards and regulations relating to construction, inspection and safety standards;
- Candidate must have strong technical and communication skills to effectively interact with Contractor and owner teams;
- Must be a team player but maintain the ability to work independently;
- Basic understanding of Microsoft Word and Excel is preferred; and
- Incumbent must be willing to work at site.

PREPARED BY:

Greg Snyder

APPROVED BY:

Robert Woolgar

DATE:

30 Jul 2015

DATE:

4-August-2015

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> MF Site - Geologist	<b>POSITION NO.:</b> MFGN.2.020	<b>DATE PREPARED:</b> 30    JUL    2015		
<b>DEPARTMENT:</b> MFG - Engineering	<b>LOCATION :</b> Muskrat Falls, Labrador			
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  This position may have direct reports. The Work involves planning, directing and executing Geological Engineering in the field to support the construction of the Muskrat Falls Generating Station. As required, the successful candidate will interface and coordinate activities with Home Office Engineering, field construction supervision, and field Quality Assurance. Additionally, will support Field Procurement, Completions, and Commissioning.				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  Reporting to the MF Site Resident Engineer, the MF Site Geologist should be capable of functioning with a limited level of supervision. This position will interface with and provide support to other construction and engineering groups including Construction Management, Project Controls, and Quality Assurance.				
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  The MF Site Geologist will work closely with the MF Site Resident Engineer, Design Engineering, Construction Management and Contractors to contribute to and coordinate design information to support the Project. This includes interpreting the technical requirements or the design documents to provide clear understanding of the requirements and processing of Site Queries, Concession Requests and Change Requests including Engineering Change Notices.				



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The following is being executed as a Contract Scope of Work.

The duties and functions of the MF Site Geologist shall include, but are not limited to, the following:

- Studies Drawings and specifications issued to the field and reports to Resident Engineer and Engineering Manager any ambiguities, interferences or errors found on the drawings, specifications and assigned work;
- Inspection and mapping of foundations prior to contractor placing concrete or embankment materials;
- Participate in review of Contractor's Quality Control program;
- Assist QA in review of Contractors material certification, surveying and materials testing;
- Assist Home Office in preparation and conveyance of Engineering Change Notices;
- Provide technical support to construction activities at the worksite;
- Expedite design changes for timely response to Engineering Change Notices;
- Advise Resident Engineer, Construction Manager and contractors on the interpretation of geologic related technical drawings and specifications;
- Advises on additional details or clarifications required from project design;
- Reviews proposals for field changes and substitutions and recommends action to Resident Engineer and Engineering Manager, and Construction Manager for approval;
- Work with Shift Engineers and Construction Monitors in problem recognition and resolution;
- Performs any other duties that may be requested by Resident Engineer;
- Review of contractor's documentation related to geological and geotechnical works;
- Inspection and geological mapping of foundation surfaces of permanent civil structures;
- Suggest foundation treatment to be carried out before placement of concrete and fill, and approval of foundation surface before placement of fill and concrete;
- Inspection of overburden and rockmass excavation and embankment construction activities for recording data of the ground conditions encountered for the foundation of various civil structures including embankment construction;
- Inspection of rock and overburden excavation, and embankment construction areas for the effectivity of the dewatering systems in place and suggest additional requirement if any;
- To provide assistance to the Engineers on ground consolidation and stabilization, support and safety issues;
- To participate in construction and contractual discussions;
- Inspection and recording of data if required during the drilling and grouting of curtain grouting holes and drainage hole construction, installation of rock dowels / anchors and quality / proof tests;
- Inspection and supervision of geotechnical instrumentation during installation and monitoring if and when it is necessary.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



## SCOPE / ROLE DESCRIPTION



### ACADEMIC QUALIFICATIONS:

Bachelor's Degree in Geology or Geological Engineering, P. Eng. or P.Geo. registration in Province of Newfoundland and Labrador; 10 years of experience in a similar role is preferred.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- Knowledge of engineering theory, principals practices as they relate to geological designs;
- Preferably significant geological experience in the hydroelectric engineering consulting sector;
- Site inspection and construction experience with structure foundations for earth and concrete structures;
- Experience with foundation preparation, materials testing, specifications and drawing preparation;
- Interpretation of information from geotechnical field investigations;
- Experience in rock surface mapping and inspection;
- Design experience for cold weather environments an asset;
- Good knowledge of engineering principals, standards and regulations relating to construction, inspection and workplace health and safety
- Working knowledge of Quality Assurance and Quality Control principals and procedures
- Demonstrated experience with identification of construction problems and resolution through change notice
- Demonstrated ability to verbally and graphically convey problem resolution to engineering and construction parties

### JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:

- Strong interpersonal and communication skills to effectively interact with a variety of personnel, and other industry participants, both internal and external
- Proven skills in effectively managing multiple tasks, often under pressure and within time constraints
- Ability to develop processes and articulate within the project organization
- Ability to quickly assimilate new data, including highly technical information
- Strong ability to use Microsoft applications such as word, excel, outlook, power point, etc.
- Demonstrate a willingness to adhere to Nalcor Energy's vision and values
- Willingness to work on a management-style turnaround arrangement
- Must be able to work effectively as a key member of the Project Delivery Team within a multi-functional team environment (matrix style organization structure)
- Excellent leadership and communication skills
- Solution oriented
- Must be able to work in a collaborative / supportive manner with stakeholders
- Safety oriented.



PREPARED BY: Neil Ferguson/Greg Snyder

APPROVED BY: Robert Woolgar

DATE: 15 August 2014/30 Jul 2015

DATE: 4-August-2015



	<b>SCOPE / ROLE DESCRIPTION</b>							
<b>POSITION:</b> MF Site Lead Mechanical Engineer	<b>POSITION NO.:</b> <b>MFGN.3.033</b>	<table border="1"> <tr> <th colspan="3"><b>DATE PREPARED:</b></th> </tr> <tr> <td>12</td> <td>NOV</td> <td>2015</td> </tr> </table>	<b>DATE PREPARED:</b>			12	NOV	2015
<b>DATE PREPARED:</b>								
12	NOV	2015						
<b>DEPARTMENT:</b> MFG - Engineering	<b>LOCATION :</b> Muskrat Falls, Labrador							
<b>DIRECTION EXERCISED AND AUTHORITY:</b> <p>This position may have direct reports. The Work involves planning, directing and executing Mechanical Engineering in the field to support the construction of the Muskrat Falls Generating Station. As required, the successful candidate will interface and coordinate activities with Home Office engineering, field construction supervision, field Quality Assurance and field subcontractors (surveying and materials testing). Additionally, will support Field Procurement, Completions, and Commissioning.</p>								
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <p>Reporting to the MF Site Resident Engineer, the MF Site Lead Mechanical Engineer should be capable of functioning with a limited level of supervision. This position will interface with, and provide support to other construction and engineering groups including Construction Management, Project Controls, Quality Assurance and Surveying.</p>								
<b>PURPOSE AND SUMMARY OF SCOPE:</b> <p>The Lead Mechanical Engineer will work closely with the MF Resident Engineer, Design Engineering, Construction Management and Contractors to contribute to and coordinate design information to support the project. This includes interpreting the technical requirements of the design documents to provide clear understanding of requirements and processing of Site Queries, Concession Requests and Change Requests including Engineering Change Notices.</p>								



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The following is being executed as a contract scope of work.

The duties and job functions of the Lead Mechanical Engineer shall include, but are not limited to, the following:

- Liaise with the Home Engineering Office and interpret drawings and specifications;
- Studies drawings and specifications issued to the field and reports to MF Site Resident Engineer any ambiguities, interferences or errors found on drawings, specifications and assigned work;
- Participate in Review of Contractors Quality Control program;
- Assist QA in review of Contractors material certification;
- Assist Home Office in preparation and conveyance of Engineering Change Notices;
- Participate in review of Contractor's submittals;
- Provide technical support to construction activities at the worksite, while expediting design changes for timely response to Site Queries;
- Advises Resident Engineer on the interpretation of mechanical IFC drawings and specifications and advises on additional details or clarifications required from project design;
- Reviews proposals for field changes and substitutions and recommends action to the Engineering Manager and Resident Engineer for approval;
- Obtains and supplies field representatives and QA/QC inspectors with applicable codes, manufacturer's instructions, vendor drawings and installation procedures required for field work;
- Assists material control group when requested in inspection of equipment and material;
- Work with team of Shift Engineers and Construction Monitors in problem recognition and resolution;
- Performs any other duties that may be requested by MF Site Resident Engineer and Muskrat Falls Engineering Manager; and
- Act as Engineering's representative on the construction site, when the MF Site Resident Engineer delegates authority.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



## SCOPE / ROLE DESCRIPTION



### ACADEMIC QUALIFICATIONS:

Bachelor's Degree in Mechanical Engineering, P. Eng. registration in Province of Newfoundland and Labrador; 10 years of experience in a similar role is preferred.

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- Knowledge of engineering theory, principles and practices as they relate to design of hydro mechanical and rotating equipment;
- Knowledge of the construction materials standards and approved testing methodologies established by the Canadian American Society of Mechanical Engineers (ASME) and other standards organizations;
- Experience in engineering projects development and techniques;
- Experience in administration of contracts;
- Experience in budget preparation and cost control;
- Working knowledge of Quality Control and Quality Assurance procedures;
- Ability to read and interpret issued for construction (IFC) and shop drawings;
- Experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, gates and hoists, turbine and generator and balance of plant considered an asset;
- Experience with reviews of construction drawings identifying problems and resolutions;
- Demonstrated experience with identification of construction problems and resolution through design change notice; and
- Demonstrated ability to verbally and graphically convey problem resolution to engineering and construction parties.

### JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:

- Minimum of 10 years of progressive responsibility work experience related to large multi-discipline projects;
- Knowledge of analysis and design of hydro mechanical equipment;
- Knowledge of analysis and design of steel components of large water control gates and hoists;
- Good knowledge of engineering principles, standards and regulations relating to construction, inspection and safety standards;
- Candidate must have strong technical and communication skills to effectively interact with Contractor and owner teams;
- Must be a team player but maintain the ability to work independently;
- Basic understanding of Microsoft Word and Excel is preferred; and
- Incumbent must be willing to work at site.

PREPARED BY:

Greg Snyder

APPROVED BY:

Robert Woolgar

DATE:

30 Jul 2015

DATE:

4-August-2015



**SCOPE / ROLE DESCRIPTION**



<b>POSITION:</b> COMPLETIONS COORDINATOR - MECHANICAL	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		5	June	2015

<b>DEPARTMENT:</b> Engineering / Completions	<b>LOCATION :</b> Muskrat Falls, Labrador
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**DIRECTION EXERCISED AND AUTHORITY:**

The work involves planning, directing and executing daily Completions Activities at the Muskrat Falls site with the addition of providing field Mechanical Engineering support during the construction of the Muskrat Falls Generating Station. The incumbent will liaise with the Completions Lead on a regular basis to prioritize Completions objectives while also coordinating activities with Home Office Engineering, field construction supervision, field Quality Assurance and Contractor equivalent personnel to support both the Completions and Mechanical Engineering activities at site.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the **Site Resident Engineer**, with overall accountability to the Home Office Engineering Manager in the capacity of Mechanical Engineer, the incumbent should be capable of functioning with a limited level of supervision and is expected to demonstrate a high degree of personal initiative, sound judgment, technical and project delivery expertise in carrying out duties and responsibilities. In the capacity of Site Completions Coordinator, the incumbent will also have a functional reporting link to the home office Completions Lead. Generally, this position will interface with and provide support to other construction and engineering groups including Construction Management, Project Controls and Quality Assurance.

**PURPOSE AND SUMMARY OF SCOPE:**

In performing the duties of a Mechanical Engineer, the incumbent will work closely with the Site Resident Engineer to contribute to and coordinate design information to support the Project. This includes interpreting the technical requirements or the design documents to provide clear understanding of the requirements and processing of Site Queries, Concession Request, Change Requests and Engineering Change Notices. In the capacity of the Site Completions Coordinator, the incumbent works closely with the Completions Lead to ensure that activities associated with Mechanical Completion, Commissioning and Preservation are coordinated between Company and Contractors in an effective manner and expedited when required.



**SCOPE / ROLE DESCRIPTION**



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:**

The position shall:

- Assist the Site Resident Engineer by participating and overseeing aspects of mechanical engineering activities including: design, specifications and project management;
- Work with the Completions Lead to provide coordination of completion activities related to the Muskrat Falls Generation Project;
- Steward delivery of key project components through Mechanical Completion and Commissioning;
- Coordinate and expedite company and contractor sign-off of all completion certificates;
- Verify and manage the contractors and vendor progress through construction and commissioning;
- Support Contractor with implementation and updating of Project Completion System;
- Monitor contractor execution and reporting of preservation activities;
- Review manufacturers' drawings and technical data to verify conformity with design criteria, technical specifications and standards, codes, practices and operating philosophy;
- Studies Drawings and specifications issued to the field and reports to Site Resident Engineer any ambiguities, inconsistencies, interferences or errors found on the drawings, specifications and assigned work;
- Participate in review of Contractor's Quality Control program;
- Assist QA in review of Contractors material certification;
- Assist in preparation and conveyance of Engineering Change Notices;
- Provide technical support to construction activities at the worksite, while expediting design changes for timely response to Site Queries, Concession Requests and Change Requests;
- Advise Site Resident Engineer, Construction Manager and contractors on the interpretation of mechanical drawings and specifications and advise on additional details or clarifications required from project design;
- Reviews proposals for field changes and substitutions and recommends action to Site Resident Engineer, Engineering Manager, and Construction Manager for approval;
- Work with field engineers in problem recognition and resolution;
- Performs any other duties that may be requested by Site Resident Engineer; and,
- Review of contractor's documentation related to mechanical engineering works.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

Graduation from a recognized university with a Bachelor's Degree in Engineering (Mechanical); eligible for membership in PEGNL.



**SCOPE / ROLE DESCRIPTION**



**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Two (2) to five (5) years in the mechanical field or equivalent combination of experience and education
- Experience with construction, commissioning and start-up of major Civil/Electrical/Mechanical packages for large projects; preferably Hydro/Electric..
- Demonstrated experience with identification of construction problems and resolution
- Demonstrated ability to verbally and graphically convey problem resolution to engineering and construction parties
- Familiarity required with codes and standards applicable with the discipline.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Safety oriented.
- Demonstrated willingness to adhere to the Nacor's vision and core values.
- Strong interpersonal skills and the ability to interact and communicate with other team members.
- Must be able to work effectively as a key member of a project delivery team within a multi-functional team environment.
- The incumbent must exhibit a project execution and project delivery skill set.
- The incumbent must display enthusiasm and initiative.
- This position requires thinking within concepts, principles and broad guidelines towards the project's overall objectives.
- The incumbent must possess excellent analytical skills combined with sound judgment and technical skills and ability to function in an unstructured environment.
- This position requires a proven ability to accept responsibility in a highly technical environment.
- The incumbent will work in a field environment.
- The incumbent is required to work full time in a construction or industrial environments and may be exposed to environments that are dirty, noisy, and potentially hazardous.
- Must be self-motivated with demonstrated sound judgment and decision making skills.
- Strong and effective communicator.
- Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.

PREPARED BY: Wayne Edwards / Greg Snyder

APPROVED BY: 

DATE: \_\_\_\_\_

DATE: 8-Jun-2015



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> North Spur Geotechnical Engineer	<b>POSITION NO.:</b> Various	<b>DATE PREPARED:</b>		
		25	MAR	2014
<b>DEPARTMENT:</b> MFG - Engineering	<b>LOCATION :</b> Muskrat Falls, Labrador			

**DIRECTION EXERCISED AND AUTHORITY:**

The Work involves North Spur stabilization works, planning, directing and executing Geotechnical Engineering in the field to support the construction of the North Spur Stabilization. As required, the successful candidate will interface and coordinate activities with Home Office Engineering, field construction supervision, field Quality Assurance and field subcontractors (surveying and material testing).

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the Muskrat Falls Engineering Manager, the North Spur Geotechnical Engineer should be capable of functioning with a limited level of supervision. This position will interface with and provide support to other North Spur Construction Management Team and work closely with the Area Construction Manager.

**PURPOSE AND SUMMARY OF SCOPE:**

The North Spur Geotechnical Engineer will work closely with Design Engineering, Construction Management and Contractors to contribute to and coordinate design information to support the Project. This includes interpreting the technical requirements or the design documents to provide clear understanding of the requirements and processing of Site Queries, Concession Requests and Change Requests including Engineering Change Notices. The North Spur Geotechnical Engineer has the responsibility to supervise construction works related with earth works and application of geotechnical specifications for the North Spur. Application of observational method and adaptative design will be part of the scope. The North Spur Geotechnical Engineer will maintain interface with home office engineering team for review and approval of any required field changes.



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The following is being executed as a Contract Scope of Work.

The duties and functions of the North Spur Geotechnical Engineer shall include, but are not limited to, the following:

- Liaise with the Home Engineering Office and interpret drawings and specification;
- Studies Drawings and specifications issued to the field and reports to the Muskrat Falls Engineering Manager any ambiguities, interferences or errors found on the drawings, specifications and assigned work;
- Assist QA in review of Contractors material certification, surveying and materials testing;
- Review and assess Owners field Materials Testing;
- Participate in review of Contractor's Quality Control program;
- Assist Home Office in preparation and conveyance of Engineering Change Notices;
- Participate in review of Contractors submittals;
- Provide technical support to construction activities at the worksite;
- Expedite design changes for timely response to Engineering Change Notices;
- Advise Area Construction Manager and contractors on the interpretation of geotechnical drawings and specifications and advises on additional details or clarifications required from project design;
- Reviews proposals for field changes and substitutions and recommends action to the Muskrat Falls Engineering Manager or approval;
- Obtains and supplies field representatives and QA inspectors with applicable codes, manufacturer's instructions, vendor drawings and installation procedures required for field work;
- Assists material control group when requested in inspection of equipment and material;
- Performs any other duties that may be requested by Area Construction Manager; and
- Acts as engineering representative on the Construction Site.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b>                  Bachelor’s Degree in Geotechnical Engineering, P. Eng. registration in Province of Newfoundland and Labrador; 15 years of experience in a similar role is preferred.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• 15 years of related experience in similar role is preferred;</li> <li>• Significant geotechnical experience in the hydroelectric engineering consulting sector is preferred;</li> <li>• Experience interpreting information from geotechnical field investigations;</li> <li>• Demonstrated experience with identification of construction problems and resolution through change notice;</li> <li>• Experience in earth hydroelectric dam construction, Till Placement, Rock foundation preparation, slurry cut off wall, material production, compaction, instrumentation installation etc.</li> <li>• Site inspection and construction experience in large earth structures;</li> <li>• Experience with foundation preparation, materials testing, specifications and drawing preparation;</li> <li>• Design experience for cold weather environments would be considered an asset;</li> <li>• Knowledge of engineering theory, principals practices as they relate to geotechnical designs;</li> <li>• Good knowledge of civil engineering principals, standards and regulations relating to construction, inspection and workplace health and safety;</li> <li>• Working knowledge of Quality Assurance and Quality Control principals and procedures;</li> <li>• Demonstrated ability to verbally and graphically convey problem resolution to engineering and construction parties;</li> <li>• Strong interpersonal and communication skills to effectively interact with a variety of personnel, and other industry participants, both internal and external;</li> <li>• Proven skills in effectively managing multiple tasks, often under pressure and within time constraints;</li> <li>• Ability to develop processes and articulate within the project organization;</li> <li>• Ability to quickly assimilate new data, including highly technical information;</li> <li>• Excellent leadership and communication skills;</li> <li>• Solution oriented;</li> <li>• Must be able to work in a collaborative / supportive manner with stakeholders; and</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Strong ability to use Microsoft applications such as word, excel, outlook, power point, etc.;</li> <li>• Demonstrate a willingness to adhere to Nalcor Energy’s vision and values.</li> <li>• Willingness to work on a management-style turnaround arrangement;</li> <li>• Incumbent must be willing to work at site;</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><u>Greg Snyder</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Robert Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>30 Jul 2015</u></p>	<p><b>DATE:</b></p>	<p><u>4-August-2015</u></p>

# Site Management Team

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>MUSKRAT FALLS GENERATION SITE MANAGER</b>	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		12	AUG	2015
<b>DEPARTMENT:</b> <b>MFG – SITE MANAGEMENT</b>	<b>LOCATION :</b> <b>MUSKRAT FALLS SITE, LABRADOR</b>			

**DIRECTION EXERCISED AND AUTHORITY:**

Under the authority of the Project Manager – Muskrat Falls Generation, the ***Muskrat Falls Generation Site Manager*** will provide direction, supervision and guidance to Site and Electrical Services Team, Training Coordination, and manage the overall Permit to Work at Site for Temporary Infrastructure to ensure the proper organization and controls are in place at Muskrat Falls to manage the Site. This position will also be responsible to work closely with Construction Management, Health and Safety, and Labour to support the operation of a safe, secure, and productive site.

