

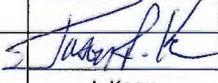
Lower Churchill Management Corporation



LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)

Nalcor Doc. No. LCP-PT-MD-0000-RI-RP-0001-01

Comments: PRIVILEGED AND CONFIDENTIAL, PREPARED IN CONTEMPLATION OF LITIGATION	Total # of Pages: (Including Cover): 392 16 + 21 Attachments
---	---

B1	17-Jun-2016	Issued for Use	 J. Kean	N/A	N/A	N/A
Status / Revision	Date	Reason for Issue	Prepared by	Functional Manager Approval	Quality Assurance Approval	General Project Manager Approval

CONFIDENTIALITY NOTE:

This document contains intellectual property of Lower Churchill Management Corporation and shall not be copied, used or distributed in whole or in part without the prior written consent from Lower Churchill Management Corporation.

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)

Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	1

Inter-Departmental / Discipline Approval (where required)

Department	Department Manager Approval	Date
Project Director	 P. Harrington	
	Name	
	Name	
	Name	

**LTA - LITL
Quantitative Risk Analysis
May 2016**

**PRIVILEGED AND CONFIDENTIAL
PREPARED IN CONTEMPLATION OF LITIGATION**

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	2

TABLE OF CONTENTS

	PAGE
1 PURPOSE	3
2 SCOPE.....	3
3 DEFINITIONS.....	3
4 ABBREVIATIONS AND ACRONYMS.....	3
5 REFERENCES	4
6 SCOPE OF ANALYSIS.....	4
7 METHODOLOGY.....	5
8 BASIS OF ASSESSMENT.....	7
9 QRA RESULTS.....	9
10 ATTACHMENTS.....	15

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	3

1 PURPOSE

The purpose this report is to document the results of the Quantitative Cost and Schedule Risk Analysis completed on the Labrador – Transmission Assets (LTA) and Labrador – Island Transmission Link (LITL) sub-Projects during February – April 2016 (hereafter referred to simplify as “QRA”).

2 SCOPE

This QRA encompasses the capital expenditure (“CAPEX”) phase of both LTA and LITL inclusive of the following Components:

- Component 3 HVdc Specialties
- Component 4 Overland Transmission
- SOBI Marine Crossing
- Enabling LCMC Project Management scope

This QRA excludes the following scope:

- Muskrat Falls Generation
- Maritime Link
- Readiness for Operations risk review
- Post First Power operating expenditure risk review

3 DEFINITIONS

[LCP-PT-MD-0000-PM-LS-0001-01 Project Dictionary, Acronyms & Abbreviations List](#) is the approved dictionary of definitions for the Project.

4 ABBREVIATIONS AND ACRONYMS

AFE	Authorization for Expenditure
HVdc	HVdc Specialties Component of Project
IPS	Integrated Project Schedule
LCMC	Lower Churchill Management Corporation
LCP	Lower Churchill Project
LITL	Labrador – Island Transmission Link
LTA	Labrador – Transmission Assets
MFG	Muskrat Falls Generation Sub-Project
OTL	Overland Transmission Lines Component of the Project
QRA	Quantitative Risk Analysis
SOBI	Strait of Belle Isle

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	4

5 REFERENCES

LCP-PT-MD-0000-PC-PI-0001-01	Project Controls Management Plan
LCP-PT-MD-0000-RI-PL-0001-01	Project Risk Management Plan
LCP-PT-MD-0000-RI-RP-0002-01	Decision Gate 3 Project Cost and Schedule Risk Analysis Report

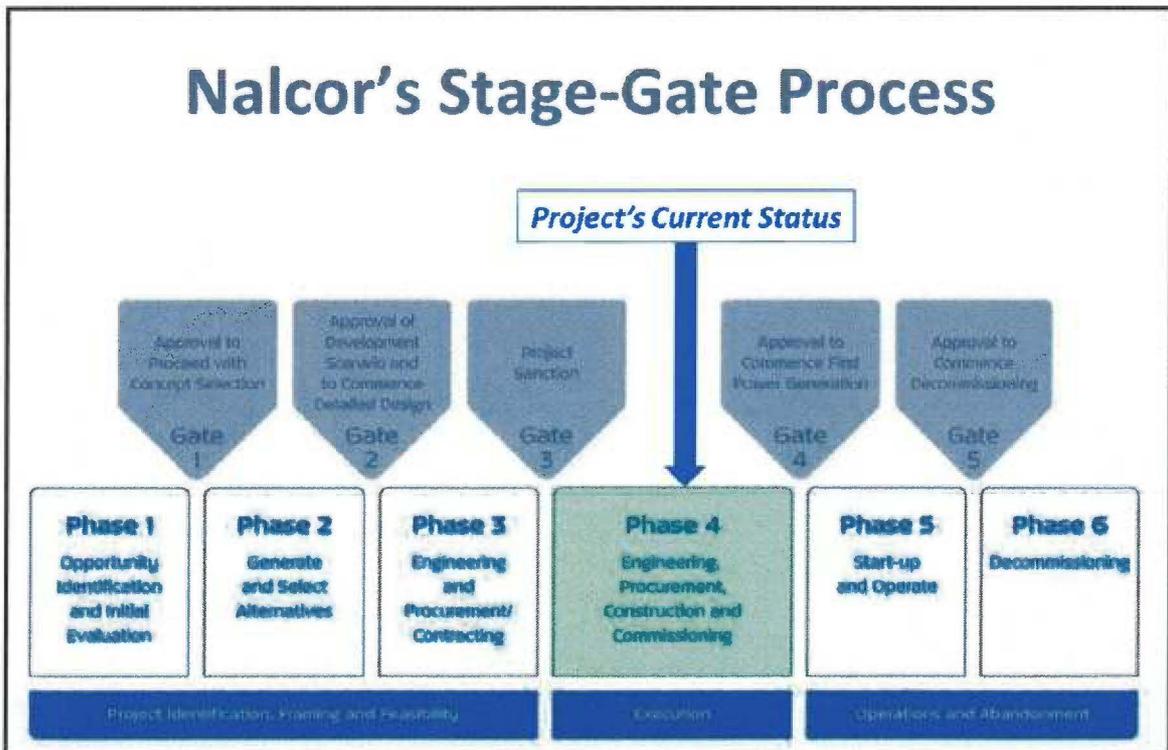
6 SCOPE OF ANALYSIS

The Lower Churchill Project (“LCP” or the “Project”) is presently in a mid-execution phase (Gateway Phase 4 as illustrated in Figure 1) with the LTA and LITL transmission system targeted for energization in Q4-2017. In light of the existing schedule uncertainty surrounding First Power from Muskrat Falls Generation (“MFG”) and the residual risk profile for LTA and LITL, a decision was made to complete a QRA having the following objectives:

1. Quantify the likelihood of LTA-LITL transmission system being available before Winter 2017; and
2. Confirm, with a significant degree of certainty, the final forecast cost which would be required to support a supplemental Authorization for Expenditure (“AFE”).

This QRA documents the results of this analysis for the purposes of achieving the above stated objectives.

Figure 1: Gateway Model noted to reflect Project’s current status



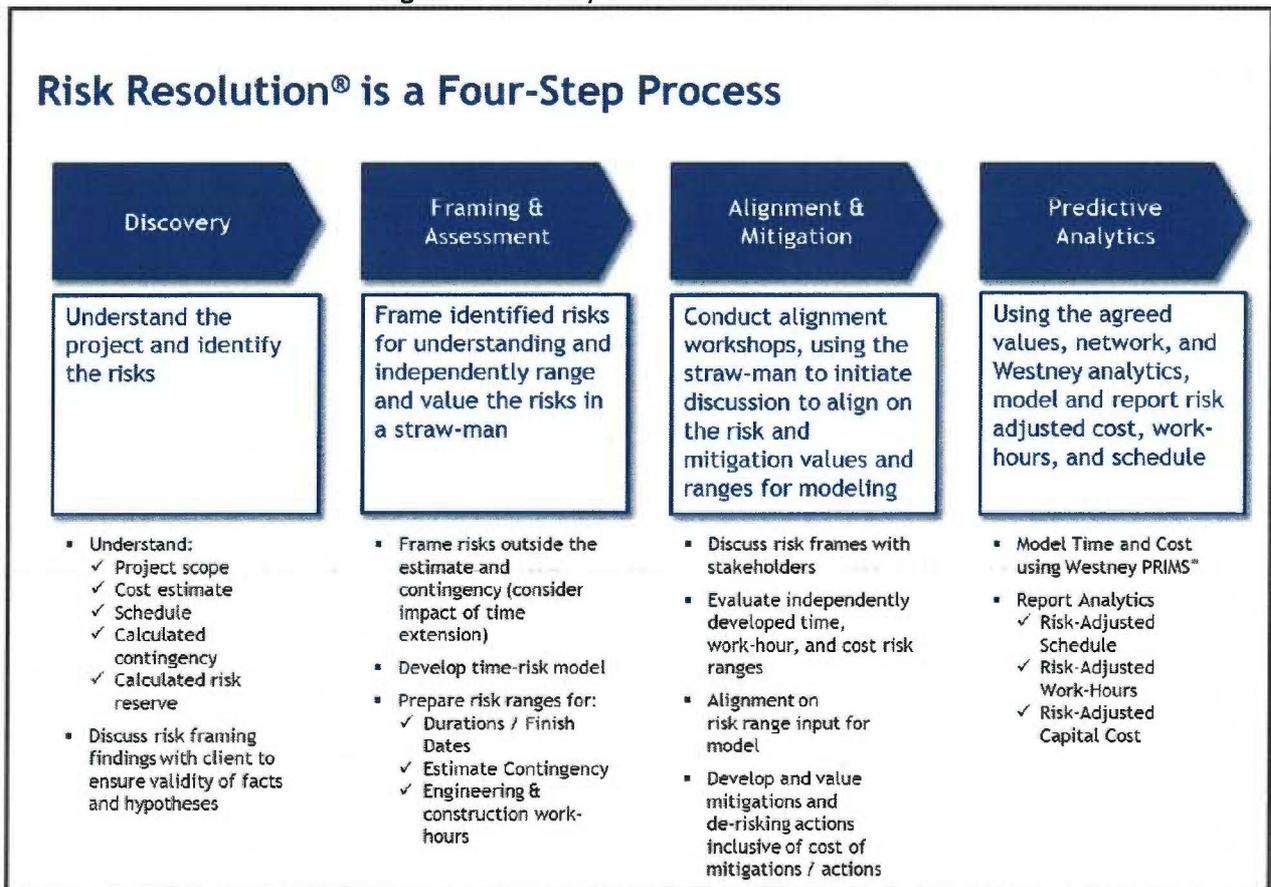
LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	5

7 METHODOLOGY

The Project Risk Management Plan, document no. LCP-PT-MD-0000-RI-PL-0001-01 (reference Attachment A.1), establishes LCMC’s protocol and practices for the management of risk within the Project, including the completion of this QRA. In reference to Section 10 of this Plan, LCMC have engaged our Risk Advisor, Westney Consulting Group (“Westney”) to support the completion of this QRA using the latest available information on the status and risk profile of each of LTA and LITL.

LCMC, working with Westney, having leveraged Westney’s Risk Resolution Process to quantify both the cost and time risk exposure beyond that of AFE Rev 2 and the Target Completion Date in order to prepare this QRA. This current QRA largely followed the same process as was completed prior to each of Decision Gates 2 and 3, with the last formal QRA having been completed in April 2012 as input into the Decision Gate 3 recommendation (reference Decision Gate 3 Project Cost and Schedule Risk Analysis Report, document no. LCP-PT-MD-0000-RI-RP-0002-01). Westney’s Risk Resolution Process, as illustrated in Figure 2, endeavours to understand the potential risks the Project’s cost and schedule projections could be influenced by, while using these risks as inputs into the predictive outcomes using probabilistic modelling techniques. The outcome is a predictive view of cost and schedule, including a predictive range (P25 to P75) as illustrated in Figure 3.

Figure 2: Westney’s Risk Resolution Process

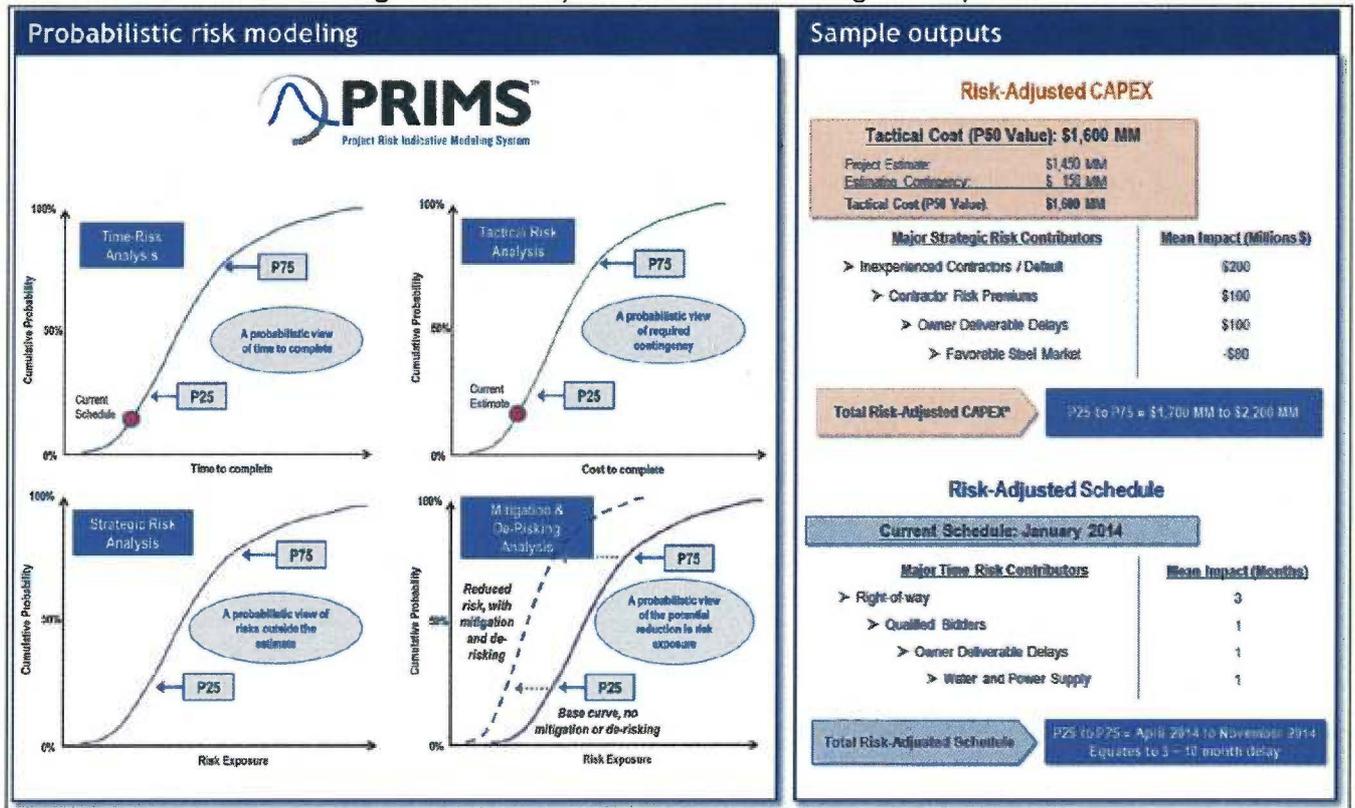


LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)

Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	6

Given the Project is at the mid execution phase, a decision was made to model all cost and time risk as one, rather than distinguish either of strategic and tactical risks as was the case for the Decision Gate 3 analysis or as illustrated in Figure 3. Westney’s PRIMS modelling techniques and expertise were used to undertake the analysis.

Figure 3: Westney’s Probabilistic Modeling Techniques



This QRA heavily relies upon the extensive risk management activities that have been ongoing by LCMC since Decision Gate 2, inclusive of the active risks contained on the following risk registers (see Attachment A.2 – A.5 and with reference to the Project Risk Management Plan):

1. LCP General Risk Register
2. HVdc Specialities Risk Register
3. Overland Transmission Risk Register
4. SOBI Risk Register

With the engagement of LCMC and with the benefit of these registers, current project status reports, historical risk reviews, Westney completed a full risk discovery for each of LTA and LITL for the purposes of confirming the current status and identifying new or residual risks that could influence the QRA.

Copies of the each of the above risk registers are provided as attachments to this report.

With Westney’s guidance, both cost and time-models were developed as the basis for probabilistic modelling, consistent with past practice. Pursuant to Westney’s Risk Resolution Process, these models are developed with

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	7

the objective of modelling the core cost and schedule attributes and interdependencies of LTA and LITL, having a level of detail that Westney determine as prudent to model the potential influence of the identified risks on the cost and schedule. In the case of the Time-Model, its core objective is to model the schedule core driving logic and key activities so as to facilitate a means of assessing the potential viability of the schedule in consideration of identified risks. For reference, Attachment X provides the published critical path as extracted from the IPS for each of LTA and LITL.

In the case of LTA – LITL, the January 2016 version of the Integrated Project Schedule (“IPS” – see Attachment A.6) provides the basis for the Time-Model developed jointly between Westney and LCMC to support this QRA.

In the case of the Cost-Model, for consistency and ease of implementation, it was agreed to follow the same model format as was used for the Decision Gate 3 QRA with the January 2016 Project Cost Report serving as the basis of the analysis (reference Attachment A.7).

Using this Cost-Model and Time-Model as the basis of analysis, LCMC and Westney jointly evaluated the potential cost and time influence of each of the identified risks in the four (4) Risk Registers listed above, noting the dominating risks in the cost and time model spreadsheets. It should be noted that as per the Project Risk Management Plan each identified risk in these four (4) risk registers include details of the risk response plan, including supporting actions; the analysis is predicated upon these risk response plans being implemented. As such, the QRA includes cost for implementation of these risk response plans as well as a view of the residual risk exposure. The aggregate of capital to implement the risk response plan and the residual risk exposure for all known risks provides the time and cost input for QRA modelling using Westney’s PRIMIS™ technique.

8 BASIS OF ASSESSMENT

This basis for this QRA is the Cost Report and IPS Update as of January 2016 as contained as Attachments A.6 and A.7 of this report. Table 1 below provides the current approved capital for each of LTA and LITL as approved with AFE Revision 1, while the available contingency at that point is also noted. For the purposes of this QRA, the available contingency is not risked; rather the outcome of the QRA confirms the Estimate at Completion from which this available contingency is used to supplement.

Using the information, the Cost Model contained in Attachment A.10 is aligned to ensure that cost risk exposure is appropriately defined per each of the major cost categories.

With respect to schedule, as indicated earlier the Time-Model reflects the latest IPS progress update as well as core sequence, logic and constraints, thus serving to mimic the critical path to achievement of the each of the three (3) planning target milestones listed in Table 2.

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	8

Table 1: Basis of Assessment – Cost

Sub-Project	AFE Rev 1	Available Contingency	Risked Cost
Labrador Transmission Assets	877.6	17.8	859.7
Labrador – Island Transmission Link	3,089.4	95.9	2,993.5
Total	3,967.0	113.7	4,080.7

Table 2: Target Milestone Dates

Milestone	Target Date
First Power Transfer Labrador to Island	September 2017
Ready for Sustainable Power Transfer Labrador to Island	December 2017

Using the Risk Resolution Process, the cost and time models were appropriately ranged to reflect the expected cumulative impact of the risks that would influence the particular cost or schedule element (e.g. Risk OTLR044 – Spring Break-up and impact on access cost and overall TL construction schedule is noted in the Time and Cost Ranging Model Inputs contained in Attachment A.14 and A.16).

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)

Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	9

9 QRA RESULTS

Attachment A.18 provides a presentation-style report of the QRA findings as prepared by Westney from the analysis completed January through March 2016. Based upon it’s analysis, Westney’s concludes that there is a minimal probability of achieving the published milestones dates, while an incremental \$150 to 300 million of capital will be required to successfully conclude LITL. An extract of key elements of Westney’s report is provided in Figures 4 & 5.

Figure 4: Summary from Westney’s QRA Report

Summary for LTA / LITL

Westney Consulting Group (WCG), in concert with LCMC, completed a risk-adjusted view of cost and schedule for both Labrador Transmission Assets (LTA) and Labrador-Island Transmission Link (LITL).

- Predictive range (P25 - P75) for cost is:
 - » LTA: C\$860 to C\$897 million compared to the current AFE of C\$878 million
 - » LITL: C\$3.2 to C\$3.4 billion compared to the current AFE of C\$3.1 billion
- Predictive range (P25 - P75) for schedule for LTA-LITL energization / first power transfer is 14 December 2017 to 20 April 2018, compared to the current schedule date of 08 September 2017
- Predictive range (P25 - P75) for schedule for LTA-LITL final commissioning (completion of low-load testing) is 09 April 2018 to 20 September 2018, compared to the current schedule date of 13 November 2017

The primary cause for the increase in cost to-date for LITL, and the biggest cost-risk to completion for LITL, is the difficulty in establishing construction access along the length of the transmission line versus that assumed in the estimates and bids.

The effort to establish “fit-for-purpose” access to what is the longest single transmission project completed in North America in recent times in remote and challenging terrain was underestimated by both Valard and LCMC. On-site conditions, challenging spring break-ups, unpredictable winters for iced roads, heavy snowfall, difficult logistics, lack of existing infrastructure, and permitting are amongst many of the contributing factors that have lead to the significant increase in cost (spent to-date). Despite a large portion of the access has now been completed, the Project has yet to tackle the Long Range Mountains (LRM), while Valard’s lack of progress in the interior of Labrador winter zone leaves residual cost exposure.

LTA and LITL have a number of sub-critical path activities that each have time-risk, which when combined are threatening the likelihood of LTA/LITL Energization in 2017.

The HVdc Transmission Line (TL), Muskrat Falls (MF) Converter, and Churchill Falls (CF) Switchyard (each key elements of the LTA/LITL transmission system) are driving the timeline to completion, attributable largely to contractor performance issues. The risk characteristics of the TL (contracted to Valard) are vastly different than the scope under Alstom’s control (MF and CF). While a significant volume of work remains for the TL, Valard, with backing by Quanta Services, has the potential to deploy additional resources across the linear project in order to minimize schedule delay; however, activity is strongly influenced by weather (e.g. Long Range Mountains, winter zones, and spring break-up). Alstom Management’s timely response to the delays and improved subcontractor management will be critical in order to improve the likelihood of completion of the HVdc specialties scope (MF and CF) in a time required to energize the TL.

Note: Risk modeling does not consider any organizational risk related to readiness for operations/transition to operations elements of the project and its potential impact on first power transfer



2

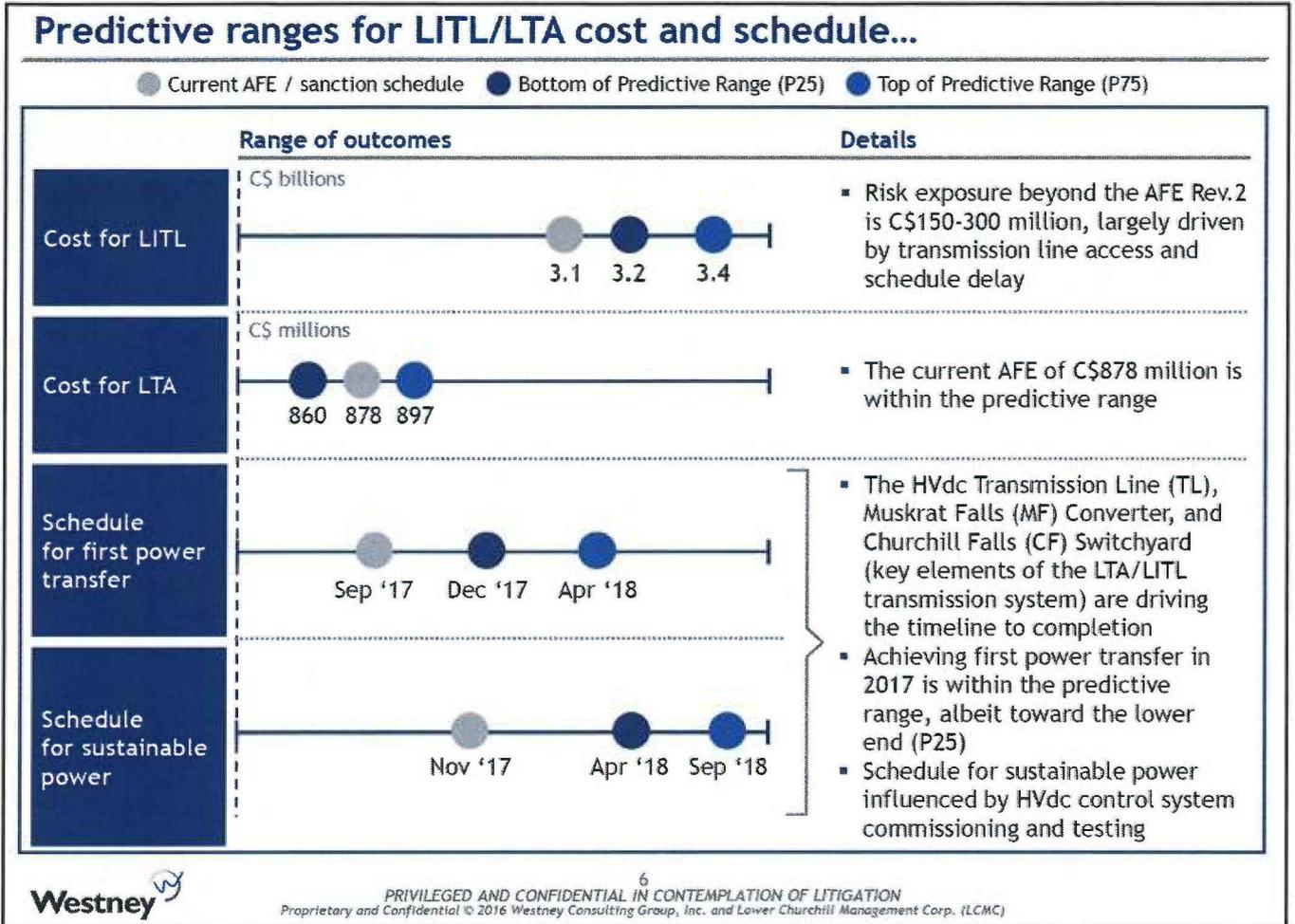
PRIVILEGED AND CONFIDENTIAL IN CONTEMPLATION OF LITIGATION

Proprietary and Confidential © 2016 Westney Consulting Group, Inc. and Lower Churchill Management Corp. (LCMC)

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)

Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	10

Figure 5: Predictive Ranges for LTA and LITL Cost and Schedule



From Westney’s analysis, they reaffirm that two (2) major items are driving the final cost at completion of LITL:

1. ROW Clearing and Access Works scope for the HVdc Transmission Line, with a mean cost impact of \$138 million; and
2. LCMC carrying cost for time extension due to schedule risk, with a mean impact of \$97 million.

The net exposure for the other risk items is largely manageable within the existing available contingency under AFE Revision 1 of \$3,089 million.

As detailed within Westney’s report, the cost exposure for the ROW Clearing and Access Works is driven by a number of factors, including:

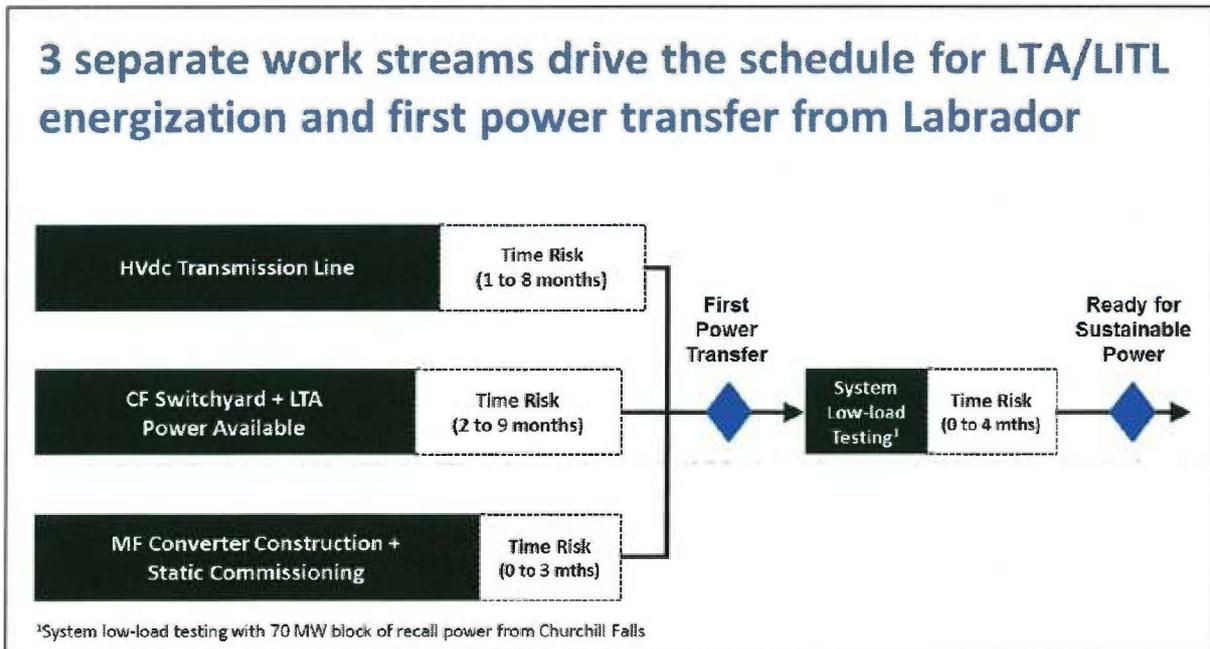
- The cost remaining to construct the access required for the HVdc transmission line, specifically the sections remaining to be completed from Clarendville to Soldier’s Pond, and the Long Range Mountains;

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	11

- The cost to maintain access over several seasons and likely schedule extension given Valard’s overall progress;
- Valard’s lack of progress in the Labrador winter zone is exposing the project to the cost of a second winter season;
- Severity and implications of spring break-up 2016 and 2017 on constructed access is unknown;
- Cost exposure to address viability of 25km winter zone in Eastern NL given the uncharacteristic mild winters in recent times; and
- Water crossings permitting to-date have been temporary in nature, unless approval for permanent installation can be granted, the project will have a much larger remediation cost; and
- Non-productive costs if receipt of quarry permits is not timely are essential to optimize production (this item added significant cost exposure in 2015).

From the schedule analysis, Westney concludes that it is apparent that the performance of each of Alstom and Valard will determine the timeline of readiness for energization. In short, LTA and LITL have a number of sub-critical path activities that each have time-risk, which when combined are threatening the likelihood of LTA/LITL Energization in 2017. Figure 6 illustrates LCMC’s depiction of this situation. As can be seen each of the HVdc Transmission Line (TL), Muskrat Falls (MF) Converter, and Churchill Falls (CF) Switchyard (each key elements of the LTA/LITL transmission system) are driving the timeline to completion. The risk characteristics of the TL (multiple work faces, weather sensitive, and materials available) are vastly different than the scope under Alstom’s control (engineering, equipment manufacture, subcontractor management, integration, etc.)

Figure 6: Illustration of Concurrent Activities Driving First Power Transfer (LCMC Depiction)



LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	12

Armed with this knowledge and with the latest status of Project costs (reference Attachments A.19 & 20) and the key influencing cost risks, LCMC decided in late April that it would be prudent to complete a sensitivity check on the Westney’s January – March cost analysis (which used period ending January 2016 as input data) in order to reaffirm estimated cost at completion that was planned to be released publically in June 2016. Given that progress continued to track forecast, it was determined to be little value of completing a sensitivity check on the schedule risk work undertaken by Westney.

In this regard, it was decided to update the Cost Model inputs with the latest available progress and cost data (period ending 30-April – see Attachments 20 & 21), as well as status implementation of the risk response plans as extracted from IRIS. While not dismissing Westney’s QRA findings, this sensitivity check was deemed prudent since as indicated by Westney’s findings, the largest influencer on the cost outlook was ROW Clearing and Access Works, wherein significant effort was being made to de-risk the outcome, thus the band of cost certainty should be tighter. LCMC notes that some approximate 4 months of progress has lapsed since the earlier analysis was complete wherein during this winter period significant effort was being expended to de-risk the overall TL program (e.g. spring break-up preparedness, bids had been received and reviewed for the two (2) remaining Commitment Packages for ROW Clearing and Access Works (i.e. Clarenville to Soldier’s Pond, Long Range Mountains).

In addition to the ROW Clearing and Access Works, during the January – April period LCMC had spent considerable time updating its staffing plan in order to ensure that an accurate of final forecast cost, including allowance amongst each of the three (3) assets – Muskrat Falls Generation, LTA and LITL. This exercise resulted in the allocation of forecasted cost from MFG to LTA and LITL, which became as input into the Cost Model input. Separately a review of foreign currency exposure has identified additional exposure to LITL, resulting in a cost influencer on the QRA.

Using all available data the Cost Model was Attachment A.21 provides the Cost Model input for this latest QRA update.

Westney’s re-run of the Cost Model sensitivity check in early May 2016 analysis concluded that the cost range on the lower end (P25) has increased by some \$100 million, while the P25 to P75 spread has now shifted to \$250 to \$350 million, with the primary driver being the adjustments to both the staffing plan and due to foreign currency exposure. Given that the adjustments to the inputs are well understood, Westney’s QRA findings are considered valid, reaffirming no rational to update the overall QRA report presented in Attachment A.18.

Tables 3 and 4 provide the final results of the QRA that will be used by LCMC for the purposes of setting AFE Rev 2 and communications to stakeholders.

It must be emphasized that this QRA does not consider the potential cost or schedule impact of either of the following two emerging Project issues:

1. **HVdc Conductor Proud Stranding** – HVdc conductor proud stranding phenonena recently discovered and under investigation. At present a full root cause investigation into the situation is underway in order to understand why this condition exists, if it is acceptable, and options to reduce future occurrence. Presently ~ 150km of conductor has been strung, with both stringing crews suspended on 7-June. Insurance claim for conductor installed has been raised, however claim entitlement is not understood. Exposure for LIL could be significant from a cost and schedule viewpoint, with rough

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	13

estimates of \$10 to \$50 million and 2 to 6 months schedule exposure pending the outcome of the current investigation to determine whether the existing conductor can be modified for use or whether an alternate design is required.

2. **Organizational and Governance Risk** – The potential organizational disruption that could result from the recent move to alter the overall governance and organizational structure of the Project by sub-dividing it into a Generation (power development), and (2) Transmission (power supply) projects each reporting to an Executive Vice President. In short, this QRA has not considered the potential disruption or broader organizational effectiveness impacts (i.e. loss of key personnel, duplication of activities, loss of synergies, etc.) that may result from a sub-division of the LCMC working organization. Any fundamental organizational re-design efforts within LCMC could create substantial delivery risk for the Project, likely adding considerable cost and schedule beyond that that forecasted in this QRA.