The incumbent will have a level of authority required for day-to-day decision making, including financial approval authority as delegated by the Project Manager – Muskrat Falls Generation, to fulfil the responsibilities of managing the site.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting directly to the Project Manager – Muskrat Falls Generation.

**PURPOSE AND SUMMARY OF SCOPE:**

The incumbent will have the responsibility to ensure a safe work site and manage all aspects of Site Services to ensure the site functions. The role will also include direct support to site labour relations, Innu Liaison, and Health and Safety.



	<b>SCOPE / ROLE DESCRIPTION</b>	
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**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

The ***Muskrat Falls Generation Site Manager*** is responsible for the following:

- Proactively identifying and working to resolve any site services/ infrastructure issues that may impede Project delivery.
- Championing a safety culture where “Nobody Gets Hurt”.
- Work with Construction Team to establish the MF site operations to facilitate productivity and safety enhancement.
- Establishing and maintaining robust communication lines with Project Office so as to maintain overall alignment on priorities and critical operational decisions.
- Ensuring all functional controls and processes are embedded for conducting site management operations.
- Facilitating problem resolution and assuming responsibility to ensure closure.
- Ensures opportunities for improvement (safety, environment, cost, and quality) are items of focus and vigorously championed from a site services perspective.
- Ensure the compliance of Health and Safety, Environmental, Regulatory, Benefits, Social/Community.
- Support of labour agreement administration and resolution of industrial relations concerns.
- Oversee the smooth operation of the Muskrat Falls Site, including the management and operation of camp and site services.
- Approval of field work instructions for issue to site services contractors.
- Ensure site activities are executed in compliance with all laws and regulations, including permits.
- Provides formal (LCP) interface/communications to external entities at site.
- Serve as representative for liaison committee under the Muskrat Falls SPO.
- Serve as representative for the site-level safety steering committee.
- Serve as Incident Commander for Emergency Response, Level 1 incidents.
- Serve as first escalation point of serious site issues with respect to safety incidents, labor, community, benefits, etc.
- Serve as the focal point for request for Nalcor and external groups to visit site.
- Fostering relationships with local stakeholders.
- Fostering relationships with NLH and CF(L)Co. in order to avail of synergies.
- Management of Permit of Work process for Temporary infrastructure.

“Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness.”

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Bachelor of Engineering or an equivalent combination of education, training and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Relevant experience managing a large construction or fabrication site, in particular leading large site teams on a multi-million dollar project.</li> <li>• Demonstrated leadership skills in develop and leading diverse work teams.</li> <li>• Commercially astute individual with a strong background in contracts management and claims avoidance.</li> <li>• Strong background in industrial relations, with previous track record of successfully executing works with Building Trades.</li> <li>• Experienced in stakeholder management, including aboriginal groups, considered essential.</li> <li>• Experience working in northern climates considered an asset.</li> <li>• Excellent and demonstrated safety and environmental record with aboriginal, diversity and cultural awareness.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values.</li> <li>• Strong interpersonal skills and the ability to interact and communicate with other team members.</li> <li>• Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.</li> <li>• Excellent problem solving skills.</li> <li>• Visit the construction site daily with a view of communicating the importance of safety.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Be prepared to accept for responsibility and decision making authority.</li> <li>• Demonstrate a willingness to adhere to Nalcor Energy’s vision and values.</li> <li>• Must be able to work effectively as a key member of the Integrated Project Delivery team within a multi-functional team environment (matrix style organization structure).</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative / supportive manner with stakeholders</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><b>Robert Woolgar</b></p>	<p><b>APPROVED BY:</b></p>	<p><b>Scott O’Brien</b></p>
<p><b>DATE:</b></p>	<p><b>11-August-2015</b></p>	<p><b>DATE:</b></p>	<p><b>11-August-2015</b></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>MUSKRAT FALLS GENERATION SITE DEPUTY MANAGER</b>	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
<b>DEPARTMENT:</b> <b>MFG – SITE MANAGEMENT</b>	<b>LOCATION :</b> <b>MUSKRAT FALLS SITE, LABRADOR</b>			

**DIRECTION EXERCISED AND AUTHORITY:**

Under the authority of the Site Manager – Muskrat Falls Generation, the Deputy Site Manager will provide overall support to the Site Manager in relation to site services and operations. The incumbent will provide rotational coverage for the Site Manager when the Site Manager is off site. When both positions overlap on site, the Deputy Site Manager will provide support to the Site Manager, but most notably in Site Services.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting directly to the Muskrat Falls Generation Site Manager.

**PURPOSE AND SUMMARY OF SCOPE:**

The incumbent will have the responsibility to ensure a safe work site and manage all aspects of Site Services to ensure the site functions. The role will also include direct support to site labour relations, Innu Liaison, and Health and Safety.



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

The ***Muskrat Falls Generation Site Deputy Manager*** is responsible for the following:

- Support identifying and working to resolve any site services/ infrastructure issues that may impede Project delivery.
- Championing a safety culture where “Nobody Gets Hurt”.
- Work with Construction Team to establish the MF site operations to facilitate productivity and safety enhancement.
- Ensuring all functional controls and processes are embedded for conducting site management operations.
- Facilitating problem resolution and assuming responsibility to ensure closure.
- Ensures opportunities for improvement (safety, environment, cost, and quality) are items of focus and vigorously championed from a site services perspective.
- Ensure the compliance of Health and Safety, Environmental, Regulatory, Benefits, Social/Community.
- Oversee the smooth operation of the Muskrat Falls Site, including the management and operation of camp and site services.
- Ensure site activities are executed in compliance with all laws and regulations, including permits.
- Provides formal (LCP) interface/communications to external entities at site.
- Serve as representative for the site-level safety steering committee, when delegated.
- Serve as Incident Commander for Emergency Response, Level 1 incidents, when delegated.
- Serve as first escalation point of serious site issues with respect to safety incidents, labor, community, benefits, etc, when delegated.
- Serve as the focal point for request for Nalcor and external groups to visit site, when delegated.
- Fostering relationships with local stakeholders.
- Management of Permit of Work process for Temporary infrastructure.

“Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness.”

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Bachelor of Engineering or an equivalent combination of education, training and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Relevant experience managing a large construction or fabrication site, in particular leading large site teams on a multi-million dollar project.</li> <li>• Demonstrated leadership skills in develop and leading diverse work teams.</li> <li>• Commercially astute individual with a strong background in contracts management and claims avoidance.</li> <li>• Strong background in industrial relations, with previous track record of successfully executing works with Building Trades.</li> <li>• Experienced in stakeholder management, including aboriginal groups, considered essential.</li> <li>• Experience working in northern climates considered an asset.</li> <li>• Excellent and demonstrated safety and environmental record with aboriginal, diversity and cultural awareness.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values.</li> <li>• Strong interpersonal skills and the ability to interact and communicate with other team members.</li> <li>• Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.</li> <li>• Excellent problem solving skills.</li> <li>• Visit the construction site daily with a view of communicating the importance of safety.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Be prepared to accept for responsibility and decision making authority.</li> <li>• Demonstrate a willingness to adhere to Nalcor Energy’s vision and values.</li> <li>• Must be able to work effectively as a key member of the Integrated Project Delivery team within a multi-functional team environment (matrix style organization structure).</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative / supportive manner with stakeholders</li> </ul>

<p><b>PREPARED BY:</b>     <u>Robert Woolgar</u></p>	<p><b>APPROVED BY:</b>     <u>Scott O’Brien</u></p>
<p><b>DATE:</b>     <u>11-August-2015</u></p>	<p><b>DATE:</b>     <u>11-August-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Site Office Administrator	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		12	AUG	2015
<b>DEPARTMENT:</b> MFG – Site Management	<b>LOCATION:</b> Muskrat Falls Site, Labrador			

**DIRECTION EXERCISED AND AUTHORITY:**

The position will provide direction and support to Site Administrative staff with the Muskrat Falls Site Management Team.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Work performed under the direction of the Muskrat Falls Generation Site Manager. Incumbent shall also receive general direction and work collaboratively with the C1 Administrative Assistant in St. John’s office.

**PURPOSE AND SUMMARY OF SCOPE:**

This role is the focal point for all facilities/office and administrative supports for the Muskrat Falls site management team. In this capacity, this position provides office administration services to the assigned project, in accordance with Project Instructions and Procedures. The scope includes a variety of responsibilities involving inventory control and general administrative duties and support to document control, IT, fleet management, buying, reporting.



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work:

- Provide assistance to new and existing staff in the following areas:
  - Help process IT paperwork for new staff and coordinate set up of IT equipment;
  - Pick up and drop off of staff at airport - arrange for truck availability, if necessary;
  - Expense Claim processing;
- Perform various site office administration duties including:
  - Coordinate office maintenance and repairs, as required;
  - Pick up office supplies, personal protective equipment (PPE), and other supplies, as needed;
  - Order coffee and water supplies for C1 site office;
  - Work with onsite buyer to process purchase orders for site consumables;
  - Track purchases under C1 budget and complete inventory tracking of PPE, office furniture, etc.;
  - Coordinate office space when visitors come to site office;
  - POC – office maintenance – develop list of providers for consideration;
  - Ensure Fire Extinguisher checks;
  - Maintain Safety Board;
  - Support reception desk coverage at site Administration Complex.
- Administrator duties:
  - Provide support to Contract Administrators, as required
  - Provide support to Head Office Management as required
  - Provide support and oversee Site Administrative Assistant
  - Provide overall Administrative Support to Muskrat Falls Site Management Team

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Graduate from a recognized Business Management or Office Administration program. An equivalent combination of education, training and experience may also be considered.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• 5+ years of office administration at a senior management level.</li> <li>• 2+ years of executive team support experience.</li> <li>• Previous office management experience would be considered an asset.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Incumbent must be willing to work at site or other Nalcor work locations as required.</li> <li>• Must possess a valid driver’s license and be eligible to drive in Newfoundland and Canada.</li> <li>• Demonstrate a willingness to adhere to Nalcor Energy’s vision and values.</li> </ul>

<b>PREPARED BY:</b> <u>Robert Woolgar</u>	<b>APPROVED BY:</b> <u>Scott O’Brien</u>
<b>DATE:</b> <u>12-August-2015</u>	<b>DATE:</b> <u>12-August-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>FLEET COORDINATOR</b>	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
<b>DEPARTMENT:</b> <b>Project Delivery Team – Muskrat Falls Generation</b>	<b>LOCATION :</b> <b>Muskrat Falls Site/ Goose Bay, Labrador</b>			
<b>DIRECTION EXERCISED AND AUTHORITY:</b> <p>This position will have no direct reports.</p> <p>This position will be expected to exercise day-to-day decision making in the administration of the overall Project fleet.</p>				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <p>Receives direction from the Muskrat Falls Generation Site Manager with respect to day-to-day priorities, and from Nalcor LCP Deputy General Manager with respect to fleet administration policies and procedures. Incumbent is expected to demonstrate a high degree of personal initiative in carrying out his/her duties and responsibilities.</p>				
<b>PURPOSE AND SUMMARY OF SCOPE:</b> <p>The Fleet Coordinator’s responsibility is to provide support to Labrador Operations in all aspects relating to fleet vehicles. Specifically, the Fleet Coordinator will be responsible for coordinating the inspection, servicing, maintenance and repair of all vehicles as per Lower Churchill Project (LCP) policies and procedures for the entire LCP, including Transmission Lines and HVdc Specialities. He / she will be responsible to ensure that the LCP vehicle fleet remains safe and reliable to support operational requirements.</p> <p>He/she will also be responsible to administer facilities issues including but not limited to office space, parking and property issues.</p>				

	<b>SCOPE / ROLE DESCRIPTION</b>	
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**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:**

The duties and job functions of the Fleet Coordinator shall include, but not limited to, the following:

- Day-to-Day focal point within the Project for all fleet administration requirements.
- Oversee vehicle assignment to the various Project departments in accordance with Nalcor policies.
- Manage all fleet vehicles and administer facilities issues including but not limited to office space, parking and property issues.
- Work with Nalcor LCP Deputy General Manager to support fleet procurement and retirement.
- Maintain fleet asset listing, including all relevant records.
- Ensure that each vehicle addition to the fleet is equipped as per the requirements of applicable Nalcor policies, including safety equipment and Nalcor branding.
- Work with Nalcor LCP to establish maintenance service agreements for LCP fleet, and then ensure maintenance services agreements are administered per Nalcor policies.
- Ensure drivers meet the requirements of having successfully passed all driving safety training.
- Provide training on proper use of vehicle equipment as required including use of safe and defensive driving method at all times.
- Vehicle administration activities including:
  - Undertake regular inspections on vehicles
  - Coordinate the servicing, maintenance and repair of all vehicles as per LCP policies and procedures.
  - Coordinate the handling of vehicle accidents. Identifies and recommends where the vehicle condition may impact safe operation and takes remedial action.
  - Review Vehicle Inspection Sheets for issues and book corrective maintenance as required.
  - Ensuring vehicles are outfitted and decaled as per company standards.
  - Issuing/cancelling fuel cards and maintaining online databases.
  - Collecting and tracking Monthly Vehicle Inspection data.
  - Tracking unit mileage and/or hours.
  - Accumulate receipts for fuel and other vehicle items on a monthly basis.
  - Ensure annual licensing is complete.
  - Ensure drivers provide appropriate Travel Authorization forms prior to reserving a vehicle.
  - Manage the vehicle bookings schedule, monitor keys in and out, collect and maintain paperwork.
  - Handle tires, moving from vehicles to storage and vice versa.

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

Successful candidate should have an Office Administration diploma or an Automotive Technician certificate or relevant experience.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Minimum of two (2) years experience in fleet management.
- General operational and mechanical knowledge of vehicles and heavy equipment would be an asset.
- Previous experience in a service role for a vehicle dealer considered an asset.
- Strong negotiation abilities.
- Strong organizational skills.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Driver's license and a safe driving record.
- Customer focused, solution oriented individual.
- Strong and effective communication skills. Ability to communicate in written and spoken English is required.
- Must be able to work effectively as a member of the Project Delivery Team within a multi-functional team environment (matrix style organization structure).
- Proficiency in the MS Office Suite, especially Word and Excel.
- Solution oriented and demonstrated creative thinking.
- The incumbent will work primarily at the Muskrat Falls site. It is anticipated that while working in construction environments the incumbent may be exposed to environments that are dirty, noisy, and potentially hazardous.

<p><b>PREPARED BY:</b></p>	<p><u>Robert Woolgar</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Scott O' Brien</u></p>
<p><b>DATE:</b></p>	<p><u>11-August-2015</u></p>	<p><b>DATE:</b></p>	<p><u>11-August-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> IT COORDINATOR	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
<b>DEPARTMENT:</b> MFG – SITE MANAGEMENT	<b>LOCATION :</b> MUSKRAT FALLS SITE, LABRADOR			
<b>DIRECTION EXERCISED AND AUTHORITY:</b> <p>Under the authority of the Muskrat Falls Generation – Site Manager, the <b>IT Coordinator</b> will Coordinate the IT element of the Lower Churchill Project Information Management program at Muskrat Falls Site with a view to providing a dedicated focus on fulfilling the project’s commitment to “providing an environment where people can work safely and collaboratively with a confidence that information, and the systems that manage it, are <b>accessible, accurate, reliable</b> and <b>timely</b> throughout the full life cycle of the asset”.</p>				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <p>Reporting directly to the Muskrat Falls Generation – Site Manager.</p>				
<b>PURPOSE AND SUMMARY OF SCOPE:</b> <p>The incumbent will have the responsibility to coordinate all IT activities at the Muskrat Falls Site.</p>				



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

The **Site IT Coordinator** is responsible for the following:

- Coordination of definition, analysis and resolution of technical issues.
- Development of IT specific configuration, specification and procedural documentation for inclusion in the IM portion of the project's Quality based Integrated Management System.
- Identification, agreement and management of IT related service level agreements (internally and externally, as applicable).
- Coordination of IT input and participation for LCP system/application/program strategies, selections, implementations and ongoing maintenance activities.
- Alignment/integration with established Hydro infrastructure/processes.
- Capture of related metrics for the specific purpose of proactively driving improvements.
- General capture and reporting of IT related statistics.
- Coordination of end user related training.
- Other IT related duties as required.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <ul style="list-style-type: none"> <li>• Degree or Diploma/Certification from an Information Technology/Systems related program</li> </ul>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• 5 years experience in busy computerized environment involving installing, configuring, upgrading, trouble shooting, testing and maintaining of IT related tools.</li> <li>• Personal contact support to end users</li> <li>• Working with and understanding change control processes related to IT support documentation</li> <li>• IT asset management</li> <li>• Experience providing IT related support to fast paced, schedule and budget driven mega projects, with multiple locations, desired.</li> <li>• Application development experience, desired</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values.</li> <li>• Strong interpersonal skills and the ability to interact and communicate with other team members.</li> <li>• Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.</li> <li>• Excellent problem solving skills.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative / supportive manner with stakeholders</li> <li>• Solid base of technical knowledge in the IT field with a general knowledge and appreciation of the other Information Management areas</li> </ul>

<p><b>PREPARED BY:</b> <u>Robert Woolgar</u></p>	<p><b>APPROVED BY:</b> <u>Scott O’Brien</u></p>
<p><b>DATE:</b> <u>11-August-2015</u></p>	<p><b>DATE:</b> <u>11-August-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> IT ANALYST	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
<b>DEPARTMENT:</b> MFG – SITE MANAGEMENT	<b>LOCATION :</b> MUSKRAT FALLS SITE, LABRADOR			

**DIRECTION EXERCISED AND AUTHORITY:**

Under the authority of the Muskrat Falls Site IT Coordinator, the **IT Analyst** will support coordination of the IT element of the Lower Churchill Project Information Management program at Muskrat Falls Site with a view to providing a dedicated focus on fulfilling the project's commitment to "providing an environment where people can work safely and collaboratively with a confidence that information, and the systems that manage it, are **accessible, accurate, reliable** and **timely** throughout the full life cycle of the asset".

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Working under the direction of the MF Site IT Coordinator, the incumbent will provide information services and technical support to LCP staff at the Muskrat Falls Site Administration office.

**PURPOSE AND SUMMARY OF SCOPE:**

Reporting to the IT Coordinator, the incumbent will be part of an integrated team providing a wide range of support for Information Technology services and infrastructure at the Muskrat Falls site location and other Project locations as required. The incumbent will support and maintain LCP's IT Systems including support for End User desk side, client communications, infrastructure and associated software and business applications to ensure that the LCP staff can maximise use of the IT related systems in support of LCP business operations.



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

The **IT Analyst** is responsible for the following:

- Provide end user hardware, software, and infrastructure support to ensure effective and timely resolution of technical problems.
- Document problems and their resolutions in the LCP knowledge and problem tracking database.
- Provide direction and training to staff on use of standard LCP applications.
- Record, track, analyze, implement and escalate as required all service requests.
- Develop solid knowledge of the Lower Churchill Project in order to respond knowledgeably to requests or questions regarding technology and infrastructure.
- Provide support for IT related peripherals including but not limited to printers, scanners, video conference equipment, multifunction devices, wireless devices and other communications systems as required.
- Provide “smart hands” support for specialized communications equipment and services as required.
- Read technical manuals, confer with users, and conduct computer diagnostics and troubleshooting to resolve problems and to provide technical assistance for LCP systems.
- Refer major hardware or software problems or defective problems to vendors or technicians for service and keep continuous contact with them to ensure problem resolution.
- Assist in evaluations of hardware or software when required.
- Recommend improvements or upgrades to the IT related systems and infrastructure.
- Answer user questions regarding computer hardware, software and system operation to provide knowledge or to resolve problems.
- Setup equipment for employee use
- Install and/or perform minor repairs to hardware, software, and peripheral equipment, following design or established installation instructions.
- Communicate effectively within the team, with other teams and across the Nalcor Energy company as a whole.
- Have responsibility for coordinating the setup of technical presentation facilities including laptops, projectors and video conference.
- Provide IT support for Lower Churchill Project staff in the field and in other locations as required
- Lead or participate as team member in IT projects in support of LCP business initiatives.
- Provide New Hire Orientations based on Orientation Package.
- Management of IT assets using LCP Asset Management software
- Provide After Hours Support to Muskrat Falls and other Project locations as required.
- Additional duties or responsibilities as requested or required.

“Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness.”

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>University Degree, College Diploma in Computer Systems/Information Technology, or an equivalent combination of education, training and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <p>Minimum 2-4 years experience in the Information Technology field. Demonstrated experience in providing support in a fast paced, demanding environment where the ability to manage multiple priorities is essential.</p>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• The preference is for this position to be located in the HVGB area and for the incumbent to commute to site daily.</li> <li>• Team oriented person with a positive, can-do attitude</li> <li>• Strong analytical skills and creative problem solver</li> <li>• Self-starter with the ability to work independently with minimal supervision</li> <li>• Effective communicator</li> <li>• Enthusiastic, friendly and enjoys interacting with people on a day-to-day basis</li> <li>• Ability to work with minimal supervisory direction</li> <li>• Willingness to travel and work in remote locations as required</li> </ul>

<b>PREPARED BY:</b> <u>Robert Woolgar</u>	<b>APPROVED BY:</b> <u>Scott O'Brien</u>
<b>DATE:</b> <u>11-August-2015</u>	<b>DATE:</b> <u>11-August-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> LEAD SITE ELECTRICAL ENGINEER	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		12	AUG	2015
<b>DEPARTMENT:</b> MFG – Site Management	<b>LOCATION :</b> Muskrat Falls, Labrador			

**DIRECTION EXERCISED AND AUTHORITY:**

The work involves planning, directing and executing Electrical Engineering in the field to support the construction of the Muskrat Falls generating station and management of Electrical Services within Site Management Team. The incumbent is generally self-directing in achieving objectives. As required, the incumbent will interface and coordinate activities with Home Office Engineering, field construction supervision, and field Quality Assurance. Additionally, will support Field Procurement, Work Turnover and Commissioning. This position will have direct reports and provide supervision and technical direction to junior engineers, engineering co-op students, and construction power coordinator and inspectors. The incumbent will also provide oversight, interpretation and guidance to contractors in support of project execution requirements.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the **Muskrat Falls Generation Site Manager** incumbent should be capable of functioning with a limited level of supervision and is expected to demonstrate a high degree of personal initiative, sound judgment and technical and project delivery expertise in carrying out duties and responsibilities. This position will interface with and provide support to other construction and engineering groups including Construction Management, Site Management, Project Controls and Quality Assurance. Incumbent will also have a functional reporting link to the home office Area Manager Mechanical & Electrical and Engineering Manager.

**PURPOSE AND SUMMARY OF SCOPE:**

The incumbent performs the duties of an Electrical Engineer with experience in the area of Hydroelectric Developments and Associated Facilities. Incumbent will work closely with the Site Resident Engineer, Home Office Engineering, Construction Management, Contractors, Site Services Team to contribute to and coordinate design information to support the Project. This includes interpreting the technical requirements of the design documents to provide clear understanding of the requirements and processing of Site Queries, Concession Requests, Change Requests and Engineering Change Notices.



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

The position shall:

- Assist the Site Resident Engineer by participating and overseeing aspects of electrical engineering activities including: design, specifications and project management.
- Provide technical management to the site Electrical Department to support the Site Permitting Process.
- Steward delivery of key project components through engineering, manufacturing and installation.
- Verify and manage the contractors and vendor progress through project execution.
- Work closely on the development of the Muskrat Falls generating station project, including construction power and other works as required.
- Provide leadership in the completion of activities related to Electrical aspects of the Muskrat Falls Generation Project.
- Review manufacturers' drawings and technical data to verify conformity with design criteria, technical specifications and standards, codes, practices and operating philosophy.
- Support technical review of Contractor document submittals for site construction power
- Support home office Electrical Team with site surveys and technical assessments of installed facilities.
- Explore, analyse, and introduce new design concepts, solutions, and innovative methods for achieving the project's strategic objectives, relying on basic theory, first principles, and original ideas.
- Reviews Drawings and specifications issued to the field and reports to Engineering Manager any ambiguities, interferences or errors found on the drawings, specifications and assigned work;
- Participate in review of Contractor's Quality Control program;
- Assist QA in review of Contractors material certification;
- Assist Home Office in preparation and conveyance of Engineering Change Notices;
- Provide technical support to construction activities at the worksite, while expediting design changes for timely response to Site Queries, Concession Requests and Change Requests;
- Advise Resident Engineer, Construction Manager and contractors on the interpretation of electrical drawings and specifications and advise on additional details or clarifications required from project design;
- Reviews proposals for field changes and substitutions and recommends action to Resident Engineer, Engineering Manager, and Construction Manager for approval;
- Work with field engineers in problem recognition and resolution;
- Performs any other duties that may be requested by Resident Engineer; and,
- Review of contractor's documentation related to electrical engineering works.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Graduation from a recognized university with a Bachelor’s Degree in Engineering (Electrical); eligible for membership in PEGNL.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Minimum of seven (7) years in the electrical engineering design field</li> <li>• Preferably significant electrical engineering experience in the hydroelectric industry.</li> <li>• Project management background with past experience on large scale projects.</li> <li>• Familiar with the design, installation and maintenance of 25kV and lower power distribution systems would be considered an asset.</li> <li>• Demonstrated experience with identification of construction problems and resolution</li> <li>• Demonstrated ability to verbally and graphically convey problem resolution to engineering and construction parties</li> <li>• Familiarity required with codes and standards applicable with the discipline, particularly ASTM, IEEE, NEC, ANSI, IEC, CSA, ASME, and NFPA.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values.</li> <li>• Strong interpersonal skills and the ability to interact and communicate with other team members. Must be able to work effectively as a key member of a project delivery team within a multi-functional team environment.</li> <li>• The incumbent must exhibit a project execution and project delivery skill set.</li> <li>• The incumbent must display enthusiasm and initiative.</li> <li>• This position requires thinking within concepts, principles and broad guidelines towards the project’s overall objectives.</li> <li>• The incumbent must possess excellent analytical skills combined with sound judgment and technical skills and ability to function in an unstructured environment.</li> <li>• This position requires a proven ability to accept responsibility in a highly technical environment.</li> <li>• The incumbent will work in a field environment.</li> </ul>

<b>PREPARED BY:</b> <u>Robert Woolgar</u>	<b>APPROVED BY:</b> <u>Scott O’Brien</u>
<b>DATE:</b> <u>12-August-2015</u>	<b>DATE:</b> <u>12-August-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>MUSKRAT FALLS CONSTRUCTION POWER ELECTRICAL INSPECTOR</b>	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b> 20    OCT    2015		
<b>DEPARTMENT:</b> MFG – Site Management Team	<b>LOCATION :</b> Muskrat Falls Construction Site			
<b>DIRECTION EXERCISED AND AUTHORITY:</b> <p>Working within an Owner’s Project Delivery Team, and with accountability residing with the <b>Lead Electrical Engineer</b>, the <b>Electrical Inspector</b> is responsible to ensure the integrity of the site electrical system, including the 25kV utility distribution system, and emergency power generation. Provide electrical inspection services as required to support the ongoing construction program on site. In addition provide single point of contact for Contractor and Home Office Engineering team liaison regarding new and existing installed electrical facilities as directed by the <b>Lead Electrical Engineer</b>.</p> <p>Assist the LCP Team on electrical issues to mitigate hazards, promote safety via relevant codes and standards,</p> <p>The incumbent will be a key member of the Project Delivery Team and will interface extensively with MF Site Services and Safety Teams as well as Nalcor Energy Control Center during utility power outages and emergency power conditions</p>				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <p>Receives direction from the <b>Lead Electrical Engineer</b> – Incumbent is expected to demonstrate a high degree of personal initiative in carrying out his/her duties and responsibilities.</p> <p>As directed by <b>Lead Electrical Engineer</b>, work closely with the home office Electrical Department to ensure that all existing and new infrastructure is properly documented with appropriate as-built documentation. Ensure that mechanical completion and commissioning activities are witnessed , approved and documented on behalf of the Owner for Contractor installed electrical infrastructure</p> <p>Ensure all energized electrical work, electrical safe work practices, electrical power distribution equipment and installations, and electrical standards and procedures are consistent with current industry accepted best practices, specifically the control measures contained in CSA Z462 Workplace Electrical Safety Standard</p>				
<b>PURPOSE AND SUMMARY OF SCOPE:</b> <p>The purpose of the Site Construction Power Electrical Inspector is to assist the <b>Lead Electrical Engineer</b> on electrical issues on site, to identify and mitigate hazards, promote safety via application and enforcement of the relevant codes and standards, and ensure the quality and integrity of the site electrical system. In addition inspection of electrical installations to ensure conformance with issued project documents and adherence to relevant codes and standards is an integral part of the duties.</p>				



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

- One point of contact for electrical technical assistance that affects the site as a whole
- Implement electrical policies, procedures, methodologies and codes of performance for contractors from LCP's perspective to provide a baseline of acceptability from which conduct and product will be measured and accepted by LCP.
- Implement process to continuously monitor Contractor's Electrical Safety Programs and related work practices to validate that the contract electrical workers are qualified/competent, and understand the electrical hazards of shock and arc flash
- Review Emergency Response to electrical incidents with the Site Emergency Response team to ensure they have specific electrical safety training and are familiar with approved methods for the release of shock victims.
- Implement permits to control the release of energy on the project, regardless of generated or utility power.
- Provide project control duties on site to monitor contractors, troubleshoot problem areas, and ensure all electrical installation is in accordance with design including any design changes, witness testing and recommendations.
- Prepare all requisite documentation for control activities to ensure LCP has satisfied all obligations in maintaining records for due diligence in the electrical field. Reports, inspections, witness testing, etc. will be transmitted appropriately to all relevant project personnel so all parties will be aware of contractor performance and status.
- Control site electrical emergency situations with switching, generated power, utility communications and ultimately maintaining adequate power source for site activities.
- Ensure all project electrical activities are in accordance with, as a minimum, the Canadian Electrical Code and all relevant CSA standards governing electrical work and conduct.
- Assist project team with electrical scope review and delineation, maintain site consistencies to ensure all LCP baselines including design, conduct, procedures and end product and flowed through the contractors and measured via monitoring, inspections, sign-offs and document control.
- Provide recommendations for best safe work and operating practices.
- Continuously monitor Contractor's Electrical Safety Programs and related work practices to validate that the contract electrical workers are qualified/competent, and understand the electrical hazards of shock and arc flash.
- Validation of Contractor electrical worker competency to ensure that workers are skilled and experienced to work on particular electrical equipment and systems. The contractor's training and competency validation process of its staff should be reviewed to ensure the training provided to its employees is acceptable.
- Implement a formal approved procedure for the Operation of Circuit Breakers and Fused Disconnects.
- Implement detailed switching order(s) for the safe and efficient start-up of emergency power supply upon loss of utility supply
- Implement the LCP Permit System to be applied to all new and existing electrical installations on site

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<p><b>PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:</b> The following is being executed as a contract scope of work.</p> <ul style="list-style-type: none"> <li>Implement electrical policies, procedures, methodologies and codes of performance for contractors from LCP's perspective to provide a baseline of acceptability from which conduct and product will be measured and accepted by LCP.</li> </ul> <p>Provide primary electrical inspection services for all site Contractor installed facilities</p> <p><b>ACADEMIC QUALIFICATIONS:</b></p> <ul style="list-style-type: none"> <li>Construction and Maintenance Electrician ticket 309A</li> <li>Minimum 10 years field experience</li> <li>Fully trained and knowledgeable with CSA Z-462- electrical workplace safety standard</li> </ul> <p>Knowledgeable with the Occupational health and Safety Act and Z1000</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>Strong focus on proactive safety management</li> <li>Experience in the design of electrical primary and auxiliary systems</li> <li>Experience in isolation and switching operations for medium and low voltage distribution systems</li> <li>Competency as defined in CSA Z-462 (4.1.6.4.1 – Qualified Persons) a qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and installation and has received safety training to recognize and avoid the hazards involved.</li> <li>Construction and Maintenance electrical trade license</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>Safety oriented.</li> <li>Demonstrated willingness to adhere to the Nalcor's vision and core values.</li> <li>Strong interpersonal skills and the ability to interact and communicate with other team members.</li> <li>Must be able to work effectively as a key member of the Owner Project Delivery Team within a multi-functional team environment</li> <li>Proven interpersonal, leadership and team skills.</li> <li>Solution oriented and demonstrated creative thinking.</li> <li>Must be able to work in a collaborative/supportive manner with stakeholders.</li> </ul>

<b>PREPARED BY:</b>	<u>Robert Woolgar</u>	<b>APPROVED BY:</b>	<u>Dave Pardy</u>
<b>DATE:</b>	<u>20-October-2015</u>	<b>DATE:</b>	<u>20-October-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> SITE BUYER	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
<b>DEPARTMENT:</b> MFG – Site Management Team	<b>LOCATION :</b> Muskrat Falls Site, Labrador			
<b>DIRECTION EXERCISED AND AUTHORITY:</b> This position will not have subordinates.				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> Reports to and receives day to day supervision from the Site Services Lead. Once oriented should be capable of processing day to day functions with minimal supervision and direction.				
<b>PURPOSE AND SUMMARY OF SCOPE:</b> Primarily but not limited to the bidding, administration, monitoring and reporting of Purchase Orders and Blanket PO's for the purchase of materials and equipment in accordance with established Project Procedures.				

**SCOPE / ROLE DESCRIPTION**

**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

- Execute the bid, evaluation, award and administration processes for PO's and service contracts in support of construction activities and site services for items such as MRO supplies; service contracts; etc
- Work in accordance with the Project procedures
- Compile commercial/contractual documents
- Prepare and issue commercial correspondence and communication
- Maintain electronic and hard copy files of all PO's and Contracts in accordance with Project procedures
- Liaise with key functional groups including Engineering, Finance, Legal and Project Controls.
- Develop and maintain relationships with suppliers
- Prepare, issue and administer service agreements for technical support at site, if requested
- Understand the IBA requirements and implement as required
- Input Purchase Orders into project procurement management system
- Facilitate supplier meetings

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**ACADEMIC QUALIFICATIONS:**

Business or Commerce Degree or equivalent combination of education and experience.

- RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**
- Up to 3+ years work experience in similar role with successful experience in negotiating, drafting, interpreting and administering Purchase orders and Contracts.
  - Prior experience dealing with a variety of PO's related to site support services and materials such as safety equipment; industrial supplies; and MRO supplies.
  - Knowledge of the local (HVGB) business community or the Province of Newfoundland and Labrador
  - General experience in office environment
  - Good communication, interpersonal and team skills
  - Competency in Microsoft office applications is considered an asset.

- JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**
- Structured, methodical, process driven
  - Good interpersonal and communication skills to effectively interact with a variety of personnel and other industry participants, both internal and external.
  - Ability to quickly assimilate new data, including highly technical information, and communicate same in layperson terms.
  - Ability to effectively managing multiple tasks, often under pressure and within time constraints.
  - Ability to quickly assimilate new data, including technical information, and communicate same in layperson terms.

<p><b>PREPARED BY:</b></p>	<p><b>Robert Woolgar</b></p>	<p><b>APPROVED BY:</b></p>	<p><b>Robert Woolgar</b></p>
<p><b>DATE:</b></p>	<p><b>12-August-2015</b></p>	<p><b>DATE:</b></p>	<p><b>12-August-2015</b></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> SITE SERVICES LEAD	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		12	AUG	2015
<b>DEPARTMENT:</b> MFG – Site Management Team	<b>LOCATION :</b> Muskrat Falls Site, Labrador			
<b>DIRECTION EXERCISED AND AUTHORITY:</b> The incumbent is generally self-directing in achieving objectives. Provides supervision and technical direction to Consultants, Contractors, junior engineers and engineers regarding infrastructure maintenance activities. Approving the opening of work orders as it relates to the work.				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> Receives direction from the Muskrat Falls Generation - Site Manager. Is expected to demonstrate a high degree of personal initiative, sound judgment and technical expertise in carrying out his/her duties and responsibilities. Supervision will vary depending on the assignment and the degree of expertise of the incumbent				
<b>PURPOSE AND SUMMARY OF SCOPE:</b> In support of the Muskrat Falls Generation – Site Manager, the incumbent is responsible for stewarding maintenance delivery requirements associated with the Muskrat Falls infrastructure and site services, including scope, cost and schedule as required. The incumbent will provide leadership and direction throughout the development and implementation of a detailed Preventative Maintenance plan for infrastructure of the Lower Churchill Project.  The Site Services Lead provides oversight and surveillance of the Maintenance Leads and trades and will interface directly with the Site Manager and other staff, in accordance with project procedures.  The incumbent specializes in the Operation & Maintenance of the key infrastructures and equipment required during the construction of the Lower Churchill Project. Exercises strong judgment and initiative in implementation of major work assignments. Reviews work of consultants and others.				



**SCOPE / ROLE DESCRIPTION**



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Graduation from a recognized university or significant experience in infrastructure maintenance management. Ideally with supporting technical background on Building maintenance and construction.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <p>Suggested minimum of ten (10) years of progressively responsible experience working with large scale industrial construction project with particular focus on design, implementation and commissioning of workforce housing, modular buildings and associated infrastructure. Including remote electrical generation, waste and water treatment plant operations.</p>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values.</li> <li>• Strong interpersonal skills and the ability to interact and communicate with other team members.</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><u>Dave Pardy</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Robert Woolgar</u></p>
<p><b>DATE:</b></p>	<p><u>12-August-2015</u></p>	<p><b>DATE:</b></p>	<p><u>12-August-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> MAINTENANCE SUPERVISORS	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
<b>DEPARTMENT:</b> MFG – Site Management Team	<b>LOCATION :</b> Muskrat Falls Site, Labrador			
<b>DIRECTION EXERCISED AND AUTHORITY:</b> The incumbent is generally self-directing in achieving objectives. Provides supervision and technical direction to Consultants, Contractors, Maintenance Staff, Site Buyer, Engineers and Trades regarding infrastructure maintenance activities. Approving the opening of work orders as it relates to the work. Leads the preventative maintenance program for LCP infrastructure Equipment and Assets.				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> Receives general direction from the Site Services Lead - Muskrat Falls Facilities. Is expected to demonstrate a high degree of personal initiative, sound judgment and technical expertise in carrying out his/her duties and responsibilities. Supervision will vary depending on the assignment and the degree of expertise of the incumbent				
<b>PURPOSE AND SUMMARY OF SCOPE:</b> In support of the Site Services Lead - Muskrat Falls, the incumbent is responsible for stewarding maintenance delivery requirements associated with the Muskrat Falls infrastructure and site services, including scope, cost and schedule as required. The incumbent will provide leadership and direction throughout the development and implementation of a detailed Preventative Maintenance plan for infrastructure of the Lower Churchill Project. In addition the incumbent must address any ad hoc maintenance issues in a timely manner to ensure that productivity and production at the Muskrat Falls site is not compromised.  The Maintenance Lead provides oversight and surveillance of the Maintenance Coordinators and trades performing the maintenance work  The incumbent specializes in the Operation & Maintenance of the key infrastructures and equipment required during the construction of the Lower Churchill Project. Exercises strong, prudent judgment and initiative in implementation of major work assignments.				



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

- Promote Safe work practices with the maintenance team.
- Ensure a fit for purpose preventative maintenance program is established and executed.
- Ensure ad hoc maintenance requirements are prioritized and resolved in an efficient and timely manner.
- Manage the labour force to ensure they are productive and working at desired scopes of work.
- Maintain a work order “system” to efficiently plan, execute and close out scopes of work.
- Work with site procurement / buyer to purchased required materials / equipment.
- Work with site procurement / buyer to establish required frame agreements and vendor call out arrangements.
- Manage interfaces with other service providers – i.e. road maintenance / snow clearing.
- Identify and track and work required and or performed that is deemed to be warranty work.
- Working with the Site Electrical Team - Ensure safe, timely and efficient transfer to generator power during power outages (planned and unplanned)
- Ensure a safe access is maintained to all site services buildings and assets during summer and winter conditions.
- Provide oversight and management of Garbage Removal, and Sewage and Water contracts.
- Review maintenance expenditures, budget and cost forecast on a monthly basis.

“Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness.”

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Graduation from a recognized university or technical college will be considered an asset. At a minimum the incumbent should have successfully completed and achieved a recognized Trade designation. However, a strong maintenance background along with a track record of solving problems in the field is ultimately required.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <p>Suggested minimum of five (5) years of progressively responsible experience working in the operations and maintenance of a large scale construction site accommodations complex, associated utilities and other office structures to support construction management.</p> <p>This would include a good general knowledge of the following:</p> <ul style="list-style-type: none"> <li>• Building construction and operating systems</li> <li>• Building mechanical and electrical systems</li> <li>• Water and Sewer operations</li> <li>• Industrial safety procedures and requirements</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Demonstrated willingness to adhere to the Nalcor’s vision and core values.</li> <li>• Strong interpersonal skills and the ability to interact and communicate with other team members.</li> <li>• Must be willing to stay at the Muskrat Falls Camp during working rotations.</li> <li>• Anticipated work rotation is 2 weeks on 1 week off.</li> </ul>

<p><b>PREPARED BY:</b> <u>    Dave Pardy    </u></p>	<p><b>APPROVED BY:</b> <u>    Robert Woolgar    </u></p>
<p><b>DATE:</b> <u>    24 February 2015    </u></p>	<p><b>DATE:</b> <u>    12-August-2015    </u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Training Coordinator - Labrador	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		15	04	2013
<b>DEPARTMENT:</b> MFG – Site Management Team	<b>LOCATION :</b> Labrador			

**DIRECTION EXERCISED AND AUTHORITY:**

Provides direction, supervision and guidance to trainers hired both internally and externally to meet the training needs of the Lower Churchill Project.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Work performed under the direction of the Training Lead for the Lower Churchill Project on the coordination and delivery of training for all components of the Lower Churchill Project.

**PURPOSE AND SUMMARY OF SCOPE:**

Reporting to the training Lead, this position coordinates cost effective and efficient delivery of training that meets the training requirements of the Lower Churchill Project components. This includes legislated and company related training required for the employees of Nalcor and SNC Lavalin Inc. (SLI) as well as pre-employment orientations and supervisory training to potential contractor employees as a pre-requisite for employment with the different components of the Lower Churchill Project. Additionally the position supports the training and skills development of Innu Nation members seeking employment or employed at the LCP.



## SCOPE / ROLE DESCRIPTION



### PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:

- Schedules and coordinates delivery of site and pre-employment orientations for the different components of the Lower Churchill Project (LCP) both on site and off site.
- Co-ordinates pre-employment training for potential Innu employees in the communities impacted by project
- Develops and maintains training matrices for the different Nalcor & SLI occupations/roles working on the components of the LCP
- Implements the training matrix requirements by coordinating (and delivering where appropriate) delivery of role specific training for Nalcor/SLI employees
- Develops training programs required for the LCP which meets legislated and company requirements and standards
- Creates and maintains an electronic training database which tracks training and certification of all training required for Nalcor & SLI employees
- Creates and maintains an electronic training database which tracks orientation, shop steward and supervisory training delivered as pre-employment training for the different components of the LCP
- Maintains a hard copy training record system for all aspects of the project
- Establish communication and contact with all contractors at site who have Innu employees working for them and evaluate what experience and training these employees are receiving and what their training plans are
- Establish communication and contact with all contractors at site to monitor their training programs, plans and employee's training records, and ensure they are meeting legislated training requirements for all of their employees
- Liaises with government, the Labrador Aboriginal Training Partnership (LATP), and Innu Training Coordinators to build positive, effective relationships, which lead to effective training plans and programs designed to both increase the level of skills at site and to maximize Innu employment
- Liaises with government, the employers' associations and the unions to build positive, effective relationships, which lead to effective training plans and programs designed to both increase the level of skills at site and to maximize employment of qualified Newfoundlanders and Labradoreans
- Delivers orientation training both on and off site
- Delivers safety specific training where qualifications and certifications allow
- Supervises and gives direction to training staff contracted to deliver training required for the project
- Delivers construction safety training to selected members of Innu Nation seeking employment at the LCP
- Delivers Innu Orientations to contractor Innu employees and potential employees
- Works jointly with the Innu Employment and Training Coordinator to support the development of Innu Nation members
- Supports Innu Nation Apprentices through regular monitoring of apprenticeship status with the employee and the employer
- Submits quarterly Innu Apprentice status reports to Training Lead and Innu Nation
- Makes recommendations and provides support to promote Innu Apprentices working on the LCP
- Liaises with the Labrador Aboriginal Training Partnership, Post-Secondary Education and the Apprenticeship and Certification Officer to support Innu Apprentices

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**ACADEMIC QUALIFICATIONS:**

- Certificate / Diploma from a College / Technical School in Adult Education and / or Journeyed / Red Seal Certificate in a construction related trade OR High School Graduation Diploma / GED holder with progressive experience (minimum 8 years) in construction.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- 5 years of experience in construction or industry training function with at least one year in a supervision or coordination function.
- Trainer certification in WHSCC certified courses such as Confined Space, Fall Protection, Power line Hazards and OH&S Committee training would be an asset
- Trainer certification in Aerial Lift Operation would be an asset
- Experience in coordination and delivery of Leadership Skills training would be an asset
- Good understanding of respectful workplace policies and programs as it relates to aboriginal culture awareness, gender awareness, diversity, and harassment
- Good understanding of Impact and Benefit Agreements with aboriginal First Nations
- Working knowledge of best practices for delivery of training to a diverse workforce
- Working knowledge of the Newfoundland and Labrador Apprenticeship program and Plans of Training
- Strong knowledge of the Newfoundland and Labrador Occupational Health and Safety Act and Regulations as well as regulations that require compliance for the construction industry
- Knowledge of computer operation, specifically Microsoft Office with emphasis on Word, Excel and Power Point
- Time management and organization and coordination skills
- Strong Facilitation and presentation skills
- Strong verbal and written communication skills
- Excellent conflict resolution skills

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Position will be based at the Muskrat Falls work site
- Generally the position is in an office environment at the site, but will be expected to coordinate and deliver training off site at a location which is to be determined based on the work component and collective agreement affected
- Must be willing to travel and live in a camp environment where required
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	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>PREPARED BY:</b></p>	<p><b>Bob Marshall</b></p>	<p><b>APPROVED BY:</b></p>	<p><b>Robert Woolgar</b></p>
<p><b>DATE:</b></p>	<p><b>April 15, 2013</b></p>	<p><b>DATE:</b></p>	<p><b>11-August-2015</b></p>

# Construction Management Team



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Muskrat Falls Construction Manager	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b> 15    MAR    2015		
<b>DEPARTMENT:</b> Construction Management Team – Muskrat Falls	<b>LOCATION :</b> Muskrat Falls Site			
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  Under the authority of the General Project Manager, the <i>Muskrat Falls Construction Manager</i> will provide oversight and leadership to the Area Construction Managers / Construction Team in the performance of all activities related to the execution of the construction work for all construction areas.  The incumbent will have a level of authority required for day-to-day decision making, including financial approval authority as delegated by the General Project Manager, in order to fulfil the responsibilities of construction execution.  In fulfilling this mandate, the incumbent is expected to liaison extensively with all Functional Managers to ensure all functional processes and requirements are strictly adhered to by the Construction Management team.				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  Strategic only, reporting directly to the General Project Manager; however is expected to interact extensive with Area Managers that have the overall accountability for delivery of specific elements of the Project.				
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  As the leader of the Construction Management organization for Muskrat Falls, the <i>Muskrat Falls Construction Manager</i> has the responsibility to ensure Nalcor’s construction management objectives are fulfilled for all construction areas. These include: <ul style="list-style-type: none"> <li>• Contract administration to ensure that work is carried out according to approved contracts, specifications, drawings and schedules, within authorized budgets and in compliance with safety and environmental standards.</li> <li>• Management of interface between contract packages so as to ensure timely completion and avoidance of claims.</li> <li>• Overseeing the smooth operation of construction areas.</li> <li>• Responding promptly to issues and requests for information from the contractors and to minimize exposure for potential claims arising from contractors. Fostering positive working relations with both contractors and labour to ensure the broader project objectives are achieve; and</li> <li>• Championing a safety culture where “Nobody Gets Hurt.”</li> </ul>				





## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

The duties and job functions of the ***Muskrat Falls Construction Manager*** shall include, but are not limited to, the following:


- Working within the Integrated Project Delivery Team to establish a fully-functional Construction Management team organization that is able to effectively fulfil Nalcor's Construction Management obligations. In particular, working closely with Muskrat Falls Generation Area Managers, to ensure alignment and delivery expectations are being met, ensuring regular status updates are provided on progress, and identifying potential issues requiring resolution.
- Championing a safety culture where "Nobody Gets Hurt."
- Ensuring all functional controls and processes are embedded for conducting construction operations.
- Proactively identifying any site issues that may impede Project delivery, and taking action with the construction team to address.
- Overseeing the activities of the Area Construction Managers to ensure their teams are fulfilling Nalcor's obligations and meeting construction management objectives.
- Establishing and maintaining robust communication lines and interfacing with Functional Managers and the Project Office so as to maintain overall alignment on priorities and critical operational decisions.
- Ensure construction management organization is staffed with competent personnel and that team members have clear understanding of their roles, responsibilities, accountabilities and decision making authority.
- Ensuring opportunities for improvement (safety, environment, cost, schedule, and quality) are items of focus and vigorously championed.
- Ensuring Site Contracts Administration and Disputes Resolution teams are fully engaged with the Area Construction Managers.
- Meeting with contractors and suppliers to address issues of importance and solve pending problems.
- Ensuring compliance of Health and Safety, Environmental, Regulatory, Benefits, Social/Community.
- Liaising with Quality, Safety, Permitting, and Environment staffs to ensure construction needs are met.
- Ensuring controls, schedules, costs, risks, procedures and contracting strategies are optimized.
- Ensuring area construction activities are executed in compliance with all laws and regulations, including permits.
- Serving as representative for the site-level safety steering committee, and as Incident Commander for Emergency Response, Level 1 incidents.
- Providing support to help manage serious site issues with respect to safety incidents, labor, community, benefits, construction management, progress, etc.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."



"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Bachelor of Engineering or an equivalent combination of education, training and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• Extensive background (20+ years) in Construction Management with a focus on heavy civil / concrete works.</li> <li>• Relevant experience successfully managing a large construction or fabrication site(s), in particular leading site teams on multi-million dollar project(s).</li> <li>• Demonstrated leadership skills in develop and leading diverse work teams.</li> <li>• Commercially astute individual with a strong background in contracts management and claims avoidance.</li> <li>• Some background in industrial relations.</li> <li>• Experience in stakeholder management, including aboriginal groups.</li> <li>• Experience working in northern climates considered an asset.</li> <li>• Excellent and demonstrated safety and environmental record.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Safety oriented.</li> <li>• Willingness to adhere to the Nalcor’s vision and core values.</li> <li>• Strong interpersonal skills, and the ability to positively interact and communicate with other team members.</li> <li>• Must be able to work effectively as a key member of the Integrated Project Delivery team within a multi-functional team environment (matrix style organization structure).</li> <li>• Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.</li> <li>• Excellent problem solving skills.</li> <li>• Visit the construction site daily with a view of communicating the importance of safety.</li> <li>• Ability to plan work well, and to be well-organized.</li> <li>• Be prepared to accept for responsibility and decision making authority.</li> <li>• Solution oriented.</li> <li>• Must be able to work in a collaborative / supportive manner with stakeholders</li> </ul>

<p><b>PREPARED BY:</b> <u>Ron Power</u></p>	<p><b>APPROVED BY:</b> <u>Ron Power</u> </p>
<p><b>DATE:</b> <u>16-Mar-2015</u></p>	<p><b>DATE:</b> <u>16-Mar-2015</u></p>



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Sr. Construction Engineer	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b> 21    SEP    2015		
<b>DEPARTMENT:</b> Construction Management Team – Muskrat Falls	<b>LOCATION :</b> Muskrat Falls Site			

**DIRECTION EXERCISED AND AUTHORITY:**

The *Sr. Construction Engineer* will provide support to the Muskrat Falls Construction Manager in the performance of all activities related to the execution of the construction work for all construction areas.

The incumbent will have a level of authority required for day-to-day decision making as delegated by the Construction Manager, in order to fulfil the responsibilities of construction execution.

In fulfilling this mandate, the incumbent is expected to liaison extensively with the Area Construction Managers and with all Functional Managers to ensure all functional processes and requirements are strictly adhered to by the Construction Management team.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Strategic only, reporting directly to the Construction Manager; however is expected to interact extensively with Area Construction Managers.

**PURPOSE AND SUMMARY OF SCOPE:**

The *Sr. Construction Engineer* has the responsibility to ensure Nalcor’s construction management objectives are fulfilled for construction areas, as directed by the Construction Manager. These include:

- Contract administration to ensure that work is carried out according to approved contracts, specifications, drawings and schedules, within authorized budgets and in compliance with safety and environmental standards.
- Ensuring interfaces between contract packages are managed so as to ensure timely completion and avoidance of claims – working with Area Construction Managers to ensure alignment in achieving interface management.
- Overseeing the smooth operation of construction areas.
- Oversees and manages construction material usage related to quarries and borrow areas.
- Responding promptly to issues and requests for information from the contractors and to minimize exposure for potential claims arising from contractors. Fostering positive working relations with both contractors and labour to ensure the broader project objectives are achieve; and
- Championing a safety culture where “Nobody Gets Hurt.”

	<b>SCOPE / ROLE DESCRIPTION</b>	
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**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.



The duties and job functions of the **Sr. Construction Engineer** shall include, but are not limited to, the following:

- Working within the Integrated Project Delivery Team to help fulfil Nalcor's Construction Management obligations. In particular, working closely with Area Construction Managers, to help ensure alignment and delivery expectations are being met, ensuring regular status updates are provided on progress, and identifying potential issues requiring resolution.
- Ensuring all functional controls and processes are embedded for conducting construction operations.
- Proactively identifying any site issues that may impede Project delivery, and taking action with the construction team to address.
- Supporting the activities of the Area Construction Managers to ensure their teams are fulfilling Nalcor's obligations and meeting construction management objectives.
- Maintaining robust communication lines and interfacing with Functional Managers and the Project Office so as to maintain overall alignment on priorities and critical operational decisions.
- Help ensuring opportunities for improvement (safety, environment, cost, schedule, and quality) are items of focus and vigorously championed.
- Help ensuring Site Contracts Administration and Disputes Resolution teams are fully engaged with the Area Construction Managers.
- Meeting with contractors and suppliers to address issues of importance and solve pending problems.
- Help ensuring compliance of Health and Safety, Environmental, Regulatory, Benefits, Social/Community.
- Liaising with Quality, Safety, Permitting, and Environment staffs to ensure construction needs are met.
- Help ensuring controls, schedules, costs, risks, procedures and contracting strategies are optimized.
- Help ensuring area construction activities are executed in compliance with all laws and regulations, including permits.
- Providing support to help manage serious site issues with respect to safety incidents, labor, community, benefits, construction management, progress, etc.
- Filling in for / assuming an Area Construction Manager role on an acting basis as requested by the Construction Manager.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**ACADEMIC QUALIFICATIONS:**

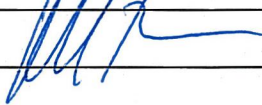
Bachelor of Engineering (civil preferred) or an equivalent combination of education, training and experience.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- 10 years in Construction Management with a focus on heavy civil / concrete works.
- Experience in interface management across various contracts with parallel work activities.
- Commercially astute individual with a background in contracts management and claims avoidance.
- Experience in construction quality control, including execution of inspection and test plans;
- Knowledge of embankment dam construction and concrete dam construction considered an asset.
- Knowledge and experience in managing quarry and borrow area operations.
- Experience working in northern climates considered an asset.
- Excellent and demonstrated safety and environmental record.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Safety oriented.
- Willingness to adhere to the Nalcor’s vision and core values.
- Strong interpersonal skills, and the ability to positively interact and communicate with other team members.
- Must be able to work effectively as a key member of the Integrated Project Delivery team within a multi-functional team environment (matrix style organization structure).
- Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.
- Excellent problem solving skills.
- Ability to plan work well, and to be well-organized.
- Strong knowledge of civil engineering principles, standards and regulations relating to construction, inspection and safety standards;
- Be prepared to accept for responsibility and decision making authority.
- Solution oriented.
- Must be able to work in a collaborative / supportive manner with stakeholders

<p><b>PREPARED BY:</b></p>	<p><u>Ron Power</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Ron Power</u> </p>
<p><b>DATE:</b></p>	<p><u>21-Sep-2015</u></p>	<p><b>DATE:</b></p>	<p><u>21-Sep-2015</u></p>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>DISPUTES RESOLUTION ADVISOR</b>	<b>POSITION NO.:</b> <b>BUSS.1.019</b>	<b>DATE PREPARED:</b> <table border="1"> <tr> <td>24</td> <td>OCT</td> <td>2014</td> </tr> </table>	24	OCT	2014
24	OCT	2014			

<b>DEPARTMENT:</b> <b>BUSINESS SERVICES</b>	<b>LOCATION :</b> <b>MUSKRAT FALLS, LABRADOR</b>
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**DIRECTION EXERCISED AND AUTHORITY:**

The position will provide direction and support to the Project Delivery Team in disputes avoidance, and support to the Contract Administrators in addressing critical non-routine situations.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting directly to the Business Services Manager, incumbent is expected to interact extensively with direct reports, LCMC Management Team, Site based Project Controls teams, Project and Area Managers, Area Construction Managers, and the function managers for Procurement and Accounting.

**PURPOSE AND SUMMARY OF SCOPE:**

The Lower Churchill Project is committed to avoidance of disputes and the resulting waste in Project resources. The Project has already implemented a disputes avoidance program and with the increase in level of work activity a Muskrat Falls sees the need to have a full time disputes avoidance representative at site.

Working with the Project Delivery Team and the on-site Construction Manager develop an overall strategy for the identification of disputes and events which may lead to disputes and mitigate the impact of these events. Provide support to the Contracts Management Team in the administration of contracts in developing and implementing global Strategies for addressing contractor issues.





## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

- Providing oversight and leadership in the performance of all activities related to administration of contracts at the Muskrat Falls site with a focus on disputes avoidance and mitigation;
- Overseeing the implementation of project procedures correct and consistently applied over all contracts;
- Working with the CA's to monitor Contractor activities to identify early indicators of issues that could lead to disputes;
- Work with CA's and Project Delivery Team to ensure all parties are aligned with the contract requirements and are working in unison to achieve project success.
- Provide training in individual aspects of contract administration to improve the team's effectiveness in administration of contracts.
- Review extra work procedures and approved field work orders and changes are priced correctly;
- Review all action logs and status logs for contract administration activities to insure they are up to date and accurate, review to identify trends or early warning signs of potential issues;
- Working with the Component Manager develop strategies for the long term management of contracts, material issues, performance issues, quality, safety and communications;
- Review all contract correspondence to identify inappropriate behaviour, trends and issues;
- Identify gaps in response to correspondence and standard documents, implement corrective actions to correct, and maintain an improve level of recognition for the timely response to contractor correspondence;
- Attending site management meetings and presenting the status and areas of concern for individual contracts;
- Ensure contract administrators maintain a current notice register and review the notices with the Contractor on a regular basis.
- In the event a Claim or Request for Equitable Adjustment is submitted notify the Disputes Avoidance Manager and commence the gathering of documents and data regarding the claim and initiate the phase one analysis.
- Taking all necessary actions to help support the Company in its efforts to avoid claims by taking all reasonable steps for the early identification and resolution of issues and be familiar with Contractor Claims Management and Avoidance as detailed in Document No. LCP-PT-MD-0000-CA-PR-0006-01.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



**SCOPE / ROLE DESCRIPTION**



**ACADEMIC QUALIFICATIONS:**

College graduate with a degree in Engineering, Construction Management or Architecture

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Eight or more years experience in construction disputes analysis and resolution.
- Relevant experience managing a large construction or fabrication site, in particular leading large site teams on a multi-million dollar project.
- Demonstrated leadership skills in develop and leading diverse work teams.
- Commercially astute individual with a strong background in contracts management and claims avoidance.
- Experience working in northern climates considered an asset.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Safety oriented.
- Demonstrated willingness to adhere to the Nalcor's vision and core values.
- Strong interpersonal skills and the ability to interact and communicate with other team members.
- Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.
- Excellent problem solving skills.
- Ability to plan work well, and to be well-organized.
- Demonstrate a willingness to adhere to Nalcor Energy's vision and values.
- Must be able to work in a collaborative / supportive manner with stakeholders
- Solution oriented.