Table 3: QRA Results – Cost (Sensitivity Check)

Sub-Project	AFE Rev 1	Available Contingency	Risked Cost	P25	P50	P75
Labrador Transmission Assets	877.6	17.8	859.7	852	868	887
Labrador – Island Transmission Link	3,089.4	95.9	2,993.5	3,352	3,391	3,437
Total	3,967.0	113.7	3,853.2	4,108	4,259	4,324

Table 4: QRA Results – Schedule

Milestone	Target Date	P25	P50	P75
First Power Transfer Labrador to Island	Sep-2017	Dec-2017	Feb-2018	Apr-2018
Ready for Sustainable Power Transfer Labrador to Island	Dec-2017	Apr-2018	Jun-2018	Sep-2018

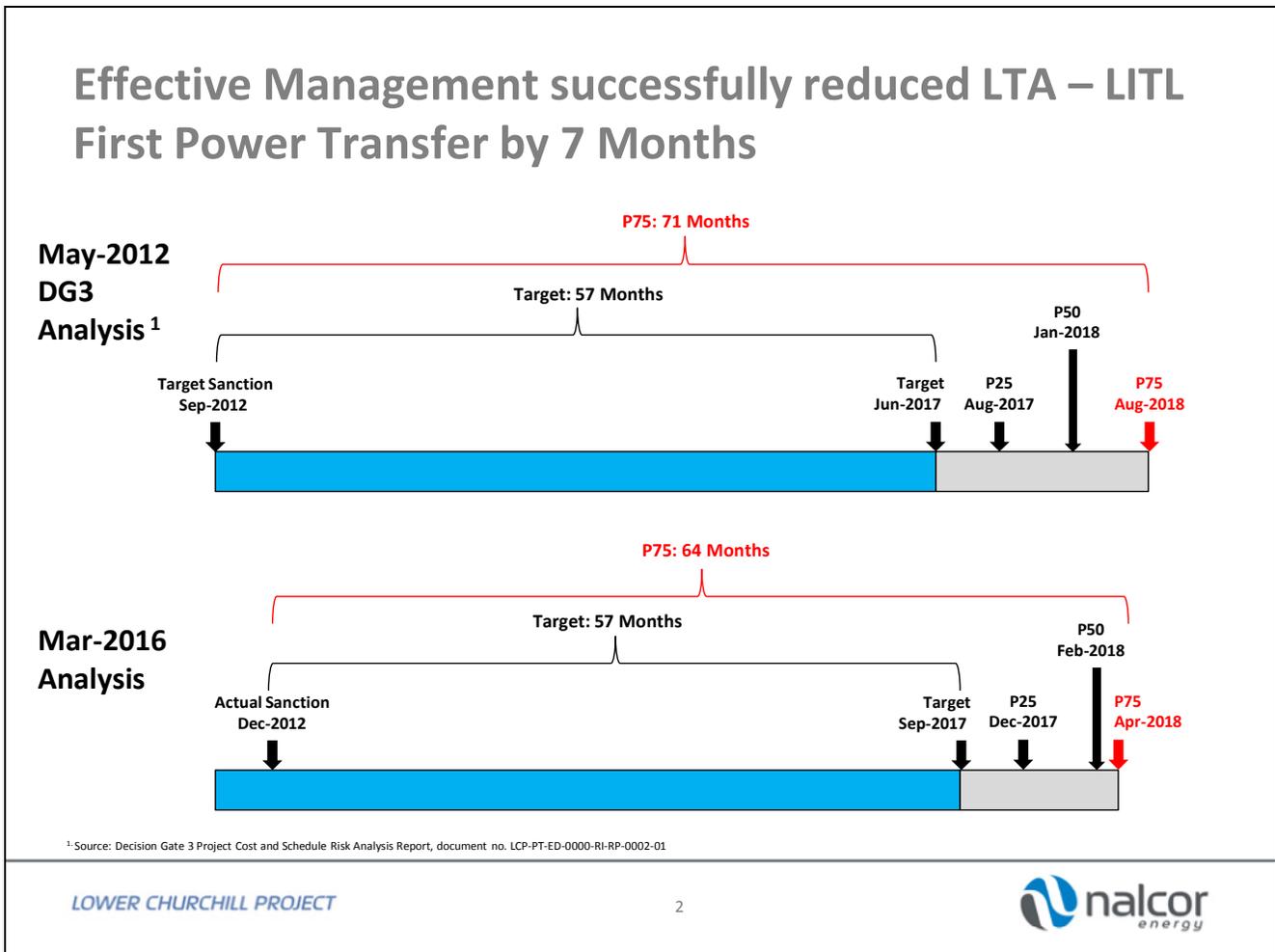
LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	14

As illustrated in Figure 7, this recent analysis provides a surprising comparison to the Decision Gate 3 Risk Analysis completed in May 2012, document No. LCP-PT-ED-0000-RI-RP-0002-01, wherein it was concluded that there was a range for 2 to 14 month delay beyond the schedule date of June 2017 for First Power Transfer (Labrador to Island). The probabilistic modelling results concluded:

- P25 = August 2017
- P50 = January 2018
- P75 = August 2018

Despite the fact that Project Sanction slipped by some months, LCMC’s focussed effort to de-risk the LTA – LITL schedule have considerably reduced the overall risk exposure.

Figure 7: QRA Schedule Analysis Comparison – DG3 to Current



LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)

Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	15

10 ATTACHMENTS

- A.1 Project Risk Management Plan, Nalcor Doc. No. LCP-PT-MD-0000-RI-PL-0001-01
- A.2 Risk Register – LCP General
- A.3 Risk Register – HVdc Specialties
- A.4 Risk Register – Overland Transmission
- A.5 Risk Register – SOBI
- A.6 Project Cost Report – January 2016
- A.7 IPS Monthly Schedule and Progress Analysis – January 2016
- A.8 LTA / LITL Critical Paths – January 2016
- A.9 IPS Low Power Testing Logic – December 2015
- A.10 LTA – LITL Cost Model Templates
- A.11 IPS Extract for LTA – LITL Time Model
- A.12 LTA – LITL Network Logic
- A.13 LTA – LITL Time Model and Ranging Sheet
- A.14 LTA – LITL Time Model Inputs
- A.15 LTA – LITL Time Model Analysis – 5-February
- A.16 LTA – LITL Cost Model Inputs – 4-February
- A.17 Presentation of Preliminary QRA Findings – 14-March
- A.18 Westney Final Report
- A.19 Project Cost Report – March 2016
- A.20 Expected Contingency Draw Report – April 2016
- A.21 LTA – LITL Cost Model Inputs Update – 3-May-2016 (Sensitivity Check)
- A.22 LTA – LITL Cost Sensitivity Check (May 2016)

ATTACHMENT A.1



PROJECT RISK MANAGEMENT PLAN

Nalcor Doc. No. LCP-PT-MD-0000-RI-PL-0001-01

<p>Comments:</p> <p>General review and update throughout in order to describe Risk Management process, tool and resources for the current phase of LCP.</p>	<p>Total # of Pages: (Including Cover): 59</p>
---	--

Status / Revision	Date	Reason for Issue	Prepared by	Functional Manager Approval	Quality Manager Approval	General Project Manager Approval
B2	23-Oct-2014	Issued for Use	 C. Fernandez	 E. Bush	 D. Green	 R. Power
B1	30-Jun-2011	Issued for Use	-	-	-	-

CONFIDENTIALITY NOTE:

This document contains intellectual property of the Nalcor Energy – Lower Churchill Project and shall not be copied, used or distributed in whole or in part without the prior written consent from the Nalcor Energy – Lower Churchill Project.

Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	1

Inter-Departmental / Discipline Approval (where required)

Department	Department Manager Approval	Date
Deputy General Project Manager	 Jason Kean	21-Oct-2019

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	2

TABLE OF CONTENTS

1 PURPOSE4

2 SCOPE4

3 DEFINITIONS.....5

4 ABBREVIATIONS AND ACRONYMS8

5 RESPONSIBILITIES.....9

6 REFERENCE DOCUMENTS AND/OR ASSOCIATED FORMS 11

7 RISK MANAGEMENT PHILOSOPHY 11

7.1 Risk Management Synopsis 15

7.1.1 The Risk Management Environment..... 15

7.2 LCMC Risk Management Strategy..... 15

7.2.1 Key Success Factors..... 16

7.2.2 LCMC Organization for Risk Management 16

7.2.3 Levels of Risk Management at LCMC..... 17

8 OVERVIEW OF RISK MANAGEMENT PROCESS..... 18

8.1 Risk Management Process Cycle..... 18

8.2 Scope of LCMC Responsibilities 20

8.3 Flow of Risks from Sub-Project Risk Registers to List of Key Risks..... 21

9 RISK IDENTIFICATION AND ORGANIZATION..... 22

9.1 Initial Risk Identification 23

9.1.1 Caution During Risk Identification..... 24

9.2 Organizing Risks by Category 25

9.3 Identifying Risk Owners 26

9.4 Updating Risk Registers based upon Gathered Intelligence..... 26

9.5 LACTI Chart for Risk Identification and Organization..... 27

10 RISK ASSESSMENT AND PRIORITIZATION..... 27

10.1 Determining Preliminary Risk Rankings 28

10.2 Develop List of Key Risks to be Overseen by Risk Resolution Team / LCP Executive Committee 29

10.3 Risk Assessments (Tactical-Risk, Strategic-Risk and Time-Risk Analyses)..... 29

10.4 Health, Safety and Environmental Risk Assessments 31

10.5 Confirm List of Key Risks based upon Gathered Intelligence 31

10.6 LACTI Chart for Risk Assessment and Prioritization..... 31

11 RISK RESPONSE 32

11.1 Developing and Implementing Response Plans to Address Key Risks Overseen by Risk Resolution Team 33

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	3

- 11.1.1 Risk Response Planning for Threats 34
- 11.1.2 Risk Response Planning for Opportunities..... 34
- 11.2 Developing and Implementing Action Plans to Address Project Risks on Sub-Project Risk Registers 35
- 11.3 Risk Addressing through the Procurement Process..... 35
 - 11.3.1 Package Risk Review – RFI preparation phase 36
 - 11.3.2 Package Risk Review – RFP preparation phase 36
 - 11.3.3 Bidding, Negotiation and Risk Brokering 37
 - 11.3.4 Contract Preparation..... 37
 - 11.3.5 Contractors and Suppliers Risk Management process and Risk Monitoring 38
- 11.4 Project Insurance Procurement 39
- 11.5 LACTI Chart for Risk Response 39
- 12 RISK MONITORING AND CONTROL..... 40**
 - 12.1 Monitoring and Adjusting Response Plans for Key Risks Overseen by Risk Resolution Team 40
 - 12.2 Monitoring and Adjusting Actions Plans for Project Risks on Sub-Project Risk Registers 41
 - 12.3 LACTI Chart for Risk Monitoring and Control..... 41
- 13 RISK MANAGEMENT TOOL 42**
 - 13.1 Risk Registers 45
 - 13.2 Risk Reports 46
- 14 ADDITIONAL RISK MANAGEMENT TOPICS 48**
 - 14.1 Risk Updating 48
 - 14.1.1 Objectives of the Risk Updating Process..... 48
 - 14.1.2 Risk Updating Process 49
 - 14.2 Conducting Risk Reviews and Workshops 49
 - 14.3 Risk associated with LCP Supplier and Contractors 50
- 15 ATTACHMENTS 52**
 - 15.1 Risk Register – Iris Risk Management Tool 53
 - 15.2 Risk Report – Iris Risk Management Tool 54

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	4

1 PURPOSE

This *Project Risk Management Plan* is one of several key management plans under the umbrella of the Lower Churchill Project (LCP) [Project Execution Plan \(Scope and Approach\)](#), reference document No. [LCP-PT-MD-0000-PM-PL-0001-01](#) that details how the Lower Churchill Management Corporation (LCMC) – Lower Churchill Project (LCP) will be managed in order to achieve the goals and objectives stated in the Project Charter. This Management Plan provides:

- Overall risk approach / philosophy adopted by LCMC;
- Roles and responsibilities LCMC Project Delivery Team as it relates to risk management;
- Risk Management process to be used on the LCP – LCP Sub-Projects and
- Overview of the Risk Management tool.
- This plan also describes the methodology to be used for conducting risk management planning and implementation within the Lower Churchill Management Corporation (LCMC) to ensure that risk management is performed in a consistent manner throughout the Lower Churchill Project (LCP) and Sub-Projects.

2 SCOPE

This *Project Risk Management Plan* is a key component of the LCMC Risk Management Framework illustrated in Figure 1. Together these documents provide the core direction as to how risk management will be conducted within the Project.

This Management Plan is applicable during the planning and execution of Phase 1 of the LCP, including the following project elements:

- LCMC management activities including environmental assessment, aboriginal affairs, regulatory, financing, and labor relations
- Muskrat Falls Generation Sub-Project (MFG)
- HVdc Specialties Sub-Project (DCS)
- Overland Transmission Lines Sub-Project (OTL)
- Marine Crossing Team – SOBI Sub-Project (MCT)

This *Project Risk Management Plan* addresses all project risks, however does not specifically address the completion of specific health, safety and environmental risk assessments (e.g. hazard operability reviews “HAZOPs”, or process hazard analysis). While general project risks will be evaluated in accordance with these criteria, details of specific risks assessments related to these items are contained in the respective management plans.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	5

Figure 1: LCMC Risk Management Framework



3 DEFINITIONS

- Allowance** Costs added to the base estimate, based on experience, to cover foreseen but not fully defined elements.
- Action Plan** Action plan prepared to address Risks identified in the Sub-Project Risk Register.
- Base Estimate** Reflects most likely costs for known and defined scope associated with project’s specifications and execution plan.
- Decision Gates** A Decision Gate is a predefined moment in time where the Gatekeeper has to make appropriate decisions whether to move to the next stage, make a temporary hold or to terminate the project. The option to recycle to the current stage is considered an undesirable option unless caused by changes in business conditions.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	6

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

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

Key Risks A risk selected to be overseen by the Risk Resolution Team or LCP Executive Committee due to the risk’s complex nature and high profile.

Lower Churchill Management Corporation (LCMC) Established in November 2013, Lower Churchill Management Corporation, which is 100% owned by Nalcor Energy, will carry out the project management functions, including planning, engineering and design management, construction management, risk management, cost control, finance and accounting, procurement and supply chain management for Phase 1 of the Lower Churchill Project, which comprises the power generation facility at Muskrat Falls, the Labrador-Island Link and the Labrador Transmission assets.

Management Reserve Approved capital budget held in reserve and controlled by Gatekeeper, which is used to provide a higher confidence cost level (i.e. comfort factor).

It is often used by Gatekeeper as a mechanism to support scope additions in a project raised as part of the change management process which would not be covered by Estimate Contingency. The Management Reserve is also used to handle the impact of strategic risk.

Unlike Estimate Contingency, Management Reserve is not expected to be spent unless the Gatekeeper so directs.

Pareto’s Principle Also known as the 80-20 rule, states that, for many events, roughly 80% of the effects come from 20% of the causes. Application to risk management suggests that 80% of the risk exposure comes from 20% of the project’s risk.

Project Change A deviation which represents a change or departure from the Project baseline scope, estimate, schedule, intended plant quality, HSE targets, project policy, or execution plan that causes an addition or reduction to the Original Control Budget or baseline Project Control Schedule including correction for scope / estimate omissions, or change in execution approach.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	7

Project Change Notice (PCN)	A mechanism used to facilitate the processing of Project Changes.
Project Management Team (PMT)	The Project Management Team (PMT) is led by the Project Director and is made up of project leaders and key functional representatives. The PMT meets periodically, to identify issues that may affect cost and schedule and to determine how such issues should be resolved.
Project Scope	A concise and accurate description of the end products or deliverables to be expected from the project and that meet specified requirements as agreed between the Project stakeholders. It represents the combination of all project goals and tasks, and the resources and activities required to accomplish them.
Project Delivery Team (PDT)	Personnel assembled to develop and execute a project from planning through start-up. The Project Delivery Team (PDT) is dedicated to managing the overall project including significant focus on monitoring and controlling LCP consultant’s and contractor’s performance in execution of the work.
Risk	An uncertain event or condition that, if it occurs, has a positive (opportunity) or negative (threat) effect on a project’s objectives.
Risk Brokering	The process of allocating project risks to various providers (of technology, engineered equipment, engineering & construction services, insurance, and financing) such that each provider’s levels of cost and risk are optimized.
Risk Management	Risk Management is the act or practice of dealing with threats and opportunities. It includes creating an environment and a context for dealing pro-actively with them, identifying and analyzing potential threats and opportunities, prioritizing threats and opportunities (by comparing the probable consequence of different risks) so that the right resources can be applied in a timely manner, preparing and implementing mitigation plans, recording and communicating threats and opportunities, as well as the eventual close-out of specific risks and the Project itself.
Risk Owner	Responsible to define and implement mitigation and action plans to deal with identified risks for LCP Project and Sub-Projects. This role can be performed for any individual within the Project Delivery Team.
Risk Register	Document including LCP Project and Sub-Projects identified risks.
Risk Response Plan	Management strategy and action list prepared for Key Risks.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	8

Risk Resolution Team Multi-functional group, acting as a resource to the Project Director, who select the highest priority risks (can include identification of that risk) for management based upon defined criteria and assist Risk Owners with the development of response plans.

Sub-Project Sub-division of LCP Projects contained in the Work Breakdown into components to assist with the planning, executing and controlling of the work. Reference [Project Controls Management Plan](#), reference document No. [LCP-PT-MD-0000-PM-PL-0001-01](#) for details.

Strategic Risk Identified background risks that are outside of the controllable scope of the project team, typically pertaining to external issues such as enterprise-level issues, governance, financial markets, stakeholders, hyperinflation, and regulatory approvals. Managing these risks requires significant effort and influence by the Gatekeeper with external stakeholders. Strategic risk is also referred to as the risk of failure of the general execution plan.

Strategic Risk Exposure Probabilistic impact of Strategic Risks that is quantified. Covered by Management Reserve.

Tactical Risk Identified background risks that are inside of the controllable scope of the project team. Basically it refers to risks associated with the base capital cost estimate as a result of uncertainties with the four components of the estimate: (1) project definition and scope omission, (2) construction methodology and schedule, (3) performance factors, and (4) price. It excludes price escalation.

4 ABBREVIATIONS AND ACRONYMS

DCS	HVdc Specialties Sub-Project
ERM	Enterprise Risk Management
FEL	Front End Loading
HAZID	Hazard Identification Review
HAZOP	Hazard Operability Review
HSE	Health, Safety and Environment
LACTI	Leads, <u>A</u> ccountable, <u>C</u> onsulted, <u>T</u> echnical and <u>I</u> nformed Chart
LCMC	Lower Churchill Management Corporation
LCP	Lower Churchill Project
MCT	Marine Crossing Team - SOBI
MFG	Muskrat Falls Generation Sub-Project
MoC	Management of Change
OTL	Overland Transmission Lines Sub-Project
PCN	Project Change Notice

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	9

PMT	Project Management Team
PDT	Project Delivery Team
SOBI	Strait of Belle Isle Sub-Project
WBS	Work Breakdown Structure

5 RESPONSIBILITIES

Project Director: Responsible for:

- Chairing the Risk Resolution Team and accountable for implementation of this Risk Management Plan.
- Approving Risk Response Plans for Key Risks and subsequent updates, or seeks approval of Risk Response Plan (as required) from LCP Executive Committee.

LCP General Project Manager and Sub-Projects Project Managers: Responsible for:

- Implementing of this Risk Management Plan within their Sub-Project.
- Managing of risk within their Sub-Project or area of responsibility.

Risk Owner: Responsible for:

- Developing the Risk Response Plan for Key Risks or Risk Action Plan for other project risks.
- Spearheading the implementation of the Risk Response Plans.
- Advising the LCP Risk Coordinator and Project Manager of any implementation issues with Risk Response Plans.
- Taking action to adjust mitigation efforts as appropriate for Risk Response Plans.

Risk Resolution Team: Responsible for:

- Multi-functional group, acting as a resource to the Project Director, who select the highest priority risks (can include identification of that risk) for management based upon defined criteria and assists Risk Owners with the development of Risk Response Plans, including assistance with the assistance of optimal risk brokering.
- Monitoring the implementation status of Risk Response Plans.

LCP Executive Committee: Responsible for:

- Approving the selected list of highest priority risks made by the Risk Resolution Team.
- Approving selective Risk Response Plans (as required due to their delegation of authority or nature of the risk).
- Making decisions on risk mitigation trade-offs (corporate / project trade-offs).
- Removing roadblocks to enable Risk Response Plans to be implemented.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	10

LCP Risk Coordinator: Responsible for:

- Scheduling and facilitating risk assessments.
- Leading the population of the Sub-Project Risk Register.
- Facilitating discussions to identify the Risk Owners for each risk.
- Facilitating the identification of the Key Risks.
- Providing updated risk listing to procurement or package engineer for contracting strategy preparation and subsequent commercial negotiations.
- Ensuring Risk Response Plan is prepared for Key Risks in a consistent fashion.
- Ensuring Risk Action Plans are developed and implemented for all Project Risks.
- Monitoring the status of Risk Response Plan implementation (i.e. collecting updates).
- Producing Risk Response Plan status reports.
- Facilitating the Risk Resolution Team meetings.
- Developing, reviewing and evaluating risk questionnaires as part of the Request for Proposals (RFPs) packages.
- Reviewing Risk Response Plans as required for LCP Project Change Notices (PCNs).

Sub-Project Risk Coordinator: Responsible for:

- Organizing and consolidating the Sub-Project risk register by category.
- Leading the preliminary risk ranking on the Sub-Project risk register.
- Coordinating with Risk Owners to develop and implement Risk Action Plans.
- Informing LCP Risk Coordinator of overall risk status.

Risk Advisor (Westney): Responsible for:

- Providing process expertise and specialized tools for conducting risk assessments.
- Assisting with the assessment of financial exposure of Strategic Risks.
- Participating on Risk Resolution Team reoccurring meetings.
- Acting as independent risk broker.

Nalcor ERM Committee LCP Representative: Responsible for:

- Providing the linkage between the Project Risk Register and the Corporate Risk Register in terms of risk identification, risk rating and ongoing monitoring of mitigation strategies.
- Conveying details of best practices in project risk management as practiced by the LCMC to the benefit of the ERM Committee and Nalcor Energy generally.
- Ensuring that Nalcor Corporate Policy is being implemented by LCP Project.

Supply Chain: Responsible for:

- Responsible for development of contracting and procurement plans that consider risk inventory for the package.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	11

- Risk Brokering during the negotiation of the commercial terms of the package with the contractor or supplier.

6 REFERENCE DOCUMENTS AND/OR ASSOCIATED FORMS

LCP-PT-MD-0000-PM-PL-0001-01	Project Execution Plan
LCP-PT-MD-0000-PM-LS-0001-01	Project Dictionary
LCP-PT-MD-0000-PC-PI-0001-01	Project Controls Management Plan
LCP-PT-MD-0000-PR-PL-0001-01	Procurement Management Plan
LCP-PT-MD-0000-PC-PL-0001-01	Project Change Management Plan
LCP-PT-MD-0000-SC-PL-0001-01	Procurement Management Plan
LCP-PT-MD-0000-RI-RP-0001-01	Gate 2 Project Risk Analysis
LCP-PT-MD-0000-LE-PH-0001-01	Insurance Philosophy
LCP-PT-MD-0000-PM-PY-0001-01	Project Risk Management Policy
LCP-PT-MD-0000-PM-PR-0002-01	Project Execution Risk & Uncertainty Management Guidelines
LCP-PT-MD-0000-RI-PH-0001-01	Risk Management Philosophy

7 RISK MANAGEMENT PHILOSOPHY

LCMC’s [Project Risk Management Policy](#), reference document No. [LCP-PT-MD-0000-PM-PY-0001-01](#) for the Lower Churchill Project, as shown in Figure 2, makes a strong commitment towards identifying and management all project risks. With consideration of this Policy Statement, the Project’s risk management program described in this Management Plan is structured to encapsulate the following beliefs held by LCMC.

- Proactive risk awareness and management is a key enabler of “flawless execution.”
- Predictability of outcome will be vastly improved when achievable objectives are first established. A full understanding of project risks early in the project’s lifecycle will provide the greatest opportunity to complete the necessary work required to fully understand these risks (i.e. Risk-Driven Front End Loading) from which achievable objectives will be established.
- Quality decision making will be facilitated through a comprehensive understanding of project risks and how they can be managed with least impact on the Project. Such risk-informed decision making, illustrated in Figure 3, will be a standard for the Project.
- Consistent with Pareto’s Principle, we believe a few (15-20) select, complex risks will provide the greatest exposure for the Project. These Key Risks will be subject of heavy focus by LCMC Project Management Team and the Risk Resolution Team.
- Many risks are multi-dimensional and complex requiring creative solutions. Cost effectively managing risks will require risks to be allocated to various stakeholders who are best positioned to manage them through

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	12

Risk Brokering. This process of risk allocating will be featured significantly through the procurement process for the project’s supply and construction contracts.

- Risk management is an on-going, continual looped process as the project progresses through the Gateway Phases (i.e. Plan-Do-Check-Act process).
- Consistent with practice up to Decision Gate 3, the Project will continue to use the Risk Resolution Team as illustrated in Figure 4, to support the development and validation of Risk Response Plans, however its membership will be adjusted as required to reflect the progression of the Project.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	13

Figure 2: Project Risk Management Policy Statement



Lower Churchill Project

Risk Management Policy

The Lower Churchill Project Management Team is committed to planning and executing the Lower Churchill Project in such a way as to minimize the potential negative effects of risks and to maximize opportunities. We will serve the needs of all our internal and external customers, stakeholders and our shareholder by tangibly demonstrating this commitment through compliance with our Risk Management System and by making continual improvement an integral part of our activities.

Our Philosophy

- Proactive risk management is fundamental to achieving the Lower Churchill Project's objectives.
- All participants in the Lower Churchill Project are responsible for identifying & mitigating risk and identifying & developing opportunities.
- Empowerment comes through strong leadership and involvement of all personnel.

Our Goals

- Create a culture that supports proactive project risk management that is viewed by all Team Members as an enabler to successfully achieve the Lower Churchill Project's objectives.
- Identify, assess, respond to and manage all key risks and uncertainties.
- Allocate project risk to the party who can most efficiently and effectively manage the risk.
- Improve decision-making by thoroughly understanding project risks and uncertainties.

Our Commitments

- We will ensure this Policy is known and clearly understood by all persons associated with the Lower Churchill Project.
- We will work to identify, assess, respond to and manage all key project risks and opportunities consistent with guidelines and tools advocated by this Policy.
- We are committed to managing project risks and opportunities from the following perspectives: occupational health and safety, environmental, technical, schedule, cost, operational reliability/quality, and reputation/image.

This Policy Statement supports and complements other policies within the Lower Churchill Project Integrated Management System. This Policy Statement is not intended to replace or duplicate Newfoundland and Labrador Hydro Corporate risk management policies with respect to market and financial loss risk mitigation activities.

Endorsed by:



 Vice-President
 Lower Churchill Project

20 Dec 07
 Date



 Project Manager
 Lower Churchill Project

18 Dec 07
 Date



 Strategic Planning Lead
 Lower Churchill Project

18 Dec 07
 Date

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	14

Figure 3: Risk-informed Decision Making Approach

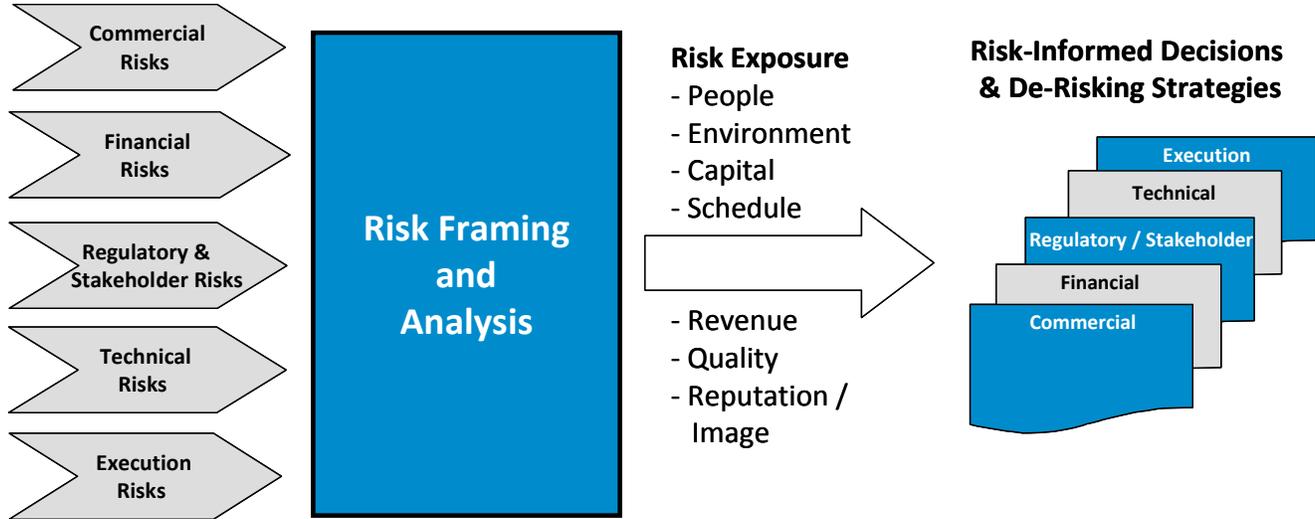
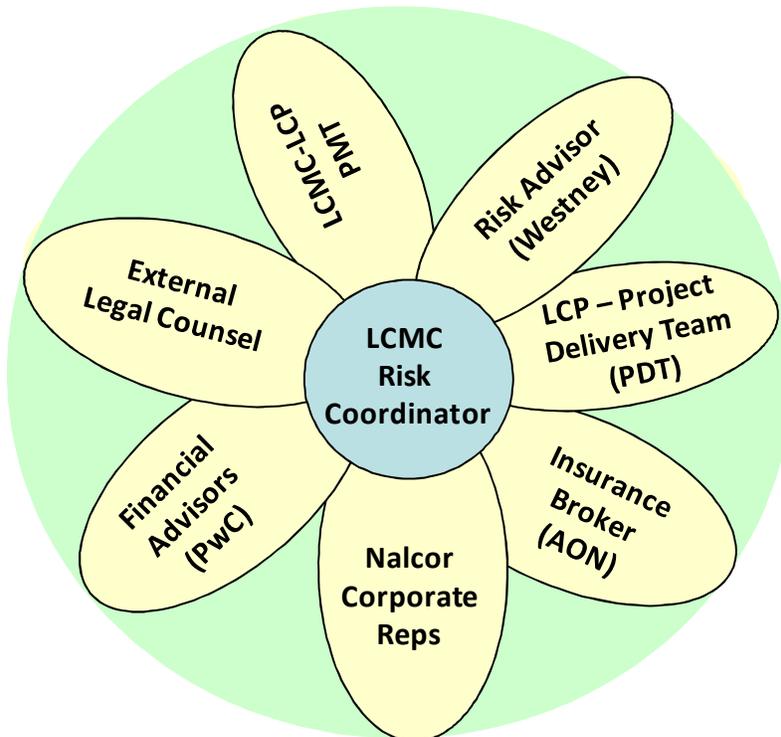


Figure 4: Risk Resolution Team Post Decision Gate 3



Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	15

7.1 Risk Management Synopsis

7.1.1 The Risk Management Environment

Project risk management addresses the uncertain events or conditions that, if they occur, it will have negative (threat) or positive (opportunity) effects in the LCP Project objectives: cost, schedule, quality, safety, environment and reputation.

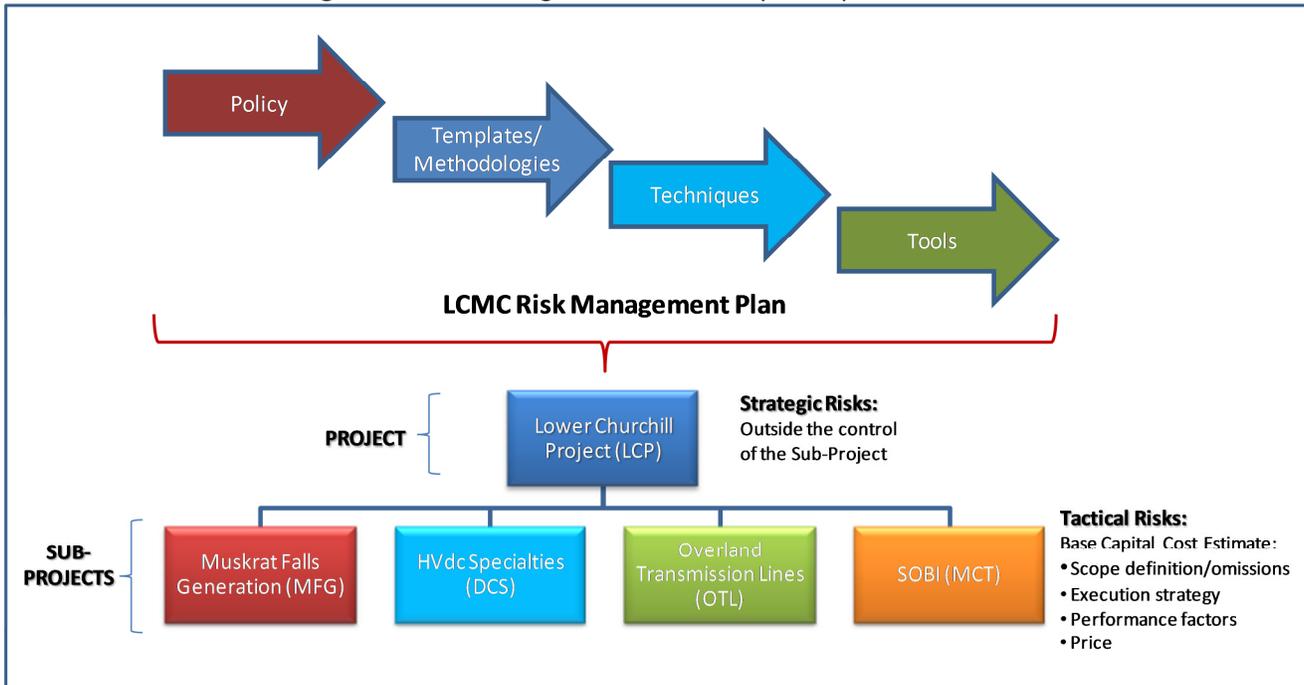
A risk event may have one or more causes and one or more effects. Primarily the effects would be on the LCP Project triple constraint: scope, cost and schedule. These effects also extend to cover all defined LCP Project’s objectives. Risk management seeks to protect the LCP Project in fulfilling its objectives by developing mitigation strategies and related actions plans.

For LCMC risk management is going to be pursued as an integral part of the LCP Project management process. Risks are going to be managed in a concerted effort by the LCP Project and Sub-Projects Management Team and identified members of LCP Project Delivery Team (PDT).

7.2 LCMC Risk Management Strategy

LCMC is committed to follow established risk management practices for LCP Project and Sub-Projects proactively investing in the deploy of the risk management methodology ensuring that LCP Project requirements and high expectations are going to be achieved.

Figure 5: Risk Management from Policy to Implementation



Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	16

7.2.1 Key Success Factors

LCMC recognizes that organizational culture is a key success factor for effective risk management within the LCP Project and Sub-Projects. The goal is to develop a culture that:

- Supports a honest, realistic and open recognition of LCP Project and Sub-Project risk even if they indicate problems with the project;
- Encourages talking about risk realistically, with no penalty for people who do so openly with the LCP risk management process;
- Promotes discussion in an atmosphere where there are no risks are out-of-bounds for discussion and no enforcement of bureaucratic hierarchy in meetings where risk identification and assessment is discussed and;
- Maintains commitment to collecting realistic and high-quality data about risk. Risk data are often based on the judgement and expertise of informed individual within the LCP Project Delivery Team (PDT).