**PREPARED BY:** Bruce Hallock

**APPROVED BY:** \_\_\_\_\_

**DATE:** 19 November 2014

**DATE:** \_\_\_\_\_

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Site Contract Administrator	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
<b>DEPARTMENT:</b> Business Services – Supply Chain	<b>LOCATION :</b> Muskrat Falls Site			
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <b>Monitor and Verify the Contractor’s Performance</b> <ul style="list-style-type: none"> <li>• Maintain daily log of all Contractor activities, discussions and deficiencies</li> <li>• Report activities impacting the Contractor’s performance</li> <li>• Report on deficiencies</li> </ul>				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <ul style="list-style-type: none"> <li>• Reports to Site Contracts Manager at the site and takes functional direction from the Supply Chain Manager.</li> <li>• Works closely as a team member with Engineering, Construction, Project Controls and Procurement.</li> <li>• Maintains working relationships between Company and Contractor.</li> </ul>				
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  Provide commercial oversight for assigned contracts and act as Company interface with Contractor on all commercial matters.				



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work:

### Initial (Start-up)

- Obtain contract document(s) from Procurement including briefing from Contract Formation Team to be conversant with the commercial and technical provisions of the contract.
- Attend Business, Commercial and Project Control Briefings (Contract Specific) for site operations and clarification of Coordination Procedures.
- Arrange kick-off meetings, as required, and hold regular contract review meetings with Contractor and Project Team.
- Ensure all Contractor Statutory Documents are in place and properly filed:
  - Performance Securities
  - WHSCC Clearance Letter
  - Insurances
  - Permits

### Progress and Reporting

- Develop with Contractor and agree the required formal process for:
  - Progress Measures
  - Progress Reporting
  - Quantity Measurement
  - Quantity Reporting
  - Other Reporting Forms (as required by contract)
    - Weekly Resource Reporting
      - Labour
      - Equipment
      - Resource Projections
      - Fuel Use & Forecasted (as required by contract)
      - Site Accommodation Forecasted
      - Air Travel Actual & Forecasted
  - Manage Change
    - Change Proposals
    - Change Orders
    - Change Order Register (to be managed by CA) of Contractor requested and Company approved Changes using designated Company system

### Contract Administration

- Ensure compliance with contractual terms
- Enforce contractual provisions
- Ensure contractual notice provisions are respected and enforced
- Develop and maintain filing system
- Review and verify invoices for payment. Where applicable, ensuring statutory declaration, as identified in contract, showing status of payment to subcontractors, UIC, CCP, and listing of claims accompanies each invoice.
- As first point of contact, review and assess Contractor claims/change requests for entitlement. Inform management of claims. Negotiate favorable settlements to claims and change requests and obtain appropriate approval
- Close out contract when complete



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

Business, Commerce or Engineering Degree or equivalent combination of training and experience.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- 15+ years' work experience in a similar role with successful experience in negotiating, drafting, interpreting and administering significant contracts;
- Prior experience dealing with a variety of contracts related to major CAPEX development;
- Strong understanding of contractual issues related to risk and liability complimented with a strong background with commercial issues related to long term value is important;
- The ability to demonstrate competency in Microsoft Office applications is considered an asset;
- Claims analysis skills and ability to develop claims strategies;
- Structured, methodical, process driven problem solving ability;
- Exceptional negotiation skills;
- Proven interpersonal and communication skills to effectively interact with a variety of personnel, and other industry participants, both internal and external;
- Ability to quickly assimilate new data, including highly technical information, and communicate same in layperson terms;
- Proven skills in effectively managing multiple tasks, often under pressure and within time constraints; and
- Use initiative to independently recommend solutions based on logical assumptions and analysis of facts/data while considering constraints and impacts on the organization.



SCOPE / ROLE DESCRIPTION



**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Incumbent must be willing to work at site.
- Valid drivers licence, with the ability to drive in Newfoundland and Labrador.

PREPARED BY:

APPROVED BY:



DATE:

19 Mar 2014

DATE:

19 Mar 2014



	<b>SCOPE / ROLE DESCRIPTION</b>				
<b>POSITION:</b> Area Construction Manager – Powerhouse, Intake & Spillway	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b> <table border="1"> <tr> <td>15</td> <td>MAR</td> <td>2015</td> </tr> </table>	15	MAR	2015
15	MAR	2015			
<b>DEPARTMENT:</b> Construction Management Team – Muskrat Falls	<b>LOCATION :</b> Muskrat Falls Site				
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  <p>Under the authority of the Construction Manager, the <b>Area Construction Manager – Powerhouse, Intake and Spillway</b> will work within the limits of the Project Instructions while demonstrating adherence to Nalcor’s values, to oversee the construction activities for the Powerhouse, Intake and Spillway. Responsibility within this position includes, but is not limited to, safety and environmental performance, contracts administration, quality assurance, planning, cost control, and progress reporting.</p> <p>The incumbent will have a level of authority required for day-to-day decision making, as delegated by the Construction Manager, in order to fulfil the responsibilities of construction execution.</p> <p>In fulfilling this mandate, the incumbent is expected to liaison extensively with the relevant contractors and have direct interface with the members of the Muskrat Falls Project Delivery Team to ensure alignment on key priorities and strategies. The incumbent shall work in accordance to Nalcor’s Values.</p>					
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  <p>Strategic only, reporting directly to the Construction Manager to ensure alignment on key priorities and execution strategies.</p>					
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  <p>The <b>Area Construction Manager – Powerhouse, Intake and Spillway</b> will oversee area construction operations by the various contractors on a day-to-day basis, and ensure that work is done safely, on time and to the right quality standards. As a leader within the Site Team, the incumbent will lead a multi-functional team of construction monitoring coordinators, construction monitors, contractor administrators, surveyors, etc. to ensure Nalcor’s construction management objectives are fulfilled for the construction areas. These include:</p> <ul style="list-style-type: none"> <li>• Contract administration to ensure that work is carried out according to approved contracts, specifications, drawings and schedules, within authorized budgets and in compliance with safety and environmental standards;</li> <li>• Management of construction interface between contract packages so as to ensure timely completion and avoidance of claims;</li> </ul>					



## SCOPE / ROLE DESCRIPTION



- Overseeing the smooth operation of construction areas;
- Responding promptly to issues and requests for information from the contractors and to minimize exposure for potential claims arising from contractors;
- Fostering positive working relations with both contractors and labour to ensure the broader project objectives are achieved; and
- Championing a safety culture where "Nobody Gets Hurt."

**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** Note: The following is being executed as a contract scope of work

In collaboration and support of the Construction Manager, the duties and job functions of the **Area Construction Manager – Powerhouse, Spillway and Intake** shall include, but are not limited to, the following:

- Provide overall leadership to the Area Construction Management team.
- Ensure that the Area Construction Management team is staffed, guided, and empowered to accomplish its mandate.
- Ensure that Area Construction Management team has a clear understanding of plans and priorities, and that all members work in unison to achieve the plan.
- Ensure Area Construction Management team members thoroughly understand the contracts and that they proactively ensure work is executed accordingly;
- Monitor the activities of all contractors engaged in the construction to ensure their obligations are fulfilled, while ensure all active construction interfaces are managed;
- Ensure work is executed in accordance with approved Inspection and Test Plans (ITP).
- Proactively identify and work to resolve any site issues that may impede Project delivery;
- Ensure that decisions requiring actions are addressed in a timely fashion;
- Prepare formal correspondence as required, and participate in the sign-off process for formal correspondence and notifications to contractors.
- Ensure all Company supplied material, equipment and services are provided in a timely fashion;
- Ensuring opportunities for improvement (safety, environment, cost, schedule, and quality) are items of focus and vigorously championed;
- Chair construction coordination meetings with contractors;
- Participate in risk assessment activities with contractors and ensure control measures are implemented for high-risk works;
- Evaluate the performance of team members, and assist team members in their personal development;
- Prepare construction management methods to be included in the relevant management plans, and implement;
- Work with labour and management in order to foster labour harmony;



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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- Maintain close contact with the Resident Engineer to help ensure all technical matters are proactively managed;
- Interface directly with Manager – Civil Coordination to resolve interface issues with E&P being carried out in Project Office and at fabrication sites;
- Participate in site H&S plan, including undertaking regular safety tours and inspections, responding to safety observations, championing FELT leadership, and participating in Job Safety Analyses and Tailboards;
- Ensure records of contractor’s activities on-site including daily inspection records, site progress records, events, etc. are produced and maintained.
- Ensure required reporting is implemented.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

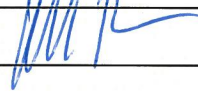
Bachelor of Engineering or an equivalent combination of education, training and experience.

- RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**
- Extensive background (15+ years) in Construction Management with a focus on concrete construction.
  - Experience working on large-scale hydroelectric projects considered an asset.
  - Experience in contract administration and progress verification.
  - Experience working in northern climates considered an asset.
  - Excellent and demonstrated safety and environmental record
  - Aboriginal, diversity and cultural awareness considered an asset.
  - Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.
  - Strong problem solving skills.
  - Strong planning and organizational skills.
  - Solution oriented.

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Safety oriented.
- Willingness to adhere to Nalcor’s vision and core values.
- Strong interpersonal skills and the ability to positively interact and communicate with other team members.
- Must be able to work effectively as a key member of the Integrated Project Delivery team within a multi-functional team environment (matrix style organization structure).
- Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.
- Excellent problem solving skills.
- Visit the construction site daily with a view of communicating the importance of safety.
- Ability to plan work well, and to be well-organized.
- Be prepared to accept for responsibility and decision making authority.
- Solution oriented.
- Must be able to work in a collaborative / supportive manner with stakeholders
- Willingness to accept full responsibility and decision making authority.

<b>PREPARED BY:</b>	<u>Ron Power</u>	<b>APPROVED BY:</b>	<u>Ron Power</u> 
<b>DATE:</b>	<u>16-Mar-2015</u>	<b>DATE:</b>	<u>16-Mar-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Shift Engineer	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		24	APR	2015
<b>DEPARTMENT:</b> Construction Management Team – Muskrat Falls	<b>LOCATION :</b> Muskrat Falls Site			

**DIRECTION EXERCISED AND AUTHORITY:**

The *Shift Engineer* may be delegated the responsibilities and authority level of the Area Construction Manager (ACM) during periods when the ACM is absent from his/her position.

The *Shift Engineer* will have direct reports – the Construction Monitors will report to the *Shift Engineer*.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the Area Construction Manager

**PURPOSE AND SUMMARY OF SCOPE:**

The *Shift Engineer* is responsible to “steer” the overall construction monitoring effort within his/her assigned area. This includes:

1. Assessing upcoming work areas for issues potentially impacting construction;
2. Overseeing ongoing construction activities for general compliance;
3. Capturing field issues and effecting resolution via established mechanisms;
4. Documenting observations;
5. Facilitating the work by working collaboratively with the appropriate contractors;
6. Providing general safety oversight.





## SCOPE / ROLE DESCRIPTION

**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:**

(Note: the following is being executed as a contract scope of work):

The duties and job functions of the **Shift Engineer** shall include, but are not limited to, the following:

- Assures that all work undertaken by contractors is done in a safe manner and in accordance with approved drawings, specifications and regulations;
- Works and interfaces extensively with the ACM, Contracts Administrator, Disputes Advisor, QA Advisors, Survey Lead, H&S advisors, and Environmental Monitors in order to collectively ensure that contractors are adhering to Execution Plan(s), including all supporting plans and procedures required to ensure that the work is done to the level of specified quality, safety and environmental standards;
- Assures that ACM and all others, as appropriate, are kept informed of events occurring at the work site(s);
- Investigates upcoming work areas for issues or potential issues that may adversely impact construction and takes those steps appropriate to mitigate these impacts;
- Assures that contractors' look-ahead plans are appropriate and include consideration of issues that may impact construction. Provides recommendations, as appropriate, to contractor(s) to assure construction activities adequately address field conditions;
- Coordinates with any and all team groups to assure proper communications and to effect resolution/mitigation of identified issues;
- Assures that engineering related issues are promptly relayed to the Resident Engineer for action and follows up to assure timeliness of resolution efforts;
- Ensures work areas are inspected/monitored for compliance with safety, environmental and other related functions.
- Coordinates the work of all construction monitors assigned to the area;
- Coordinates construction surveillance activities with respect to QA inspection activities, field engineering, survey, materials management, H&S Advisors and Environmental Monitors based upon agreed work prioritization with ACM;
- Ensures that required inspections and tests carried out in the field are correctly documented and approved;
- Ensures that there is a sufficient level and competency of monitors available to support the verification of the contractors' work in accordance with the Agreements;
- Coaches and mentors monitors to ensure they are provided with the level of guidance/direction required to fulfil their duties;
- Coordinates various contractors at points of interface and determines work priorities;
- Issues and reviews Site Instructions issued to the contractor(s) to ensure compliance with the Agreement and with the Project Delivery Team's work processes;
- Supports ACM in the reviews and comments on justifications given by contractors for any extra or claims requested;
- Provides technical support to the Contract Administrator and Disputes Advisor with respect to the review and validation of contractors' progress declaration and certificates;
- Identifies performance trends on safety, schedule & quality and works with ACM to coordinate corrective actions;
- Maintains awareness of resources mobilized by contractors and of the progress of the work;
- Supports the review of contractor Concession Requests;
- Supports management of non-conformances;
- Conducts job site coordination meetings with members of the LCP Team as required;
- Attends various coordination meetings with contractors;
- Prepares regular job progress status reports and review contractors' status reports for the ACM;
- Ensures all 'As-Built' documentation requirements are stewarded.
- Provides technical support to other team members as required.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

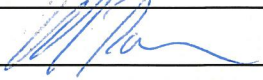



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**ACADEMIC QUALIFICATIONS:**  
 Bachelor of Engineering

- RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**
- 5 years of experience on civil construction projects.
  - Experience in performing QA/QC oversight, monitoring, surveillance and inspection activities on large civil construction projects.
  - Ability to read and interpret drawings, specifications, codes and standards.
  - Experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, turbine and generator and balance of plant considered an asset.
  - Previous experience with auditing construction QA programs considered an asset.
  - Working knowledge of incident investigation / root cause analysis.
  - Supervisory experience considered an asset.

- JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**
- Safety oriented.
  - Demonstrated willingness to adhere to the Nalcor’s vision and core values.
  - Strong interpersonal skills and the ability to interact with all stakeholders.
  - Must demonstrate accountability and ownership for the assigned work area;
  - Solid knowledge of engineering principles, standards and regulations relating to construction, inspection and safety standards;
  - Strong technical and communication skills;
  - Self-starter who identifies priority tasks and puts plans in place to complete;
  - Must be a team player but maintain the ability to work independently;
  - Demonstrated understanding of Quality Assurance principles;
  - Incumbent must be willing to work at site; possibly on night shift.

<p><b>PREPARED BY:</b> <u>Ron Power</u></p> <p><b>DATE:</b> <u>24-Apr-2015</u></p>	<p><b>APPROVED BY:</b> <u>Ron Power</u> </p> <p><b>DATE:</b> <u>24-Apr-2015</u></p>
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	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Sr. Civil Construction Monitor	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		09	APR	2015
<b>DEPARTMENT:</b> Construction Management Team – Muskrat Falls	<b>LOCATION :</b> Muskrat Falls Site			

**DIRECTION EXERCISED AND AUTHORITY:**

The incumbent is responsible for monitoring, surveillance and inspection of construction activities of works related to the Powerhouse/ Intake/ Spillway.

In this capacity, the incumbent will be required to review and interpret work specifications and verify that the contractors are fulfilling their obligations as defined in the relevant Agreements.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the Supervisory Engineer, direction and guidance will be provided.

**PURPOSE AND SUMMARY OF SCOPE:**

Working within the Integrated Project Delivery Team responsible for Site Construction Management, the **Sr. Civil Construction Monitor** will to:

- Provide Owner Construction Management oversight over the contractors’ activities to ensure compliance with the contractual requirements, including identifying and managing key interface points as required for coordination of the overall works;
- Ensure the work is constructed meeting all requirements of the Agreement(s);
- Implement and participate in monitoring, surveillance and inspection programs and activities for construction and installation activities of contractors and suppliers;
- Ensure Contractors’ and Suppliers’ QA/QC programs are implemented and effective.



	<b>SCOPE / ROLE DESCRIPTION</b>	
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**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** (Note: The following is being executed as a contract scope of work.)

The duties and job functions of the **Sr. Civil Construction Monitor** shall include, but are not limited to, the following:

- Implement all applicable Owner construction management oversight, monitoring, surveillance and inspection plans, procedures and checklists for inspecting and reporting of the work activities at the Powerhouse/ Spillway/ Intake;
- Perform monitoring, surveillance and inspection of the work, on behalf of Nalcor Energy, to ensure contractors' and suppliers' quality programs are fully implemented and effective through review and acceptance of contractors' quality documentation (including inspection and test plans, procedures, quality records, final documentation, etc.);
- Ensure full compliance with the regulatory requirements, technical specifications, drawings and any special supplier installation procedures as defined in contractors' and suppliers' inspection and test plans;
- Ensure contractors are working to the latest revisions of specifications, drawings, procedures and ITPs;
- Maintain detailed records of the work, including all observations and concerns;
- Provide daily, weekly and monthly inspection reports and maintain quality control files of all on-going construction work;
- Implement the quality audit and surveillance plan and issue reports such as corrective actions, non-conformances, and observations;
- Work with Contractors and Suppliers to ensure clarity in understanding project and technical requirements;
- Interface daily with the engineering team to help ensure compliance to all technical specifications and drawings for selected scopes;
- Review documentation received from contractor (material specification, method statements, Inspection and Test Plans, drawings, test results, other technical documentation, etc.) for implementation and compliance;
- Attend construction meetings as required;
- Support the Construction Management Team in the coordination and management of Project interfaces between contractors;
- Ensure management of turnover documentation is implemented;
- Ensure all audit findings, NCRs, etc. are closed;
- Provide technical assistance to team members as required;
- Other activities as assigned.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**ACADEMIC QUALIFICATIONS:**

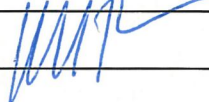
Bachelor of Engineering (civil Engineering or a related discipline), supplemented by experience in construction QA/QC oversight, monitoring, surveillance and inspection activities for large civil projects, or an equivalent combination of education and experience.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- 5 to 10 years of field experience in performing monitoring, surveillance and inspection activities on construction projects;
- Experience in construction quality control, including execution of inspection and test plans;
- Demonstrated ability to digest and interpret construction Agreements including ability to read and interpret drawings, specifications, codes and standards;
- Experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, turbine and generator and balance of plant considered an asset;
- Experience with auditing construction QA programs;
- Working knowledge of incident investigation / root cause analysis.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Safety orientated;
- Willingness to adhere to Nalcor’s vision and core values;
- Willing to assume accountability and ownership for the assigned work area;
- Strong knowledge of civil engineering principles, standards and regulations relating to construction, inspection and safety standards;
- Strong technical and communication skills;
- Knowledge of Quality Management principles;
- Good interpersonal skills and the ability to effectively interact with stakeholders;
- Good communication skills;
- Self-starter who identifies priority tasks and puts plans in place to complete;
- Must be a team player but maintain the ability to work independently;
- Incumbent must be willing to work at site; possibly on night shift.

<p><b>PREPARED BY:</b></p>	<p><u>Ron Power</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Ron Power</u> </p>
<p><b>DATE:</b></p>	<p><u>09-Apr-2015</u></p>	<p><b>DATE:</b></p>	<p><u>09-Apr-2015</u></p>
<p><i>*Attach additional pages if necessary</i></p>			



	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Jr. Civil Construction Monitor	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		09	APR	2015
<b>DEPARTMENT:</b> Construction Management Team – Muskrat Falls	<b>LOCATION :</b> Muskrat Falls Site			

**DIRECTION EXERCISED AND AUTHORITY:**

The incumbent will assist in monitoring, surveillance and inspection of construction activities of works related to the Powerhouse/ Intake/ Spillway.