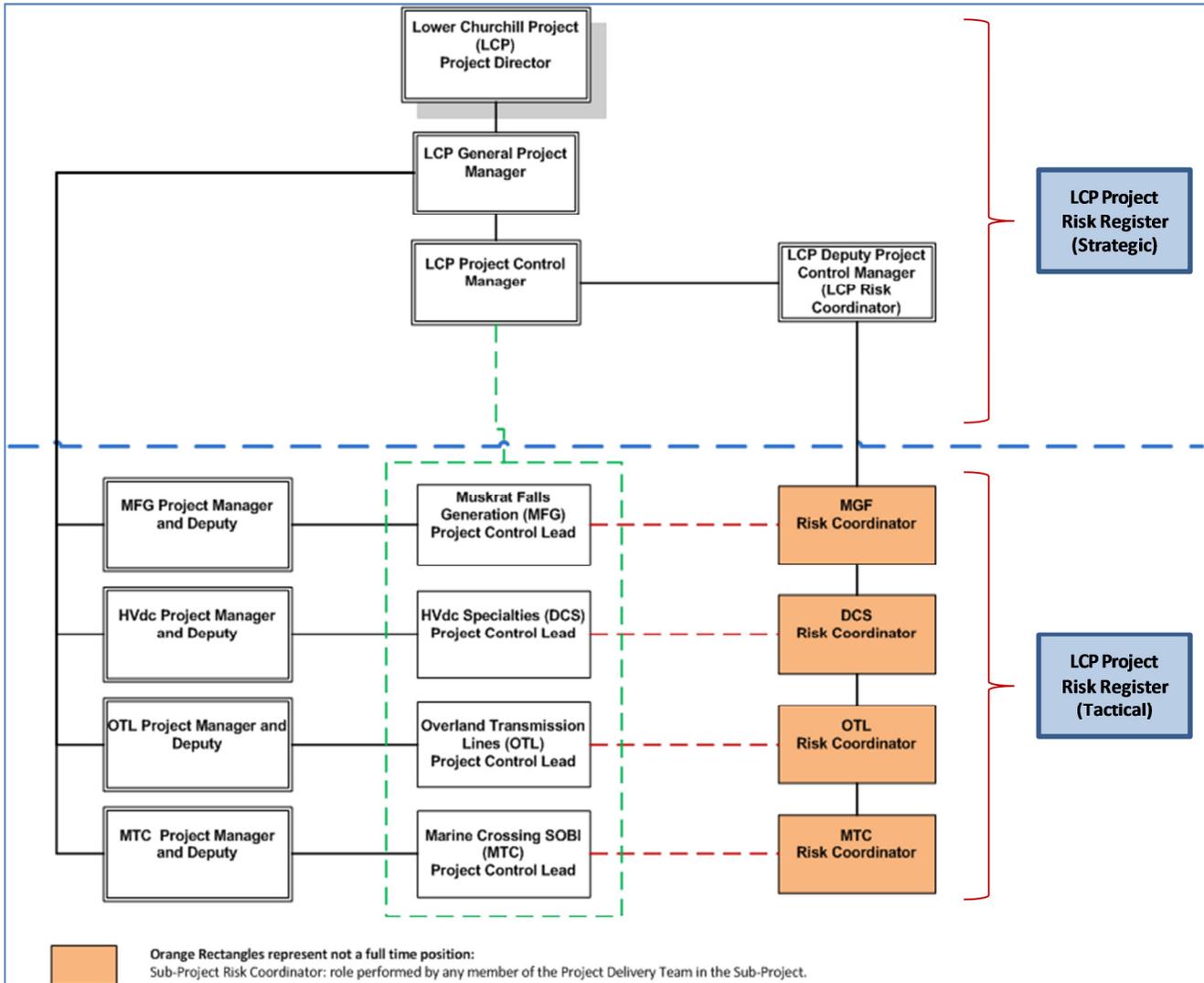
7.2.2 LCMC Organization for Risk Management

The organizational chart implemented to perform Risk Management process for LCP Project and Sub-Project is indicated in Figure 6.

The role of the LCP Risk Coordinator is performed by the LCP Deputy Project Control Manager. The roles of Sub-Project Risk Coordinator aren't full-time positions in the project; this role can be performed for any member of the Sub-Project delivery team who will coordinate with the LCP Risk Coordinator the methodology, process and tools for risk management.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	17

Figure 6: Organizational Chart for LCP Risk Management



7.2.3 Levels of Risk Management at LCMC

As indicated in Figure 5, two risk levels have been defined:

- **Strategic Risks:** applies to LCP Project and basically related to external issues like: (these risks are largely outside the control and management of the Sub-Project using their own resources)
 - Enterprise – corporation level issues
 - Governance
 - Financial markets
 - Stakeholders
 - Hyperinflation

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	18

- Regulatory approvals

These risks are largely outside the control and management of the Sub-Project using their own resources

- **Tactical Risks:** applies to LCP Sub-Projects and basically related to internal issues; these risks are under the control and management of the Sub-Projects using their own resources. For LCP, tactical risks are associated with the Base Capital cost estimate and cover the uncertainty of the following four estimate's elements: (it doesn't include price escalation).
 - Sub-Project definition and scope omission
 - Construction Methodology and execution
 - Performance factors
 - Price

The LCP Risk Register and Sub-Project Risk registers will reflect this approach for all identified risks.

8 OVERVIEW OF RISK MANAGEMENT PROCESS

This section covers the Lower Churchill Project (LCP) and Sub-Projects risk management process from the identification of LCP risks (strategic) and Sub-Projects risk (tactical) to establishing the appropriate risk plans that address these risks and the subsequent monitoring and control.

The central focus of this section is the risk management process, which guides the members of the LCP Project Delivery Team (PDT) through the steps of:

1. Risk Identification and Organization;
2. Risk Assessment and Prioritization;
3. Risk Response;
4. Risk Monitoring and Control.

For LCP Project and Sub-Projects, the step of Risk Assessment and Prioritization is basically a qualitative analysis oriented to define the risk level and expected value as a basis to categorize the top ten risks.

8.1 Risk Management Process Cycle

The risk management process used to effectively manage risks during the planning and execution stages of the Lower Churchill Project (LCP) and Sub-Projects is depicted in Figure 7. This risk management process is comprised of four main steps which combine to form an ongoing cycle and it is a cyclical and iterative process performed throughout the project development cycle that for LCP refers to the gateway process as indicated in the [LCP Project Execution Plan](#), reference document No. [LCP-PT-MD-0000-PM-PL-0001-01](#).

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	19

Figure 7: LCP Risk Management Process Cycle



Step 1 – Risk Identification and Organization

All risks are captured on Sub-Projects risk registers. The risks are then organized by major activity and type of risk; this organization facilitates both efficiency and effectiveness handling of the risks.

Step 2 – Risk Assessment and Prioritization

Each risk is given a “first-cut” priority ranking which is a function of the risk’s likelihood of occurrence and its potential consequence. From there, approximately 15-20 of the more complex and high impact- likelihood profile risks (Key Risks) are selected to be overseen by the Risk Resolution Team. Risk qualitative assessments are performed to evaluate both the individual and collective impacts of risks on the project, and to provide insight into the value of possible risk mitigations.

Step 3 – Risk Response

Each Key Risk is managed using a Response Plan which is recorded in the LCP risk management tool – Iris Intelligence. The Response Plan will detail the recommended strategy for managing the risk (i.e., avoidance, transfer, mitigation, or acceptance). The majority of risks are not elevated to Key Risk status and are managed using Action Plans within the LCP risk management tool which are reflected on the sub-project risk registers. Each risk’s Risk Owner is responsible for leading the development and implementation of that risk’s response or action plans.

Step 4 – Risk Monitoring and Control

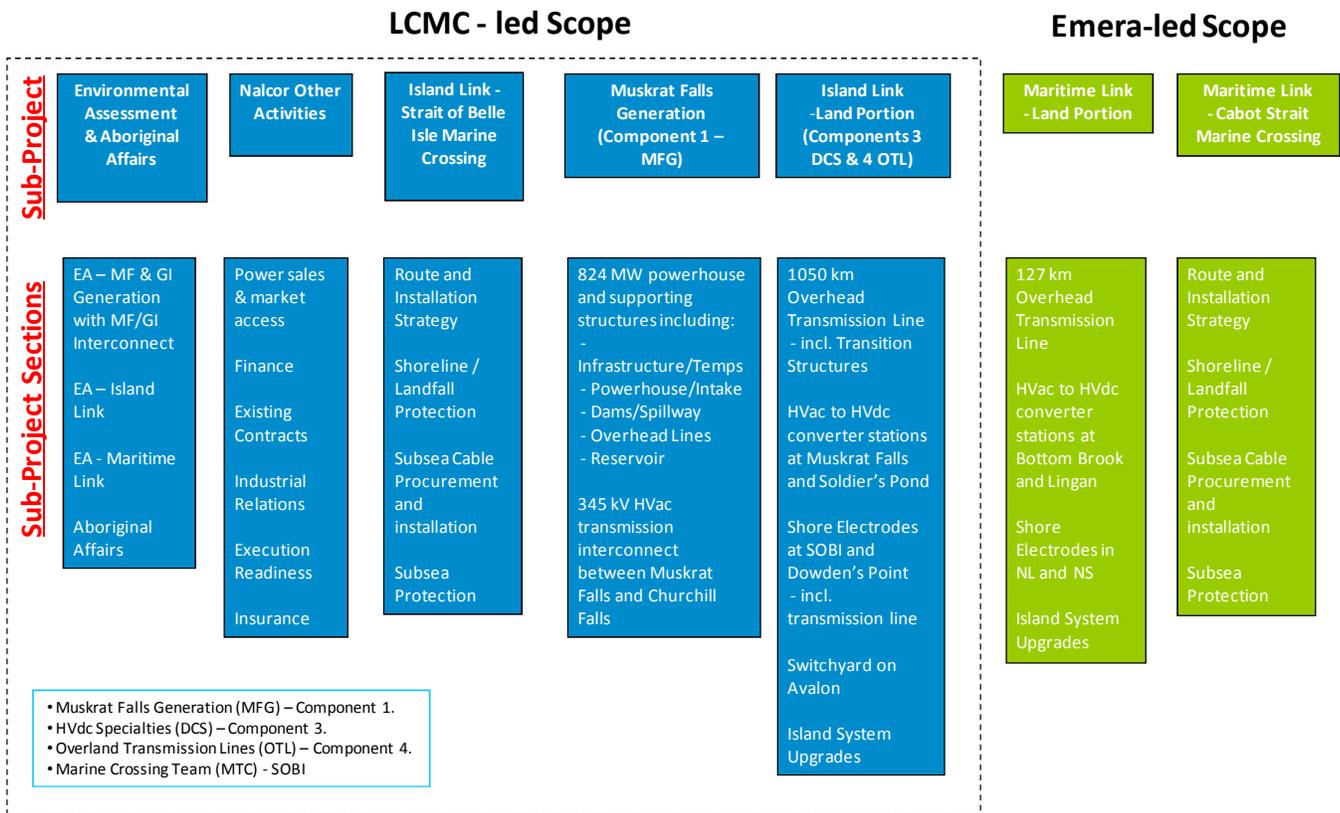
Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	20

The response and action plans are reviewed on a regular basis and are adjusted as conditions warrant promoting optimal outcomes. The frequency of reviews ranges from monthly to quarterly depending on the organizational entity involved in the review.

8.2 Scope of LCMC Responsibilities

Figure 8 shows the division of responsibilities between LCMC and interface with Emera for Phase I of the Lower Churchill Project (LCP). The overall Project is divided into Sub-Project areas; these Sub-Project areas are used as the basis for designating the Sub-Projects Risk Registers used in the Risk Management Process.

Figure 8: Depiction of Risk Register Responsibilities



LCMC will have the responsibility for overseeing: the Strait of Belle Isle (SOBI) Marine Crossing; and General Project Risks (including issues related to overall project execution, Environmental Assessment, Aboriginal Affairs, Financing, Regulatory and Labour Relations).

The LCMC through the Project Delivery Team (PDT) will oversee sub-project risk registers pertaining to: Muskrat Falls Generation - MFG (Component 1), HVdc Specialties - DCS (Component 3), Overland Transmission Lines – OTL (Component 4), and General Execution of Project Management within its area of responsibility.

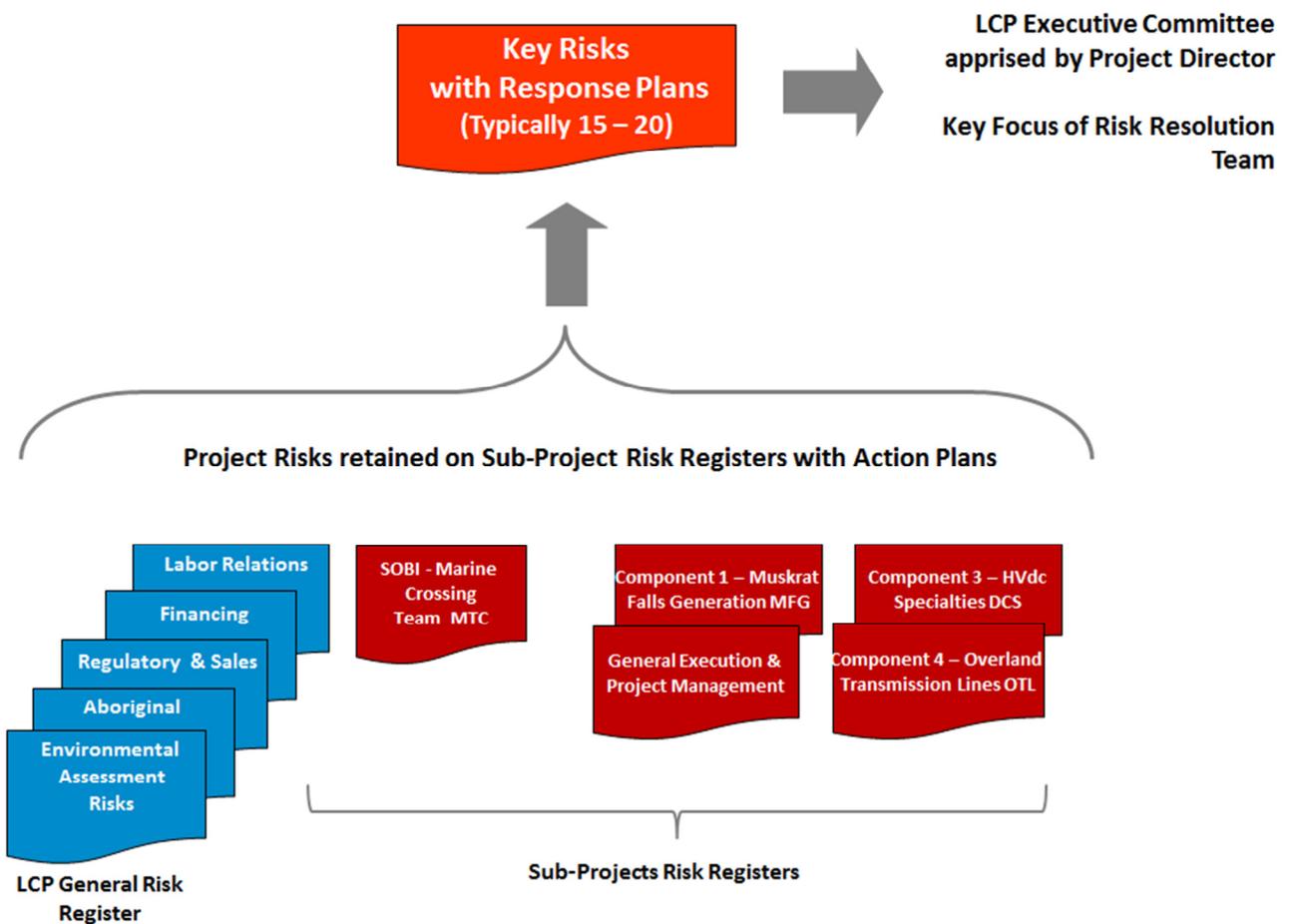
Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	21

At current it is envisioned that Emera, as lead for the Maritime Link, will be responsible for overseeing the risks associated with the Maritime Link.

8.3 Flow of Risks from Sub-Project Risk Registers to List of Key Risks

Figure 9 portrays the flow of project risks from the Sub-Projects Risk Registers to the List of Key Risks which are overseen by the Risk Resolution Team / LCP Executive Committee. Response Plans are used to manage the Key Risks while action plans are used to manage the risks that are retained on the Sub-Projects Risk Registers.

Figure 9: Flow of Project Risks from Sub-Project Risk Registers



Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	22

9 RISK IDENTIFICATION AND ORGANIZATION

This is the initial step for determining what, where, when, why and how something could happen. Each risk as it is identified will be recorded into the LCP Project or Sub-Project risk registers, these risk registers are structured in accordance with the LCP Risk Management tool following guidelines indicated in this document.

Risk items and issues may be identified through facilitated workshops including LCP Management Team for strategic risks and internal workshops/internal coordination meetings at the Sub-Project level for tactical risks during the life cycle of the LCP – Gateway Process.

Figure 10: Risk Identification and Organization



The process of identifying and organizing risk is continuous and can lead to new categories being added to the list of risk as indicated in Section 9.2.

During this step risks should be simply be listed and no judgement should be made regarding their validity. The risk should be stated clearly using explicit statements describing situations that can be negated or made conditional, it is recommend for LCP to use the following structure:

- IF
- Conditional statement (allowing probability to be addressed) - Cause.
- THEN
- Statement describing the consequences which can be assessed - Effect.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	23

Example:

IF a delay of one week in an LCP supplier delivery for free-issue materials occurs during construction, THEN the project delivery schedule of free-issue materials will be late by one week, exposing LCP to Contractor’s claims.

9.1 Initial Risk Identification

All project risks associated with Phase 1 of the LCP Project and Sub-Projects will be placed on their respective Risk Registers using the LCP Risk Management tool. As described in Section 7.2.3 and Figure 11, the following risk register will be available:

- General LCP Risk Register (strategic)
- Sub-Projects Risk Registers (tactical)

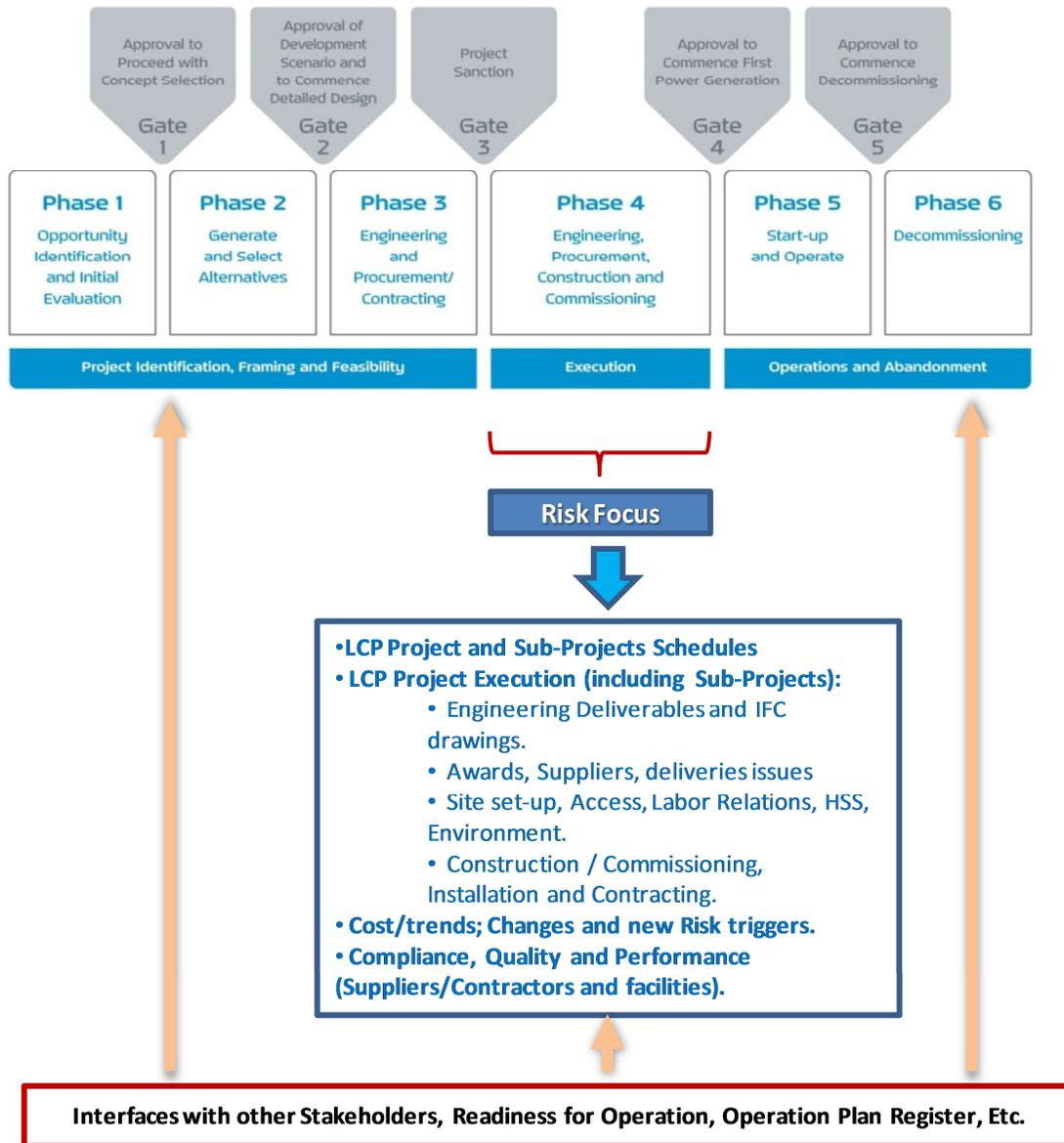
To assist with the initial population of a Sub-Project Risk Register, it is recommended that the Sub-Project Risk Register Coordinator create a preliminary list of the risks which pertain to that particular Sub-Project. A workshop can then be held, with broad participation from multiple disciplines, to further develop the list of risks for the risk register. This workshop will be facilitated by the LCP Project Risk Coordinator.

Core members of the LCP Project Delivery Team should be involved in this process so that they can develop and maintain a sense of ownership and responsibility for the risk and associated mitigations strategies and response actions.

Risk identification will be aligned with the current stage of LCP Project and Sub-Projects life cycle following the Gateway process (i.e. Post Gate 3 – Phase 4 Execution) as indicated in Figure 11.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	24

Figure 11: Risk identification – Gateway Process



9.1.1 Caution During Risk Identification

Before a potential LCP Project or Sub-Project risk item is added to the Risk Register, it must be scrutinized to ensure that it is a real Risk event as opposed to a normal day-to-day challenge.

A Risk event has a trigger which causes it, and the trigger needs to be realistic and credible, with a real possibility of occurrence. Challenges, on the other hand, are events faced in day-to-day Project execution and are sometimes more difficult than other normal events but still will happen, these challenges are known and are manageable, and therefore not a risk. It is expected that on many occasions, it will be difficult to draw the line

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	25

between a risk and a challenge. However, consensus among the LCP Project Delivery Team participants of a risk identification workshop will help in clearing-up the difference and will steer the discussion into identifying a clear LCP risk event.

The important point to remember here is to ensure that only LCP potential risk events are addressed in the register and that other challenges are left to the Project, Sub-Projects and Functional Managers to manage these challenges as part of their day-to-day normal execution activities.

9.2 Organizing Risks by Category

Organizing the risks on the Sub-Project risk registers is critical to the risks being efficiently and effectively managed. The Sub-Project Risk Coordinator will have primary responsibility for organizing risks on the Sub-Project risk register using LCP Risk Management tool.

Initially, it may be helpful to group risks by major activity or physical component of the Work Breakdown Structure. Risks should be further organized by type of risk. In addition to the ten strategic risk categories defined for LCP as indicated below, Figure 12 indicates risk categories identified in order to have a differentiation of the risk level between the LCP Project (strategic) and Sub-Projects (tactical).

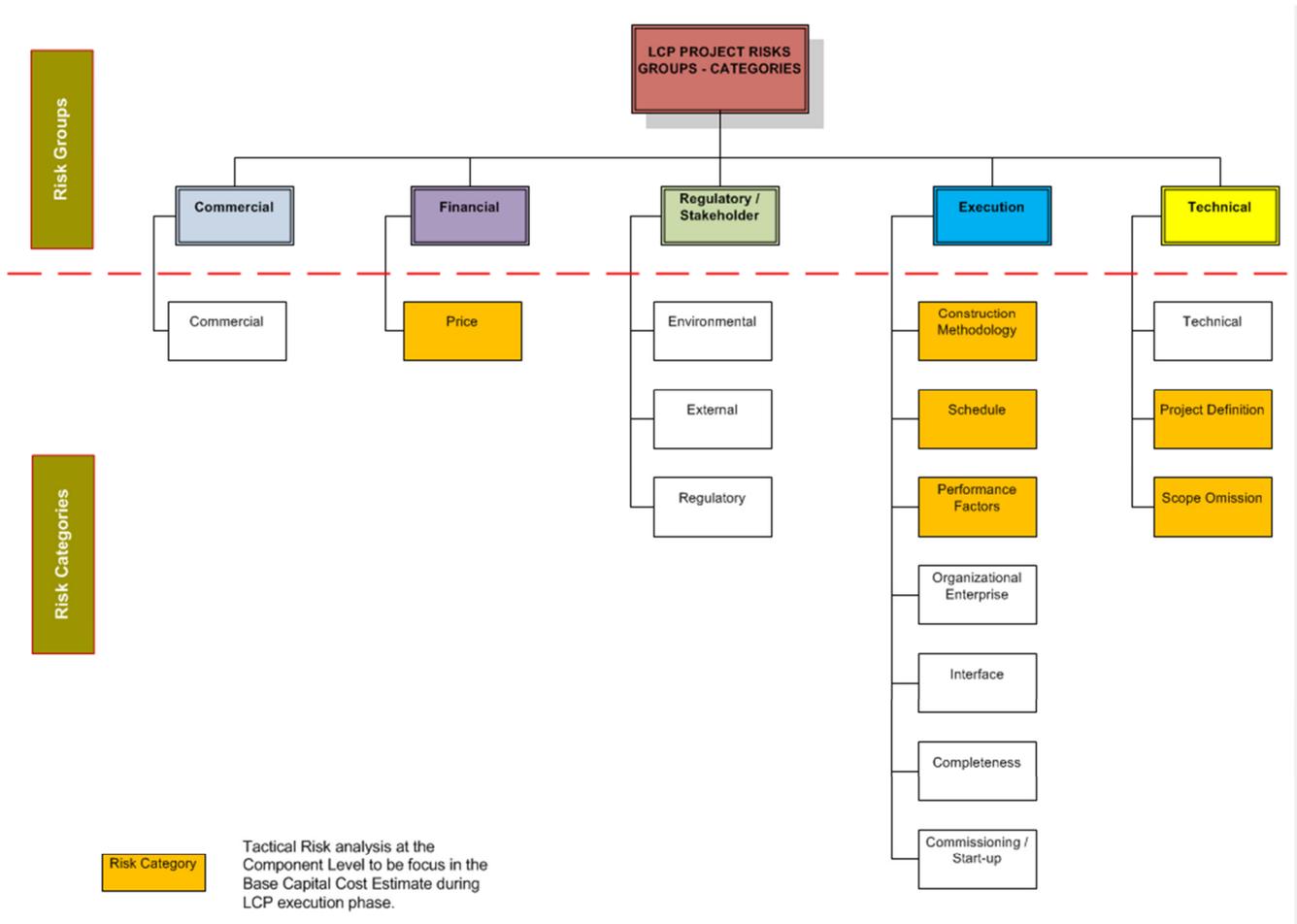
- 1) Commercial
- 2) Commissioning and Start-up
- 3) Completeness
- 4) Environmental
- 5) Construction
- 6) External
- 7) Interface
- 8) Organizational / Enterprise
- 9) Regulatory
- 10) Technical

After this level of organization has taken place, the list of risks should be reviewed to see what consolidation/elimination is appropriate.

Finally, to assist future risk assessments, a determination should be made for each risk as to whether it is a tactical risk or a strategic risk. In general, if the Sub-Project team has the authority to address a risk, it is a tactical risk; if a level of the organization above the Sub-Project team is required to address a risk, then it is a strategic risk.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	26

Figure 12: LCP Risk Categories



9.3 Identifying Risk Owners

The LCP Risk Coordinator and the Sub-Projects Risk Coordinators have primary responsibility for identifying the Risk Owners for each risk. This identification would typically be made during the workshop discussion at the time the risk is placed on the risk register. Afterwards, it is important that the Risk Coordinators confirm with the Risk Owner that he/she understands and accepts the responsibilities associated with being the Risk Owner.

9.4 Updating Risk Registers based upon Gathered Intelligence

The Sub-Project Risk Coordinators will work together to update or add risks to the Sub-Project risk registers based on discussions in management meetings, information gathered from Risk Assessments, or other new

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	27

intelligence. The Sub-Project Risk Coordinators will also have primary responsibility for updating the status of each risk on the Sub-Project risk register as appropriate.

9.5 LACTI Chart for Risk Identification and Organization

Description of Activity	LCP Executive Committee	LCP Project Director	LCP Risk Resolution Team ¹	LCP Risk Coordinator	Sub-Project Risk Coordinators	Risk Owner	Risk Advisor (Westney)	Sub-Project Project Manager or Deputy	Nalcor ERM Committee LCP Rep.	LCP Change Management Lead
Initial Population of Sub-project Risk Register		A	I	L	C	C	T	I	I	
Organizes Risks by Category on Sub-project Risk Registers (incl. designating tactical/strategic & consolidating risks)		A	I	C	L	C	T	I		
Identify Risk Owner for each Risk		A	I	L	C	C	T	I		
Update Risk Registers based on Intelligence Gathered from LCP Executive Committee, Risk Resolution Team, Risk Workshops, Contractors, and General Surveillance	C	A	C	L	C	C	T	C		C

Legend:
L LEADS - Who leads the activity
A ACCOUNTABILITY - Who has accountability for the activity
C CONSULTED - Who needs to be consulted during the activity
T TECHNICAL - Who provides technical input on the activity
I INFORMED - Who should be informed, but is not actively participating in the activity

¹ Financial Advisor, Legal Advisor, and Insurance Advisor participate on Risk Resolution Team as appropriate.

10 RISK ASSESSMENT AND PRIORITIZATION

In the risk assessment and prioritization step, the LCP Project and Sub-Projects delivery teams evaluates the risks identified in the risk register to determine the probability of risk occurrence, the potential risk impact (consequences) to the project objectives within categories indicated in Section 10.1.

Using this information the LCP Project Delivery Team can subsequently develop risk mitigation strategies to address LCP prioritized threats and opportunities. One of the objectives of this step is to understand the

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	28

magnitude of the impact (consequence) if a risk will be materialized in order to develop appropriate LCP strategies and tactics to mitigate the risk.

It is recommend as a good practice that at this stage the LCP Project delivery team should refrain from developing any action plan until the ranking of the risk has been performed, if however discussions are held, the conclusion should be noted and used during the risk response step.

Figure 13: Risk Assessment and Prioritization



10.1 Determining Preliminary Risk Rankings

The Sub-Project Risk Coordinator, with assistance from the LCP Risk Coordinator and other members of the Sub-Project delivery team as appropriate, will assess the likelihood of occurrence and the potential consequence(s) of each risk on the Sub-Project Risk Register. There are six categories used for potential consequences:

- Safety (Occupational Health and Safety).
- Environmental (Physical).
- Cost (LCP Capital Cost).
- Schedule (First Power Target Date).
- Quality (Availability, Reliability, and Performance).
- Reputation.

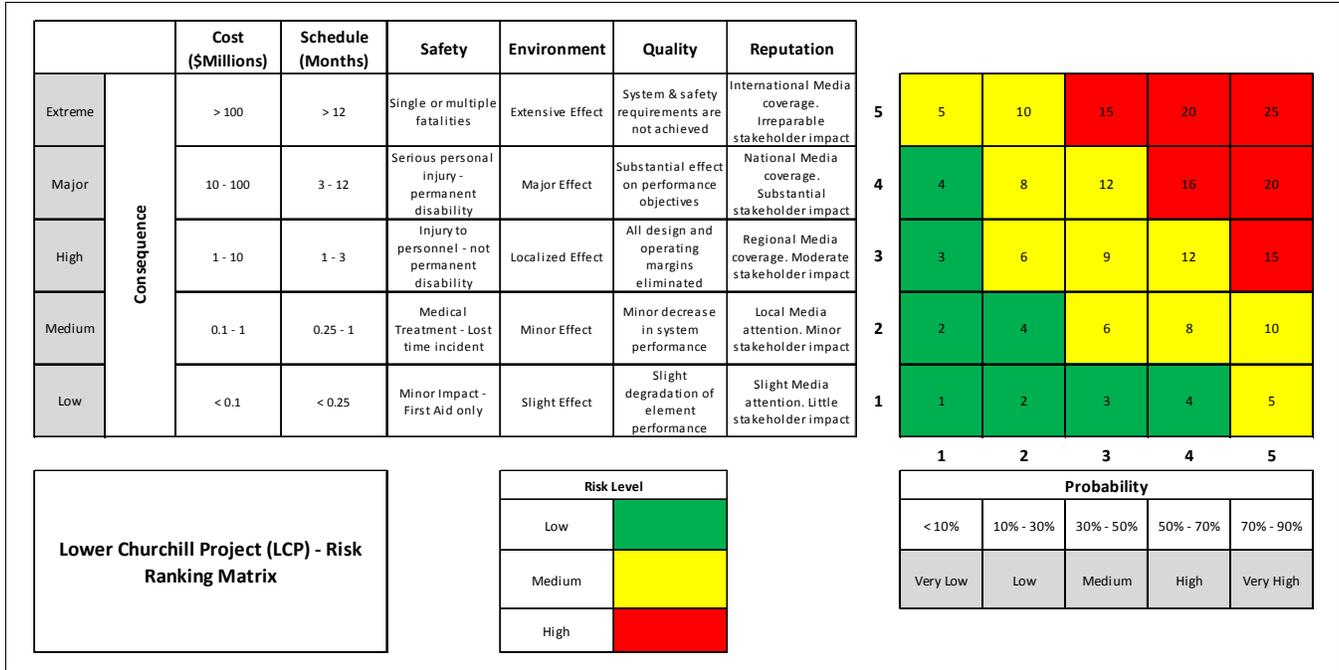
Each risk’s likelihood of occurrence combined with its potential consequence(s) produces a first-cut priority ranking for the risk (High – Medium – Low) following the LCP Risk Assessment Matrix as indicated in Figure 14.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	29

This process is performed in the LCP risk management tool that has been set-up with all parameters as indicated above.

LCP Project and Sub-Projects management team will validate all first-cut rankings for risks related to their areas of responsibility.

Figure 14: LCP Risk Assessment Matrix



10.2 Develop List of Key Risks to be Overseen by Risk Resolution Team / LCP Executive Committee

A critical aspect of LCMC Risk Management Philosophy, reference document No. LCP-PT-MD-0000RI-PH-0001-01, is the Risk Resolution Team (with involvement from the LCP Executive Committee as appropriate) managing a select number (approximately 15-20) of complex risks which provide the greatest exposure for the Project. The 15-20 Key Risks to be overseen by the Risk Resolution Team are selected from all of the risks on all sub-project risk registers as well as the risks on the Decision Gate 2 Strategic Risk Frames, reference document Gate 2 Project Risk Analysis LCP-PT-MD-0000-RI-RP-0001-01. The LCP Risk Coordinator has responsibility for facilitating the Key Risk selection process with the Risk Resolution Team.

10.3 Risk Assessments (Tactical-Risk, Strategic-Risk and Time-Risk Analyses)

The LCP Project Risk Coordinator has primary responsibility for developing a schedule for Risk Assessments (Tactical-Risk, Strategic-Risk, and Time-Risk analyses) to evaluate risks at the LCP Project and Sub-Projects.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	30

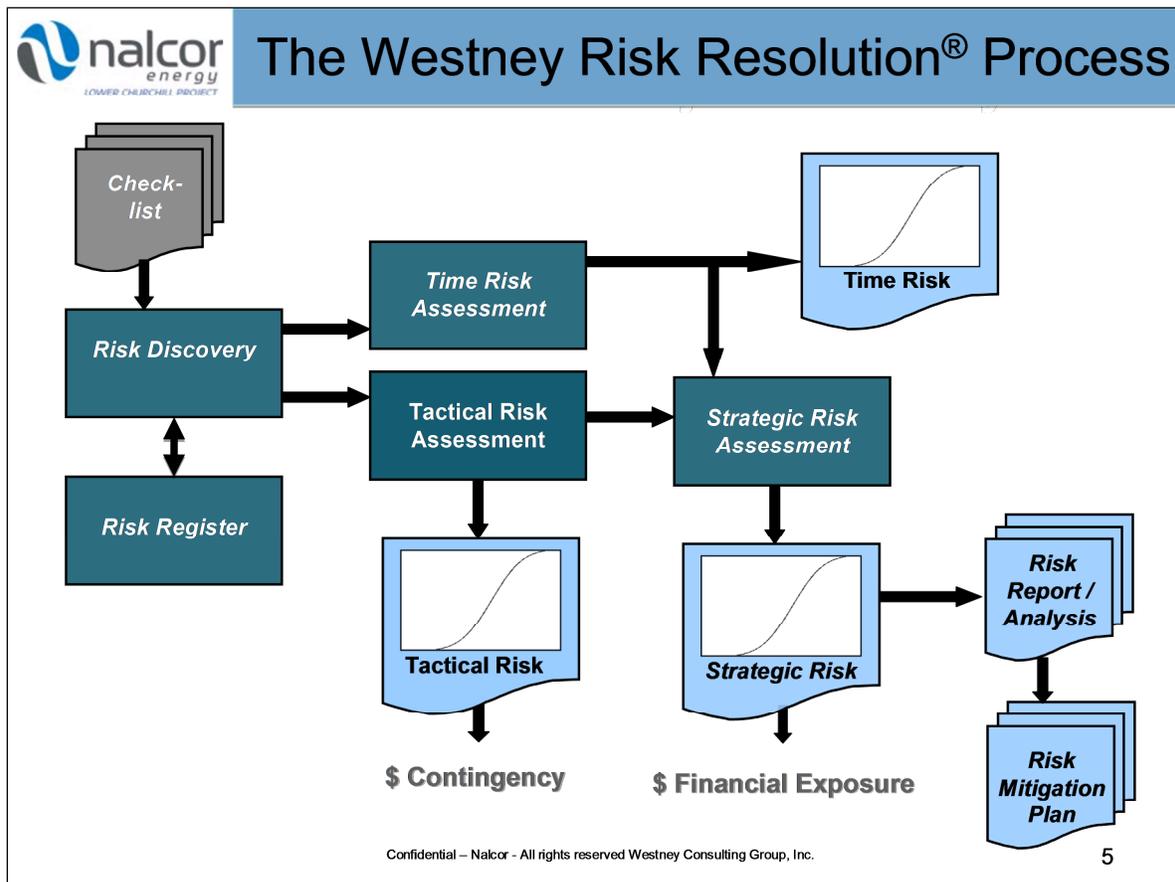
Where required, the LCP Risk Coordinator, working with the Risk Advisor (Westney Consulting Group), will facilitate the discovery (document review and interviews) and workshop discussions associated with the Risk Assessments. It is intended that a broad range of project knowledge holders participate in the discovery process and Risk Workshops. LCP Strategic Risk Frames will be used to describe the attributes of each Key Project Risk.

Prior to LCP Gate 3, the Risk Advisor (Westney) will be responsible for performing the analysis and creating reports to document findings. The analysis, including Monte Carlo-type simulation techniques, will be structured to gain insights on important issues identified by Nalcor; these issues may pertain to individual risks or groups of risks. Risk Assessments may consider both the impact of risks as well as the impact of potential mitigations. The Risk Assessment results are carefully considered in the determinations of both project contingency and management reserve levels (reference [Project Controls Management Plan](#), reference document No. LCP-PT-MD-0000-PC-PI-0001-01).

Post LCP Gate 3 - Project Execution, the Risk Advisor (Westney) will be engaged in an “as needed” basis.

The Risk Assessment process is illustrated in Figure 15 below.

Figure 15: Westney’s Risk Assessment Process



Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	31

10.4 Health, Safety and Environmental Risk Assessments

As noted in Section 2, the Project Risk Management Plan does not address the completion of specific health, safety and environmental risk assessments. Focused health, safety and environmental risk assessments (e.g. HAZIDs, HAZOPs, etc.) will be undertaken. Details on the process for undertaking these specific risk assessments can be found in [Health and Safety Management Plan](#), reference document No. [LCP-PT-MD-HS-PL-0001-01](#) and [Environmental Management Plan](#), reference document No. [LCP-PT-MD-EV-PL-0001-01](#).

Depending on the relevant risk ranking, a health & safety or environmental risk may become a Key Risk.

10.5 Confirm List of Key Risks based upon Gathered Intelligence

On a regular basis, the LCP Risk Coordinator will facilitate reviews with the Risk Resolution Team to confirm that the list of Key Risks is current based on discussions in management meetings, information gathered from Risk Assessments, or other new intelligence. The LCP Risk Coordinator will update the list of Key Risks as appropriate.

10.6 LACTI Chart for Risk Assessment and Prioritization

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	32

<u>Description of Activity</u>	LCP Executive Committee	LCP Project Director	LCP Risk Resolution Team ¹	LCP Risk Coordinator	Sub-Project Risk Coordinators	Risk Owner	Risk Advisor (Westney)	Sub-Project Project Manager or Deputy	Nalcor ERM Committee LCP Rep.	LCP Change Management Lead
Conduct Preliminary Risk Rankings	I	A	I	C	L	C	T	I		
Develop List of Key Risks to be Overseen by Risk Resolution Team / LCP Executive Committee	C	A/C	C	L	C	C	T	C	I	
Determine Schedule for Risk Assessments (Tactical-, Strategic-, and Time-Risk Assessments)	I	A	C	L	C	C	T	C		
Conduct Risk Assessments (including discussion and evaluation of key individual risks)	C	A	C	L	C	C	T	C		
Update Lists of Key Risks based on Intelligence Gathered from LCP Executive Committee, Risk Resolution Team, Risk Workshops, Contractors, and General Surveillance	C	A	C	L	C	C	T	C	I	C

Legend:
L LEADS - Who leads the activity
A ACCOUNTABILITY - Who has accountability for the activity
C CONSULTED - Who needs to be consulted during the activity
T TECHNICAL - Who provides technical input on the activity
I INFORMED - Who should be informed, but is not actively participating in the activity

¹ Financial Advisor, Legal Advisor, and Insurance Advisor participate on Risk Resolution Team as appropriate.

11 RISK RESPONSE

This step risk response is also referred as risk management strategies; it means the process of identifying various risk mitigation strategies and risk action plans for each LCP risk, evaluating the effectiveness of each option and selecting the best approach.

For the LCP Project and every Sub-Project risk several strategies or alternatives may apply. The LCP Project Management team and the Project Delivery Team (PDT) must identify these alternatives, evaluate their individual merits and select the one that offers the best solution – mitigation strategy for the LCP Project to:

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	33

- Reduce the probability (likelihood) of the LCP risk;
- Reduce the consequence to the LCP objectives;
- Transfer in full or in part to those best qualified to manage the risk (e.g. contractors) and
- Avoid the risk.
- Accept the risk.

Figure 16: Risk Response



11.1 Developing and Implementing Response Plans to Address Key Risks Overseen by Risk Resolution Team

The Risk Owner for each Key Risk has the primary responsibility for developing the Response Plan for that risk. The Response Plan will detail the recommended strategy for managing the risk as:

- Threats: avoidance, mitigation, transfer or acceptance
- Opportunities: acceptance, exploit, share or enhance

The Risk Owner will consult with members of the Risk Resolution Team or the LCP Risk Coordinator as appropriate when developing the Response Plan. Findings from Risk Assessments should also be used to help shape the Response Plans. This process is performed using the LCP risk management tool.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	34

The LCP Project Director will approve each Response Plan or, when required, seek higher-level approval for the Response Plan. The Risk Owner for each Key Risk will be responsible for leading the implementation of the Response Plan.

11.1.1 Risk Response Planning for Threats

These four basic strategies for response to threats are: (as defined by the Project Management Institute (PMI) in the PMBOK – Project Management Body of Knowledge).

1. **Avoid:** risk avoidance involves changing the project management plan to eliminate the threat posed by and adverse risk to isolate the project objectives from the risk’s impacts, or to relax the objective that is in jeopardy such as extending the schedule or reducing scope. Some risks that arise early in the project can be avoided by clarifying requirements, obtaining information, improving communication or acquiring expertise.
2. **Transfer:** risk transference requires shifting the negative impact of a threat along with ownership of the response to a third party. Transferring the risk simply gives another party responsibility for its management, it does not eliminate it. Transferring liability for risk is most effective in dealing with financial risk exposure; risk transference nearly always involves payment of a risk premium to the party taking the risk. Transference tools can be quite diverse and include, but are not limited to the use of insurance, performance bonds, warranties, guarantees, etc. Contracts may be used to transfer liability for specified risks to another party.
3. **Mitigate:** risk mitigation is a preventive action strategy and implies a reduction in the probability and/or impact of an adverse risk event to an acceptable threshold. Taking early action to reduce the probability and/or impact of a risk occurring in the project is often more effective than trying to repair the damage after the risk has occurred. Adopting less complex process, conducting more tests or choosing more stable supplier/contractor are examples of mitigation actions. Mitigation may require prototype development to reduce the risk of scaling up from a bench-scaled model of a process or product. Where it is not possible to reduce probability a mitigation response might address the risk impact by targeting linkages that determine the severity, for example designing redundancy into a subsystem may reduce the impact from a failure of the original component.
4. **Acceptance:** a strategy that is adopted because it is seldom possible to eliminate all risk from a project. This strategy indicates that the project management plan is not changed to deal with a risk or it isn’t possible to identify any other suitable response strategy. It may be adopted for either threats or opportunities. This strategy can be either passive or active. Passive acceptance requires no action leaving the project team to deal with the threats or opportunities as they occur. The most common active acceptance strategy is to establish a contingency reserve including amounts of time, money, or resources to handle known or even sometimes potential unknown threats or opportunities.

11.1.2 Risk Response Planning for Opportunities

These four basic strategies for response to opportunities are: (as defined by the Project Management Institute (PMI) in the PMBOK – Project Management Body of Knowledge).

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	35

1. **Acceptance:** as explained for threats in section 11.1.1.
2. **Exploit:** this strategy may be selected for risk with positive impacts where the project wishes to ensure that the opportunity is realized. This strategy seeks to eliminate the uncertainty associated with a particular upside risk by making the opportunity definitely happen. Directly exploiting responses include assigning more talented resources to the project to reduce the time to completion, or to provide better quality than originally planned.
3. **Share:** sharing a positive risk involves allocating ownership to a third party who is best able to capture the opportunity for the benefit of the project; examples of sharing actions include forming risk-sharing partnerships, teams, special-purpose companies, or joint ventures, which can be established with the express purpose of managing opportunities.
4. **Enhance:** this strategy modifies the size an opportunity by increasing probability and/or positive impact risks. Seeking to facilitate or strengthen the cause of the opportunity and proactively targeting and reinforcing its trigger conditions may increase probability. Impact drivers can also be targeted seeking to increase the project’s susceptibility to the opportunity.

11.2 Developing and Implementing Action Plans to Address Project Risks on Sub-Project Risk Registers

The vast majority of risks are not elevated to Key Risk status, and they continue to reside on the Sub-Project Risk Registers; Action Plans are used to manage these Project Risks. The Risk Owner for each Project Risk has the responsibility for developing that risk’s mitigation strategy and associated Action Plan using the LCP risk management tool. The Risk Owner will be responsible for consulting the Sub-Project Risk Coordinator and other resources as appropriate in developing the Action Plan.

The applicable LCP Sub-Project Manager (or delegate) will approve each Action Plan. The Risk Owner for each Sub-Project Risk will be responsible for leading the implementation of the Action Plan.

11.3 Risk Addressing through the Procurement Process

Another important aspect of the Project’s Risk Management Philosophy is effectively using the procurement process to address risks. Area Managers or Package Leads (or delegates) will work with the contracts coordinator/specialist and the Sub-Project Risk Register Coordinator to develop a risk inventory for each contract package.

The procurement strategy for each contract package will then consider the optimal Risk Brokering for the identified risk inventory. The LCP Risk Coordinator is responsible for working with the contracts coordinator/specialist to facilitate any required Risk Brokering reviews and approvals.

Five steps have been identified for the risk response through the procurement process:

1. Request for Inquiry (RFI) preparation;

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	36

2. Request for Proposal (RFP) preparation;
3. Bidding / Negotiation / Risk brokering;
4. Contract preparations; and
5. Risk monitoring.

11.3.1 Package Risk Review – RFI preparation phase

LCP Package Lead, Engineer - Area Managers and LCP Risk Coordinator define the risk criticality of a LCP package and conclude on eligibility for package risk management.

For instance, small LCP packages related to supply of standard off-shelf products or standardized works not on project schedule's critical path usually have low criticality (non-critical) and do not require package risk management.

However, as a rule, all packages of value more than \$5M CAD should be considered critical and eligible for risk management. In addition, some LCP packages of value less than \$5M CAD will require package risk management if they satisfy to one or more of the following criteria:

In case of supply and service packages:

- Proximity to the project schedule critical path,
- A lack of maturity of technical or other requirements,
- Represents an unusually high degree of technical development,
- Concerns exist regarding the robustness of the supplier's/ provider's Quality Management System,
- Requires unusual design and/or manufacturing processes,
- A lack of LCP prior or positive experience with the Supplier/ provider,
- Concerns regarding any sub-vendors to the supplier/ provider,
- Criticality of the supplier/ provider to the overall success of the project,
- Any other relevant considerations;

In case of construction packages:

- The work is on or close to the critical path,
- The workforce will be a high percentage of the site workforce or will contain a large percentage of people new to the industry,
- The work will be undertaken in a heavily congested area,
- The work involves a high level of contractor design,
- The work involves new construction techniques and
- Any other relevant considerations.

If a LCP package is not considered risk critical and eligible for package risk management, corresponding decision is documented by the LCP Risk Coordinator. All possible project risks associated with the package are considered low and accepted.

11.3.2 Package Risk Review – RFP preparation phase

LCP Project Delivery Team representatives of Engineering, Safety, Environment, QA, Supply Chain, Permitting, etc. assigned as package risk owners, should develop detail response strategies (mitigation and actions) for each

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	37

identified risk. Changes may be recommended to the package scopes or decisions may be made on risk response that should be negotiated and written into the package Contract's or purchase order's terms and conditions.

The information of the Package Risk Inventory along with the proposed response strategy should be collected in the Package Purchasing Plan and returned to the LCP Risk Coordinator to prepare a Package Risk Questionnaire. A Package Risk Questionnaire normally contains both standard risk questions and package specific ones depending on risks exposure.

Information about package risks (Package Risk Inventory) should be collected in the LCP risk management tool. This should include names of risk owners, assessment of risks before response, proposed response as well as assessment after response. All LCP package risks that are believed to have a high risk level ('red') and medium risk level ('yellow') after performing the risk response step should be reflected in the LCP Package Risk Questionnaire.

The criteria to evaluate the Risk Questionnaire during the bidding process is Pass/Fail, in order to achieve a status of Pass responses to the Risk Questionnaire must have a value over 60%.

11.3.3 Bidding, Negotiation and Risk Brokering

Selection of LCP Suppliers, Contractors or Service Providers will be made on a risk informed basis for all risk critical packages.

Upon receiving the RFP responses, the Package Risk Questionnaire responses along with package Risk Management Plans (including bidder's Risk Registers) become a basis for development of Bidder's Ranking Template to rank bidders and develop their short list.

In addition, during the bid clarification process LCP Supply Chain, Engineering and Risk personnel will collect risk information. The additionally collected risk information should be also used for evaluation of bidders. A risk review will be held to compare the risk exposure of awarding a particular package to each contender using the Ranking Template.

The next step of the process is most critical for the LCP package risk management. It is focused on negotiations with short listed bidders in order to allocate risks to the potential contractors where deemed best for the LCP Project (Risk Brokering). The LCP Risk Coordinator should work with the Contract Coordinator to facilitate any required risk brokering reviews and approvals.

As a result of this phase, the Contract award recommendation will be issued based on most optimal negotiated risk brokering approach for LCP project. Corresponding risk addressing obligations of the recommended bidder should be included to the package Contract. The General Package Risk Inventory should be updated to reflect corresponding residual medium and high risks as negotiated. If required, additional vendor specific medium and high risks should be identified and added to the Inventory.

11.3.4 Contract Preparation

The updated Package Risk Inventory should be reviewed with a selected LCP supplier, service provider or contractor. Addressing actions should be reviewed and included to the Contract. Similarly, the reporting

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	38

requirement for a selected list of high and medium residual risks should become part of the Agreement (Contract). All these packages and supplier/ service provider/ contractor specific risks that are believed to have high or medium level after addressing should be added to the Sub-Project risk registers in the LCP risk management tool. Low level risk after addressing should stay in the LCP Package Risk Register.

11.3.5 Contractors and Suppliers Risk Management process and Risk Monitoring

To the maximum extent possible and as necessary, contractors and suppliers will be integrated into LCP project risk management activities. The degree of the involvement depends on a type of the package contract (fixed price, unit price, reimbursable) and phase of procurement process (package contract pre-award vs. post-award).

As during the pre-award phases the main goal of the package risk management is to collect risk information and evaluate bidders, there are following risk requirements for bidders pre-award:

- To answer all questions of the Package Risk Questionnaire;
- To provide a package Risk Management Plan (including Risk Register) according to item A04 of the LCP Supplier Document Requirement List (SDRL).

As the main goal of the package risk management post-award is risk addressing, monitoring and reporting a selected contractor/ supplier (the bid winner) should provide following documents post-award:

- Updated Risk Management Plan (agreed upon during Contract negotiation) according to item A04 of the LCP SDRL;
- Monthly Report (including recent package Risk Register) according to item A03 of SDRL.

LCP Risk Management Requirements for Contractors and Suppliers, reference document No. [LCP-SN-CD-0000-RI-PR-0001-01](#) defines forward general instructions on structure of the Risk Management Plan, Risk Register and Monthly Risk Report. However, particular content of these documents should be negotiated and stipulated by the Contract in the Contract's Coordination Procedure that defines particular content of the Risk Management Plan and, hence,

- Requirement to implement a formal risk management process,
- List of risks that are subject to Monthly Reporting,
- Types and frequency of package risk reviews.

In case of reimbursable types of contracts, as a rule, a LCP supplier/ provider will be required to implement a formal risk management process based on agreed Risk Management Plan. Corresponding audit could be part of the requirement. Representatives of the LCP Project could attend the internal risk review meetings performed by Supplier/Contractor.

In case of fixed price or unit price types of contracts, as a rule, the full implementation of the risk management process is recommended. Usually, representatives of the LCP Project do not attend internal risk reviews, etc.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	39

11.4 Project Insurance Procurement

The Insurance Advisor (broker) will act as the technical advisor during the procurement of the Project’s insurance program, which entails a thorough understanding of the project and its associated risks discovered throughout the application of this Management Plan. Details on the strategy for placement of the Project’s insurance program are contained within [Insurance Philosophy](#), reference document No. [LCP-PT-MD-0000-LE-PH-0001-01](#).

11.5 LACTI Chart for Risk Response

<u>Description of Activity</u>	LCP Executive Committee	LCP Project Director	LCP Risk Resolution Team ¹	LCP Project Risk Coordinator	Sub-Project Risk Coordinators	Risk Owner	LCP Supply Chain Management	LCP Business Services Manager	Nalcor Insurance Advisor	Risk Advisor (Westney)	Sub-Project Project Manager or Deputy	Nalcor ERM Committee LCP Rep.	LCP Change Management Lead
Develop and Implement Response Plans to Address Key Risks Overseen by Risk Resolution Team / LCP Executive Committee ³	A/I	A/C	T/C	C	C	L				T	C	I	I
Develop and Implement Action Plans to Response Project Risks Retained on Sub-Project Risk Registers ³		A	I	C	C	L				T	I		I
Response Risks through the Procurement Process ⁴	I	A	C	C	C	C	L			T	C		I
Secure Construction All-Risk Policy	I	A	C	C	C	C		L	T	C	C	I	

Legend:
 L LEADS - Who leads the activity
 A ACCOUNTABILITY - Who has accountability for the activity
 C CONSULTED - Who needs to be consulted during the activity
 T TECHNICAL - Who provides technical input on the activity
 I INFORMED - Who should be informed, but is not actively participating in the activity

¹ Financial Advisor, Legal Advisor, and Insurance Advisor participate on Risk Resolution Team as appropriate.
² The results of Risk Assessments should be used to help shape Response Plans (and Action Plans as appropriate).
³ Supply Chain Management with the Scope or Area Manager will be responsible for developing of a contracting strategy which considers risk brokering.
⁴ Nalcor insurance group with AON as broker will technical support for the placement of the CAR policy.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	40

12 RISK MONITORING AND CONTROL

This step of risk monitoring and control is the process of tracking identified risks, reassessing existing risk, monitoring trigger conditions for contingency plans, identifying, assessing and planning for new risks and reviewing the execution of risk responses while evaluating their effectiveness to the LCP Project.

Project assumptions are validated and/or modified. The risk monitoring and control process applies variance and trend analysis from performance data generated and collected during LCP Project and Sub-Projects execution. Risk monitoring and control is an ongoing process throughout the life of the project.

Figure 17: Risk Monitoring and Control



12.1 Monitoring and Adjusting Response Plans for Key Risks Overseen by Risk Resolution Team

The Risk Owner for each Key Risk will be responsible for providing a monthly update on the status of the Response Plan to the LCP Risk Coordinator. The LCP Risk Coordinator will issue a Response Plan Status Report from the LCP risk management tool, which will be reviewed with the LCP Management Team on a monthly basis and reviewed with the Risk Resolution Team on a quarterly basis. After each quarterly review with the Risk Resolution Team, the LCP Project Director will review highlights of the Response Plan Status Report with the LCP Executive Committee.

Response Plans may be adjusted based on feedback from the reviews. The LCP Project Director will approve any adjustments to a Response Plan or, when required, seeks higher-level approval for the adjustment.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	41

12.2 Monitoring and Adjusting Actions Plans for Project Risks on Sub-Project Risk Registers

The Risk Owner for each Project Risk will be responsible for providing a monthly update on the status of the Action Plan to the Sub-Project Risk Coordinator. All updates of Action Plans are captured in the Sub-Project Risk Registers using LCP risk management tool. Each Sub-Project Risk Coordinator will prepare an Action Plan Status Report which will be provided to Project Managers and Area Managers on a monthly basis.

Action Plans may be adjusted based on feedback. The applicable Sub-Project Manager (or delegate) will approve each Action Plan adjustment.

12.3 LACTI Chart for Risk Monitoring and Control

<u>Description of Activity</u>	LCP Executive Committee	LCP Project Director	LCP Risk Resolution Team ¹	LCP Project Risk Coordinator	Sub-Project Risk Coordinators	Risk Owner	Risk Advisor (Westney)	Sub-Project Project Manager or Deputy	Nalcor ERM Committee LCP Rep.	LCP Change Management Lead
Review (and adjust as appropriate) Response Plans to Address Key Risks Overseen by Risk Resolution Team / LCP Executive Committee	A/I	A/C	T	L	C	C	T	C	I	I
Review (and adjust as appropriate) Action Plans to Address Project Risks Retained on Sub-Project Risk Registers		A	I	C	L	C	T	I	I	I

<p>Legend:</p> <p>L LEADS - Who leads the activity</p> <p>A ACCOUNTABILITY - Who has accountability for the activity</p> <p>C CONSULTED - Who needs to be consulted during the activity</p> <p>T TECHNICAL - Who provides technical input on the activity</p> <p>I INFORMED - Who should be informed, but is not actively participating in the activity</p>
--

¹ Financial Advisor, Legal Advisor, and Insurance Advisor participate on Risk Resolution Team as appropriate.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	42

13 RISK MANAGEMENT TOOL

For the LCP Project and Sub-Projects, the Risk Management tool is the software called Iris Risk Management Software - Iris Intelligence. The software is based on a relational database hosted in the cloud and has been customized and set-up to manage LCP requirements and methodology for risk management.

Figure 18: Software Overview and Benefits.

Software Overview

IRISIntelligence is a revolutionary software solution that empowers you to identify, manage and reduce the risk exposure of your organisation. The first software of its kind made exclusively by risk managers for risk managers, IRISIntelligence enables you to:

- Align project and programme activity with corporate goals and objectives
- Identify, evaluate and address risks before they arise
- Implement robust contingency plans to minimise the impact of risks should they crystallise
- Understand the total risk exposure of their company as a whole, individual departments or divisions or specific programmes and projects of work
- Make informed decisions on which areas of risk management should be prioritised and whether the costs of mitigating each risk outweigh the benefits of doing so

IRIS is consistently hailed by organisations and individuals alike as the most intuitive and user friendly risk management software package available.

Benefits of IRIS Intelligence

IRISIntelligence addresses all of the common problems of risk management faced by most organisations, including:

- The ability to roll out consistent, repeatable and effective processes across your organisation
- Calculation of your total risk exposure, by project, programme, business unit or for the organisation as a whole
- Illustrates how this risk exposure may be reduced in the most cost effective manner
- Demonstrates the Return on Investment delivered to your stakeholders
- Embeds a risk management culture in resources across the organisation
- Ensures risks are actively managed and data remains current
- Generates clear, consistent and effective reports to enable Senior Management to instantly identify the critical areas

The software is controlled and modified by the LCP Risk Coordinator coordinating with the provider of this tool as required and this tool is used by LCP Project and Sub-Projects. Two documents are provided with the tool that describes the features and functionality of the software and are embedded in the system main page, these document are:

- Iris Software User Exercise and
- Iris Software Administrator Exercise

MCT – SOBI are presently using a Ms Excel based software and will continue to do it for near term until risk information is uploaded in the LCP Risk Management Tool.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	43

Figure 19: Software User and Exercise Guides

IRIS Intelligence

Welcome to IRIS Intelligence

IRIS Intelligence is a software tool designed to help you manage risks within your organization. The system may be set up to cover risk management across the enterprise or it may be employed within a specific project, program, department, division or other organizational area.

REGISTERS

- Portfolio
 - Lower Churchill Project (LCP)
 - 01. LCP - General
 - 02. Component 1 - MFG
 - 03. Component 3 - DCS
 - 04. Component 4 - OTL
 - 05. SOBI - MCT

CUSTOM

- Data Fields

DATA VIS

- Data Vis

PERSONAL

- My Risks
- My Actions
- My Messages

SETTINGS

- My Settings
- Settings

Your Reminders

Due Date	Type	Name
No data available in table		
Showing 0 to 0 of 0 entries		

Useful Info

- [IRIS Website](#)
- [ISO 31000:2009 - Risk management -- Principles and guidelines](#)
- [Project Management Institute Risk Handbook](#)
- [Management of Risk Official site](#)
- [IRIS Software User Exercises](#)
- [IRIS Software Administrator Exercises](#)

Quick Links

- My Risks
- My Actions
- Help
- Settings

User and Exercise Guides → [IRIS Software User Exercises](#)

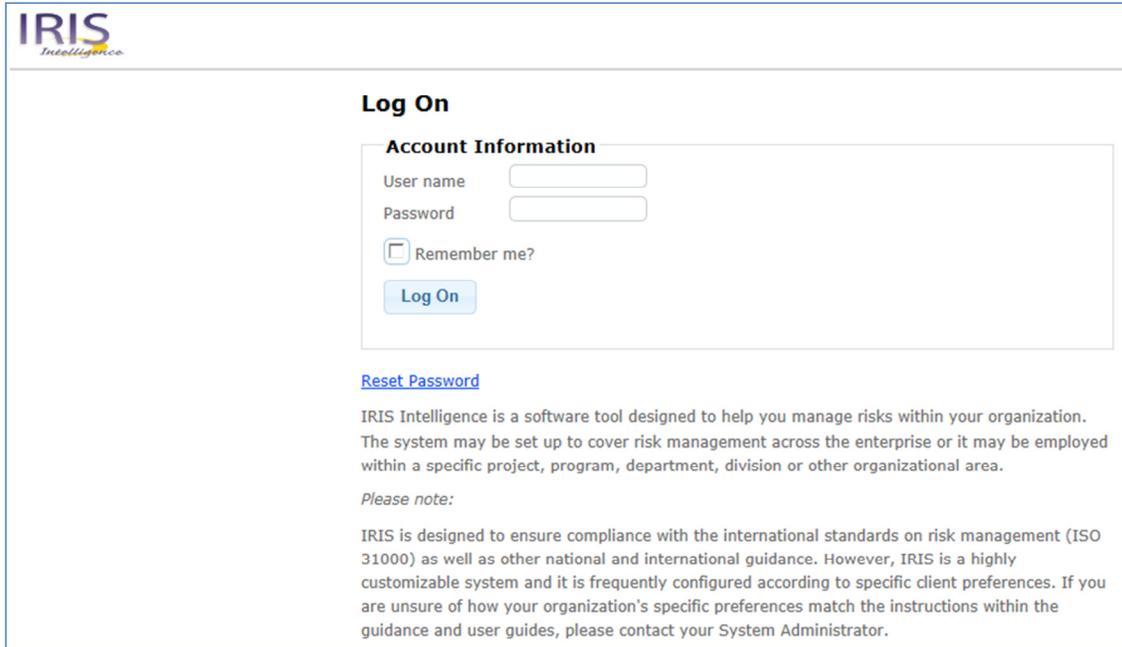
Risk Management workshops and risk update sessions for the LCP Project and Sub-Projects are all structured based on the software to conduct “live” hands-on risk management workshops.

The software restricts access to authorized users under the LCP Project and Sub-Projects. Two types of users are available in the tool: “administrator” and “user” with different administration rights (privileges) to manage the whole portfolio, program or specific project. Users’ accesses to the tool are managed by the LCP Risk Coordinator.

Project Risk Management Plan

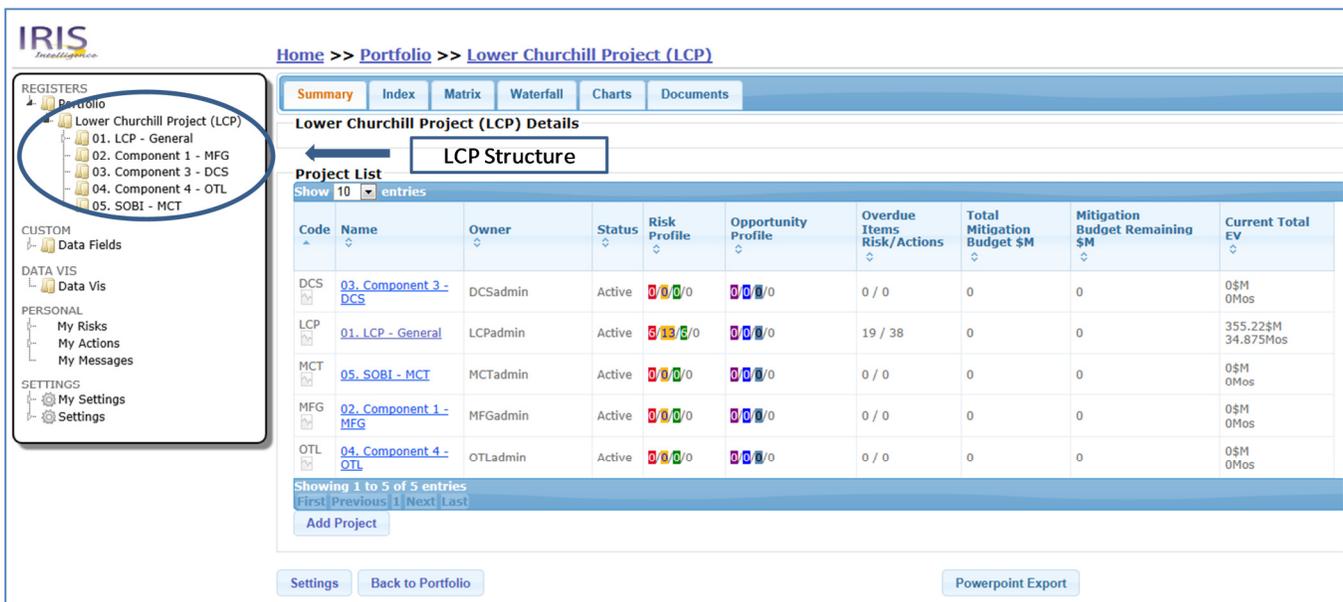
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	44

Figure 20: Iris Risk Management Software Log-On



The software has been set-up to cover risk management requirements for LCP Project and Sub-Projects in order to reflect the approach of strategic (LCP Project) and tactical (Sub-Projects) risk management. Each Sub-Project Risk Coordinator will be responsible to keep risk information up to date in the tool.