In this capacity, the incumbent will assist the Supervisory Engineer (s) and the Sr. Construction Monitors review and interpret work specifications and verify that the contractor is fulfilling its obligations as defined in the relevant contract or agreement.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the Supervisory Engineer, direction and guidance will be provided.

**PURPOSE AND SUMMARY OF SCOPE:**

Working within the Integrated Project Delivery Team responsible for Site Construction Management, the **Jr. Civil Construction Monitor** will provide assistance to:

- Provide Owner Construction Management oversight over the contractors’ activities to ensure compliance with the contractual requirements, including identifying and managing key interface points as required for coordination of the overall works;
- Ensure the work is constructed meeting all requirements of the Agreement(s);
- Implement and participate in monitoring, surveillance and inspection programs and activities for construction and installation activities of contractors and suppliers;
- Ensure Contractors’ and Suppliers’ QA/QC programs are implemented and effective.

	<b>SCOPE / ROLE DESCRIPTION</b>	
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**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** (Note: The following is being executed as a contract scope of work.)

The duties and job functions of the **Jr. Civil Construction Monitor** shall include, but are not limited to, the following:

- Assist in the implementation of all applicable Owner construction management oversight, monitoring, surveillance and inspection plans, procedures and checklists for inspecting and reporting of the work activities at the Powerhouse/ Spillway/ Intake;
- Assist with monitoring, surveillance and inspection of the work, on behalf of Nalcor Energy, to ensure contractors' and suppliers' quality programs are fully implemented and effective through review and acceptance of contractors' quality documentation (including inspection and test plans, procedures, quality records, final documentation, etc.);
- Help ensure full compliance with the regulatory requirements, technical specifications, drawings and any special supplier installation procedures as defined in contractors' and suppliers' inspection and test plans;
- Ensure contractors are working to the latest revisions of specifications, drawings, procedures and ITPs;
- Maintain detailed records of the work, including all observations and concerns;
- Assist with daily, weekly and monthly inspection reports and maintain quality control files of all on-going construction work;
- Assist in the implementation of the quality audit and surveillance plan and issue reports such as corrective actions, non-conformances, and observations;
- Work with Contractors and Suppliers to ensure clarity in understanding project and technical requirements;
- Interface daily with the engineering team to help ensure compliance to all technical specifications and drawings for selected scopes;
- Review documentation received from contractor (material specification, method statements, Inspection and Test Plans, drawings, test results, other technical documentation, etc.) for implementation and compliance;
- Attend construction meetings as required;
- Support the Construction Management Team in the coordination and management of Project interfaces between contractors;
- Assist in the preparation and management of turnover documentation;
- Assist to ensure all audit findings, NCRs, etc. are closed;
- Provide technical assistance to team members as required;
- Other activities as assigned.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."




	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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**ACADEMIC QUALIFICATIONS:**  
 Bachelor of Engineering (civil Engineering or a related discipline) supplemented by some experience in civil construction QA/QC oversight, monitoring, surveillance and inspection activities, or an equivalent combination of education and experience.

- RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**
- 1 to 2 years of field experience in performing monitoring, surveillance and inspection activities on construction projects;
  - Some experience in construction quality control, including execution of inspection and test plans;
  - Ability to read and interpret drawings, specifications, codes and standards;
  - Some experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, turbine and generator and balance of plant considered an asset;
  - Some experience with auditing construction QA programs;
  - Working knowledge of incident investigation / root cause analysis.

- JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**
- Safety orientated;
  - Willingness to adhere to Nalcor’s vision and core values;
  - Willing to assume accountability and ownership for the assigned work area;
  - Good knowledge of civil engineering principles, standards and regulations relating to construction, inspection and safety standards;
  - Good interpersonal skills and the ability to effectively interact with stakeholders;
  - Good communication skills;
  - Self-starter who identifies priority tasks and puts plans in place to complete;
  - Must be a team player but maintain the ability to work independently;
  - Incumbent must be willing to work at site; possibly on night shift.

<p><b>PREPARED BY:</b> <u>Ron Power</u></p> <p><b>DATE:</b> <u>09-Apr-2015</u></p>	<p><b>APPROVED BY:</b> <u>Ron Power</u> </p> <p><b>DATE:</b> <u>09-Apr-2015</u></p>
<p><i>*Attach additional pages if necessary</i></p>	

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Hydro-Mechanical Shift Engineer	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		17	JUL	2015
<b>DEPARTMENT:</b> MFG Construction Management Team	<b>LOCATION :</b> Muskrat Falls Site, Labrador			
<b>DIRECTION EXERCISED AND AUTHORITY:</b>  The <i>Hydro-Mechanical Shift Engineer</i> may be delegated the responsibilities and authority level of the Area Construction Manager (ACM) during periods when the ACM is absent from his/her position.  The <i>Hydro-Mechanical Shift Engineer</i> will have direct reports – the Hydro-Mechanical Construction Monitors will report to the <i>Hydro-Mechanical Shift Engineer</i> .				
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b>  Reporting to the Area Construction Manager – Powerhouse/ Intake and Spillway.				
<b>PURPOSE AND SUMMARY OF SCOPE:</b>  The <i>Hydro-Mechanical Shift Engineer</i> is responsible to “steer” the overall construction monitoring effort within his/her assigned area. This includes: <ol style="list-style-type: none"> <li>1. Assessing upcoming work areas for issues potentially impacting construction;</li> <li>2. Overseeing ongoing construction activities for general compliance;</li> <li>3. Capturing field issues and effecting resolution via established mechanisms;</li> <li>4. Documenting observations;</li> <li>5. Facilitating the work by working collaboratively with the appropriate contractors;</li> <li>6. Providing general safety oversight.</li> </ol>				



## SCOPE / ROLE DESCRIPTION

**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:**

(Note: the following is being executed as a contract scope of work):

The duties and job functions of the **Hydro-Mechanical Shift Engineer** shall include, but are not limited to, the following:

- Assures that all work undertaken by contractors is done in a safe manner and in accordance with approved drawings, specifications and regulations;
- Works and interfaces extensively with the ACM (Area Construction Manager), Contracts Administrator, Disputes Advisor, QA Advisors, Survey Lead, H&S advisors, and Environmental Monitors in order to collectively ensure that contractors are adhering to Execution Plan(s), including all supporting plans and procedures required to ensure that the work is done to the level of specified quality, safety and environmental standards;
- Assures that ACM and all others, as appropriate, are kept informed of events occurring at the work site(s);
- Investigates upcoming work areas for issues or potential issues that may adversely impact construction and takes those steps appropriate to mitigate these impacts;
- Assures that contractors' look-ahead plans are appropriate and include consideration of issues that may impact construction. Provides recommendations, as appropriate, to contractor(s) to assure construction activities adequately address field conditions;
- Coordinates with any and all team groups to assure proper communications and to effect resolution/mitigation of identified issues;
- Assures that engineering related issues are promptly relayed to the Resident Engineer for action and follows up to assure timeliness of resolution efforts;
- Ensures work areas are inspected/ monitored for compliance with safety, environmental and other related functions.
- Coordinates the work of all construction monitors assigned to the area;
- Coordinates construction surveillance activities with respect to QA inspection activities, field engineering, survey, materials management, H&S Advisors and Environmental Monitors based upon agreed work prioritization with ACM;
- Ensures that required inspections and tests carried out in the field are correctly documented and approved;
- Ensures that there is a sufficient level and competency of monitors available to support the verification of the contractors' work in accordance with the Agreements;
- Coaches and mentors monitors to ensure they are provided with the level of guidance/direction required to fulfil their duties;
- Coordinates various contractors at points of interface and determines work priorities;
- Issues and reviews Site Instructions issued to the contractor(s) to ensure compliance with the Agreement and with the Project Delivery Team's work processes;
- Supports ACM in the reviews and comments on justifications given by contractors for any extra or claims requested;
- Provisions technical support to the Contract Administrator and Disputes Advisor with respect to the review and validation of contractors' progress declaration and certificates;
- Identifies performance trends on safety, schedule & quality and works with ACM to coordinate corrective actions;
- Maintains awareness of resources mobilized by contractors and of the progress of the work;
- Supports the review of contractor Concession Requests;
- Supports management of non-conformances;
- Conducts job site coordination meetings with members of the LCP Team as required;
- Attends various coordination meetings with contractors;
- Prepares regular job progress status reports and review contractors' status reports for the ACM;
- Ensures all 'As-Built' documentation requirements are stewarded.
- Provides technical support to other team members as required.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



## SCOPE / ROLE DESCRIPTION



### ACADEMIC QUALIFICATIONS:

Bachelor of Mechanical Engineering

### RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:

- 5 years of experience on civil construction projects.
- Experience in performing QA/QC oversight, monitoring, surveillance and inspection activities on large civil construction projects.
- Ability to read and interpret drawings, specifications, codes and standards.
- Experience with construction of hydroelectric projects, specifically intake, powerhouse, spillway and transition dams, turbine and generator and balance of plant considered an asset.
- Previous experience with auditing construction QA programs considered an asset.
- Working knowledge of incident investigation / root cause analysis.
- Supervisory experience considered an asset.

### JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:

- Safety oriented.
- Demonstrated willingness to adhere to the Nalcor's vision and core values.
- Strong interpersonal skills and the ability to interact with all stakeholders.
- Must demonstrate accountability and ownership for the assigned work area;
- Solid knowledge of engineering principles, standards and regulations relating to construction, inspection and safety standards;
- Strong technical and communication skills;
- Self-starter who identifies priority tasks and puts plans in place to complete;
- Must be a team player but maintain the ability to work independently;
- Demonstrated understanding of Quality Assurance principles;
- Incumbent must be willing to work at site; possibly on night shift.

PREPARED BY: Robert Woolgar

APPROVED BY: Ed Bush

DATE: 11-August-2015

DATE: 11-August-2015

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> Area Construction Manager – North Spur	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
<b>DEPARTMENT:</b> Muskrat Falls Project Delivery Team	<b>LOCATION :</b> North Spur Site			

**DIRECTION EXERCISED AND AUTHORITY:**

Under the authority of the Area Manager - North Spur/ Dams, the **Area Construction Manager – Dams** will work within the limits of the Project Instructions while demonstrating adherence to Nalcor’s values, to oversee the construction activities for the North Spur. Responsibility within this position includes, but is not limited to, safety and environmental performance, contracts administration, quality assurance, planning, cost control, and progress reporting.

The incumbent will have a level of authority required for day-to-day decision making, as delegated by the Muskrat Falls Generation Project Manager, to fulfil the responsibilities of construction execution.

In fulfilling this mandate, the incumbent is expected to liaison extensively with the contractor and have direct interface with the members of the Muskrat Falls Project Delivery Team to ensure alignment on key priorities and strategies. The incumbent shall work in accordance to Nalcor’s Values.

**DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**

Reporting to the Area Manager – North Spur/ Dams and the Muskrat Falls Generation Project Manager, the Area Construction Manager – North Spur is expected to interact extensively with the Construction Management Team located at the North Spur site, Package Engineers, and Contractors.

The Area Construction Manager – North Spur will be expected to work in a team environment as well as independently with direction from the Area Manager – North Spur/ Dams.

**PURPOSE AND SUMMARY OF SCOPE:**

The **Area Construction Manager – North Spur** will oversee area construction operations by the contractor on a day-to-day basis, and ensure that work is done safely, on time and to the right quality standards. As a leader within the North Spur Construction Team, the incumbent will lead a multi-functional team construction monitors and contractor administrators to ensure Nalcor’s construction management objectives are fulfilled for the construction areas. These include:

- Contract administration to ensure that work is carried out according to approved contracts, specifications, drawings and schedules, within authorized budgets and in compliance with safety and environmental standards;
- Overseeing the smooth operation of construction areas;
- Responding promptly to issues and requests for information from the contractors and to minimize exposure for potential claims arising from contractors;
- Fostering positive working relations with both contractors and labour to ensure the broader project objectives are achieve; and
- Championing a safety culture where “Nobody Gets Hurt.”



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** Note: The following is being executed as a contract scope of work in collaboration and support of the Area Manager – North Spur/ Dams, the duties and job functions of the **Area Construction Manager – North Spur** shall include, but are not limited to, the following:

- Provide overall leadership to the Area Construction Management team.
- Ensure that the Area Construction Management team is staffed, guided, and empowered to accomplish its mandate.
- Ensure that Area Construction Management team has a clear understanding of plans and priorities, and that all members work in unison to achieve the plan.
- Ensure Area Construction Management team members thoroughly understand the contracts and that they proactively ensure work is executed accordingly;
- Monitor the activities of all contractors engaged in the construction to ensure their obligations are fulfilled, while ensure all active construction interfaces are managed;
- Ensure work is executed in accordance with approved Inspection and Test Plans (ITP).
- Proactively identify and work to resolve any site issues that may impede Project delivery;
- Ensure that decisions requiring actions are addressed in a timely fashion;
- Prepare formal correspondence as required, and participate in the sign-off process for formal correspondence and notifications to contractors.
- Ensure all Company supplied material, equipment and services are provided in a timely fashion;
- Ensuring opportunities for improvement (safety, environment, cost, schedule, and quality) are items of focus and vigorously championed;
- Chair construction coordination meetings with contractors;
- Participate in risk assessment activities with contractors and ensure control measures are implemented for high-risk works;
- Evaluate the performance of team members, and assist team members in their personal development;
- Prepare construction management methods to be included in the relevant management plans, and implement;
- Work with labour and management in order to foster labour harmony;
- Maintain close contact with the Muskrat Falls Generation Engineering Manager to help ensure all technical matters are proactively managed;
- Interface directly with Area Manager – North Spur/ Dams to resolve interface issues with E&P being carried out in Project Office;
- Participate in site H&S plan, including undertaking regular safety tours and inspections, responding to safety observations, championing FELT leadership, and participating in Job Safety Analyses and Tailboards;
- Ensure records of contractor's activities on-site including daily inspection records, site progress records, events, etc. are produced and maintained.
- Ensure required reporting is implemented.



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

**ACADEMIC QUALIFICATIONS:**

Bachelor of Engineering or an equivalent combination of education, training and experience.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Extensive background (15+ years) in Construction Management.
- Experience working on large-scale civil construction projects considered an asset.
- Experience in contract administration and progress verification.
- Experience working in northern climates considered an asset.
- Excellent and demonstrated safety and environmental record
- Aboriginal, diversity and cultural awareness considered an asset.
- Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.
- Strong problem solving skills.
- Strong planning and organizational skills.
- Solution oriented.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Safety oriented.
- Willingness to adhere to Nalcor’s vision and core values.
- Strong interpersonal skills and the ability to positively interact and communicate with other team members.
- Possess strong people skills, with the ability to interact, motivate and lead team members and contractors.
- Excellent problem solving skills.
- Visit the construction site daily with a view of communicating the importance of safety.
- Ability to plan work well, and to be well-organized.
- Be prepared to accept for responsibility and decision making authority.
- Solution oriented.
- Must be able to work in a collaborative / supportive manner with stakeholders
- Willingness to accept full responsibility and decision making authority.

<b>PREPARED BY:</b>	<u>Robert Woolgar</u>	<b>APPROVED BY:</b>	<u>Robert Woolgar</u>
<b>DATE:</b>	<u>31-Jul-2015</u>	<b>DATE:</b>	<u>31-Jul-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> North Spur Site Administrative Assistant	<b>POSITION NO.:</b>	<b>DATE PREPARED:</b>		
		20	APR	2015
<b>DEPARTMENT:</b> Muskrat Falls Generation	<b>LOCATION:</b> North Spur Site			

**DIRECTION EXERCISED AND AUTHORITY:**

This position reports to the Area Construction Manager – North Spur.

- DIRECTION RECEIVED AND REPORTING RELATIONSHIP:**
- The Administrative Assistant reports directly to the Area Construction Manager – North Spur or delegate for the execution of daily tasks.
  - Ensures that the Area Construction Manager – North Spur or delegate is informed of leave plans as timely as possible.

**PURPOSE AND SUMMARY OF SCOPE:**

The purpose of this position is to provide administrative services to the assigned project, in accordance with Project Instructions and Procedures. The scope includes all administrative activities for the Area Construction Manager – North spur and other department managers as directed.



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** The following is being executed as a contract scope of work.

In accordance with the Project Instructions and Procedures, and as approved by the Area Construction Manager – North Spur, the Assistant has the responsibility to accomplish the following duties:

- Utilizing word processing (MS Word, Excel and Power Point), as required prepare letters, memos and other documentation. The typing of priority documents shall be subject to the approval of the Area Construction Manager – North Spur or delegate.
- Responsible for travel arrangements of business travel for the personnel identified by the Area Construction Manager – North Spur and their visitors at site.
- To make all necessary arrangements prior to the arrival of a new hire in departments identified by the Area Construction Manager – North Spur.
- To welcome and provide administrative support to all VIP visitors as identified by Area Construction Manager – North Spur.
- Initiate and maintain an efficient filing system using designated filing system numbers, plus additional files as required.
- Ensure incoming mail, documents, faxes are delivered in a timely manner to the correct person. Outgoing documentation to be clearly marked.
- Make photocopies and distribute when required; and arrange for bulk copies and special print jobs.
- Printing and distribution of documents when received on site.
- Monitor and update office supplies as required (ie. requisition stationery etc).
- Answer telephone and take telephone messages for the people in designated departments and advise them accordingly.
- Book conference or function rooms as required and maintain the necessary register for the rooms.
- Send/receive faxes.
- Advise project administration of any technical problems affecting personal or department productivity, e.g. LAN downtime, photocopier breakdowns, etc.
- Check timesheets before submission.
- Take and prepare draft Minutes of Meetings as required.
- Enter and update information on employee turn around schedules.
- Accomplish other tasks of a similar nature as requested by the North Spur Area Construction Manager.
- Provide support for Document Control such as filing, document numbering and scanning.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."

	<b>SCOPE / ROLE DESCRIPTION</b>	
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**ACADEMIC QUALIFICATIONS:**  
 Graduate from a recognized office administration/secretarial program or an equivalent combination of education, training and experience.

**RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:**

- Proficiency in administrative services with 5-7 years of work experience as an administrative assistant with experience in an office environment.
- General knowledge and past experience in the construction industry or past major industrial projects would be considered an asset.

**JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:**

- Safety oriented.
- Demonstrated willingness to adhere to the Nalcor’s vision and core values.
- Strong interpersonal skills and the ability to interact and communicate with other team members.
- Incumbent must be willing to work at site.
- Must possess a valid driver’s license and be eligible to drive in Newfoundland and Canada.
- Contract position for six to ten months.