Figure 21: LCP Structure – Iris Risk Management Tool



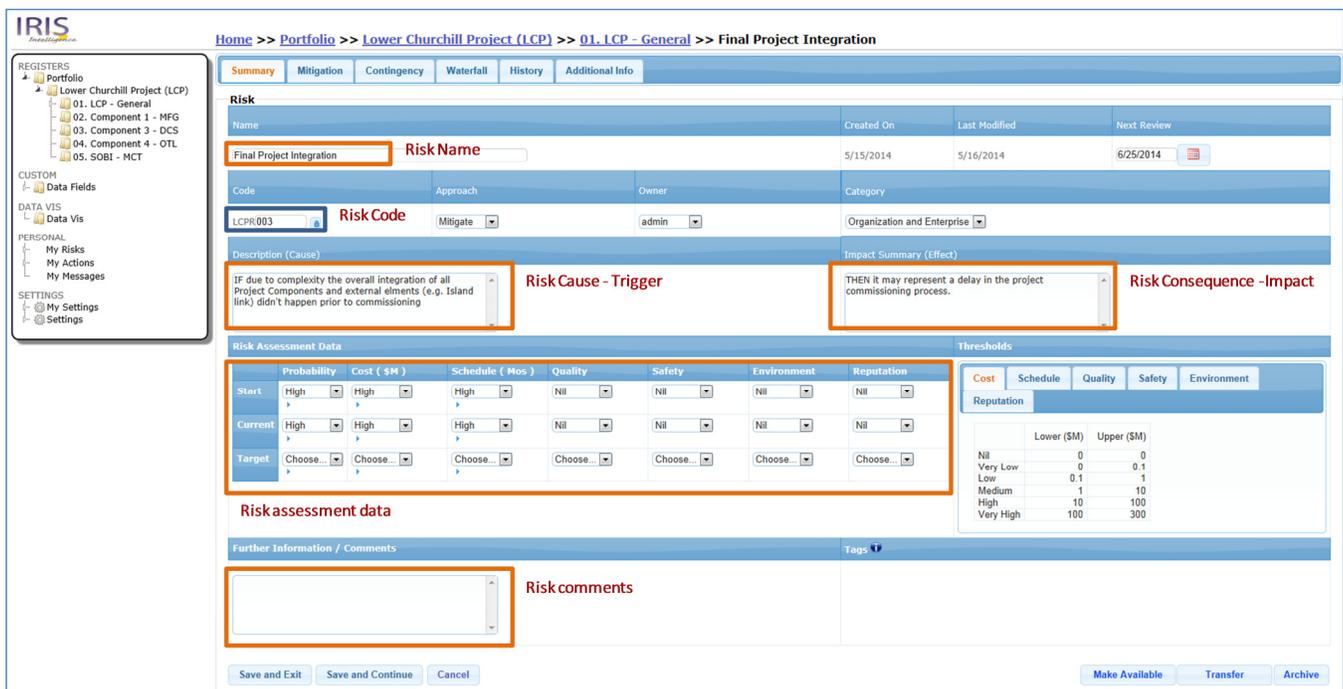
Project Risk Management Plan

Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	45

The following information for LCP Project and Sub-Projects is gathered in the tool for each identified risk:

- Risk code – auto-generated by the tool;
- Risk title – “Name”;
- Brief description of the risk outlining causes (triggers), IF; and consequences (impact), THEN;
- Risk assessment data;
- Further information – comments.

Figure 22: Risk Information – Iris Risk Management Tool



13.1 Risk Registers

The following risk registers are managed with the tool for LCP Project and each Sub-Projects:

- **“Candidates” Risk Register:** refers to all risk identified in internal workshops and recorded in the tool waiting approval for incorporation in the live risk register.
- **“Live” Risk Register:** refers to all risk that have been identified with response and actions to deal with them – active risks.
- **“Archive” Risk Register:** refers to all risks that have been retired.
- **“Issues” Risk Register:** refers to all risks that have been accepted, no mitigation strategy and actions are implemented but those risk need to be followed-up by the team to deal with the issue once it is materialized.
- **“Opportunity” Risk Register:** refer to all opportunities identified as part of the risk management process.

Project Risk Management Plan

Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	46

The structure of these risk registers indicated above is shown in the Attachment 15.1.

13.2 Risk Reports

The LCP Risk Management tool has the capability to produce automated report in MS PowerPoint following standard templates.

These reports are structured in three categories:

- Summary Reports
- Graphs
- Detailed Reports

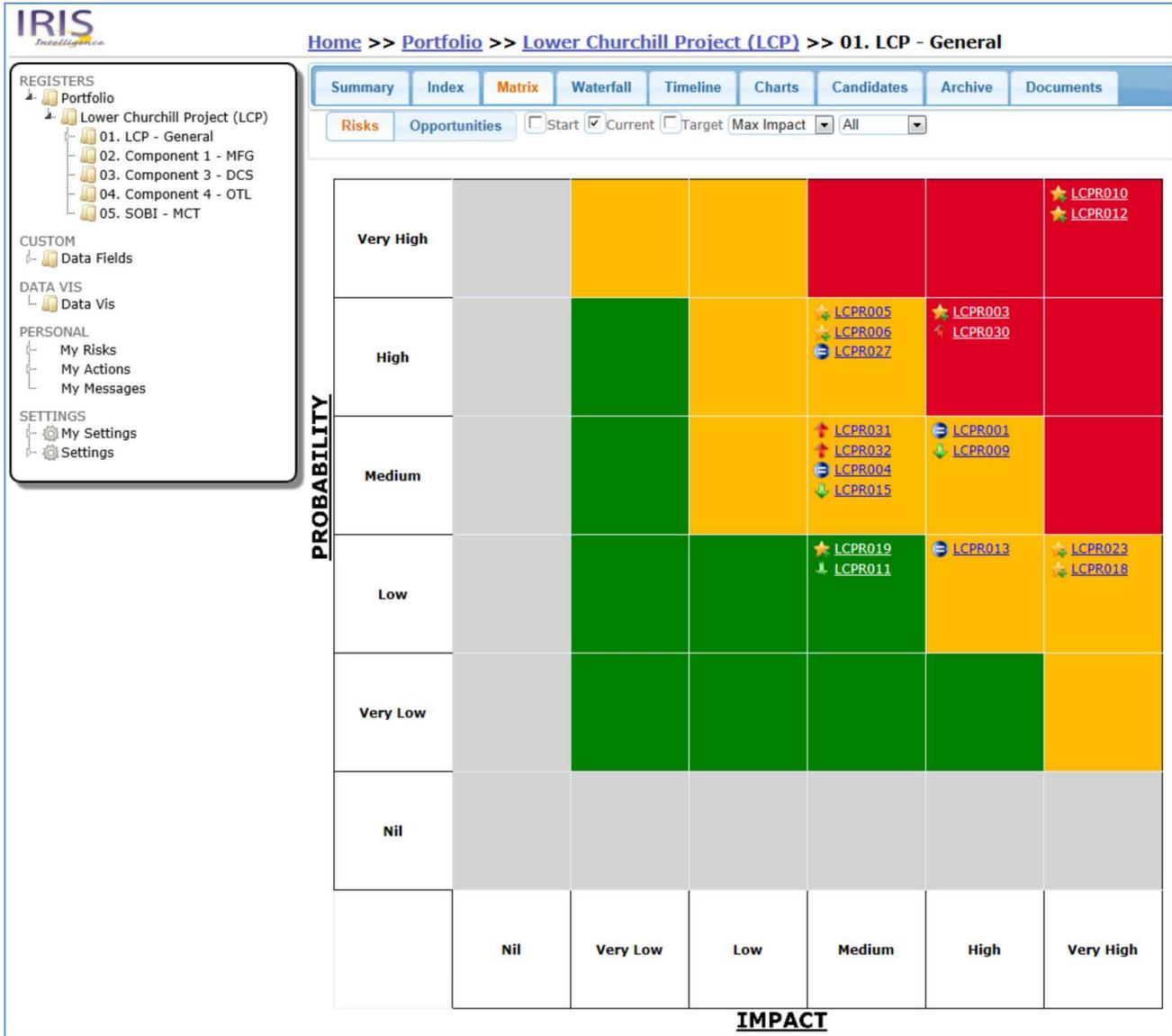
Figure 23: Risk Reports Structure - Iris Risk Management Tool

The screenshot shows the Iris Risk Management Tool interface. The top navigation bar includes tabs for Summary, Index, Matrix, Waterfall, Timeline, Charts, Candidates, Archive, and Documents. The main content area displays a table for '01. LCP - General in Lower Churchill Project (LCP)'. The table has columns for Code, Owner, Review, Status, Risk Profile, Opportunity Profile, Overdue Items Risk/Actions, Total Mitigation Budget \$M, Mitigation Budget Remaining \$M, and Current Total EV. Below the table, there is a 'Powerpoint Exports' window titled '01. LCP - General Export' with sections for 'Summary Reports', 'Detailed Reports', and 'Graphs'. The 'Summary Reports' section includes options for General Summary, Dashboard, Risks and Issues, and Graphs. The 'Detailed Reports' section includes Summary, Quantitative Data, Waterfall, and Actions. The 'Graphs' section includes options for graphs by Category, Cost (pie), Cost Impact (pie), Owner (bar), Owner (pie), and Probability (pie). A 'Risks' list is also visible, showing items like LCPR016 Water Contamination, LCPR017 Permit Special Conditions, and LCPR020 Reservoir Final Impoundment timeline (C1).

Project Risk Management Plan

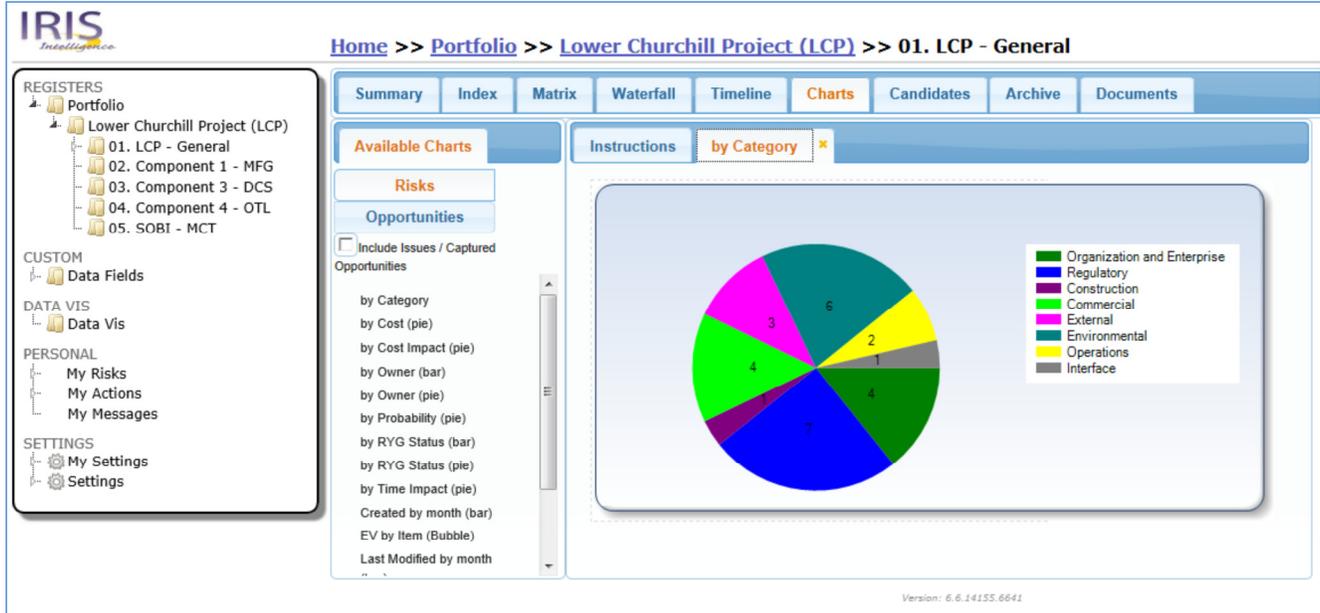
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	47

Figure 24: Risk Heated Matrix – Iris Risk Management Tool



Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	48

Figure 25: Risk Graphs – Iris Risk Management tool



A sample of the risk reports available in the LCP Risk Management tool is provided in Attachment 15.2.

14 ADDITIONAL RISK MANAGEMENT TOPICS

14.1 Risk Updating

As indicated in Section 12, Risk Management is a dynamic process through the life cycle of LCP Project and Sub-Projects. The risk register needs to stay current and updated regularly; it keeps track of identified risk, residual risk and new risk monitoring the execution of planned mitigation strategies and actions on identified risk in order to evaluate their effectiveness for the project.

As the project moves throughout the Gateway process, the LCP Risk Coordinator will be engaged heavily in re-evaluating the major issues raised from the previous phase(s) and ensuring that proposed management strategies are validated, adopted and followed-up.

Risk Owners will report to the Sub-Project Risk Coordinator on a periodic basis (pre-set period) on the status of the mitigated risk items as well as of any events that have been raised during the period, this step is performed using the LCP Risk Management Tool.

14.1.1 Objectives of the Risk Updating Process

These objectives are:

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	49

- Evaluating existing risk items already identified and registered during previous sessions including re-assessment of its probabilities and consequences to the LCP Project and/or Sub-Projects.
- Introducing new risk items by refreshing (updating) the risk register and introducing new risk issues raised during previous period including assessment, consequences and proposed mitigation strategies and actions.
- Informing the LCP Project Management Team and stakeholders on the status of the risk register through reporting updates including newly introduced risk as well as retired risks.
- Identifying new events from different sources and circumstances related to the LCP Project. It is responsibility of every manager on the LCP Project to bring risk issues and discuss them with the LCP Risk Coordinator for further follow-up.

14.1.2 Risk Updating Process

The risk updating process involves:

- Updating the status of existing risk items and progress;
- Following-up on the action log – reports related to the risk events;
- Choosing alternative response strategies;
- Implementing a contingency plan;
- Taking corrective actions;
- Re-planning the project as needed and
- Adding new risk items that have materialized during the last month (period) and identified during workshop sessions.

14.2 Conducting Risk Reviews and Workshops

General Checklist:

- Make sure that attendees know what to expect in advance of the workshop so that they can arrived prepared;
- Clarify objectives of the Risk Workshop with participants;
- Ensure agenda is in place with allocated time per subject;
- The meeting agenda should cover the Scope and Objectives of the Risk Review, defines the context for all participants and also facilitates proper workshop time management;
- The workshop shall systematically work through the defined scope areas to be handled during the session and record new risk events (candidates) in the risk register including probability and consequences using the LCP risk management tool.

It is suggested as a good practice that during the workshop the audience first identifies the major risk by title and description. In the interest of proper management of the workshop time only the most severe risk may be analyzed in greater detail during the session.

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	50

The risk identification / assessment meeting should be structured as a “brainstorming session” where everybody will have the opportunity to participate. For risk ranked as medium or higher the participants should also propose high level mitigation strategies and any action to support them.

Clarity on the scope to be covered during the workshop:

The scope of each workshop – risk identification meeting should be clearly communicated to the participants. Some risk identification meetings may cover the complete scope and duration of the project while other may be more limited.

The scope of the meeting will be defined within the following boundaries:

- Phase of the project – activities;
- Exposure activities (engineering, procurement, construction, commissioning, etc);
- Physical location (specific location or locations) or package specific;
- Risk category (some or all categories);
- Risk level (greater than a certain level only).

Selecting Participants:

- For strategic risks at the LCP Project level it is recommended to include all LCP Project Management Team.
- For tactical risks at the LCP Sub-Project level it is recommended that the Project Manager include all Area Managers, Technical Team and Functional Managers as required.

Workshop Session Roles:

- Facilitator: for the LCP project workshops the facilitator will normally be the LCP Deputy Project Control Manager, his role is to ensure that the meeting runs smoothly and to ensure that all participants have the opportunity to propose and evaluate candidate risk. For the LCP Sub-Project the facilitator will be the Risk Coordinator and may have assistance of the LCP Deputy Project Control Manager.
- Recorder: a recorder will be assigned from the participants, his role is to correctly record entries in the risk register and capture significant discussion – comments related with project risk. For meetings to discuss a large scope it is recommend that the facilitator and recorded not be the same person.
- Key participants (audience).

14.3 Risk associated with LCP Supplier and Contractors

LCMC integrates LCP Suppliers and Contractors risks into the overall risk process with their respective scope of supply or work during the contracted period and during future or anticipated project phases following LCP Gateway process. Suppliers and Contractors risks can result from binding obligations with other parties, delays or deviations resulting from failure to meet quality standards, conformity to specifications requirements or workmanship that are likely to affect their performance (cost and schedule).

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	51

For LCP procurement packages is recommend that Suppliers keep the risk identification process focused on quality and schedule.

For LCP construction packages is recommended that Contractors keep the risk identification process focused on safety, environment, quality and schedule. If a contract type of “cost –plus” or reimbursable is in place may be necessary for the Contractor to include risk related to cost, session can be organized with the participation of the LCP team following size, complexity and criticality of the package for the delivery of LCP Project.

There are two key deliverables to be produced by LCP Suppliers/Contractors in order to be aligned with the LCP risk management process, these are: the Supplier/Contractors Risk Management Plan and the Risk Register.

It is recommended to include in the Risk Register to be produced by Suppliers/Contractors the following information but not limited to as indicated in Figure 26 below.

Figure 26: Risk Register fields for Suppliers/Contractors

01	Risk ID
02	Exposure Activity
03	Exposure Status
04	Risk Title / Possible Outcome
05	Risk Description
06	Risk Type
07	Owner
08	Location
09	Risk Status
10	Risk Exposure Period (Start - end)
11	Probability
12	Consequence
13	Probable Consequence / Risk Level
14	Mitigation Strategy
15	Mitigation Description
16	Mitigation Status
17	Action
18	Action Status
19	Responsible
20	Original due date
21	Revised due date
22	Comments

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	52

15 ATTACHMENTS

15.1 Risk Register – Iris Risk Management Tool

15.2 Risk Report – Iris Risk Management Tool

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	53

15.1 Risk Register – Iris Risk Management Tool

Motion	Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review	Current EV	Future ROI	Category
	LCPR001	Contractor's availability and contracting strategy adjustments for unawarded packages	Medium	High	High	Very Low	Very Low	Very Low	Very Low	12	Mitigate	admin	6/4/2014	22 \$M 3 Mos	0 0	Commercial
	LCPR003	Final Project Integration	High	High	High	Nil	Nil	Nil	Nil	16	Mitigate	admin	5/30/2014	33 \$M 4.5 Mos	0 0	Organization and Enterprise
	LCPR004	Building Operations organization	Medium	Medium	Nil	Nil	Nil	Nil	Nil	9	Mitigate	admin	6/20/2014	2.2 \$M 0 Mos	0 0	Operations
	LCPR005	Innu involvement IBA	High	Medium	Medium	Nil	Nil	Nil	Medium	12	Mitigate	admin	5/30/2014	3.3 \$M 1.2 Mos	0 0	External
	LCPR006	Spare parts vs RAM	High	Medium	Medium	Medium	Nil	Nil	Nil	12	Mitigate	admin	5/30/2014	3.3 \$M 1.2 Mos	0 0	Operations
	LCPR009	Construction Labour Availability LCP	Medium	High	High	Medium	High	Nil	High	12	Mitigate	admin	6/4/2014	22 \$M 3 Mos	0 0	Commercial
	LCPR010	Construction Labour Productivity LCP	Very High	Very High	Very High	Medium	Nil	Nil	High	25	Mitigate	admin	5/30/2014	160 \$M 14.4 Mos	0 0	Commercial
	LCPR011	Sensitive Areas LCP	Low	Medium	Medium	Nil	Nil	Nil	Medium	6	Mitigate	admin	6/4/2014	1.1 \$M 0.4 Mos	0 0	Regulatory
	LCPR012	Interfaces LCP	Very High	Very High	Very High	High	Very High	Nil	High	25	Mitigate	admin	5/30/2014	160 \$M 14.4 Mos	0 0	Interface

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	54

15.2 Risk Report – Iris Risk Management Tool

Lower Churchill Project (LCP)
01. LCP - General

Summary

Name	01. LCP - General
Code	LCP
Manager	admin
Objective	

	1	2	3	Other	Overdue	
Risk Profile	4	12	2	10	Risks: 21	Actions: 46
Opportunity Profile	0	0	0	0	Opp.: 0	Actions: 0

Quantitative Impact Limits:

	Cost \$M		Schedule Mos	
	Lower	Upper	Lower	Upper
Nil	0	0	0	0
Very Low	0	0.1	0	0.25
Low	0.1	1	0.25	1
Medium	1	10	1	3
High	10	100	3	12
Very High	100	300	12	24

Summary
6.1.14155.1439
6/11/2014
1

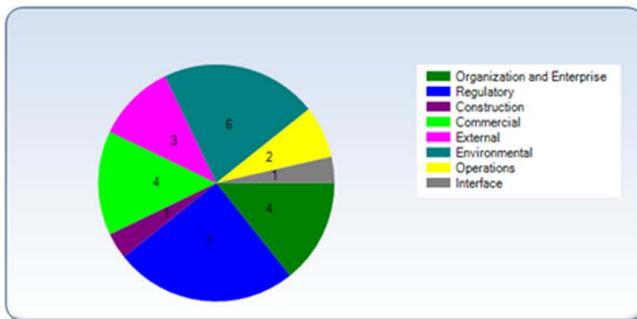
Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	55

01. LCP - General Dashboard



Top 10 By Expected Value

#	Name	Owner	EV \$M	Next Review
1	Construction Labour Productivity LCP	admin		5/30/2014
2	Interfaces LCP	admin		5/30/2014
3	Final Project Integration	admin		5/30/2014
4	Availability and retention of skilled construction labour	admin		6/12/2014
5	Contractor's availability and contracting strategy adjustments for unawarded packages	admin		6/4/2014
6	Construction Labour Availability LCP	admin		6/4/2014
7	Innu involvement IBA	admin		5/30/2014
8	Spare parts vs RAM	admin		5/30/2014
9	Terrestrial Habitat (Loss of Wetlands)	admin		6/20/2014
10	Foreign currency exchange risk	admin		6/12/2014



Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	56

Lower Churchill Project (LCP)
01. LCP - General

LCPR016
Water Contamination

Category	0	Owner	admin		
Score	0	Approach	Mitigate	Created	5/16/2014
Mitigation Budget	Total	Spent	Remaining	Amended	5/20/2014
	0.00	0.0000	0.0000	Next Review	6/3/2014

Description (Cause)

IF due to earth moving activities

Impact Summary (Effect)

THEN a risk of impacting water quality at the North Spur, Dams, Dowden's Electrode, Anse au Diable locations, Converter station at MF

Quantitative Impacts

	Cost \$M		Schedule(Days)	
	Lower	Upper	Lower	Upper
Nil	0	0	0	0
Very Low	0	0.1	0	0.25
Low	0.1	1	0.25	1
Medium	1	10	1	3
High	10	100	3	12
Very High	100	300	12	24

	Initial Probability	Cost	Schedule	Quality	Safety	Environment	Reputation
Start	Not Set	Not Set	Not Set	Not Set	Not Set	Not Set	Not Set
	0	0	0				
Current	Not Set	Not Set	Not Set	Not Set	Not Set	Not Set	Not Set
	0	0	0				
Target	Not Set	Not Set	Not Set	Not Set	Not Set	Not Set	Not Set
	0	0	0				

Risk Summary
6.1.14155.1439
6/11/2014
1

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	57

Lower Churchill Project (LCP)		01. LCP - General
LCPR016	Water Contamination	
Further Information / Comments		
Action to be completed by D. Healey		
	Risk Summary	6.1.14155.1439 6/11/2014

Project Risk Management Plan		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-PL-0001-01	B2	58

Lower Churchill Project (LCP)
01. LCP - General

LCPR016

Water Contamination

Owner	admin	Category	0	Amended	5/20/2014	Next Review	6/3/2014
Spend so far		Remaining Budget		Total Budget		0.00	
Cost	ROI Future	0	Expected Value	0	Target Expected Value		0
	Time	ROI Future	0	Expected Value	0	Target Expected Value	

Step No.	Name	Output	Owner	Status	Start Date	End Date	% Complete
	Site Water Control Plan				5/16/2014	5/16/2014	
1	Develop Site Water Control Plan		admin	Overdue	5/16/2014	5/16/2014	0.00%

Mitigation
6.1.14155.1439
6/11/2014
3

ATTACHMENT A.2

LCP General Risk Register

Date Generated: 13/01/2016

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
LCPR003	Final Project Integration	IF due to complexity the overall integration of all Project Components and external elements (e.g. Island link) didn't happen prior to commissioning	THEN it may represent a delay in the project commissioning and start-up.	P. Harrington	16	Organization and Enterprise	Mitigate	Clear definition of responsibilities between Project/System Planning and Asset Manager	Establish RFO/RFI and Asset Manager responsibility definition	Senior Nalcor leadership have agreed to and endorsed the responsibility split between RFO, RFI and Operations, the definition of each group and primary responsibilities have been agreed and selection of Manager and 2IC's is complete.	07/03/2014	23/09/2014	83	100
								Early engagement of System Planning with necessary resources and budget to meet the defined scope of work	System Planning are involved in specification and contract reviews		07/03/2014	02/02/2015	215	100
								Engage Third Party Commissioning Service Providers	Develop a plan to engage specialist service providers to support the Integration and Start-up Activity	3rd Party specialist service providers have been shortlisted for further evaluation.	01/12/2016	01/12/2016	1	1
								Implement Permit to Work system to enable energization of part-systems	Develop a resource plan to support PTW and part-system energization	Planned for 2016	01/12/2016	01/12/2016	1	1
								Integration and Start-up Plan details approaches	Develop detailed plan for system turnover, start-up / energization	Early Plan developed; to be updated in 2016.	01/12/2016	01/12/2016	1	100
								Integration and Start-up Plan details approaches	Develop fully integrated commissioning and start-up schedule linked to construction schedule and 3rd party pre-requisites	Early schedule developed; to be updated in 2016.	01/12/2016	01/12/2016	1	100
								Implement Permit to Work system to enable energization of part-systems	Develop PTW system that considers the limitations and construction sequence constraints	Part-systems will be energized while construction is still ongoing. Planned for 2016	01/12/2016	01/12/2016	1	1
								Clear definition of responsibilities between Project/System Planning and Asset Manager	Develop Training and Competency Plan for all personnel	Ongoing	01/12/2016	01/12/2016	1	1
								Integration and Start-up Plan details approaches	Document Completions and Turnover Plan, including assignment of responsibilities to contractors and NLH	Early Plan developed; to be updated in 2016.	01/12/2016	01/12/2016	1	100
								Clear definition of responsibilities between Project/System Planning and Asset Manager	Establish RFO / RFI Organizations, including recruitment of key personnel	Ongoing	01/12/2016	01/12/2016	1	1
								Clear definition of responsibilities between Project/System Planning and Asset Manager	Hire key RFO personnel to monitor contractors execution plans and procedures to ensure robust plan with qualified personnel	RFO Lead hired. Plan to hire other disciplines if and when required.	01/12/2016	01/12/2016	1	1
								Early engagement of System Planning with necessary resources and budget to meet the defined scope of work	Assign budget and resources (people, process, systems) to address RFI requirements and deliverables	It includes Nalcor and Interface Management with Emera and key suppliers. RFI plan and schedule prepared.	12/01/2015	12/01/2016	367	50
								Early engagement of System Planning with necessary resources and budget to meet the defined scope of work	Participate in FATs and SATs	FAT witnessing by Component Teams with embedded OPS resources.	07/03/2014	07/03/2017	1097	10
								Early engagement of System Planning with necessary resources and budget to meet the defined scope of work	RFI to participate in ENL studies and technical committees	Regular meeting are held with ENL.	27/04/2015	12/04/2017	953	50
Early engagement of System Planning with necessary resources and budget to meet the defined scope of work	RFI to participate in Nalcor Technical Committees	Regular meetings are being held.	27/04/2015	12/04/2017	953	50								
Early engagement of System Planning with necessary resources and budget to meet the defined scope of work	Operations personnel and Asset Operations team to get involved in RFO/RFI	Part of plan once OPS resources mobilized.	07/03/2014	05/01/2018	1399	75								
LCPR004	Building the Operations Organization	IF due to limited capacity within Nalcor and NLH, it will represent understaffing during operation readiness and final project integration process	THEN it could delay start-up.	T. LeDrew	16	Operations	Mitigate	Operations Team Development	Appoint Senior Operations VP to lead BTPO and RFI	R. Henderson appointed Q4 2015	07/06/2015	12/01/2015	149	100
								Critical Operational Spares Plan in-place	Complete RAM Analysis to confirm spares ordered within CAPEX PO are correct		01/12/2016	01/12/2016	1	1
								Critical Operational Spares Plan in-place	Develop a plan for storage and preservation of spares provided under CAPEX		01/12/2016	01/12/2016	1	1
								Critical Operational Spares Plan in-place	Develop a Sparing Strategy		01/12/2016	01/12/2016	1	1
								Operations Team Development	Develop and implement Operations staffing plan	HR representative seconded from NLH	01/12/2016	01/12/2016	1	1
								Operations Team Development	Develop Training and Competency Plan for all personnel		01/12/2016	01/12/2016	1	1
								Develop people, process and systems requirements to meet the defined scope of work	Develop BTPO detailed schedule	Part of RFO/RFI/BTPO/RFI integrated plan.	04/01/2015	04/01/2016	367	90
								Operations Plan	Development of Operations strategy including resources requirements to achieve BTPO objectives	Ongoing.	01/05/2015	30/12/2016	726	10

LCP General Risk Register

Date Generated: 13/01/2016

Risk Information										Action Information					
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete	
								RAM modeling by Operations people and amendment of project economics	To require information on RAM from providers of installed equipment of the various LCP Components		01/05/2015	31/08/2017	970	5	
LCPR005	IBA Contracting	IF as a result of the commitments made within the IBA for Innu preferred contracts,	THEN there might be instances of negative influence on LCP contracting, permitting, labour relations, that leads to narrower choices of contractors, suppliers and labour, leading to extra costs, schedule delays, safety issues, etc.	B. Crawley	6	External	Mitigate	Implementation of Contracting Strategy for IBA Contracts	Contracting requirements for IBA bidding opportunities	Bidding process complete and contracts awarded. The process allows LCP to ensure best value for the project thereby reducing cost and schedule exposure.	07/03/2014	07/03/2014	1	100	
								Innu Community Engagement Strategy	Update and implement initiatives outlined in Innu Community Engagement Strategy		07/03/2014	31/03/2015	272	100	
								Innu Community Engagement Strategy	Ongoing engagement Innu Community	Ongoing	01/12/2016	01/12/2016	1	1	
LCPR010	Construction Labour Productivity - Muskrat Falls	IF due to a) features of the labour market in NL, b) issues with availability of skilled workers, c) failure of the labor agreement with the RDTC; d) inadequate organisation of construction works,	THEN the productivity assumptions upon which the DG3 estimate and key contracts were let may proven unachievable, therefore leading to cost and schedule exposure.	R. Power	16	Commercial	Mitigate	To the extent possible, Contracts to be worded that places productivity risk with the contractor	Risk being managed by increasing oversight	The type of contracts are driven by market conditions and who is able to absorb the risk plus economic considerations. Many Contracts to date are unit rates, fixed price, lump sum - Nalcor risk is with services type contracts and we are managing these risk by increasing oversight. Action owner: Contract team and Site teams	07/03/2014	07/04/2016	733	75	
LCPR012	Effective Interface Management & Coordination	IF due to multiple complex hard & soft interfaces requiring inputs from project components and disciplines as well as external organisations (CFLco, SOBI, etc.),	THEN efficiency of the interface management might turn out to be less efficient than planned in the baseline, leading to use of conservative assumptions, late changes, re-work, extra costs, schedule delays, failures during commissioning, etc.	R. Power	8	Interface	Mitigate	Interface Management System	Allocate resources for Interface at the Component level		07/03/2014	07/03/2014	1	100	
								Interface Management System	Develop Interface Management Plan		07/03/2014	07/03/2014	1	100	
								Interface Management System	Implement IT/IS system to support Interface process		07/03/2014	07/03/2014	1	100	
								Enhance Visibility of Critical Interfaces	Develop and publish an Interface Dashboard for regular updates	Dashboard in place and being issued on weekly basis	01/12/2016	01/12/2016	1	100	
								Construction Coordinattion / Interface Plan in Plan to manage SIMOPS	Develop Construction Coordination / SIMOPS plan for cross component interfaces		01/12/2016	01/12/2016	1	1	
								Clear Interfaces identified for Third Parties	Ensure all third party interfaces are identified and communication plan in-place to facilitate timely resolution		01/12/2016	01/12/2016	1	1	
								Enhance Visibility of Critical Interfaces	PMT made aware of critical risks		01/12/2016	01/12/2016	1	1	
								Enhance Visibility of Critical Interfaces	Regular Component to Component Interface Coordination Meetings scheduled		01/12/2016	01/12/2016	1	1	
								Engage Contractors/Suppliers	Roll-out of Interface process during Kick-off meetings		07/03/2014	29/02/2016	607	90	
								Follow-up effectiveness of the Interface Management System	Ensure awarness of schedule pressures and examine impacts due to interfaces among Components and packages.	Responsible: S. Gillis - T. Chudy	27/04/2015	30/12/2016	614	1	
Engage Contractors/Suppliers	Assure the Interface process is well implemented among Contractors/Suppliers		07/03/2014	29/09/2017	1185	30									
LCPR013	Lack of support from other Aboriginal groups	IF as a result of the Project not negotiating an IBA with other Aboriginal Groups due to non-recognition of the land claims by the Province for these groups,	THEN representatives of Other Aboriginal Groups could block the construction sites to apply pressure on LCP and to promote their agendas leading to schedule delay, extra costs and reputational damage	B. Crawley	9	External	Mitigate	Develop an Engagement Strategy for Other Aboriginal Groups leveraging the consultations undertaken during the Environmental Assessment Process	Develop a LCP-wide approach to engage First Nations that are not part of or don't support IBA		15/05/2014	15/05/2014	1	100	
								Develop Protest Readiness Plans	Manage blockade situations and take safety/security steps to protect personnel	Blockades have been occurred and been managed	01/01/2015	01/01/2016	366	100	
								Develop Protest Readiness Plans	Develop a Protest Readiness Plan to ensure site, organizational and contractor readiness		01/12/2016	01/12/2016	1	1	
								Develop an Engagement Strategy for Other Aboriginal Groups leveraging the consultations undertaken during the Environmental Assessment Process	Implement Engagement Strategy		01/12/2016	01/12/2016	1	1	
LCPR017	Special Conditions attached to Permits	IF due to high interest of the government, general public and NGO's in the LCP,	THEN special conditions may be attached to the project permits resulting in scope change, schedule delays and extra costs to comply. Major C1 permits in place.	D. Haley	6	Regulatory	Mitigate	Commitments Management Plan	Review of CSR, Coordination with the Provincial Government to finalize and acceptance of the EA Commitments Management Plan		07/03/2014	30/10/2015	485	90	
LCPR028	Retention of Key LCMC Members	IF recruitment and retaining of PDT-PMT members are not successful,	THEN the LCMC led delivery strategy for the Project will be impaired, thus risking the Project's objectives.	B. Crawley	6	Organization and Enterprise	Mitigate	Hold alignment session with recruitment agencies	Clarify agencies' role in managing their employees	Action Responsible: F. Cornick	07/03/2014	15/09/2014	75	100	
								Hold alignment session with recruitment agencies	Clarify HR/Supply Chain roles and responsibilities for agencies	Action Responsible: F. Cornick	07/03/2014	15/09/2014	75	100	

LCP General Risk Register

Date Generated: 13/01/2016

Risk Information							Action Information							
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Develop engagement strategy for recruiting non-bargaining unit positions.	Expand use of job search websites	Action Responsible: F. Cornick	07/03/2014	31/10/2014	121	100
								Clarify recruitment process internally	Issue updated recruitment process	Action Responsible: F. Cornick	07/03/2014	31/10/2014	121	100
								Hold alignment session with recruitment agencies	Provide clarity on assignment conditions	Action Responsible: F. Cornick	07/03/2014	27/11/2014	148	100
								Develop engagement strategy for recruiting non-bargaining unit positions.	Identify speaking venues to professional associations	Action Responsible: F. Cornick, R. Williams Action on-hold 27-Nov-2014	07/03/2014	31/12/2014	182	1
								Develop engagement strategy for recruiting non-bargaining unit positions.	Marketing campaign	Action Responsible: F. Cornick, R. Williams Action on-hold 27-Nov-2014	07/03/2014	31/12/2014	182	30
								Recruitment and Retention Strategy that leverages best practices	Develop a recruitment and retention strategy	Recruitment procedure in-place	01/12/2016	01/12/2016	1	100
								Recruitment and Retention Strategy that leverages best practices	Develop and implement an Exit Interview Process in order to understand feedback from those leaving the Project		01/12/2016	01/12/2016	1	100
								Recruitment and Retention Strategy that leverages best practices	Implement a Behavioural Based Candidate selection process that includes strong linkage to the Project's Values	Process completed and in use	01/12/2016	01/12/2016	1	100
								Recruitment and Retention Strategy that leverages best practices	Implement a progressive HR programs, including assignment conditions, respective workplace program, standards, etc.	Programs have been implemented	01/12/2016	01/12/2016	1	100
Recruitment and Retention Strategy that leverages best practices	Implement a Team Effectiveness Plan with the Project in order to help retain project personnel		01/12/2016	01/12/2016	1	1								
LCPR030	Availability and retention of skilled construction labour	IF As a result of competition from other provinces (Alberta) and/or new projects in NL,	THEN the Project may have challenges recruiting and retaining skilled, experienced trades, resulting in poor productivity, cost growth and schedule slippage.	R. Power	3	Construction	Transfer	Make work location/employment attractive (quality of accommodations, transportation, family benefits, vacation)	Consistent employment deals where possible		07/03/2014	07/03/2014	1	100
								Make work location/employment attractive (quality of accommodations, transportation, family benefits, vacation)	Develop a construction schedule based upon achievable labor productivities		07/03/2014	07/03/2014	1	100
								Make work location/employment attractive (quality of accommodations, transportation, family benefits, vacation)	Develop a dynamic labor supply and demand model in order to understand this issue.		07/03/2014	07/03/2014	1	100
								Make work location/employment attractive (quality of accommodations, transportation, family benefits, vacation)	Labor strategy that considers lessons learnt for other projects incl. demarcation and composite crewing.		07/03/2014	07/03/2014	1	100
								Make work location/employment attractive (quality of accommodations, transportation, family benefits, vacation)	Maintain some control of benefit distribution		07/03/2014	07/03/2014	1	100
								Make work location/employment attractive (quality of accommodations, transportation, family benefits, vacation)	Structure labor strategy that does not impair engaging local labor		07/03/2014	07/03/2014	1	100
								Retention strategy plan by Contractors/Suppliers	Work closely with Contractors/Suppliers to ensure implementation of retention strategies		07/03/2014	31/12/2015	547	70
LCPR033	Poor Contractor Performance	As a result of poor contractor performance	THEN, LCP will be exposed to schedule delays and increased cost.	R. Power	16	Construction	Mitigate	Work closely with Contractors	Implement QA Audit program for Contractors		07/03/2014	07/03/2014	1	100
								Work closely with Contractors	Implement Steering Committees		07/03/2014	07/03/2014	1	100
								Work closely with Contractor - Main Civil Works (package CH0007)	Integrate PDT functional expertise to bolster counterparties in Contractor team	Many functional areas addressed and improving but more work to do.	29/08/2014	29/04/2016	610	70
								Work closely with Contractor - Main Civil Works (package CH0007)	Maintain PDT awareness of contractor performance to ensure PMT ongoing alignment	Ongoing action led by R. Power	29/08/2014	29/04/2016	610	70
								Work closely with Contractor - Main Civil Works (package CH0007)	Monitor closely Contractor performance to identify deviations and opportunities for improvement	Ongoing action led by R. Power	29/08/2014	29/04/2016	610	70
								Identify options for alternative execution approaches	Implement communication process to Nalcor executive level	Ongoing action led by L. Clarke	07/03/2014	30/12/2016	912	30
								Identify options for alternative execution approaches	Maintain PDT awareness of contractors? performance to ensure PMT ongoing alignment	Ongoing action led by L. Clarke	07/03/2014	30/12/2016	912	50
								Work closely with Contractors	Integrate PDT Functional expertise to bolster counterparties in Contractors' teams	Ongoing action led by R. Power	07/03/2014	31/12/2017	1278	30

LCP General Risk Register

Date Generated: 13/01/2016

Risk Information										Action Information				
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
LCPR034	Availability of Qualified CM and Supervision by Contractors	As a result of contractors inability to hire skilled construction supervision	Then contractors will not be able achieve their schedule or quality obligation, which could result in the Project not achieving its objectives](cost, schedule, quality and safety)	R. Power	16	Construction	Transfer	Work closely with Contractors	Monitor closely Contractors' performance to identify deviations and opportunities for improvement	Ongoing action led by R. Power	07/03/2014	31/12/2017	1278	30
								Attractive work location/employment	Provide quality accommodations (MFG) to make work location/employment attractive	Complete	07/03/2014	07/03/2014	1	100
								Attractive employment - Main Civil Works (package CH0007)	Ensure that Contractor implement proper compensation plan to supervision team (Superintendents)	Ongoing action led by R. Power	29/08/2014	29/04/2016	610	60
								Attractive employment - Main Civil Works (package CH0007)	Work closely with Contractor to ensure implementation of appropriate hiring strategy	Ongoing action led by R. Power and B. Crawley	29/08/2014	29/04/2016	610	60
								Attractive work location/employment	Work closely with Contractors to ensure implementation of appropriate hiring strategy	Ongoing action	07/03/2014	30/12/2016	912	50
							Attractive work location/employment	Ensure that Contractor implement proper compensation plan to Supervision team (Superintendents)	Ongoing action		07/03/2014	29/12/2017	1276	40
LCPR035	Application of Robust Commerical Management Practices	IF as a result of Inconsistent commercial management	THEN it can lead to compromising the Project's position, which could lead to claims and eventually cost and schedule exposure	L. Clarke	12	Commercial	Mitigate	Lay out contractor claims avoidance philosophy	Hire claims avoidance specialist	Specialist hired.	07/03/2014	07/03/2014	1	100
								Ensure processes are being followed	Implement all necessary procedures based on project teams experience	Complete and being monitored continuously.	07/03/2014	07/03/2014	1	100
								Ensure all necessary processes are in place	Do third party review on process gaps for contract management	KPMG provided advice.	07/03/2014	30/09/2014	90	100
								Ensure processes are being followed	Do third party check on procedures compliance	KPMG complete review	07/03/2014	31/12/2014	182	100
								Ensure all necessary processes are in place	Do QA audits on procedures		07/03/2014	31/03/2015	272	100
								Lay out contractor claims avoidance philosophy	Do claims avoidance training for the PDT	Training held and it is ongoing.	07/03/2014	30/06/2016	729	90
LCPR036	Management of External Stakeholders	IF extensive time is required to address the demands of external stakeholders (IE, Media, Oversight Committee, Emera, PUB and representative consultants, etc.),	THEN it could result in distraction for LCMC Senior Management, which could impair the delivery of the Project.	G. Bennett	12	External	Mitigate	Stakeholder Management Strategy for Government, Partners, IE and Regulators	Conduct regularly quarterly health checks to ensure LCMC is effectively positioned to support external stakeholder demands	Ongoing	01/12/2016	01/12/2016	1	1
								Stakeholder Management Strategy for Government, Partners, IE and Regulators	Hire resource to act as the focal point for coordination of these groups.	Resource in-place - Steve Pellerin	01/12/2016	01/12/2016	1	100
								Stakeholder Management Strategy for Government, Partners, IE and Regulators	Develop and implement stakeholder management strategy for these groups.	To date team has been involved in some time consuming work to satisfy external demands. This has not been overly detrimental to progress and will continue to be managed. New hire to manage external parties has been engaged.	07/03/2014	07/03/2018	1462	100
LCPR037	System Interfaces - Emera and NLH	IF due to late delivery of enabling projects by others (Emera, Newfoundland Hydro)	THEN LCP may be unable to complete commissioning and start-up activities per its plan, which could result in delays.	P. Harrington	9	External	Mitigate	Emera progress is being provided to the PD and via JDC-ML	All major contracts are being negotiated or executed already		07/03/2014	31/12/2015	547	100
								Emera progress is being provided to the PD and via JDC-ML	Execution is generally by EPC lump sum contracts with experienced contractors.		07/03/2014	31/12/2015	547	100
								Emera progress is being provided to the PD and via JDC-ML	Assist Emera with Technical aspects	Many instances of positive support.	01/01/2015	01/01/2016	366	100
								Emera progress is being provided to the PD and via JDC-ML	NL Hydro projects to be included in RFO schedule	Integrated Schedule developed and progress monitoring ongoing.	09/01/2015	01/01/2016	123	100
								Emera progress is being provided to the PD and via JDC-ML	Monitor Contractor performance in key contracts	Key contractor in financial difficulties, assisting as required.	12/01/2015	04/01/2016	123	20
								NL Hydro outages to be planned as well as all enabling tasks	Interfaces to NLH are being identified.	Ongoing action.	07/03/2014	12/01/2016	883	20
								NL Hydro outages to be planned as well as all enabling tasks	Scope of NLH to be closely monitored	Ongoing action.	07/03/2014	12/01/2016	883	20
								Emera progress is being provided to the PD and via JDC-ML	Conduct oversight of progress and key risk to ML	Part of JDC-ML with MLPM.	07/03/2014	10/02/2017	1188	50
								Emera progress is being provided to the PD and via JDC-ML	Monitor Monthly and Weekly reports	Weekly discussion with ML Project Management.	01/01/2015	01/01/2018	1097	40
NL Hydro outages to be planned as well as all enabling tasks	RFO/RFI and Asset Manager to work together to avoid delays	Ongoing action. Good working relationship.	07/03/2014	05/04/2018	1402	10								
LCPR039	New Commitments obtained by Existing Key Project Contractors	IF existing major / key LCP Contractor is successful in pursuit of other major works,	THEN it could results in dilution of contractor resources for LCP, thereby impacting their contractual commitments, and eventually the Project cost or schedule.	L. Clarke	8	Construction	Mitigate	Monitor the market for LCP large awards	Monitor market conditions - LCP scope of work	Status ongoing.	01/07/2015	31/07/2015	206	100
								Motivate contractor to commit to LCP	Consider incentive arrangements where a real threat exists		01/12/2016	01/12/2016	1	1
								Motivate contractor to commit to LCP	Establish penalties for removal of key personnel		01/12/2016	01/12/2016	1	1

LCP General Risk Register

Date Generated: 13/01/2016

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Ensure senior management commitment to LCP	Continue to build relationship at senior levels	Status: ongoing	01/07/2015	31/03/2016	450	80
								Ensure senior management commitment to LCP	Define and implement management KPIs	Status: in progress	01/07/2015	31/03/2016	450	50
								Ensure senior management commitment to LCP	Hold steering meetings	Status: ongoing	01/07/2015	31/03/2016	450	80
LCPR043	Timely Amendments to Provincial Regulatory Framework for Operations Phase	IF regulatory framework for the Province is not developed on time aligned with LCP	THEN limitations could be imposed to operate LCP facilities connected to NL interconnected system	P. Thomas	12	Regulatory	Mitigate	Ensure Ready for Commercial Integration (RFCI) post project organization has the necessary regulatory requirements supported by key legislative change	Develop critical path plan for RFCI and ensure GNL is fully aligned		01/12/2016	01/12/2016	1	1
								Regulatory and Legislative changes identified	Define Legislative and Regulatory changes	Ongoing.	01/01/2015	31/03/2016	456	90
								Regulatory and Legislative changes identified	Develop Cabinet papers and table	By NL Government.	12/01/2015	10/03/2016	308	1
LCPR047	Contractor or Supplier Failure / Default	IF Suppliers/Contractor are not able to meet obligations as indicated in the agreement's provision due to financial, abandonment or other significant events	THEN LCP will suffer reputation, cost and schedule impacts	L. Clarke	15	Commercial	Mitigate	Review Contractor's Financial situation	Conduct Financial review to assess Contractor's true situation	Financial assessments conducted	11/03/2014	31/12/2015	424	100
								Protect the Project's Interest	Develop a commercial strategy considering all options available under Agreements		01/12/2016	01/12/2016	1	1
								Engagement of Nalcor and Contractors Senior Management to identify solutions	Implement internal coordination meetings.	Meetings held over the last two years to identify solutions. Meeting scheduled for January 2016	08/01/2014	29/04/2016	638	80
								Develop Contingency Plans	Identify alternative options to carry-on LCP execution	Options identified.	09/01/2015	06/01/2016	275	50
LCPR049	Managing Contractor Performance under T&M Compensation Scheme	IF estimated cost for time and materials contracts are exceeded because of unknown factors	THEN cost and schedule impacts will be materialized.	P. Harrington	16	Commercial	Mitigate	Minimize number of T&M Contracts and manage any that cannot be avoided	Consider incentive frameworks for all must have T&M reimbursable contracts		01/12/2016	01/12/2016	1	1
								Minimize number of T&M Contracts and manage any that cannot be avoided	Implement the necessary field oversight and controls to pre-approve work and monitor contract performance		01/12/2016	01/12/2016	1	1
								Minimize number of T&M Contracts and manage any that cannot be avoided	Oversight of Time and Materials Contracts - Site Team	Time and Materials contracts are relatively low in number. LCP Site Team staffed and it will be increased as required.	01/01/2015	30/12/2016	730	70
LCPR051	Powerhouse Completion - Muskrat Falls	IF ability of contractor to achieve contract placement performance required to achieve power in 2018 differs from expected plans,	THEN schedule delays and cost impacts will be materialized.	R. Power	16	Construction	Mitigate	Performance and Productivity Improvements Required	Assess opportunities to optimize concrete cure times, as well as explore use of pre-cast concrete.		01/12/2016	01/12/2016	1	1
								Performance and Productivity Improvements Required	Develop execution plan to optimize materials placement and equipment installation	Work with Astaldi and Andritz to make changes that will result in increased production rates, better planning and work methods. Optimize concrete cure times, pre-cast concrete. Integrate Andritz with Astaldi. Shorten construction/installation activity durations.	01/01/2016	30/12/2016	365	5
								Performance and Productivity Improvements Required	Implementation of Labour Agreement to take advantage of progressive aspects		01/01/2016	30/12/2016	365	5
								Performance and Productivity Improvements Required	Work with Astaldi to identify and implement the necessary corrective actions required to improve overall labor productivity		01/01/2016	30/12/2016	365	5
LCPR052	Maintaining support of Innu Nation	IF due to discontentment within Innu community or due to non-adherence to IBA,	THEN Innu people become discontent with the Project resulting in unrest and potential protest of work sites.	B. Crawley	12	External	Mitigate	Maintain active engagement	Ensure commitments underneat IBA are adhered too by Project	Ongoing.	01/12/2016	01/12/2016	1	1
								Maintain active engagement	Establish position of IBA Commitments Lead	Complete	01/12/2016	01/12/2016	1	100
								Maintain active engagement	Regular meetings held with Innu Nation at high-level to ensure alignment and deal with issues promptly	Ongoing.	01/12/2016	01/12/2016	1	1
LCPR053	Lack of Safety Culture	IF as a result of the a lack of safety culture in the construction workforce as well as a lack of acceptance of accountability by the Project contractors to take the required steps to ensure an adequate level of coaching and guiding,	THEN the safety performance is much worst than anticipated with the increased risk of loss.	D. Riffe	9	Construction	Mitigate	Establishing and implementing a robust, consistent H&S and E management system across the Project	Complete a reoccurring risk assessment to identify and target H&S focus areas within each Component		01/12/2016	01/12/2016	1	1
								Engaging and retaining contractors who are leaders in safety performance and have demonstrated the ability to proactively manage all aspects of HSE performance in remote worksites	Ensure senior management alignment within project contractors wrt the steps required to ensure a safe and productive workplace		01/12/2016	01/12/2016	1	1

LCP General Risk Register

Date Generated: 13/01/2016

Risk Information							Action Information							
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Maintaining team awareness and establish strong & open communication channel on all aspects of HSE.	Ensure visible engagement of LCMC and Contractor's Management in H&S activities		01/12/2016	01/12/2016	1	1
								Maintaining team awareness and establish strong & open communication channel on all aspects of HSE.	Establish safety culture in owner team (attitude and commitment)		01/12/2016	01/12/2016	1	1
								Establishing and implementing a robust, consistent H&S and E management system across the Project	Fully implement the LCP H&S Management Plan within each Component		01/12/2016	01/12/2016	1	1
								Maintaining team awareness and establish strong & open communication channel on all aspects of HSE.	Hold Annual Contractor Safety Forums		01/12/2016	01/12/2016	1	1
								Maintaining team awareness and establish strong & open communication channel on all aspects of HSE.	Hold regular LCMC team weekly H&S focus meetings		01/12/2016	01/12/2016	1	1
								Engaging and retaining contractors who are leaders in safety performance and have demonstrated the ability to proactively manage all aspects of HSE performance in remote worksites	Hold regular weekly safety meetings with contractors to ensure all are focused on the right issues		01/12/2016	01/12/2016	1	1
								Engage the Workforce - Win the Hearts and Minds	Implement a Behavioural Based Safety Program		01/12/2016	01/12/2016	1	1
								Engage the Workforce - Win the Hearts and Minds	Implement a coaching and guiding philosophy within the LCMC organization		01/12/2016	01/12/2016	1	1
								Engaging and retaining contractors who are leaders in safety performance and have demonstrated the ability to proactively manage all aspects of HSE performance in remote worksites	Implement a LCMC - Contractor Safety Steering Committee meeting with regularly monthly meetings		01/12/2016	01/12/2016	1	1
								Engage the Workforce - Win the Hearts and Minds	Implement FELT Leadership Initiative		01/12/2016	01/12/2016	1	1
								Ensure alignment with the Unions	Implement the Safety Absolute Process		01/12/2016	01/12/2016	1	1
								Establishing and implementing a robust, consistent H&S and E management system across the Project	Recruit and organize competent HSS&ER advisors for each Component		01/12/2016	01/12/2016	1	1
								Engaging and retaining contractors who are leaders in safety performance and have demonstrated the ability to proactively manage all aspects of HSE performance in remote worksites	Work with contractor to align on common strategies		01/12/2016	01/12/2016	1	1
								Ensure alignment with the Unions	Work with the Unions to seek their active engagement for safety		01/12/2016	01/12/2016	1	1

ATTACHMENT A.3

Summary Matrix for 03. Component 3 - DCS



Probability	Very High			2	3	
	High		1	7	5	
	Medium			10	0	
	Low		3	4	3	
	Very Low				1	
			Very Low	Low	Medium	High
		Impact				

Detailed Matrix for 03. Component 3 - DCS



Probability	Very High		<ul style="list-style-type: none"> DCSR128 DCSR132 	<ul style="list-style-type: none"> DCSR002 DCSR126 DCSR130 	
	High	<ul style="list-style-type: none"> DCSR070 	<ul style="list-style-type: none"> DCSR003 DCSR065 DCSR109 DCSR133 DCSR135 DCSR136 DCSR137 	<ul style="list-style-type: none"> DCSR110 DCSR114 DCSR127 DCSR131 DCSR134 	
	Medium		<ul style="list-style-type: none"> DCSR010 DCSR029 DCSR071 DCSR103 DCSR113 DCSR116 DCSR117 DCSR118 DCSR121 DCSR122 		
	Low	<ul style="list-style-type: none"> DCSR007 DCSR017 DCSR072 	<ul style="list-style-type: none"> DCSR006 DCSR115 DCSR119 DCSR124 	<ul style="list-style-type: none"> DCSR064 DCSR123 DCSR125 	
	Very Low			<ul style="list-style-type: none"> DCSR005 	
		Very Low	Low	Medium	High

03. Component 3 - DCS Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
DCSR002	CD0502 - CFLco - LCP Interface	Very High	High	High	Nil	Nil	Nil	Nil	20	Mitigate	M. Ellis	08/06/2016
DCSR003	Outage Planning for C3 Completions	High	Medium	Medium	Nil	Nil	Nil	Medium	12	Mitigate	A. Chubbs	08/06/2016
DCSR005	Interfaces (C3)	Very Low	High	High	High	Nil	Nil	High	4	Mitigate	DCSadmin	08/06/2016
DCSR006	Site Safety Coordination (C3)	Low	Nil	Low	Nil	Medium	Nil	Nil	6	Mitigate	S. Lee	08/06/2016
DCSR007	LCP Project Delivery Team management capacity of EPC Contract Requirements	Low	Low	Low	Low	Nil	Nil	Nil	4	Mitigate	T. Troke	08/06/2016
DCSR010	CD0501, CD0502, CD0510 - Accommodation capacity at MF	Medium	Medium	Medium	Not Set	Not Set	Not Set	Not Set	9	Mitigate	R. Butler	08/06/2016
DCSR017	Site Coordination of Multiple Contractors at C3 Sites	Low	Not Set	Low	Not Set	Not Set	Not Set	Not Set	4	Mitigate	R. Butler	08/06/2016
DCSR029	Availability of accommodations at the CF site	Medium	Not Set	Medium	Not Set	Not Set	Not Set	Not Set	9	Mitigate	R. Butler	08/06/2016
DCSR064	CD0510 - IRU Agreement for Redundant Communication Paths	Low	Low	Low	Nil	Nil	Nil	High	8	Mitigate	G. Winsor	08/06/2016
DCSR065	Connection of OPGW Slack Span on Gantries - Schedule Impacts	High	Low	Medium	Nil	Nil	Nil	Nil	12	Mitigate	K. Almon	22/05/2016

03. Component 3 - DCS Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
DCSR070	CD0510 - Multiple Mobilizations at Various Sites	High	Low	Very Low	Low	Very Low	Nil	Nil	8	Mitigate	G. Winsor	08/06/2016
DCSR071	Preliminary Points Lists (CD0501)	Medium	Medium	Medium	Nil	Nil	Nil	Low	9	Mitigate	A. Chubbs	08/06/2016
DCSR072	CD0510 - Redundant OTN Gateways	Low	Low	Low	Nil	Nil	Nil	Nil	4	Mitigate	G. Winsor	08/06/2016
DCSR103	CH0030 and CD0502 interfaces and lack of direct contractor engagement	Medium	Medium	Medium	Not Set	Not Set	Not Set	Not Set	9	Mitigate	M. Ellis	22/05/2016
DCSR109	C1 schedule slippage impacting C3 completion	High	Medium	Medium	Not Set	Not Set	Not Set	Not Set	12	Mitigate	A. Chubbs	22/05/2016
DCSR110	C4 Schedule slippage causing delay to C3 dynamic commissioning	High	High	Medium	Not Set	Not Set	Not Set	Not Set	16	Mitigate	A. Chubbs	08/06/2016
DCSR113	Labour Relations with IBEW at MF site	Medium	Medium	Medium	Not Set	Not Set	Not Set	Not Set	9	Mitigate	T. Troke	22/05/2016
DCSR114	Availability of experienced NLH and CF(L)Co personnel to support construction through to start-up to operations	High	High	High	Not Set	Not Set	Not Set	Not Set	16	Mitigate	A. Chubbs	22/05/2016
DCSR115	Loss of Critical Equipment	Low	Medium	Medium	Not Set	Not Set	Not Set	Not Set	6	Mitigate	M. Ellis	22/05/2016
DCSR116	Availability of Experienced Contractor Completions Personnel	Medium	Low	Medium	Not Set	Not Set	Not Set	Not Set	9	Mitigate	A. Chubbs	08/06/2016

03. Component 3 - DCS Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
DCSR117	Schedule slippage of NLH projects required for LCP	Medium	Medium	Medium	Not Set	Not Set	Not Set	Not Set	9	Mitigate	G. Winsor	08/06/2016
DCSR118	Late design changes based on NLH Operations input	Medium	Medium	Medium	Not Set	Not Set	Not Set	Not Set	9	Mitigate	T. Troke	22/05/2016
DCSR119	Completion of NLH PETS work Scope in Support of LCP	Low	Medium	Medium	Not Set	Not Set	Not Set	Not Set	6	Mitigate	A. Chubbs	08/06/2016
DCSR121	Final Points List	Medium	Medium	Medium	Nil	Nil	Nil	Medium	9	Mitigate	A. Chubbs	08/06/2016
DCSR122	Hydro Quebec Technical Requirement/Alignment	Medium	Medium	Medium	Not Set	Not Set	Not Set	Not Set	9	Mitigate	P. Thomas	08/06/2016
DCSR123	Completion of TL267 in Support of LCP	Low	Low	High	Nil	Nil	Nil	Low	8	Mitigate	A. Chubbs	08/06/2016
DCSR124	ECC Upgrades	Low	Medium	Medium	Not Set	Not Set	Not Set	Low	6	Mitigate	G. Winsor	08/06/2016
DCSR125	CD0501 - Transportation of Converter Transformers from Point of Manufacture to Final Location	Low	Low	High	Not Set	Not Set	Not Set	Medium	8	Mitigate	K. Almon	22/05/2016
DCSR126	CD0501/CD0502 (GE/Alstom Grid) - Contractor Construction Management	Very High	Medium	High	Medium	Medium	Not Set	Not Set	20	Mitigate	D. Debourke	08/06/2016
DCSR127	CF(L)Co Construction Coordination	High	High	High	Not Set	Low	Not Set	Not Set	16	Mitigate	M. Ellis	08/06/2016

03. Component 3 - DCS Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
DCSR128	CD0534(GE/Alstom Power) - Contractor Performance	Very High	Medium	Medium	Not Set	Not Set	Not Set	Low	15	Mitigate	D. Debourke	08/06/2016
DCSR130	CD0501/CD0502 (GE/Alstom Grid) - Contractor Performance	Very High	Medium	High	Not Set	Not Set	Not Set	Low	20	Mitigate	D. Debourke	08/06/2016
DCSR131	CD0501/CD0502 (GE/Alstom Grid) - Performance - Leadership and Management Competencies	High	High	High	Not Set	Not Set	Not Set	Not Set	16	Mitigate	D. Debourke	08/06/2016
DCSR132	CD0534 (GE/Alstom Power) - Contractor Construction Management	Very High	Low	Medium	Medium	Medium	Not Set	Low	15	Mitigate	D. Debourke	08/06/2016
DCSR133	CD0534 (GE/Alstom Power) - Performance - Leadership and PM Competencies	High	Medium	Medium	Not Set	Not Set	Not Set	Not Set	12	Mitigate	D. Debourke	08/06/2016
DCSR134	CD0501/CD0502 (GE/Alstom Grid) - Potential Commercial Claims Prime Contractor	High	High	Medium	Not Set	Not Set	Not Set	Not Set	16	Mitigate	D. Debourke	08/06/2016
DCSR135	CD0534 (GE/Alstom Power) - Potential Commercial Claims Prime Contractor	High	Medium	Medium	Not Set	Not Set	Not Set	Not Set	12	Mitigate	D. Debourke	08/06/2016
DCSR136	CD0504-001 &002 - Potential Commercial Claims from Civil Works Contractor	High	Medium	Medium	Not Set	Not Set	Not Set	Not Set	12	Mitigate	D. Debourke	08/06/2016
DCSR137	CD0534-002 - Potential Commercial Claims from Civil Works Contractor	High	Medium	Medium	Not Set	Not Set	Not Set	Not Set	12	Mitigate	D. Debourke	08/06/2016

Risk Management Report								Date Generated: 09/05/2016							
Risk Information								Action Information							
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete	
DCSR002	CD0502 - CFLco - LCP Interface	C3 design changes and/or onerous construction requirements prompted by CF(L)Co particularly for work inside the 735kV yard	Delay and/or rework in design and/or construction which may lead to cost and schedule impacts.	M. Ellis	20	External	Mitigate	Coordination with Stakeholders	Schedule regular interface meetings with CFLco	Bi-Weekly with the start of Construction	09/02/2015	09/02/2015	1	100	
								Coordination with Stakeholders	Coordinate site visit to CF and meeting between LCP, CF(L)Co and Alstom prior to start of work with 735kV yard		14/03/2016	29/04/2016	47	100	
								Design Review	Provide applicable drawings and deliverables to CF(L)Co for 735kV extension.	Hydro Quebec should be involved if appropriate	09/02/2015	07/01/2016	304	25	
								Coordination with Stakeholders	Elevate to LCP Senior Management for direction/resolution of issues		22/04/2016	27/01/2017	281	1	
								Coordination with Stakeholders	Engage RFI to provide direction/resolutions on specific issues		22/04/2016	27/01/2017	281	1	
DCSR003	Outage Planning for C3 Completions	If scheduling of planned outages during construction and completions is not well defined and agreed to between LCP and NLH/CF(L)co	Then there will be a delay in completing the construction and cut over and tie in of LCP infrastructure at CF and SOP resulting in a delay in the overall schedule.	A. Chubbs	12	Commissioning and Start-up	Mitigate	Provide awareness to the Stakeholders	Engage the NLH Stations Interface Committee		17/12/2014	17/12/2014	1	1	
								Provide awareness to the Stakeholders	Engage the TL Interface Committee		17/12/2014	17/12/2014	1	1	
								Coordination of Commissioning Plans	Coordinate cut over plans with C4		17/12/2014	31/05/2016	532	10	
								Coordination of Commissioning Plans	Review C3 Contractors Commissioning Plan		17/12/2014	31/01/2017	777	1	
								Provide awareness to the Stakeholders	Engage CF Interface Committee		17/12/2014	31/05/2018	1262	50	
								Provide awareness to the Stakeholders	Engage System Operations Interface Committee		17/12/2014	31/05/2018	1262	50	
								Coordination of Commissioning Plans	Coordination with project planning group to ensure this is captured in the IPS		01/10/2016	31/05/2018	873	1	
								Interface management	Resources LCP and with Contractor teams to manage interfaces		01/08/2016	01/08/2016	1	100	
DCSR005	Interfaces (C3)	As multiple complex hard & soft C3 interfaces require inputs from project components and disciplines, efficiency of the interface management might turn out to be less efficient than planned in the baseline	This may lead to use of conservative assumptions, late changes, re-work, extra costs, and schedule delays.	DCSadmin	4	Interface	Mitigate	Interface management	Effective Interface Management	-Regular interface meetings -Interface Identification -Interface Agreements	01/01/2014	06/01/2018	1613	40	
								Interface management	Resources LCP and with Contractor teams to manage interfaces		01/08/2016	01/08/2016	1	100	
DCSR006	Site Safety Coordination (C3)	If there are multiple organizations at the C3 construction sites, safety codes and operators (including union)	Then errors may occur leading to incidents.	S. Lee	6	Construction	Mitigate	Review each contractors plan and ensure communication processes are defined.	H&S Plan Review		12/11/2014	12/11/2014	1	100	
								Ensure regular inspections addresses adequate communications using Safety Net	Inspections / Leadership		12/11/2014	31/05/2017	903	30	
								Construction Management to attend morning Tool Box and weekly Safety Meeting for Contractors	Visible Leadership		12/11/2014	31/05/2017	903	30	
DCSR007	LCP Project Delivery Team management capacity of EPC Contract Requirements	If LCP Project Delivery Team resources are not sufficiently/adequately available to manage and efficiently deliver project contractual requirements	Then schedule delays, cost impacts, claims and quality issues could arise.	T. Troke	4	Organization and Enterprise	Mitigate	Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for Sr. Mechanical Engineer	T. Troke / R. Skinner action owner.	23/07/2014	24/11/2014	125	100	
								Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for Site Project Controls Coordinators for CF, MF, SP	End date to be updated. T. Troke / T. Power action owners.	25/08/2014	02/02/2015	162	100	
								Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for Area Manager - Synchronous Condensers	End date to be updated.	10/07/2014	16/02/2015	133	100	
								Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for Area Construction Manager for CF, MF, and SP	End date to be updated. T. Troke / R. Butler action owners.	25/08/2014	16/03/2015	204	100	
								Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for Area Manager - AC Substations	End date to be updated.	11/12/2014	04/06/2015	146	100	
								Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for Area Construction Coordinator for CF, MF, and SP	Start and end dates to be updated. T. Troke / R. Butler action owners.	12/10/2014	06/08/2015	181	100	
								Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for Sr. Protection & Controls Engineer	End date to be updated.	11/07/2014	15/06/2015	221	100	
								Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for Sr. Electrical Engineers	End date to be updated. T. Troke / K. Almon / M. Ellis action owners.	21/10/2014	31/03/2016	528	67	
								Engage 3rd party specialist consultants / subject matter experts to provide ad hoc assistance for reviews of critical deliverables	Meet with Teshmont to discuss requirements and assess capability and interest in providing the necessary support	Start and end date to be updated. D. DeBourke / T. Troke action owners.	12/10/2014	31/03/2016	478	1	
								Engage 3rd party specialist consultants / subject matter experts to provide ad hoc assistance for reviews of critical deliverables	Meet with TransGrid Solutions to discuss requirements and assess capability and interest in providing the necessary support	Start and end dates to be updated. D. DeBourke / T. Troke action owners.	12/10/2014	31/03/2016	478	75	
								Recruit for key positions (project delivery team members in both engineering and construction) to align with MFL	Recruit for electro-mechanical inspectors		29/02/2016	31/05/2016	93	40	
								Engage 3rd party specialist consultants / subject matter experts to provide ad hoc assistance for reviews of critical deliverables	Determine if there are other Companies that can provide such services	Start and end dates to be updated. D. DeBourke / T. Troke action owners.	12/10/2014	30/06/2016	569	50	
								Engage 3rd party specialist consultants / subject matter experts to provide ad hoc assistance for reviews of critical deliverables	Establish contracts / service agreements with specialist consultants / subject matter experts	Start and end dates to be updated. D. DeBourke / T. Troke action owners.	12/10/2014	30/06/2016	569	50	
								Establish and conduct monthly review EPC contract KPIs associated with deliverables reviews to monitor Team's capacity to complete work on time. This is to allow for early identification of any required changes to MFL.	Assess deliverable review performance associated w/CD0534 & advise PM of resource utilization & additional resource requirements	Start and end dates to be updated.	12/10/2014	30/09/2016	661	75	