<b>PREPARED BY:</b>	<u>Robert Woolgar</u>	<b>APPROVED BY:</b>	<u>Robert Woolgar</u>
<b>DATE:</b>	<u>31-Jul-2015</u>	<b>DATE:</b>	<u>31-Jul-2015</u>

	<b>SCOPE / ROLE DESCRIPTION</b>	
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<b>POSITION:</b> <b>Civil Construction Monitor – North Spur</b>	<b>POSITION NO.:</b> <b>Various</b>	<b>DATE PREPARED:</b> <table border="1" style="width: 100%;"> <tr> <td style="width: 25%;">2</td> <td style="width: 25%;">APR</td> <td style="width: 25%;">2015</td> <td style="width: 25%;"></td> </tr> </table>			2	APR	2015	
2	APR	2015						
<b>DEPARTMENT:</b> <b>Muskrat Falls Generation</b>	<b>LOCATION :</b> <b>North Spur</b>							
<b>DIRECTION EXERCISED AND AUTHORITY:</b> <p>This position has no direct reports; however the incumbent is responsible for monitoring, surveillance and inspection of construction activities related to the North Spur.</p> <p>In this capacity, the incumbent will be required to review and interpret work specifications and verify that the contractors are fulfilling their obligations as defined in the relevant Agreements.</p>								
<b>DIRECTION RECEIVED AND REPORTING RELATIONSHIP:</b> <p>Reporting to the Area Construction Manager – North Spur the incumbent should be capable of functioning with a limited level of supervision.</p>								
<b>PURPOSE AND SUMMARY OF SCOPE:</b> <p>The incumbent will work closely with the Area Construction Management Team to:</p> <ul style="list-style-type: none"> <li>• Provide Owner Construction Management oversight over the contractors’ activities to ensure compliance with the contractual requirements, including identifying and managing key interface points as required for coordination of the overall works;</li> <li>• Ensure the work is constructed meeting all requirements of the Agreement;</li> <li>• Implement and participate in monitoring, surveillance and inspection programs and activities for construction and installation activities of contractors and suppliers;</li> <li>• Ensure Contractors’ and Suppliers’ QA/QC programs are implemented and effective.</li> </ul>								



## SCOPE / ROLE DESCRIPTION



**PRINCIPAL ACTIVITIES, DUTIES AND RESPONSIBILITIES:** (Note: The following is being executed as a contract scope of work):

- Implement all applicable Owner construction management oversight, monitoring, surveillance and inspection plans, procedures and checklists for inspecting and reporting of the work activities;
- Perform monitoring, surveillance and inspection to ensure contractors' quality programs are fully implemented and effective through review and acceptance of contractors' quality documentation (including inspection and test plans, procedures, quality records, final documentation, etc.);
- Ensure full compliance with the regulatory requirements, technical specifications, and drawings as defined in contractors and suppliers' inspection and test plans;
- Provide daily, weekly and monthly inspection reports and maintain quality control files of all on-going construction work;
- Implement the quality audit and surveillance plan and issue reports such as corrective actions, non-conformances', and observations;
- Work with contractors and suppliers to ensure clarity in understanding project and technical requirements;
- Interface daily with engineering team to ensure compliance to all technical specifications and drawings for selected scopes;
- Review documentation received from contractor (material specification, method statements, inspection and test plans, drawings, test results, other technical documentation, etc.) for implementation and compliance;
- Attend construction meetings as required;
- Ensure turnover documentation is complete;
- Work with contractors and suppliers to ensure all audit findings, NCR, etc. are closed;
- Other activities as assigned.

"Incumbent shall work in accordance with the Health and Safety Policies & Procedures and strive to eliminate any potential risk which could result in personal injury or occupational illness."

"Incumbent shall be familiar with the Environmental Policy and Guiding Principles and applicable environmental Standard Operating Procedures."



	<p><b>SCOPE / ROLE DESCRIPTION</b></p>	
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<p><b>ACADEMIC QUALIFICATIONS:</b></p> <p>Bachelor of Engineering (Civil Engineering or a related discipline) or Technical Diploma (Civil Engineering or a related discipline), supplemented by experience in construction QA/QC oversight, monitoring, surveillance and inspection activities for large civil projects, or an equivalent combination of education and experience.</p>
<p><b>RELEVANT WORK EXPERIENCE AND REQUIRED COMPETENCIES:</b></p> <ul style="list-style-type: none"> <li>• 5 to 10 years of field experience in performing monitoring, surveillance and inspection activities on large construction projects;</li> <li>• Experience in construction quality control, including execution of inspection and test plans;</li> <li>• Demonstrated ability to digest and interpret construction Agreements including ability to read and interpret drawings, specifications, codes, and standards;</li> <li>• Previous experience with auditing construction QA programs;</li> <li>• Experience working in a team environment;</li> <li>• Working knowledge of incident investigation / root cause analysis.</li> </ul>
<p><b>JOB REQUIREMENTS, WORKING CONDITIONS, ETC.:</b></p> <ul style="list-style-type: none"> <li>• Good knowledge of civil engineering principles, standards and regulations relating to construction, inspection and safety standards;</li> <li>• Strong technical and communication skills to effectively interact with contractor, consultant and owner teams;</li> <li>• Must be a team player but maintain the ability to work independently;</li> <li>• Strong knowledge of Quality Management principles and ISO 9001 standard;</li> <li>• Demonstrated commitment to Quality Assurance issues;</li> <li>• Basic understanding of Microsoft Word and Excel is preferred;</li> <li>• Incumbent must be willing to work from remote work sites;</li> <li>• Contract position for six to ten months (willingness to work night shift).</li> </ul>

<p><b>PREPARED BY:</b></p>	<p><u>Robert Woolgar</u></p>	<p><b>APPROVED BY:</b></p>	<p><u>Fletcher Baltz</u></p>
<p><b>DATE:</b></p>	<p><u>2-April-2015</u></p>	<p><b>DATE:</b></p>	<p><u>2-April-2015</u></p>

# Appendix C

## Component Snapshot



MUSKRAT FALLS SNAPSHOT - NOVEMBER 2015

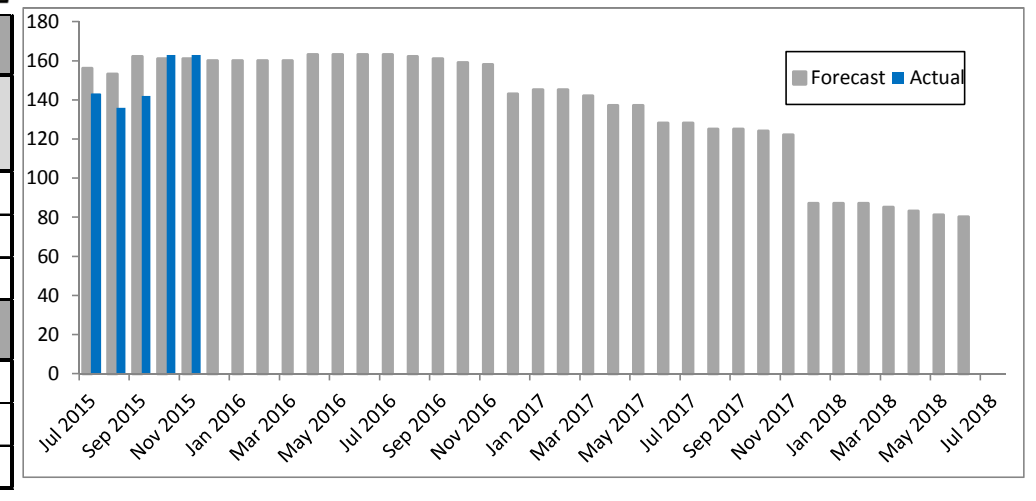
PROJECT MILESTONES



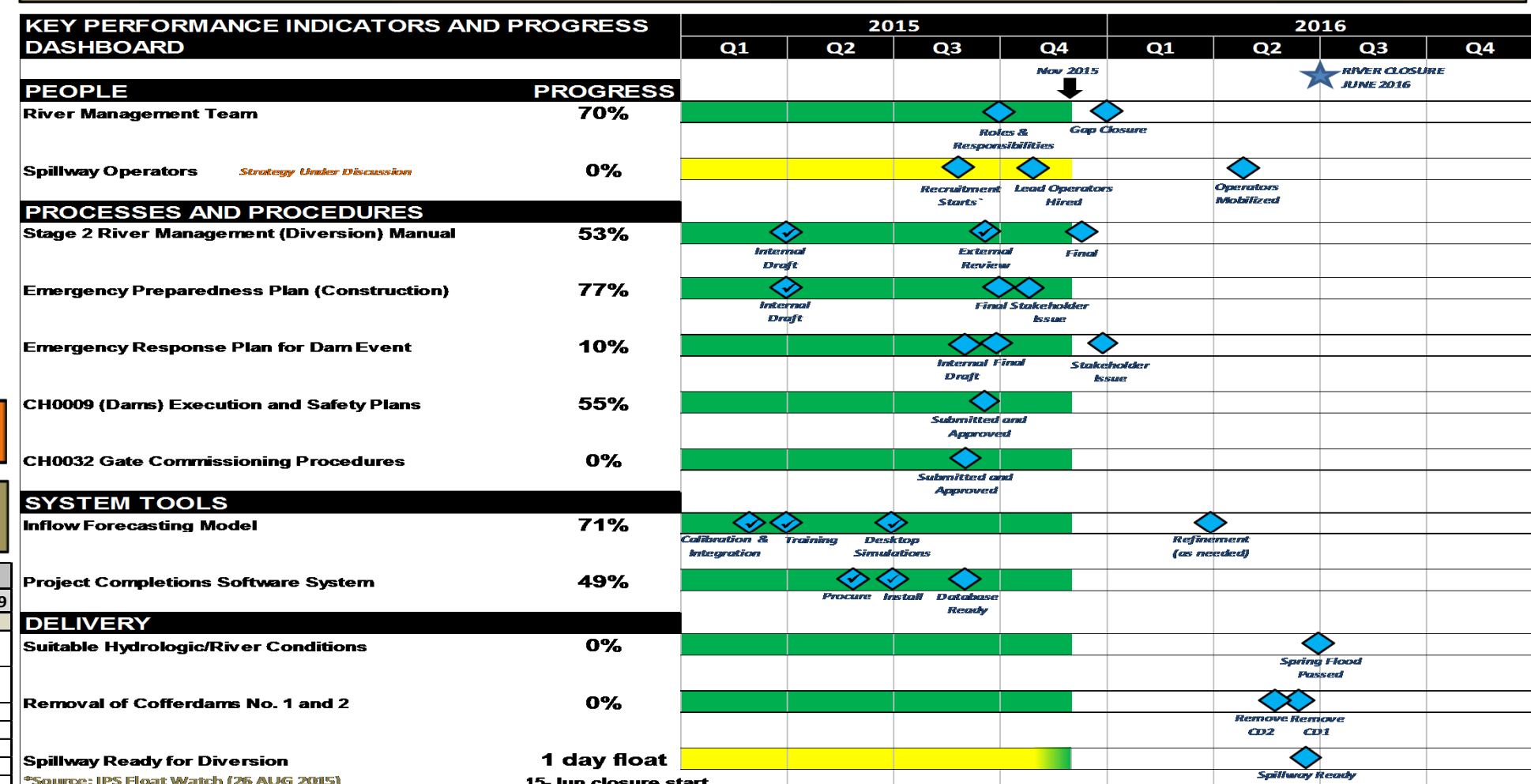
COMPLETIONS SUMMARY

Table with columns: Sub-System Definitions, Completion Certificates, Static Commissioning Certificates, Handover Certificates. Includes a punchlist summary table.

MFL STAFFING



RIVER MANAGEMENT



CH0007 SUMMARY

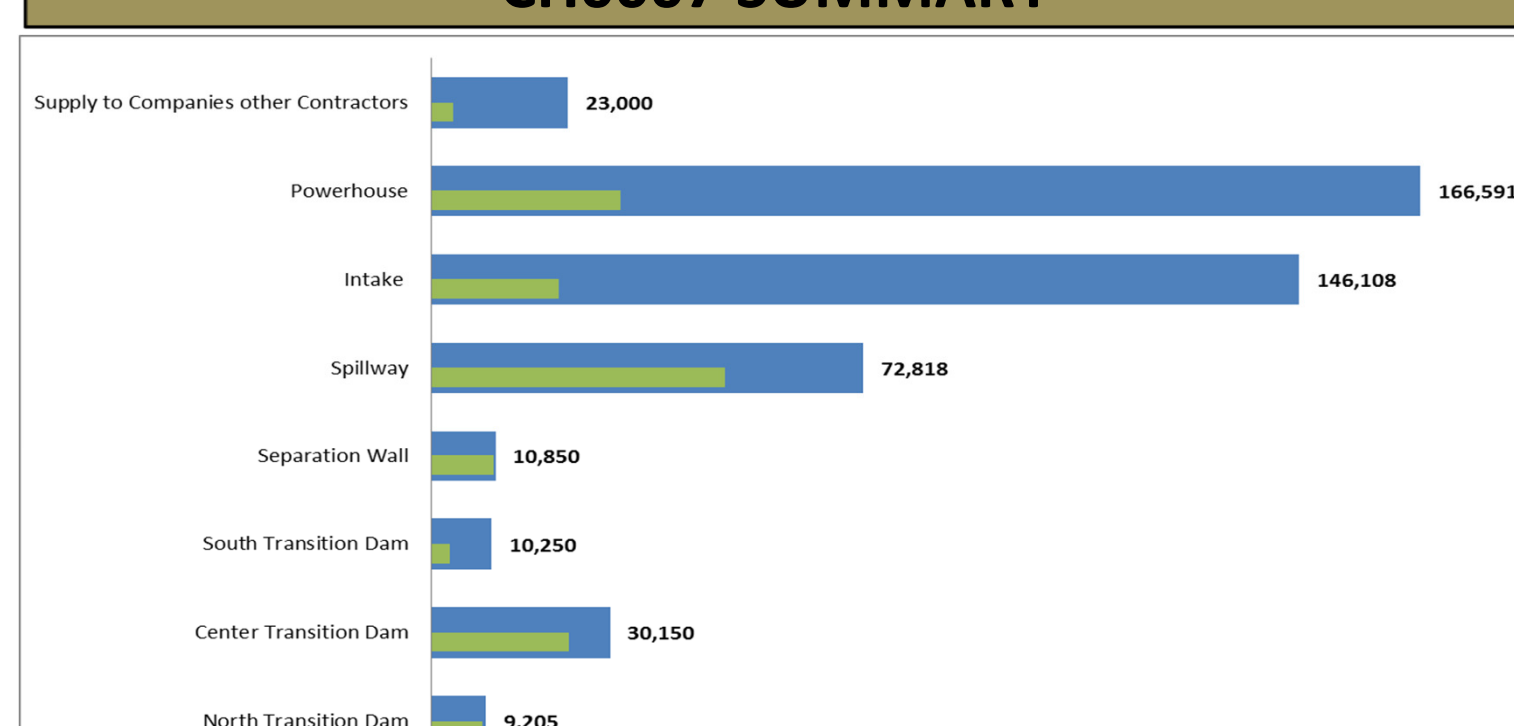


Table with columns: Description/Area, Unit of Measure, Estimated Quantities, Installed PTD.

CIVIL

CH0008 SUMMARY

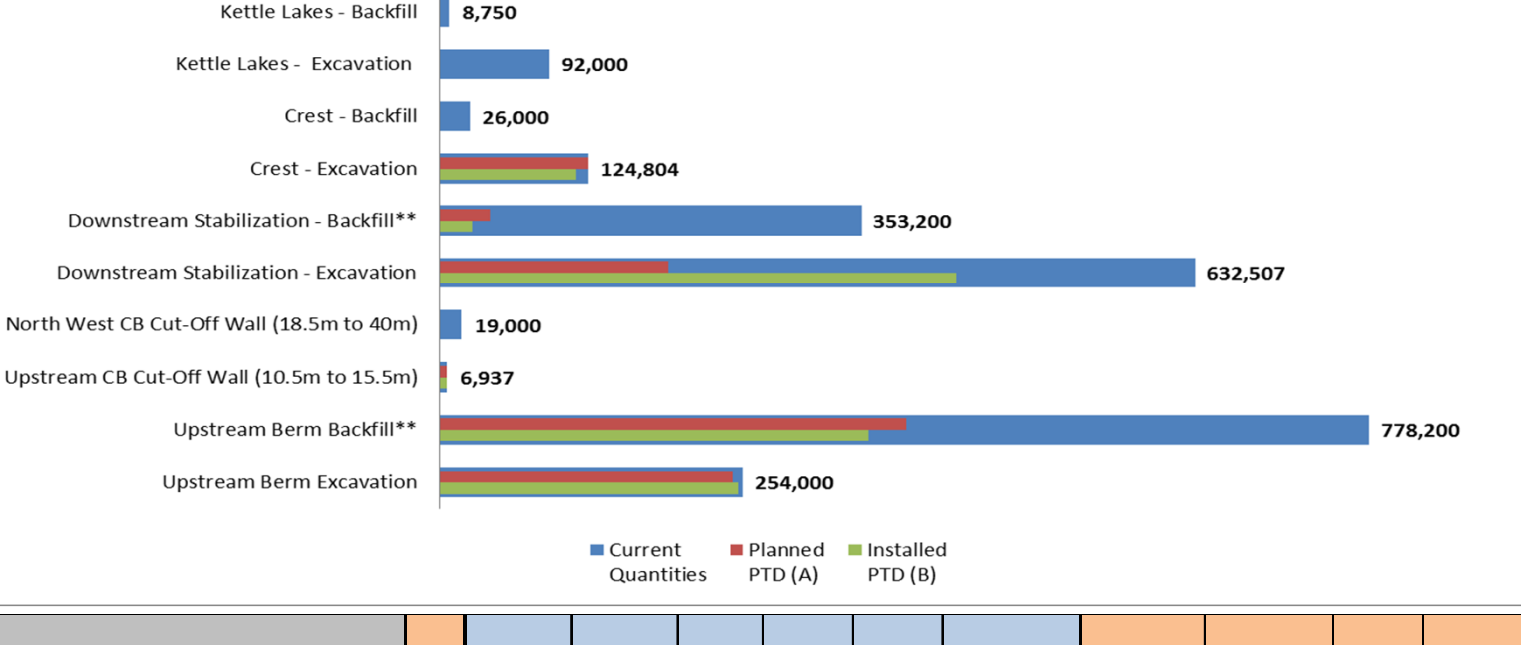


Table with columns: Area, Contract Quantity, Current Quantity, Planned Quantity, etc.

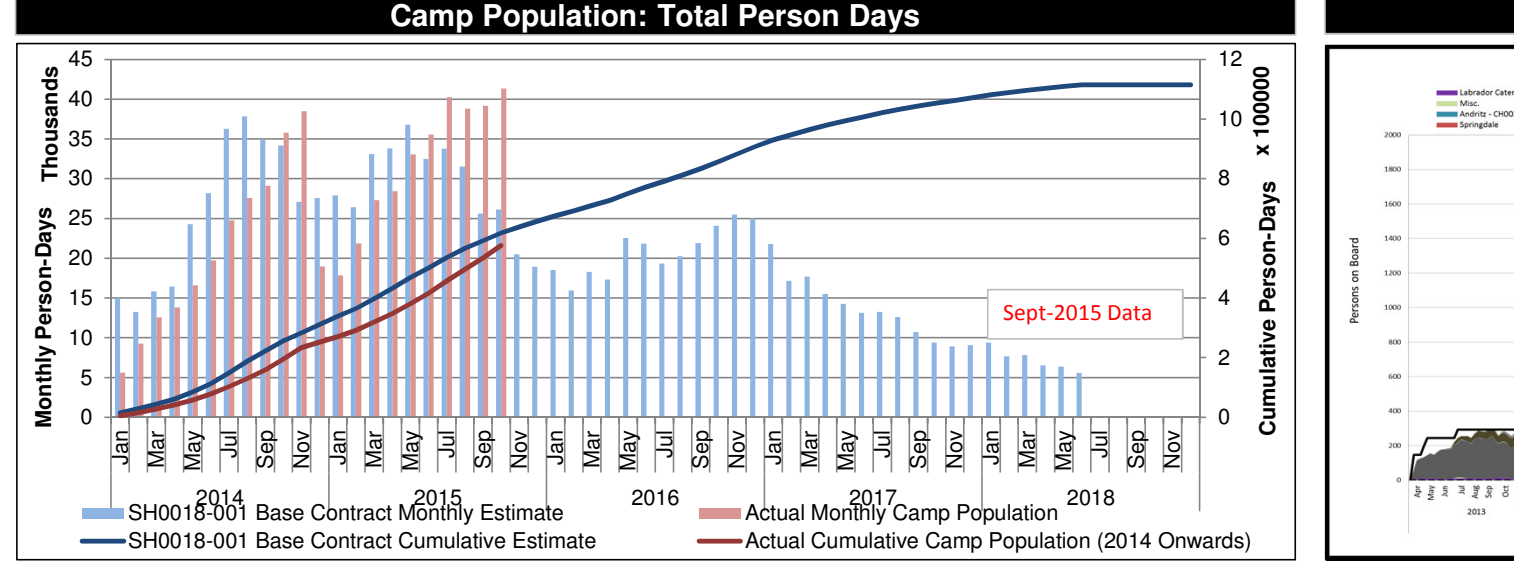
CH0009 SUMMARY

Quality Inspection Summary table with columns: Week 48, Week 49, Week 50, Week 51.