Risk Management Report										Date Generated: 09/05/2016					
Risk Information										Action Information					
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete	
								Establish and conduct monthly review EPC contract KPIs associated with deliverables reviews to monitor Team's capacity to complete work on time. This is to allow for early identification of any required changes to MFL.	Assess deliverable review performance associated w/CD0502 & advise PM of resource utilization & additional resource requirements	Start and end dates to be updated. Area Manager - AC Substations action owner.	12/10/2014	30/12/2016	752	67	
								Establish and conduct monthly review EPC contract KPIs associated with deliverables reviews to monitor Team's capacity to complete work on time. This is to allow for early identification of any required changes to MFL.	Assess deliverable review performance associated w/CD0510 & advise PM of resource utilization and addition resource requirements	Start and end dates to be updated.	12/10/2014	30/12/2016	752	67	
								Establish and conduct monthly review EPC contract KPIs associated with deliverables reviews to monitor Team's capacity to complete work on time. This is to allow for early identification of any required changes to MFL.	Assess deliverable review performance w/CD0501 & advise PM of resource utilization & requirements for additional resources	Start and end dates to be updated.	12/10/2014	30/12/2016	752	67	
DCSR010	CD0501, CD0502, CD0510 - Accommodation capacity at MF	During the construction of Converters and Substations, at MF if there is an overlap of civil works and electromechanical construction there may be insufficient camp space for the work force.	Then unavailability of accommodations can result in construction delays and cost overruns.	R. Butler	9		Mitigate	Confirm maximum number of persons to be accommodated - establish a cap to limit liability of LCP to provide for contractor accommodations	Confirm / establish maximum peak loading with CD0502 Contractor	Start and end dates to be updated. Area Manager - AC Substations action owner.	12/10/2014	12/10/2014	1	100	
								Ensure sufficient budget is available for the use of the main MF camp by the HVdc Specialties team, so this cannot be used as a roadblock.	Estimate the total cost of accommodating HVdc Specialties construction mgmt. team, CD0501, CD0502, & CD0510	Start and end dates to be updated. T. Power action owner.	12/10/2014	12/10/2014	1	100	
								Prepare for alternative accommodations in the event that the main MF camp is unavailable for use by the HVdc Specialties team and Contractors	Investigate alternative accommodation options in the Happy Valley - Goose Bay area to accommodate for Component requirements	Start and end dates to be updated.	12/10/2014	12/10/2014	1	100	
								Prepare for alternative accommodations in the event that the main MF camp is unavailable for use by the HVdc Specialties team and Contractors	Investigate alternative accommodation options with CD0501 - a contract change for the contractor to provide own accommodations	Start and end dates to be updated.	12/10/2014	12/10/2014	1	100	
								Prepare for alternative accommodations in the event that the main MF camp is unavailable for use by the HVdc Specialties team and Contractors	Investigate alternative accommodation options with CD05010 - a contract change for the contractor to provide own accommodations	Start and end dates to be updated.	12/10/2014	12/10/2014	1	100	
								Prepare for alternative accommodations in the event that the main MF camp is unavailable for use by the HVdc Specialties team and Contractors	Investigate alternative accommodation options with CD0502 - a contract change for the contractor to provide own accommodations	Start and end date to be updated. Area Manager - AC Substations action owner.	12/10/2014	12/10/2014	1	100	
								Prepare for alternative accommodations in the event that the main MF camp is unavailable for use by the HVdc Specialties team and Contractors	Investigate options to install dedicated HVdc Specialties dorm(s) at MF to accommodate for Component requirements	Start and end dates to be updated.	12/10/2014	12/10/2014	1	100	
								Ensure sufficient budget is available for the use of the main MF camp by the HVdc Specialties team, so this cannot be used as a roadblock.	Obtain confirmation of available budget	Start and end dates to be updated. T. Power action owner.	12/10/2014	12/10/2014	1	100	
								Prepare for alternative accommodations in the event that the main MF camp is unavailable for use by the HVdc Specialties team and Contractors	Prepare overflow camp for occupancy		01/12/2016	01/12/2016	1	100	
								Confirm maximum number of persons to be accommodated - establish a cap to limit liability of LCP to provide for contractor accommodations	Confirm / establish maximum peak loading with CD0510 Contractor	Start and end dates to be updated.	12/10/2014	29/04/2016	507	1	
								Confirm maximum number of persons to be accommodated - establish a cap to limit liability of LCP to provide for contractor accommodations	Confirm / establish maximum peak loading with CD0501 Contractor	Start and end dates to be updated.	12/10/2014	11/04/2016	696	1	
								Confirm manpower loading profile to provide sufficient notice to camp management for planning purposes	Request updated manpower loading profile from CD0510 on a monthly basis, starting two months prior to initial mobilization	Start and end dates to be updated.	12/01/2016	03/03/2017	93	1	
								Confirm manpower loading profile to provide sufficient notice to camp management for planning purposes	Monthly room loading for HVdc Specialties construction mgmt., CD0501, CD0502, & CD0510 to MF camp mgmt. for room reservation	Start and end dates to be updated. T. Power action owner.	12/10/2014	06/01/2018	1270	40	
								Confirm manpower loading profile to provide sufficient notice to camp management for planning purposes	Request updated manpower loading profile from CD0501 on a weekly basis, starting two months prior to initial mobilization	Start and end dates to be updated.	12/10/2014	06/01/2018	1270	40	
Confirm manpower loading profile to provide sufficient notice to camp management for planning purposes	Request updated manpower loading profile from CD0502 on a weekly basis, starting two months prior to initial mobilization	Start and end dates to be updated. Area Manager - AC Substations action owner.	12/10/2014	06/01/2018	1270	40									
Confirm manpower loading profile to provide sufficient notice to camp management for planning purposes	Confirm updated manpower loading for HVdc Specialties construction mgmt. team monthly, starting 2 months prior to mobilization	Start and end dates to be updated.	12/10/2014	29/06/2018	1298	40									
DCSR017	Site Coordination of Multiple Contractors at C3 Sites	If there are many Contractors present simultaneously at C3 sites (i.e. existing line re-routing at SOP),	Then there could be coordination issues resulting in delays and possible claims	R. Butler	4	Construction	Mitigate	Coordination meetings	Hold regular Coordination meetings with C1	should commence late 2016	01/10/2016	30/11/2016	326	0	
								Coordination meetings	Hold regular Coordination meetings with SOBI	ongoing every 2 weeks	01/10/2016	01/02/2017	359	75	
								Coordination meetings	Hold regular Coordination meetings with C4	happening internally every month as required but ongoing at sites like CF, Transition compounds and SP	01/10/2016	06/01/2018	874	50	
								Coordination meetings	Ensure regular site meetings occur with all Contractors at the various sites	ongoing daily	01/10/2016	07/02/2018	905	70	
DCSR029	Availability of accommodations at the CF site	During the construction of Converters and Substations, at CF if there is an overlap of civil works and electromechanical construction there may be insufficient camp space for the work force.	Then construction baseline schedule may be impacted.	R. Butler	9	Construction	Mitigate	Assessing alternatives	Assessing alternatives for accommodations at CF	this was discussed but not well received as CFLco said it would place additional strain on water and sewer systems.	01/12/2016	31/03/2016	80	100	
								Forecasting manpower	Forecasting of manpower requirements	waiting on schedule from Alstom\GE	01/12/2016	06/01/2018	872	50	
DCSR064	CD0510 - IRU Agreement for Redundant Communication Paths	If the negotiations with Third Party Telecom Providers are unsuccessful with regards to scope and or schedule	Then there will be impacts on commissioning, schedule and cost.	G. Winsor	8	Commissioning and Start-up	Mitigate	Define and communicate requirements with 3rd party providers	Schedule negotiation/progress meetings with 3rd party providers		31/03/2015	28/02/2016	335	90	
								Define and communicate requirements with 3rd party providers	Ensure that IRU agreements with 3rd parties are signed and executed		13/03/2015	31/03/2016	385	75	
DCSR065	Connection of OPGW Slack Span on Gantries - Schedule Impacts	If the OPGW slack spans are not terminated on the station gantries prior to static commissioning as indicated in the IPS (January 2015)	Then there will be impacts on commissioning and schedule. CD0501 Contract assume telecommunications will be available for static commissioning.	K. Almon	12	Commissioning and Start-up	Mitigate	Interface definition	Ensure required interfaces are identified		13/03/2015	08/07/2015	148	100	
								Interface definition	Tanya Power: Ensure schedule contains completion dates for required critical interfaces	validate logic for static commissioning	13/03/2015	08/07/2015	148	25	
								Establishment of 'B' path for telecommunications	Establishment of 'B' path for telecommunications	Agreement in place with Eastlink	01/10/2016	01/10/2016	1	100	
								Ensure that GE Grid agree with the principle of no slack span prior to commissioning (may not be an issue after all)	GE Agreement	Work with GE Grid Completions Lead to ensure alignment (A Chubbs)	14/04/2016	14/04/2016	1	0	
DCSR070	CD0510 - Multiple Mobilizations at Various Sites	If more than one mobilization or demobilization is required as a result of schedule	Then there will be impacts on cost.	G. Winsor	8	Construction	Mitigate	Contract Strategy	Define optimal contract structure for least commercial exposure		13/03/2015	31/07/2015	141	100	
								Execution coordination with other packages			01/10/2016	07/02/2018	905	10	

Risk Management Report								Date Generated: 09/05/2016							
Risk Information								Action Information							
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete	
DCSR071	Preliminary Points Lists (CD0501)	If there is a delay in the preliminary points lists from the various contractors to LCP	Then there will be impacts on commissioning and schedule.	A. Chubbs	9	Interface	Mitigate	Points Approval Process	Define and communicate process		13/03/2015	31/07/2015	141	100	
								Points Approval Process	Define SPAs, RACI		13/03/2015	31/07/2015	141	100	
								Monitor Contractor for compliance	Manage CD0501 Contractors to ensure criticality of points list delivery timing is well understood.		01/12/2016	31/05/2016	141	25	
								Monitor Contractor for compliance	Manage CD0502 Contractors to ensure criticality of points list delivery timing is well understood.		01/12/2016	31/05/2016	141	25	
								Monitor Contractor for compliance	Manage CD0534 Contractors to ensure criticality of points list delivery timing is well understood.		01/12/2016	31/05/2016	141	25	
DCSR072	CD0510 - Redundant OTN Gateways	If the selected OTN Gateway does not function as expected	Then there will be impacts on schedule and cost.	G. Winsor	4	Technical	Mitigate	Architecture Testing	Construct Integration Laboratory for architecture testing		13/03/2015	31/07/2015	141	100	
								Architecture Testing	Perform Gateway Redundancy Architecture testing		13/03/2015	30/06/2016	476	50	
								Architecture Testing	Prepare and co-ordinate test requirements with other packages		13/03/2015	30/06/2016	476	10	
DCSR103	CH0030 and CD0502 interfaces and lack of direct contractor engagement	C1 and C3 contractors not working directly with one another and all communications filtered through company	Contractors leveraging late interfaces for CRs	M. Ellis	9	Commercial	Mitigate	Interface management	Ensure adequate interface engagement between Alstom and Andritz	Through oversight of documentation and via regular meetings	01/08/2016	30/12/2016	358	50	
DCSR109	C1 schedule slippage impacting C3 completion	C1 schedule slips	C3 is not able to complete the work as per the IPS (Dynamic Commissioning at High Power)	A. Chubbs	12		Mitigate	Interface management	Host Meeting with CD0502 and CH0030.		03/11/2016	03/11/2017	366	15	
								Schedule Management	Tanya Power: Define potential cost impacts	LCP PMT costs Contractor resource costs	01/12/2016	31/03/2016	80	1	
								Assessing alternatives	Assess alternatives for temporary water and sewer services	Decouples reliance on C1 schedule for water and sewer services.	14/01/2016	31/03/2016	78	10	
								Schedule Management	Communicate magnitude of potential impact to Sr. management for consideration in cost-benefit analysis		01/12/2016	29/04/2016	109	1	
								Schedule Management	Tanya Power: Raise DANs for additional costs in the event of schedule delay		01/12/2016	31/07/2016	202	10	
DCSR110	C4 Schedule slippage causing delay to C3 dynamic commissioning	C4 (LTL) schedule slips and they are not ready to hook up to conductors to C3 yards at the gantries	Delay to C3 Dynamic commissioning at low power and first power.	A. Chubbs	16		Mitigate	Schedule Management	Tanya Power: Define potential cost impacts	Decouples reliance on C4 schedule for water and sewer services.	01/12/2016	31/03/2016	80	1	
								Schedule Management	Tanya Power: Raise DAN for additional costs in the event of schedule delay	Decouples reliance on C4 schedule for water and sewer services.	01/12/2016	31/03/2016	80	1	
DCSR113	Labour Relations with IBEW at MF site	Labour relation issues arise due to the introduction of IBEW workers to the MF site where it has been predominantly the RDTCC involved with the work.	Labour disputes lead to schedule delays and cost impacts	T. Troke	9	Organization and Enterprise	Mitigate	Kick-off meeting	Labour relations kick-off with Contractors prior to start of work		19/01/2016	31/05/2016	134	5	
								Contractor Management	Proactive and ongoing labour relations monitoring and management including regular meetings with Contractors		19/01/2016	06/01/2018	865	1	
DCSR114	Availability of experienced NLH and CF(L)Co personnel to support construction through to start-up to operations	IF experienced personnel are not available to support through to start-up to operations	THEN delays and cost impacts will be materialized.	A. Chubbs	16	Commissioning and Start-up	Mitigate	Ensure adequate resources are available	Ensure adequate competent resources are available and dedicated to LCP		19/01/2016	31/01/2018	744	0	
DCSR115	Loss of Critical Equipment	IF during logistic operations, a loss of critical equipment occurs,	THEN cost and schedule impacts will be materialized.	M. Ellis	6	Construction	Mitigate	Flag to Sr. Management	Flag potential issues to Sr. management		19/01/2016	31/01/2018	744	0	
								EPC Contractor to hire resources	EPC Contractor to hire competent logistics / transport resources		19/01/2016	30/09/2016	256	50	
DCSR116	Availability of Experienced Contractor Completions Personnel	If the right level of experienced personnel are not engaged the Contractors in the preparation & execution of the commissioning & integration program	Schedule delays and cost impacts as a result of the inexperience	A. Chubbs	9		Mitigate	Review Logistic for Critical Equipment	Experienced LCP resource to validate Contractor plans		19/01/2016	30/09/2018	986	50	
								Experienced completions personnel	Ensure CD0501 Contractor has experienced completions personnel in change of completions scope.		18/01/2016	31/03/2016	74	0	
								Experienced completions personnel	Ensure CD0502 Contractor has experienced completions personnel in change of completions scope.		18/01/2016	31/03/2016	74	0	
								Experienced completions personnel	Ensure CD0510 Contractors have experienced completions personnel in change of completions scope.		18/01/2016	31/03/2016	74	0	
DCSR117	Schedule slippage of NLH projects required for LCP	schedule of NLH projects required for completion of C3 work slips (i.e. ECC upgrade, breaker and relay replacement etc.).	Delay to completion of C3 work scope.	G. Winsor	9		Mitigate	Flag to Sr. Management	Flag potential issues to Sr. management	Resourcing on NLH projects may need to be adjusted to accelerate work.	19/01/2016	31/01/2018	744	10	
								Obtain updates	Obtain regular project status updates from NLH project managers		19/01/2016	31/01/2018	744	50	
DCSR118	Late design changes based on NLH Operations input	Late C3 design changes prompted by NLH Operations that are to be incorporated prior to start-up	Cost and Schedule	T. Troke	9		Mitigate	Operations imbedded in team	Operations member imbedded in the C3 team		19/01/2016	19/01/2016	1	100	
								Operations design review	Review by T&DI of all RFP design deliverables		19/01/2016	19/01/2016	1	100	
								Management of Change	Changes to be approved via the LCP Management of Change process		19/01/2016	30/04/2018	833	25	
DCSR119	Completion of NLH PETS work Scope in Support of LCP	IF there is a delay of breaker replacements on Eastern Avalon and related line protection upgrades.	THEN it will Delay final commissioning and completions on CD0502 scope during the 230 kV system cutover with C4. Could incur additional commissioning costs associated with NLH scope of work.	A. Chubbs	6	Completion	Mitigate	Engage with Contractor to ensure the scope is understood and planned for in support of NLH, etc.			03/11/2016	03/11/2016	1	0	
								Engage with NLH PETS project manager to align schedule and determine gaps.			03/11/2016	03/11/2016	1	0	
								Ensure all related scope is captured in commissioning plans, etc.			03/11/2016	03/11/2016	1	0	
DCSR121	Final Points List	If there is a delay in the final points list from the various contractors to LCP	Then there will be impacts on commissioning and schedule.	A. Chubbs	9	Interface	Mitigate								
DCSR122	Hydro Quebec Technical Requirement/Alignment	If the Hydro Quebec review process poses changes to LCP design and infrastructure	Then there may be cost and schedule impacts.	P. Thomas	9	Interface	Mitigate	Additional Studies Required	Ensure timely completion by RFI of Nalcor System Impact Study for submission to CF Water Management Committee		14/03/2016	14/03/2016	1	1	
								Monitor WMC Meetings	Monitor activities of CF Water Management Committee to ensure readiness for interconnection of the LCP		14/03/2016	14/03/2016	1	1	
								HQ System Study	Review outputs of HQ study of impact of the 735kV/315kV interconnection at CF on the HQ System		14/03/2016	14/03/2016	1	1	
DCSR123	Completion of TL267 in Support of LCP	If the new TL267 line (Western Avalon to Bay Despoir) has a delayed in service date beyond the in service date for MF Gen	THEN it will limit the power transfer capability of the HVDC link to 600-800 MW, delaying high power testing during dynamic commissioning.	A. Chubbs	8	Completion	Mitigate	Agreement opened with HQ to review LCP design.	Comments/changes to design from HQ.		01/01/2016	31/07/2016	213	1	
								Engage with NLH PETS & TL267 project manager to align schedule and determine any gaps.			03/11/2016	03/11/2016	1	0	
DCSR124	ECC Upgrades	IF Late or delayed completions of the ECC upgrade	THEN a delay in static and dynamic functional checks during commissioning, delaying first power and trial run periods of several C3 packages.	G. Winsor	6	Completion	Mitigate	Engage with NLH system ops to track schedule and communicate any changes.			03/11/2016	03/11/2016	1	0	
								Ensure all conditions are captured in commissioning plans and plan for delay in testing.			03/11/2016	03/11/2016	1	0	
								Ensure all interfaces with NLH are answered in timely manner.			03/11/2016	03/11/2016	1	0	

Risk Management Report								Date Generated: 09/05/2016														
Risk Information								Action Information														
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete								
DCSR125	CD0501 - Transportation of Converter Transformers from Point of Manufacture to Final Location	If the transformers are delayed in their manufacture,	Then transformer Shipment #2 (September 2016) at MF will be delayed and may not be able to be delivered to site because of ice conditions at Cartwright.	K. Almon	8	Construction	Mitigate	Communicate Impact of Manufacturing Delays on Delivery	Schedule follow-up meeting with CD0501 Logistics Manager		14/04/2016	14/04/2016	1	0								
								Communicate Impact of Manufacturing Delays on Delivery	Send Letter to CD0501 to communicate Company concerns with logistics		04/04/2016	29/04/2016	26	100								
								Communicate Impact of Manufacturing Delays on Delivery	Schedule meeting with CD0501 Logistics Manager		04/06/2016	27/05/2016	52	5								
								Improve visibility of Manufacturing schedule	Company representative to be more engaged with schedule	Production schedule requested from TST	04/06/2016	29/07/2016	115	1								
DCSR126	CD0501/CD0502 (GE/Alstom Grid) - Contractor Construction Management	IF GE/Alstom Grid lag with respect to construction of the CD0501 and CD0502 Contracts,	Then there is a significant likelihood that GE/Alstom Grid will not be able to deliver the various stations as per the Contract.	D. Debourke	20	Construction	Mitigate	Contractor Processes	Arrange regular working meetings between LCMC and GE/Alstom Grid's management to discuss open commercial issues with the CW Sub		11/07/2014	01/01/2018	1152	1								
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Attend Construction Coordination meeting with Contractors		11/07/2014	01/01/2018	1152	1								
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Ensure strong LCMC field engineering presence in the field for Contractor oversight		11/07/2014	01/01/2018	1152	1								
								Contractor Processes	Audit relevant Contractor Processes		11/07/2014	01/01/2018	1152	1								
								Contractor Processes	Develop an audit schedule		11/07/2014	01/01/2018	1152	1								
								Contractor Resourcing	Ensure Contractor assigns adequate resources to meet construction requirements (Safety, Quality & Environment)		11/07/2014	01/01/2018	1152	1								
								Contractor Resourcing	Ensure Contractor assigns adequate resources to meet contractual obligations with respect to engineering and deliverables		11/07/2014	01/01/2018	1152	1								
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Ensure LCMC field resources capture accurate records on Daily Construction Reports		11/07/2014	01/01/2018	1152	1								
								Labour Relations	Facilitate request for Craft labour		11/07/2014	01/01/2018	1152	1								
								Labour Relations	Implement regular LR meetings with Contractor		11/07/2014	01/01/2018	1152	1								
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Review MFL to ensure that adequate LCMC field positions identified		11/07/2014	01/01/2018	1152	1								
								Labour Relations	Supplement Contractor's team with LCMC LR representative		11/07/2014	01/01/2018	1152	1								
								Contractor Resourcing	Verify that Senior Construction Management personnel are competent for the role		11/07/2014	01/01/2018	1152	1								
								DCSR127	CF(L)Co Construction Coordination	Construction work in the CF(L)Co extension will need detailed planning and coordination	Construction may be delayed, permits denied and outages refused.	M. Ellis	12	Construction	Mitigate	Schedule Review	Review schedule on a regular basis		31/05/2016	14/04/2016	-46	1
DCSR128	CD0534(GE/GE/Alstom Power) - Contractor Performance	IF GE/Alstom Power lag with respect to engineering, procurement, and manufacturing of the CD0534 Contract,	Then there is a significant likelihood that GE/Alstom Power will not be able to deliver the Synchronous Condenser Facility to support the Project's start-up sequence.	D. Debourke	15	Commercial	Mitigate		Elevate to senior management for resolution		14/04/2016	14/04/2016	1	0								
									Engage RFI to mediate		14/04/2016	14/04/2016	1	0								
									Regular coordination meetings		14/04/2016	14/04/2016	1	0								
								Monitoring Engineering Deliverables	Continuous monitoring of deliverables to ensure schedule is maintained		11/07/2014	01/01/2018	1152	1								
								Monitoring Engineering Deliverables	Continuous monitoring of HOLDS register		11/07/2014	01/01/2018	1152	1								
								Monitoring Recovery Schedule	Continuous monitoring of the schedule		11/07/2014	01/01/2018	1152	1								
								Monitoring Engineering Deliverables	Ensure deliverables are in line with schedule		11/07/2014	01/01/2018	1152	1								
								Eliminate excuses	Ensure daily communication is occurring between GE/Alstom Power and LCMC field staff		11/07/2014	01/01/2018	1152	1								
								Monitoring Engineering Deliverables	Hire LCMC Engineering Deliverables Coordinator		11/07/2014	01/01/2018	1152	1								
								Monitoring Recovery Schedule	Identify potential opportunities and concerns		11/07/2014	01/01/2018	1152	1								
								Monitoring Recovery Schedule	Request Recovery Schedule from GE/Alstom		11/07/2014	01/01/2018	1152	1								
								Monitoring Recovery Schedule	Review, analyze, and challenge Contractors Schedule		11/07/2014	01/01/2018	1152	1								
								Contractor Processes	Request procurement dashboard		11/07/2014	01/01/2018	1152	1								
								Contractor Processes	Arrange regular working meetings between LCMC and GE/Alstom Power's management to discuss open commercial issues with the CW Sub		11/07/2014	01/01/2018	1152	1								
Eliminate excuses	Timely resolution of open CR and other commercial issues		11/07/2014	01/01/2018	1152	1																
DCSR130	CD0501/CD0502 (GE/Alstom Grid) - Contractor Performance	IF GE/Alstom Grid lag with respect to engineering, procurement and manufacturing of the CD0501 and CD0502 Contracts,	Then there is a significant likelihood that GE/Alstom Grid will not be able to deliver the various stations to support the Project's start-up sequence.	D. Debourke	20	Commercial	Mitigate	Monitoring Engineering Deliverables	Continuous monitoring of deliverables to ensure schedule is maintained		11/07/2014	01/01/2018	1152	1								
								Monitoring Engineering Deliverables	Continuous monitoring of HOLDS register		11/07/2014	01/01/2018	1152	1								
								Monitoring Recovery Schedule	Continuous monitoring of the schedule		11/07/2014	01/01/2018	1152	1								
								Eliminate excuses	Ensure daily communication is occurring between GE/Alstom Grid and LCMC field staff		11/07/2014	01/01/2018	1152	1								
								Monitoring Engineering Deliverables	Ensure deliverables are in line with schedule		11/07/2014	01/01/2018	1152	1								
								Monitoring Engineering Deliverables	Hire LCMC Engineering Deliverables Coordinator		11/07/2014	01/01/2018	1152	1								
								Monitoring Recovery Schedule	Identify potential opportunities and concerns		11/07/2014	01/01/2018	1152	1								
								Monitoring Recovery Schedule	Request Recovery Schedule from GE/Alstom		11/07/2014	01/01/2018	1152	1								
								Monitoring Recovery Schedule	Review, analyze, and challenge Contractors Schedule		11/07/2014	01/01/2018	1152	1								
								Contractor Processes	Review procurement dashboard monthly		11/07/2014	01/01/2018	1152	1								
								Contractor Processes	Request procurement dashboard monthly		11/07/2014	01/01/2018	1152	1								
								Eliminate excuses	Timely resolution of open CR and other commercial issues		11/07/2014	01/01/2018	1152	1								
								DCSR131	CD0501/CD0502 (GE/Alstom Grid) - Performance - Leadership and Management Competencies	IF as a result of GE/Alstom Grid's lack of strong PM leadership and implementation of the required level of PM competencies for a project of this size and scale,	Then the ability to effectively organize and undertake the EPC effort in a timely and productive manner is impaired, leading to schedule exposure for LCP.	D. Debourke	16	Commercial	Mitigate	Help GE/Alstom Grid see the gaps	Address the Steering Committee with concerns and seek commitment to address within fixed period		11/07/2014	01/01/2018	1152	1
																Protect LCP Position	Continue to insist and enforce contractual requirements and commitments		11/07/2014	01/01/2018	1152	1
Identify solutions for GE/Alstom Grid	Ensure any excuses for non-performance due to LCMC are eliminated		11/07/2014	01/01/2018	1152	1																
Help GE/Alstom Grid see the gaps	Ensure clear contractual communication of identified shortfalls and concerns		11/07/2014	01/01/2018	1152	1																
Protect LCP Position	Ensure LCP contractual position is documented in order to fully protect its rights under the Agreement		11/07/2014	01/01/2018	1152	1																
Protect LCP Position	Increased our oversight for all disciplines to make sure we complement where needed		11/07/2014	01/01/2018	1152	1																
Identify solutions for GE/Alstom Grid	Outline solutions to GE/Alstom Grid challenges and work with GE/Alstom Grid to implement		11/07/2014	01/01/2018	1152	1																
Help GE/Alstom Grid see the gaps	Regular meetings both structured and site level to facilitate communication		11/07/2014	01/01/2018	1152	1																

Risk Management Report										Date Generated: 09/05/2016					
Risk Information										Action Information					
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete	
DCSR132	CD0534 (GE/Alstom Power) - Contractor Construction Management	IF GE/Alstom Power lag with respect to construction of the CD0501 and CD0502 Contracts,	Then there is a significant likelihood that GE/Alstom Power will not be able to deliver the various stations as per the Contract.	D. Debourke	15	Construction	Mitigate	Contractor Processes	Arrange regular working meetings between LCMC and GE/Alstom Power's management to discuss open commercial issues with the CW Sub		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Attend Construction Coordination meeting with Contractors		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Ensure strong LCMC field engineering presence in the field for Contractor oversight		11/07/2014	01/01/2018	1152	1	
								Contractor Processes	Audit relevant Contractor Processes		11/07/2014	01/01/2018	1152	1	
								Contractor Processes	Develop an audit schedule		11/07/2014	01/01/2018	1152	1	
								Contractor Resourcing	Ensure Contractor assigns adequate resources to meet construction requirements (Safety, Quality & Environment)		11/07/2014	01/01/2018	1152	1	
								Contractor Resourcing	Ensure Contractor assigns adequate resources to meet contractual obligations with respect to engineering and deliverables		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Ensure LCMC field resources capture accurate records on Daily Construction Reports		11/07/2014	01/01/2018	1152	1	
								Labour Relations	Facilitate request for Craft labour		11/07/2014	01/01/2018	1152	1	
								Labour Relations	Implement regular LR meetings with Contractor		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Review MFL to ensure that adequate LCMC field positions identified		11/07/2014	01/01/2018	1152	1	
								Contractor Processes	Review procurement dashboard		11/07/2014	01/01/2018	1152	1	
								Labour Relations	Supplement Contractor's team with LCMC LR representative		11/07/2014	01/01/2018	1152	1	
								Contractor Resourcing	Verify that Senior Construction Management personnel are competent for the role		11/07/2014	01/01/2018	1152	1	
DCSR133	CD0534 (GE/Alstom Power) - Performance - Leadership and PM Competencies	IF as a result of GE/Alstom Power's lack of strong PM leadership and implementation of the required level of PM competencies for a project of this size and scale,	Then the ability to effectively organize and undertake the EPC effort in a timely and productive manner is impaired, leading to schedule exposure for LCP.	D. Debourke	12	Commercial	Mitigate	Help GE/Alstom Power see the gaps	Address the Steering Committee with concerns and seek commitment to address within fixed period		11/07/2014	01/01/2018	1152	1	
								Protect LITP Position	Continue to insist and enforce contractual requirements and commitments		11/07/2014	01/01/2018	1152	1	
								Identify solutions for GE/Alstom Power	Ensure any excuses for non-performance due to LCMC are eliminated		11/07/2014	01/01/2018	1152	1	
								Help GE/Alstom Power see the gaps	Ensure clear contractual communication of identified shortfalls and concerns		11/07/2014	01/01/2018	1152	1	
								Protect LITP Position	Ensure LITP contractual position is documented in order to fully protect its rights under the Agreement		11/07/2014	01/01/2018	1152	1	
								Protect LITP Position	Increased our oversight for all disciplines to make sure we complement where needed		11/07/2014	01/01/2018	1152	1	
								Identify solutions for GE/Alstom Power	Outline solutions to GE/Alstom Power challenges and work with GE/Alstom Power to implement		11/07/2014	01/01/2018	1152	1	
								Help GE/Alstom Power see the gaps	Regular meetings both structured and site level to facilitate communication		11/07/2014	01/01/2018	1152	1	
DCSR134	CD0501/CD0502 (GE/Alstom Grid) - Potential Commercial Claims Prime Contractor	IF due to poor planning strategies; i.e. a lack of proactive resource planning and under-developed and inefficient execution plans,	Then contractor could be forthcoming with claims.	D. Debourke	16	Commercial	Mitigate	Address claims and open commercial items in a timely fashion	Address GE/Alstom Grid's Monthly Reports - ensure timely submittal and accurate information		11/07/2014	01/01/2018	1152	1	
								Address claims and open commercial items in a timely fashion	Arrange regular working meetings between LCMC and GE/Alstom Grid's management to discuss open commercial issues		11/07/2014	01/01/2018	1152	1	
								Address claims and open commercial items in a timely fashion	Develop a plan to address existing commercial items		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Contractor's resource loading and workloads	Ensure all open actions are resolved in a timely fashion		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Contractor's resource loading and workloads	Instruct (and remind) team to utilize Aconex Mail as well as copy Contract Administrator		11/07/2014	01/01/2018	1152	1	
DCSR135	CD0534 (GE/Alstom Power) - Potential Commercial Claims Prime Contractor	IF due to poor planning strategies; i.e. a lack of proactive resource planning and under-developed and inefficient execution plans,	Then contractor could be forthcoming with claims.	D. Debourke	12	Commercial	Mitigate	Address claims and open commercial items in a timely fashion	Address GE/Alstom Power's Monthly Reports - ensure timely submittal and accurate information		11/07/2014	01/01/2018	1152	1	
								Address claims and open commercial items in a timely fashion	Arrange regular working meetings between LCMC and GE/Alstom Power's management to discuss open commercial issues		11/07/2014	01/01/2018	1152	1	
								Address claims and open commercial items in a timely fashion	Develop a plan to address existing commercial items		11/07/2014	01/01/2018	1152	1	
								LCMC resources assigned and proactively monitoring Contractor's resource loading and workloads	Ensure all open actions are resolved in a timely fashion (Construction mgmt. Emails, TQs, SQs, Interfaces, CONs, CHRs)		11/07/2014	01/01/2018	1152	1	
								LCMC resources assigned and proactively monitoring Contractor's resource loading and workloads	Instruct (and remind) team to utilize Aconex Mail as well as copy Contract Administrator		11/07/2014	01/01/2018	1152	1	
DCSR136	CD0504-001 & 002 - Potential Commercial Claims from Civil Works Contractor	IF due to poor planning strategies; i.e. a lack of proactive resource planning and under-developed and inefficient execution plans by the Prime Contractor GE/Alstom Power,	Then the Prime Contractor's Subcontractors could be forthcoming with claims.	D. Debourke	12	Commercial	Mitigate	Prime Contractor Processes	Arrange regular working meetings between LCMC and GE/ARP mgmt. to discuss open commercial issues with the CW Sub		11/07/2014	01/01/2018	1152	1	
								Prime Contractor Processes	Audit relevant Prime Contractor Processes		11/07/2014	01/01/2018	1152	1	
								Prime Contractor Processes	Develop an audit schedule		11/07/2014	01/01/2018	1152	1	
								Prime Contractor Resourcing	Ensure Prime Contractor assigns adequate resources to meet construction requirements (Safety, Quality & Environment)		11/07/2014	01/01/2018	1152	1	
								Prime Contractor Resourcing	Ensure Prime Contractor assigns adequate resources to meet contractual obligations with respect to engineering and deliverables		11/07/2014	01/01/2018	1152	1	
								Prime Contractor Processes	Ensure Prime Contractor has developed a plan to address existing commercial items		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Ensure timely review of Prime Contractor engineering deliverables relating to Civil Works		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Meet with Prime Contractor on a regular basis to discuss MoC relating to Civil Works to ensure timely resolution of issues		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Request visibility to Subcontractors request to ensure Prime Contractor is addressing issues in a timely fashion		11/07/2014	01/01/2018	1152	1	
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Review MFL to ensure that adequate LCMC field positions identified		11/07/2014	01/01/2018	1152	1	
Prime Contractor Resourcing	Verify that Senior Construction Management personnel are competent for the role		11/07/2014	01/01/2018	1152	1									

Risk Management Report								Date Generated: 09/05/2016						
Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
DCSR137	CD0534-002 - Potential Commercial Claims from Civil Works Contractor	IF due to poor planning strategies; i.e. a lack of proactive resource planning and under-developed and inefficient execution plans by the Prime Contractor GE/Alstom Power,	Then the Prime Contractor's Subcontractors could be forthcoming with claims.	D. Debourke	12	Commercial	Mitigate	Prime Contractor Processes	Arrange regular working meetings between LCMC and GE/Alstom Power's management to discuss open commercial issues with the CW Sub		11/07/2014	01/01/2018	1152	1
								Prime Contractor Processes	Audit relevant Prime Contractor Processes		11/07/2014	01/01/2018	1152	1
								Prime Contractor Processes	Develop an audit schedule		11/07/2014	01/01/2018	1152	1
								Prime Contractor Resourcing	Ensure Prime Contractor assigns adequate resources to meet construction requirements (Safety, Quality & Environment)		11/07/2014	01/01/2018	1152	1
								Prime Contractor Resourcing	Ensure Prime Contractor assigns adequate resources to meet contractual obligations with respect to engineering and deliverables		11/07/2014	01/01/2018	1152	1
								Prime Contractor Processes	Ensure Prime Contractor has developed a plan to address existing commercial items		11/07/2014	01/01/2018	1152	1
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Ensure timely review of Prime Contractor engineering deliverables relating to Civil Works		11/07/2014	01/01/2018	1152	1
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Meet with Prime Contractor on a regular basis to discuss MoC relating to Civil Works to ensure timely resolution of issues		11/07/2014	01/01/2018	1152	1
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Request visibility to Subcontractors request to ensure Prime Contractor is addressing issues in a timely fashion		11/07/2014	01/01/2018	1152	1
								LCMC resources on the ground proactively monitoring Subcontractor's scope of work	Review MFL to ensure that adequate LCMC field positions identified		11/07/2014	01/01/2018	1152	1
Prime Contractor Resourcing	Verify that Senior Construction Management personnel are competent for the role		11/07/2014	01/01/2018	1152	1								