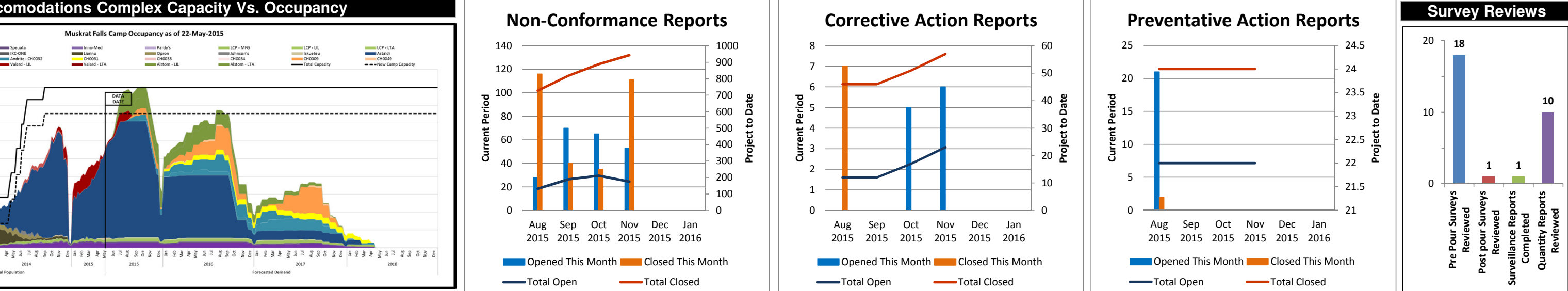
ELECTRICAL/MECHANICAL SUMMARY

Large summary table for Electrical and Mechanical work, including Document Status, Concession, Letters, DANN, PCN, and Change Orders.

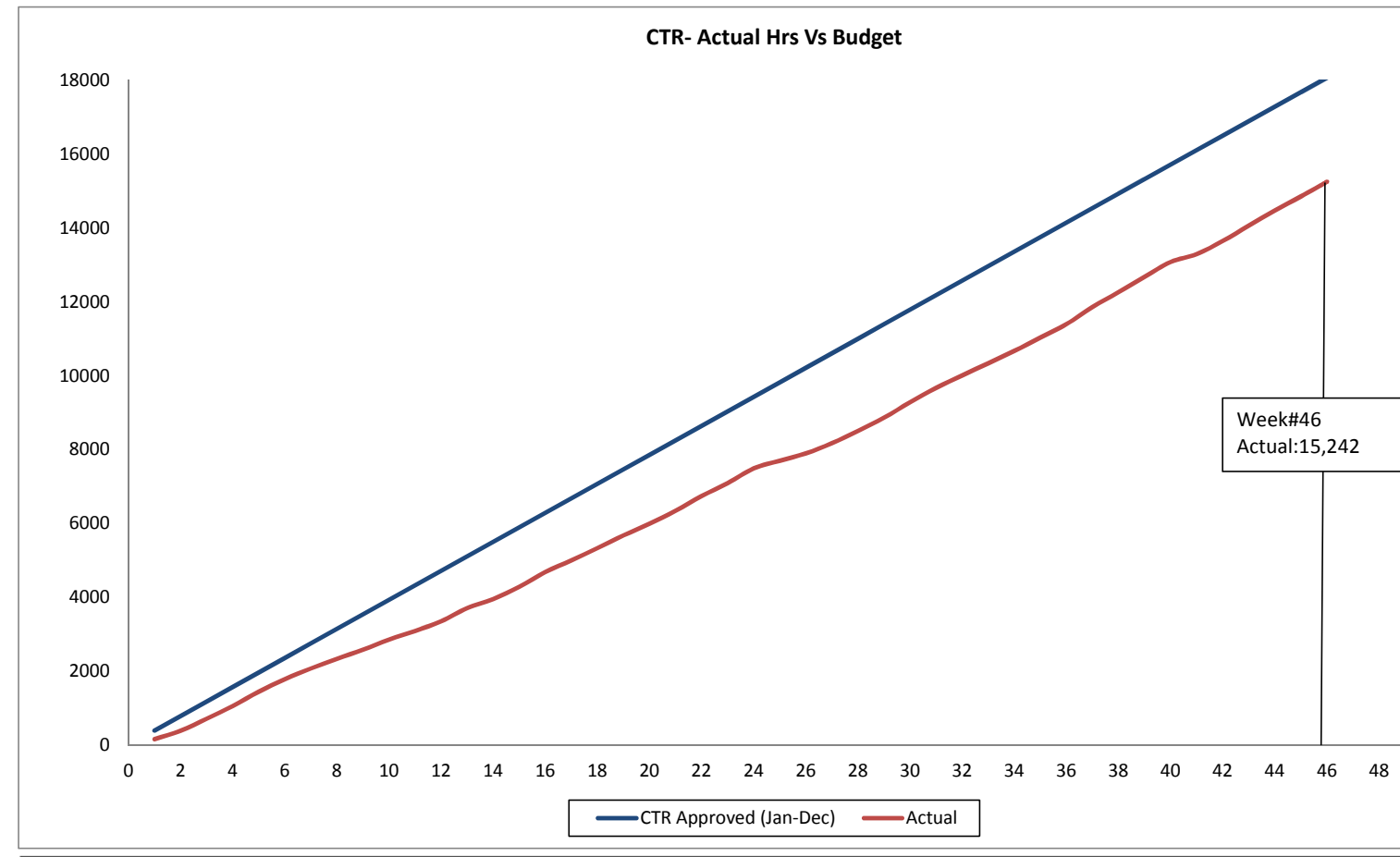
CAMP OCCUPANCY



COMPONENT 1 QUALITY REPORTS



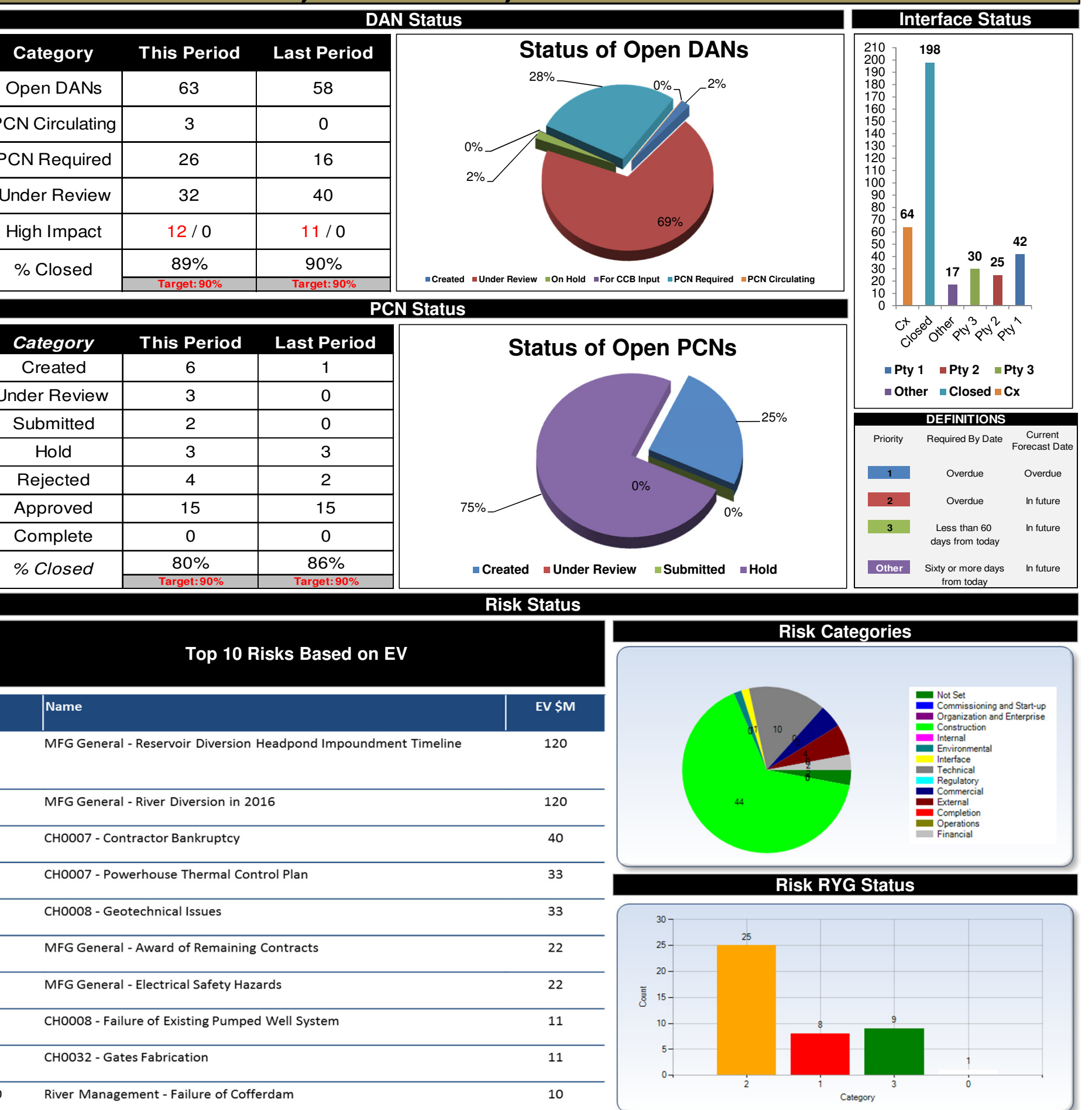
BUDGET REPORT



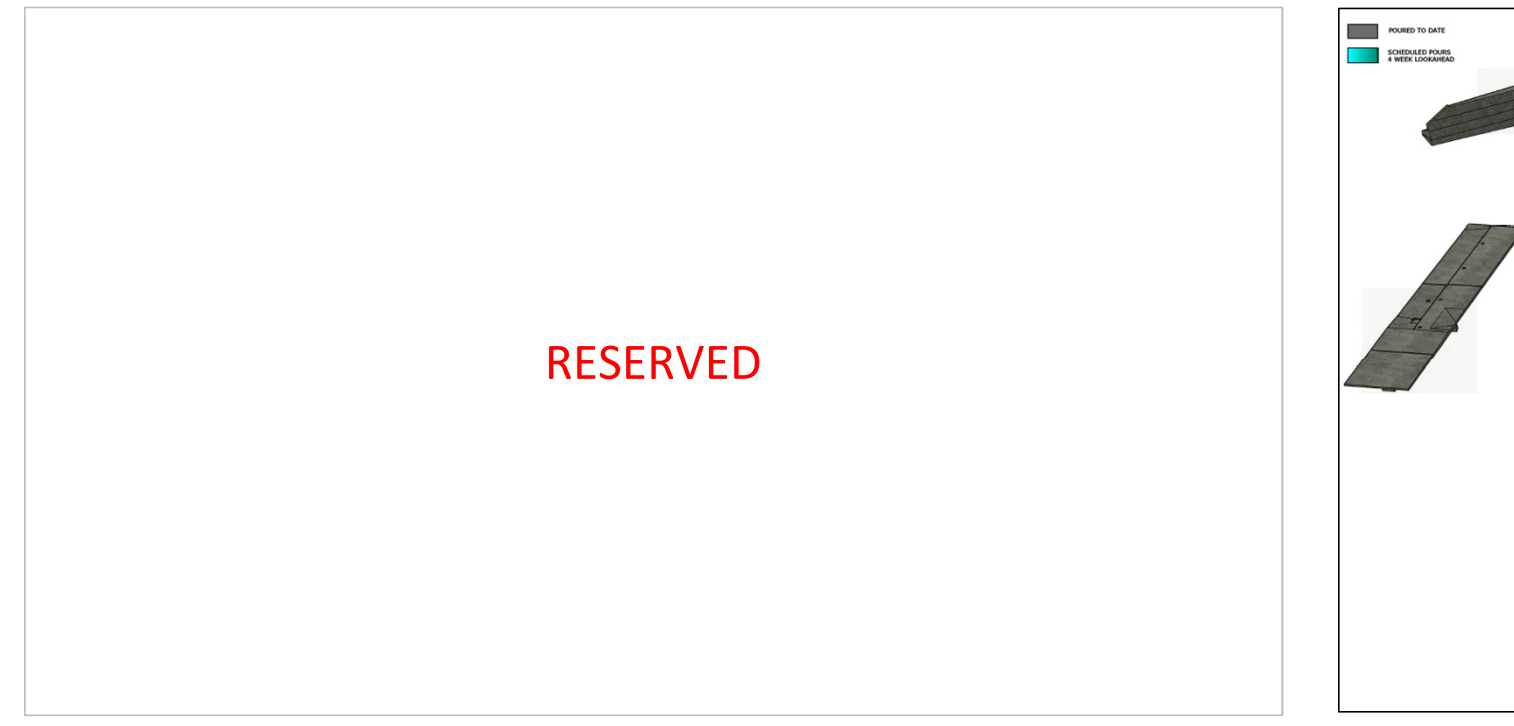
SAFETY

Incident Injury Frequency table with columns: Project Delivery, Current Period, Values to Date, Total.

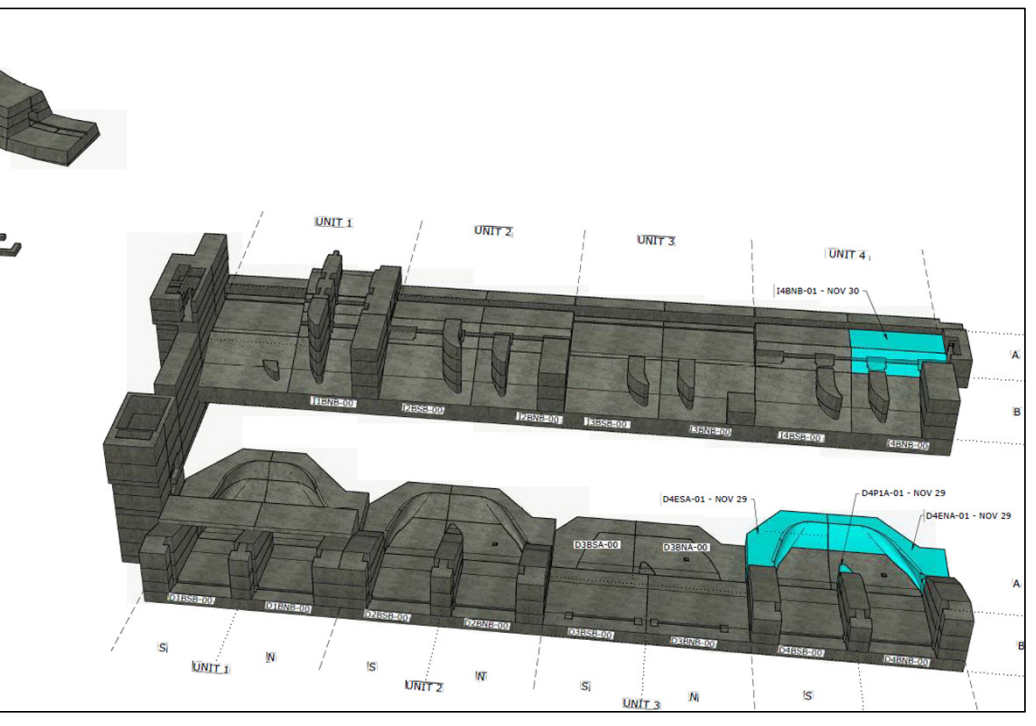
CHANGE, INTERFACE, & RISK MANAGEMENT



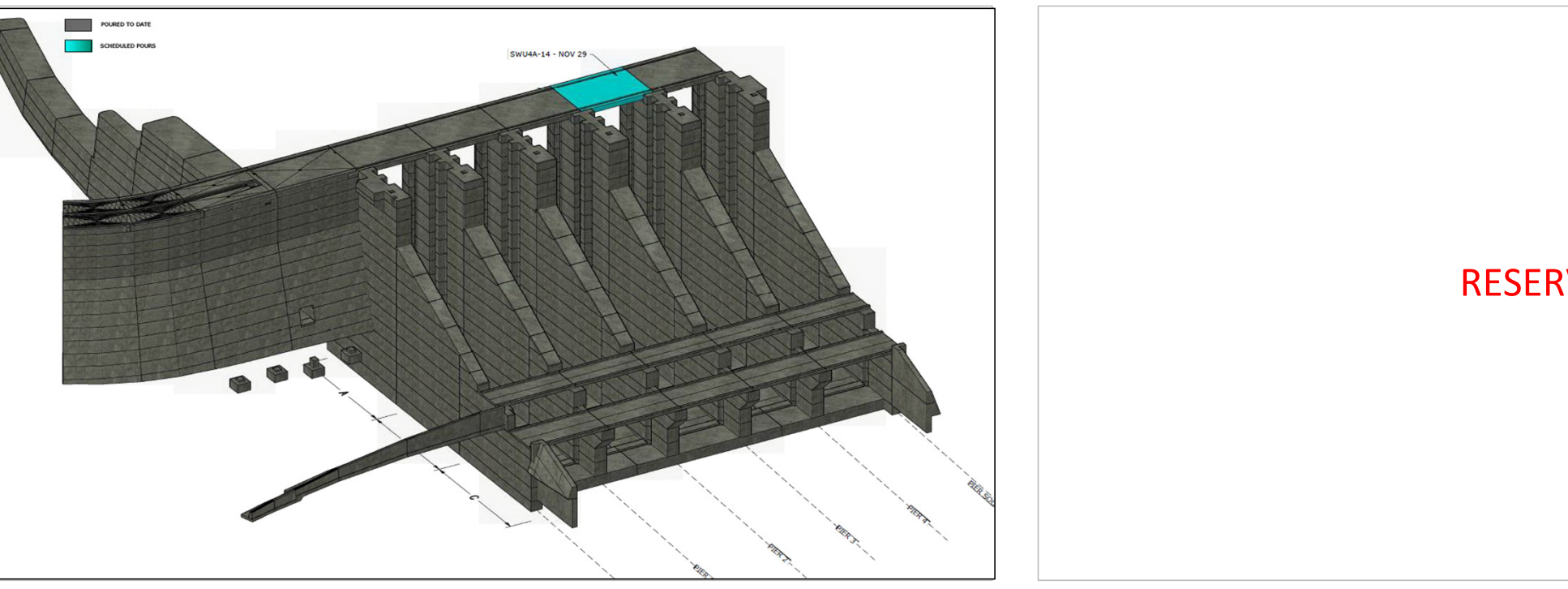
SOUTH DAM



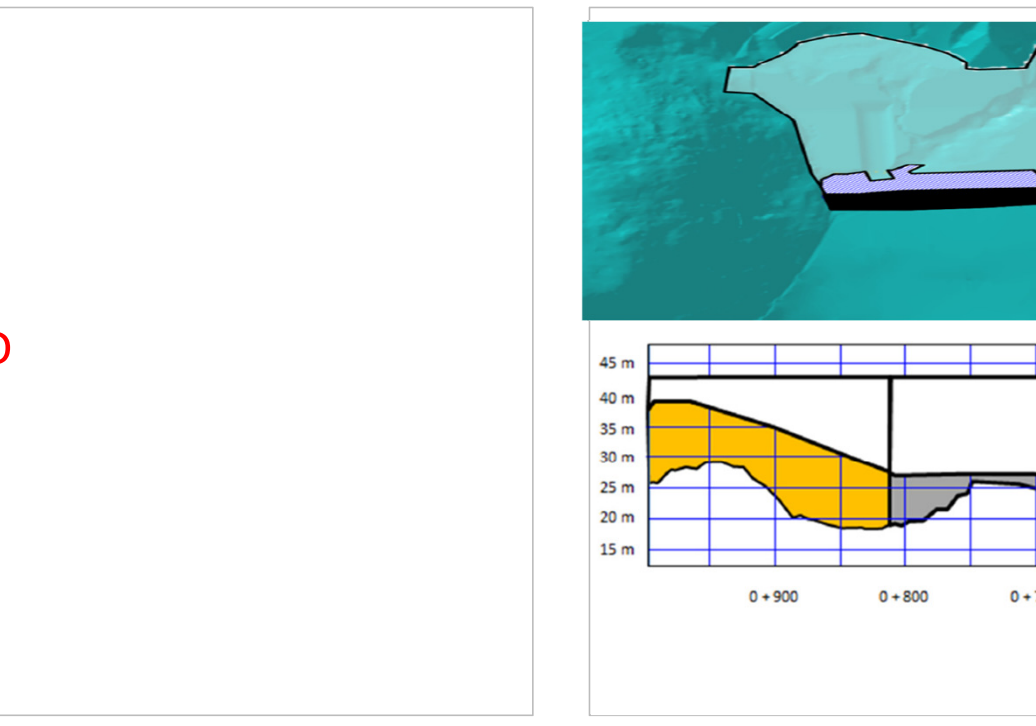
POWERHOUSE



SITE STATUS SCHEMATICS



NORTH DAM



NORTH SPUR