ATTACHMENT A.4

04. Component 4 - OTL Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
OTLR001	CT0341 - Bird Nesting (HVac) (C4)	Low	Low	Low	Nil	Nil	Nil	Nil	4	Mitigate	D. Haley	26/03/2016
OTLR015	Hazardous Terrain (HVac / HVdc)	Medium	Low	Not Set	Not Set	Low	Not Set	Not Set	6	Mitigate	K. Sparkes	12/02/2016
OTLR016	Safety Incidents vs. Evacuation (HVac / HVdc)	Low	Not Set	Not Set	Not Set	Very High	Not Set	Not Set	10	Mitigate	B. Bishop	25/03/2016
OTLR017	Safety: Neighbouring Energised Line (Hvac / HVdc)	Low	Not Set	Not Set	Not Set	High	Not Set	Not Set	8	Mitigate	B. Bishop	25/03/2016
OTLR018	CT0327 - Opposition by First Nations Groups (HVdc)	Medium	Medium	Medium	Not Set	Not Set	Not Set	Medium	9	Mitigate	M. Peddle	25/03/2016
OTLR020	CT0327 - Accommodation Complex Installation	Low	Not Set	Low	Not Set	Not Set	Not Set	Not Set	4	Mitigate	M. Peddle	25/03/2016

04. Component 4 - OTL Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
OTLR029	Differing Geotechnical Conditions and Impact on Foundation Installation	Low	High	Low	Low	Not Set	Not Set	Not Set	8	Mitigate	K. Kandaswamy	02/03/2016
OTLR030	Valard's Performance - CT0327-001	High	Low	High	Medium	Medium	Low	Not Set	16	Mitigate	J. Kean	12/02/2016
OTLR031	Access Scope Growth	High	High	Low	Not Set	Not Set	Not Set	Not Set	16	Mitigate	K. Sparkes	12/02/2016
OTLR032	Construction Permit Delays	Medium	Medium	Low	Not Set	Not Set	Not Set	Not Set	9	Mitigate	D. Haley	25/03/2016
OTLR033	ROW Route Changes	Low	Medium	Low	Not Set	Not Set	Not Set	Not Set	6	Mitigate	K. Kandaswamy	12/02/2016
OTLR034	Discovery of New Archaeological Sites	Very Low	Low	Very Low	Not Set	Not Set	Not Set	Not Set	2	Accept	D. Haley	12/02/2016

04. Component 4 - OTL Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
OTLR035	Integration - Impact on C4 Scope	Low	Medium	Low	Not Set	Not Set	Not Set	Not Set	6	Mitigate	J. Kean	12/02/2016
OTLR036	Interface Management - C4 and Other Components	Medium	Medium	Low	Not Set	Not Set	Not Set	Not Set	9	Mitigate	K. Kandaswamy	02/03/2016
OTLR037	Material Delays due to Manufacturing	Very Low	Very Low	Very Low	Not Set	Not Set	Not Set	Not Set	1	Mitigate	P. Hussey	27/02/2016
OTLR038	Material Delays - Damage during shipment	Low	Very Low	Very Low	Not Set	Not Set	Not Set	Not Set	2	Mitigate	P. Hussey	04/03/2016
OTLR039	LRM - Construction Duration	Very High	High	Very High	Not Set	Not Set	Not Set	Not Set	25	Mitigate	K. Kandaswamy	12/02/2016
OTLR040	Temporary Water Crossing Removal post Construction	Medium	Medium	Not Set	Not Set	Not Set	Low	Not Set	9	Mitigate	D. Haley	26/03/2016

04. Component 4 - OTL Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
OTLR042	Forest Fire	Low	Not Set	Low	Not Set	Medium	Not Set	Not Set	6	Mitigate	B. Bishop	25/03/2016
OTLR043	Lack of Safety Culture	Medium	Not Set	Not Set	Not Set	Medium	Not Set	Not Set	9	Mitigate	J. Kean	25/03/2016
OTLR044	Spring Break-up	Very High	High	High	Not Set	Medium	Not Set	Not Set	20	Mitigate	M. Peddle	09/03/2016
OTLR046	Stakeholder Management by Valard	Medium	Not Set	Not Set	Not Set	Not Set	Not Set	Low	6	Mitigate	S. Pamar	27/02/2016
OTLR047	Valard's Performance - Leadership and PM Competencies	High	High	High	Medium	Medium	Low	Medium	16	Mitigate	J. Kean	09/03/2016
OTLR048	Availability of ROW	Low	Low	Low	Not Set	Not Set	Not Set	Not Set	4	Mitigate	K. Sparkes	19/02/2016

04. Component 4 - OTL Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
OTLR049	Protected Water Sheds	Low	Not Set	Not Set	Not Set	Not Set	Medium	Medium	6	Mitigate	D. Haley	12/02/2016
OTLR050	Construction Access Cost Exposure	Very High	Medium	Low	Medium	Low	Not Set	Low	15	Mitigate	K. Sparkes	19/02/2016
OTLR051	Potential Commercial Claims from Transmission Line Contractor	Very High	Medium	Medium	Not Set	Not Set	Not Set	Medium	15	Mitigate	J. Kean	25/03/2016

Risk Management Report - OTL Risk Register

Date Generated: 18/05/2016

Risk Information									Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete	
OTLR001	CT0341 - Bird Nesting (HVac) (C4)	IF the construction site is located in the forest area used by birds for nesting	THEN the nesting season (May - August) may delay summer clearing activities as recommended by the EA panel leading to project delay	D. Haley	4	Environmental	Mitigate	Develop and implement Avifauna Management Plan	Develop LCP's Avifauna Mgmt Plan	Complete, special plan by Valard allows intrusion into buffers	01/11/2016	29/02/2016	50	100	
								Optimize clearing operations to reduce operational cost exposure	Clearing activities during nesting season are unavoidable due to schedule constraints.	The Avifauna management plan has been successfully implemented for the past two clearing seasons resulting in no construction delays.	01/11/2016	28/02/2017	415	60	
								Develop and implement Avifauna Management Plan	Work with ROW clearing team to optimize implementation for 2016 season	Coordinated by P. Madden	01/11/2016	28/02/2017	415	60	
OTLR015	Hazardous Terrain (HVac / HVdc)	IF a) clearing is planned in winter; b) local ponds and swamp areas are not as visible in winter	THEN equipment and vehicles might run into pond / swamp areas (same with the river itself in case of thin ice) and sink along with the crew, leading to trapping of personnel inside and resulting in fatalities	K. Sparkes	6	Construction	Mitigate	Develop Protocols for Working around Water Bodies	Document Project's standard protocols for working around or near water bodies	Covered in Fresh Start presentations. Shared Learnings from a High Potential Near Miss incident last December. Focused inspections on SafetyNet	01/11/2016	29/02/2016	50	100	
								Develop Protocols for Working around Water Bodies	Ensure a focused awareness as we move into Winter 2016 and venture into new work zones.	Action: B. Bishop/ Contractors following LCP Protocols for Crossing Bogs/Wetlands. New Ribboning Standard developed SafetyNet Mobile Equipment updated for GPS installations and Hatch checking. Ice Safety training for LCP/Contractors	01/11/2016	29/02/2016	50	100	
								Develop Protocols for Working around Water Bodies	Ensure contractors have plans for working around or near water bodies	Ribbon standard. LCP published protocol. Contractor SWP's. GPS technology. Assess for remaining contracts once awarded (if new contractors introduced).	01/11/2016	29/02/2016	50	90	
OTLR016	Safety Incidents vs. Evacuation (HVac / HVdc)	IF a) clearing area is spread for several dozen kilometers; b) some works/ transportation are done by small groups of workers or alone; c) communication equipment is not available in all clearing locations; d) workers are exposed to various hazards (weather, construction, wild life, traffic accidents, etc.)	THEN in the of case of safety incidents (any type) timely evacuation and medical treatment could not be available leading to loss of lives	B. Bishop	10	Construction	Mitigate	Develop and implement effective Emergency Response Plan	Conduct routine drills to test the plan	Remote camp drills are periodically being conducted DC 2 remote location has not yet been tested; being planned Response to serious events has inadvertently tested level of ERPs Mini Audit tools being developed Planning in place to perform DC2 mini audit in March/April	01/11/2016	31/03/2016	81	75	
								Develop and implement effective Emergency Response Plan	Ensure Valard's ERP for interior of Labrador is adequate to cover the risk	Awaiting ERP revisions for DC2 work fronts; have camp ERP only Awaiting Mini Auditing	01/11/2016	31/03/2016	81	50	
OTLR017	Safety: Neighbouring Energised Line (Hvac / HVdc)	IF ROW clearing and line construction is planned in area adjacent to existing energized line of NL Hydro (low height wood poles)	THEN moving equipment could interfere with the adjacent poles or conductors leading to injuries and fatalities	B. Bishop	8		Mitigate	Communicate protocols for working near energized lines	Complete a review of NL Power line elevations from White Hills to Soldier's Pond.	Action owner is John Walsh.Engineering has completed a review of all parallel lines from Clarenville in to Soldiers Pond. These are identified on all route map drawings. Next step is to communicate this layout formally to the construction contractor and review protocols when working around live lines	01/11/2016	29/02/2016	50	50	
								Communicate protocols for working near energized lines	Ensure all contractors adhere to NLH and NL Power protocol for working near energized lines	Complete	01/11/2016	29/02/2016	50	100	
								Communicate protocols for working near energized lines	Establish protocol for marking fibre lines to avoid impact	Complete	01/11/2016	29/02/2016	50	100	
								Communicate protocols for working near energized lines	Implement a focus surveillance program to proactively get ahead of this risk as Valard moves onto the Island	Currently covered through SafetyNet	01/11/2016	29/02/2016	50	1	
OTLR018	CT0327 - Opposition by First Nations Groups (HVdc)	IF a) IBA agreement covers mostly economic aspects of Innu people benefits; b) some Innu people oppose to LCP due to environmental and cultural concerns; c) some other First Nation's people (e.g. Metis) seem to wish benefiting from LCP same way as Innu people	THEN the Representatives of First Nations could block the construction sites to apply pressure on LCP and to promote their agendas leading to schedule delay and reputational damage	M. Peddle	9	External	Mitigate	Security Management	Continue with existing protocols to monitor security threat levels		01/11/2016	29/02/2016	50	1	

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Security Management	Work with Valard to complete a desk-top run through of the security management protocols	Security readiness assessments are conducted by the C4 HSS&ER per shift rotation on the principle contractor's (Valard) assets and facilities. Unfortunately, the principle contractor has been reluctant to participate in LCP assessments and to implement the required level of security measures for commercial reasons. Senior Management has issued an official correspondence on security management implementation. Awaiting follow through from mini Auditing	01/11/2016	29/02/2016	50	80
								Security Management	Develop a Security Management Protocol for the SPRR work sites, including a review of threats and exposures	Security Plan submitted but not executed; formal letter gone to Valard to this effect. Gaps have been identified. Quebec Innu protest document developed by LCP and communicated to all affected Contractors Awaiting Valard response to formal letter	01/11/2016	30/04/2016	111	50
OTLR020	CT0327 - Accommodation Complex Installation	IF a) camps are supposed to be installed by contractors; b) locations of camps are very remote	THEN a delay in camp installation and providing accommodation could occur leading to package schedule delay	M. Peddle	4		Mitigate	Assist Valard when possible	Assist Valard with acquisition of crown lands to support camp installation		01/11/2016	29/02/2016	50	1
								Ensure contractor has a clear plan and implements plan for accommodations	Clarify Valard's plans for accommodations to support LRM	Under review	01/11/2016	29/02/2016	50	1
								Assist Valard when possible	Coordinate free-issue of rooms at MF camp		01/11/2016	29/02/2016	50	1
								Assist Valard when possible	Evaluate options to leverage JCL's km83 camp to support Valard	Nalcor negotiated with JCL the availability of approximately 70 beds to be available to Valard. Nalcor has requested to Valard to consider the additional beds. Valard sent email to Nalcor on 18-february 2016 confirming no beds are required for Valard use	01/11/2016	29/02/2016	50	100
OTLR029	Differing Geotechnical Conditions and Impact on Foundation Installation	IF as a result of geotechnical conditions differing from that contained in the desktop study,	THEN there is a risk of either: (1) the foundation designs for the HVdc line are unsuitable, and/or (2) the estimated quantities of pile increase, and/or (3) balance between rock and soil dramatically change, and/or (4) length of required guy anchor substantial increases, and/or (5) amount of import backfill increases beyond the pay items in the contract resulting in cost and potential schedule exposure due to increase in more difficult foundations or unavailability of supplemental material to support construction requirements.	K. Kandaswamy	8		Mitigate	Increased awareness and supervision of Valard work to eliminate construction workmanship errors	Complete forensic evaluation of all failed grillage foundations	5 reports submitted to database, 2 outstanding and in progress I require clarification	01/11/2016	29/02/2016	50	70
								Implement a geotechnical program and advanced groundtruthing	Define a geotechnical program for Terra Nova winter zone	Action Owner is Nazmi Boran. Test pitting program has commenced and currently underway	01/11/2016	29/02/2016	50	70
								Evaluate alternate designs that will offset geotechnical risk	Develop micro-pile design with Valard and have available to support construction		01/11/2016	29/02/2016	50	1
								Increased awareness and supervision of Valard work to eliminate construction workmanship errors	Ensure LCMC QA resources are focused on problems areas	Action Owner is Dennis Lever	01/11/2016	29/02/2016	50	1
								Evaluate alternate designs that will offset geotechnical risk	Evaluate guy anchor design in order to optimize installed lengths		01/11/2016	29/02/2016	50	1
								Evaluate alternate designs that will offset geotechnical risk	Evaluate optimization opportunities regarding backfill requirement		01/11/2016	29/02/2016	50	1
								Increased awareness and supervision of Valard work to eliminate construction workmanship errors	Ongoing continuous monitoring and create records to justify potential claims of "change in sub surface conditions"	Action Owner is Mark Peddle Large focus has been initiated by the Nalcor team to focus on closure of outstanding letters between Valard and Nalcor. Some of these letters (0124) are associated with foundation selection & installation process ? Bearing Capacity Improvements. Input has been gathered from the Nalcor engineering, construction and quality field teams	01/11/2016	29/02/2016	50	1

Risk Information									Action Information					
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Implement a geotechnical program and advanced groundtruthing	Sanction Geotechnical investigation program to access location that may potentially be unsuitable Grillage or Rock foundation	Based on the outcome of the investigation will opt for driven pile installation option.	01/11/2016	29/02/2016	50	45
								Surplus / contingency foundation secured to support unexpected quantity requirements	Secure additional materials as required	Action Owner is Pat Hussey. Will order additional material if need arises	01/11/2016	29/02/2016	50	100
								Evaluate alternate designs that will offset geotechnical risk	Trend usage of non-native backfill	Action owner is Nazmi Boran. Trend is continuously monitored	01/11/2016	29/02/2016	50	45
								Surplus / contingency foundation secured to support unexpected quantity requirements	Monitor usage trend of each foundation and forecast requirement for all supplemental material.	Action Owner is Nazmi Boran. Trend is continuously monitored	01/11/2016	29/04/2016	110	50
								Implement a geotechnical program and advanced groundtruthing	Continuously validate Valard's foundation selection procedure to ensure it reflects Project constraints and field conditions	Action owner is Mark Peddle Valard's foundation selection procedure has been revised to revision C3 based on feedback from Nalcor Team. The selection procedure is applicable to S1 and S2 only. Nalcor have requested Valard to expand foundation selection procedure for Segments 3 and 4 on the northern peninsula	01/11/2016	31/05/2016	142	40
								Surplus / contingency foundation secured to support unexpected quantity requirements	Maintain consumption log and work with procure to order additional materials when required	Action Owner is Maria Veitch. This action will continue until foundation installation is complete.	01/11/2016	11/01/2017	661	10
OTLR030	Valard's Performance - CT0327-001	If as a result of Valard's slow start-up on the HVdc line and ongoing productivity challenges, which has resulted in a lag against plan,	there is a significant likelihood of Valard not being able to deliver the line to support the Project's start-up sequence. As well costs associated with Part B may increased in order to ensure the ROW access is maintained for the incremental period.	J. Kean	16	Commercial	Mitigate	Rebaseline Schedule	Request Valard to develop a rebaseline schedule for the Program	Action Owner Mike Tuff. Request sent. Received unmitigated plan Draft plan received in early Feb and under review. Planning workshop to be held 2-March.	01/11/2016	29/01/2016	19	100
								Eliminate excuses	Timely resolution of open Site Queries	Action Owner Maria Veitch. This action is complete. Site Queries are regularly resolved in timely manner. Open communication between Valard and Engineering on urgent queries.	01/11/2016	25/02/2016	46	100
								Ensure Valard's parent Quanta Services are fully engaged	Discuss the future of ROW and Valard's involvement therein	Internal discussions underway re Valard's role in ROW.	01/11/2016	29/02/2016	50	10
								Eliminate excuses	Ensure daily communication is occurring between Valard and LCMC field staff	Action owner Mark Peddle. A new weekly ?workface? meeting has been established every Saturday morning, between Nalcor Eng/Const/Quality and Valard Eng/Const/Quality groups. The purpose of the meeting is to provide "tactical/field" focus on: prioritizing and progressing aspects of field work identify and resolve roadblocks align resources to "focused" areas promote "collaboration" among the teams In conjunction with the meeting, MOM and associated action register are developed and issued to all in attendance	01/11/2016	29/02/2016	50	40
								Rebaseline Schedule	Ensure ROW remains available for Valard	Focus must be on locking down strategy for LRM and resolving a way forwards in Blocks 17 & 18.	01/11/2016	29/02/2016	50	30
								Eliminate excuses	Ensure strong LCMC field engineering presence in the field in order to respond to queries	Added new staff	01/11/2016	29/02/2016	50	50
								Eliminate excuses	Identify field execution challenges on foundation installation being experienced by Valard and work to find solutions	On-site visit occurred during the period of 17-22 Feb which produced fruitful results. Regular visits to continue in order to get them performing at the desired level.	01/11/2016	29/02/2016	50	20
								Ensure Valard's parent Quanta Services are fully engaged	Timely engagement of the Steering Committee in Q1-2016	Meeting held with COO and CP of Quanta on 14-January. Future meeting planned. Commercial meeting scheduled for 1-March.	01/11/2016	29/02/2016	50	1
								Eliminate excuses	Timely resolution of open CR and other commercial issues	Action Owner Rosann Taylor Working through open CRs for both CT0319-001 and CT0327-001.	01/11/2016	29/02/2016	50	1
								Rebaseline Schedule	Evaluate potential concurrent delays with C3 for the purposes of identifying any potential schedule float	Float watch in IPS to be initiated along with increased communication with C3 PM to discuss Alstom delivery risk. Updated LTA-LIL schedule risk analysis has been completed which will facilitate decision analysis	01/11/2016	30/06/2016	172	30

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
OTLR031	Access Scope Growth	If due to a change in requirements and resulting time to complete the necessary engineering and field investigation,	Then the requirements for ROW access grows, increasing potential costs and schedule.	K. Sparkes	16	Construction	Mitigate	Evaluate optimization opportunities	Define an access plan for Blocks 17 & 18 that leverages existing access and off highway opportunities	Plan being ground truthed. Limp sum contract reduces commercial risk.	01/11/2016	29/02/2016	50	100
								Evaluate optimization opportunities	Develop access plan for Blocks 15 and 16 that balances utilization of existing road networks against new bridging requirements	Terra Nova Winter Zone being evaluated	01/11/2016	29/02/2016	50	90
								Transfer risk via contracting strategy	Issue an RFP for unit price clearing in Blocks 17 & 18 and compare against blended T&M and unit rate model	Contract awarded	01/11/2016	29/02/2016	50	100
								Transfer risk via contracting strategy	Seek Valard's interest in self-performing access in Blocks 17 & 18	Close. Although Valard confirmed interest/intent, this was later withdrawn.	01/11/2016	29/02/2016	50	100
OTLR032	Construction Permit Delays	If as a result of the inability to either (i) proactively identify the requirement for, or (ii) the processing time (i.e. capacity constraints, multiple department interfaces) required by the various regulators,	Then, permits (e.g. quarry permits and camp) are not provided in the timeline required to support construction activities.	D. Haley	9	Regulatory	Mitigate	Timely identification of requirements	Established a process to receive timely notice from Construction Managers on Quarry and Borrow area needs.	Process established and agreed to by Regulator and field construction managers. 4 week notice	01/11/2016	29/02/2016	50	100
								Timely identification of requirements	Groundtruth potential off ROW quarry locations required in Blocks 15 & 16	Quarry application have been submitted on-time to the provincial regulators.	01/11/2016	29/04/2016	110	100
								Increase awareness within regulatory of criticality of permits to the Project	Review with regulators est. number permit approves in 2016 with objective of seeking approvals within 2 week notice period.	A list of required quarry locations for the balance of the TL has been drafted and is currently being reviewed by the Lands Group (proactive approach). Once finalized it will be issued to the Government for review and approval. The list includes multiple ?alternative? sites so this should minimize additional permit requests identified at the time of construction. The two week government response time will be discussed once the results of the remaining permit reviews are known.	01/11/2016	29/04/2016	110	100
								Timely identification of requirements	Identify potential camp locations requiring permits	Identify potential camp locations that could be used by contractor during construction. Work with regulatory to establish permit in advance to be ready for camp set up in advance of construction. Russell Murphy to work with Dave Haley to identify locations.	16/02/2016	31/05/2016	106	80
OTLR033	ROW Route Changes	If As a result of unexpected land owner claims or discovery of existing contaminated sites in the ROW corridor,	Then the planned ROW route may have to be modified, thereby creating rework and/or adding additional structures.	K. Kandaswamy	6	Construction	Mitigate	Optimize routing Corridor as required	Ensure staffing plan allows for adequate evaluation of re-routes so as not impede forward progression of the work	Action Owner Gokhan Saltan. Final staffing plan is adequate to cover the engineering work in case of such changes in the RoW. Given the progress to date and possibility of reroutes in the remaining un-constructed portions, this risk can be retired.	01/11/2016	29/02/2016	50	1
								Optimize routing Corridor as required	Ensure strong feedback loop from ROW field resources to home office to address any identified issues		01/11/2016	29/02/2016	50	1
								Optimize routing Corridor as required	Maintain liasion with Province re status of progress on ROW	Action owner Gilbert Bennett Landowner claims would not be a basis to reroute the TL. We hold authority to expropriate property interests to address such claims. Assessment of ownership interests on RoW has been completed - owner is John Cooper.	01/11/2016	29/02/2016	50	75
								Continue to implement Real Property Strategy for balance of ROW	Align with clearing the problem or hot spots that could be faced	Action owner John Cooper	01/11/2016	29/10/2016	293	1
OTLR034	Discovery of New Archaeological Sites	If as a result of the unexpected discovery of Archaeological Sites during either of the ROW Clearing, access road construction or line construction phases of the work,	Then unplanned / unscheduled efforts may be required to facilitate the recovery of artifacts as required by the Provincial Archaeology Office.	D. Haley	2	Construction	Accept	Fully implement archeological mitigation strategy	Ensure contractors field resources understand protocol if a discovery were to occur	ongoing risk... low now as work moves to the island	01/11/2016	29/02/2016	50	100
								Fully implement archeological mitigation strategy	Ensure plan exists to cover balance of ROW in 2016		01/11/2016	29/02/2016	50	30
								Fully implement archeological mitigation strategy	Identify and communicate remaining potential hot spots to C4 team		01/11/2016	29/02/2016	50	30

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
OTLR035	Integration - Impact on C4 Scope	If due to design definition with respect to scope integration, there remains a risk that the Project boundaries may grow to support such integration effort,	Then it leads to a risk of schedule delay impacting the delivery date for First Power from Labrador.	J. Kean	6	Interface	Mitigate	Early alignment on TL240	Align with NLH on the approach for TL240 and whether 315kV will be utilized as a interim replacement	Action Owner is Gilbert Bennett Email request once again sent by J. Kean on 24-Feb. Must confirm that work is required pre impoundment to 25m. 316 kV is not expected to be useful as an interim replacement. It will not be used if it leads to an appreciable risk of schedule delay	01/11/2016	29/02/2016	50	40
								Ensure strong interface management and communication of Project constraints exist with NLH	Ensure LCP ExCom are made aware of any constraints associated with NLH interface points	IPS being used to monitor, while schedule risk analysis currently underway with Westney.	01/11/2016	29/02/2016	50	1
								Ensure strong interface management and communication of Project constraints exist with NLH	Work with NLH to develop and align on an outage program for the AC rebuilds scope with NLH	Action owner John Walsh. Outage plan has been developed in conjunction with LCMC, Construction Contractor and NL Hydro's System Operations Department. All outages have been identified, dated and are being discussed and monitored on a daily bases to ensure proper stakeholders are aware of requirements and that outages are granted.	01/11/2016	29/02/2016	50	100
								TL267 Execution Plan to be designed to leverage LCP capabilities	Ensure TL 267 organizational structure capitalizes on synergies between TL 267 and LCP, where possible	Action Owner Kyle Tucker The eventual output will be an organizational chart indicating all TL267 roles and responsibilities. The org structure is ongoing and will be clearer as we move along	01/11/2016	31/05/2016	142	20
								TL267 Execution Plan to be designed to leverage LCP capabilities	Ensure execution balance for TL267 does not distract from focus on LIL	Organizational review is presently underway. Anticipate gap analysis for revised organization to be completed by early March.	01/11/2016	31/10/2017	660	10
OTLR036	Interface Management - C4 and Other Components	If due to a lack of management of interfaces with other Components (C1 / C3 / SOBI / Environment) or timeliness of concurrent construction interfaces,	Then it results in rework, late changes, extra costs, schedule delays, thus contributing to cost growth.	K. Kandaswamy	9	Interface	Mitigate	Active Interface Management	Continue regular meetings with Components	Meetings to discuss and update planning, schedules, and outstanding technical interfaces requiring resolution. Monthly meeting series with C1 set up (every last Thursday of the month). Monthly meeting series with C3 set up (every second Wednesday of the month).	20/01/2016	20/01/2016	1	90
								Active Interface Management	Identify all C4 interface points	Action owner is Snehal Parmar	01/11/2016	29/01/2016	19	100
									Powerhouse Interconnect Deferment	Develop an internal strategy re likely time for deferment of Powerhouse Interconnect scope that cannot be done in 2016 and communicate same to Valard.	13/01/2016	27/02/2016	46	1
								Active Interface Management	Develop a construction coordination plan for C4 activities with other components	Action Owner Snehal Parmar. Include environment as a component. C3 meeting every month in 2016-15-Jan-2016 CF switch yard station service. C1 had in 2015, restarting series for 2016.	20/03/2015	29/02/2016	347	1
								Engaged Contractors in Interfaces	Evaluate options to delay construction interfaces to avoid rework.	Such as resequencing construction activities, negotiation with Components. On-going	20/03/2015	29/02/2016	347	90
								Active Interface Management	Implement the LCP Interface Management Plan within C4 including identifying a interface management focal point		01/11/2016	29/02/2016	50	100
								Engaged Contractors in Interfaces	Obtain interface schedule from contractors for key interfaces	Obtain schedules from Contractors (Valard, Alstom, etc.) for key interfaces (MF power house, MF switch yard, MF converter station, CF switch yard, SP converter station, Shoal Cove, etc). On-going	01/11/2016	29/02/2016	50	90
								Active Interface Management	Continue to nurture relationships between construction management teams of all Components both in the field and in the office.	On-going. Ad hoc meetings are held as and when necessary in the field. Formal meetings held regularly at the office, St. John's.	20/01/2016	29/02/2016	41	1
								Active Interface Management	Identify all C4 interface points	Matrix of interfaces developed and maintained	20/01/2016	29/02/2016	41	100
	Joint review of technical interfaces on regular basis to inform and close queries.	Regular meetings with key technical resources to ensure timely closure of interfaces.	20/01/2016	29/02/2016	41	90								

Risk Management Report - OTL Risk Register

Date Generated: 18/05/2016

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
									Hawke Hill to Soldier's Pond Fibre	Work with C3 to address the implications of delay in the OPGW availability from Hawke Hill to Soldier Pond so as to facilitate commissioning of the ECC upgrades.	13/01/2016	31/03/2016	79	1
								Engaged Contractors in Interfaces	Request Valard for commercial proposal to deal with delayed construction interfaces at Powerhouse and for slack stringing	Action Owner Snehal Parmar. Not Started	02/08/2016	31/03/2016	53	1
OTLR037	Material Delays due to Manufacturing	If due to delay of manufacturing of critical transmission line material, the material required to support construction progress may not be able,	Therefore leading to a risk of delay claims from the construction contractor or risking the overall delivery schedule.	P. Hussey	1	Construction	Mitigate	Ensure timely delivery of free-issued materials	Assign expediting resources to critical Purchase Orders - Jyoti and Locweld	Action owner is Pat Hussey. Actions implemented	01/11/2016	29/02/2016	50	100
								Ensure timely delivery of free-issued materials	Ensure deliveries per the schedule contained in each PO	Action Owner is Pat Hussey. Actions implemented	01/11/2016	29/02/2016	50	100
								Ensure timely delivery of free-issued materials	Ensure tower steel bundling strategy to avoid missing pieces	Action Owner is Craig Roberts	01/11/2016	29/02/2016	50	100
								Ensure timely delivery of free-issued materials	Hold regular materials management coordination meetings with Valard	Action owner is Craig Roberts	01/11/2016	29/02/2016	50	100
								Ensure timely delivery of free-issued materials	Implement Island materials movement plan in coordination with Valard	Action owner is Craig Roberts	01/11/2016	29/02/2016	50	100
								Ensure timely delivery of free-issued materials	Implement materials management system for tracking material receipt and issue	Action owner is Craig Roberts	01/11/2016	29/02/2016	50	100
								Ensure timely delivery of free-issued materials	Ensure adequate quality surveillance is maintained in factory		01/11/2016	31/07/2016	203	50
OTLR038	Material Delays - Damage during shipment	If due to material damage during transit the material required to support construction progress may not be available,	Therefore leading to a risk of delay claims from the construction contractor or risking the overall delivery schedule.	P. Hussey	2	Construction	Mitigate							
OTLR039	LRM - Construction Duration	If as a result of more difficult terrain and harsher weather conditions than expected,	Then the construction in the LRM takes longer than anticipated, which could result in schedule slippage and impact to the critical path.	K. Kandaswamy	25	Construction	Mitigate	Route optimization	Assess market for capable and potential Access construction contractor with unit rate or Lumpsum model to reduce cost exposure.		01/11/2016	29/02/2016	50	1
								Route optimization	Develop a more detailed access plan with engineered cuts and fills which wasn't the case for the rest of the access roads.		01/11/2016	29/02/2016	50	1
								Constructability Evaluation to be undertaken to reduce efforts and ensure success	Evaluate the current construction equipment to ensure that they are suitable for the LRM given the expected road grades.		01/11/2016	29/02/2016	50	1
								Constructability Evaluation to be undertaken to reduce efforts and ensure success	Form a joint task force with Valard and develop a detailed execution plan for this portion of the line.	The Line construction will have work in step with the access construction.	01/11/2016	29/02/2016	50	1
								Consider design optimization for foundations in an effort to simplify construction, yet maintain line integrity.	Review current foundation, Anchor and Tower design to allow helicopter construction model if needed	A few towers may not have direct access to the tower location.	01/11/2016	29/02/2016	50	1
								Route optimization	Review the current line route and explore opportunities to optimize the line route	Action Owner is Shiva Shenoy Completed	01/11/2016	31/01/2017	387	100
OTLR040	Temporary Water Crossing Removal post Construction	If as a result of a lack of agreement with regulators for LCP to not remove the installed temporary bridges and culverts over ?permitted? watercourses to facilitate long term operations access,	Then extensive efforts may be required to remove all temporary water crossings, thus increasing project costs	D. Haley	9	Regulatory	Mitigate	Achieve regulatory alignment with strategy	Initiate communications and consultants with regulator	Scheduled for discussion at Quarterly meeting scheduled for March 2016.	01/11/2016	29/04/2016	110	20
								Early identification of Water Crossings to become Permanent	Identify critical Temporary Water Crossings that will become permanent		01/11/2016	29/05/2016	140	1
								Early identification of Water Crossings to become Permanent	Implement remediation program for any additional works required on water crossings to become permanent		20/01/2016	29/05/2016	131	1
								Achieve regulatory alignment with strategy	Document remediation strategy	Tabled with province	01/11/2016	29/08/2016	232	20
								Early identification of Water Crossings to become Permanent	Implement inspection program to determine if it meets design criteria, potentially allowing it to remain permanent.	In most sites this may be the case as they are remote and the potential for impacts are minimal. Documentation and justification will be required for Regulatory approval. Assessments underway	01/11/2016	29/08/2016	232	8
OTLR042	Forest Fire	IF there is a possibility of wild fires ignited by natural (lightning) or human-related events (equipment, camp, smoking, etc)	THEN forest fires might be started leading to the C4 camp & site evacuation, injuries / fatalities or loss of equipment	B. Bishop	6	Construction	Mitigate	Implement a Forest Fire Preparedness Plan	Ensure Valard's safety plan includes the necessary scenarios for a level of readiness to respond to forest fire threats.	Forest Fire readiness plans have been accepted and scenario tested for effectiveness. Complete	01/11/2016	29/02/2016	50	100

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Implement a Forest Fire Preparedness Plan	Establish a protocol to facilitate curtailment of operations should the threat of fire reach Extreme	Remote Site/Location EOC included in Contractor ERP; supported by Torbay Road EOC. Updated contacts regularly. Complete	01/11/2016	29/02/2016	50	100
								Implement a Forest Fire Preparedness Plan	Ensure all contractors undertaking ROW clearing have a fire prevention plan	Action owner is Ken Sparkes. JCL and SFR have plans. Assess LRM once awarded. Confirm C+T once 2016 work confirmed.	01/11/2016	15/04/2016	96	75
OTLR043	Lack of Safety Culture	If as a result of the a lack of safety culture in the construction workforce as well as a lack of acceptance of accountability by Valard to take the required steps to ensure an adequate level of coaching and guiding,	Then the safety performance is much worst than anticipated with the increased risk of loss.	J. Kean	9	Construction	Mitigate	Maintaining team awareness and	Hold regular C4 team weekly H&S focus meetings	Completed; meet every Thursday morning	01/11/2016	02/12/2016	33	100
								Engaging and retaining contractors who	Hold regular weekly safety meetings with contractors to ensure all are focused on the right issues	Completed; meet every Monday morning	01/11/2016	02/12/2016	33	100
								Engaging and retaining contractors who	Implement a coaching and guiding philosophy within the C4 organization	Completed; FELT Leadership is paramount	01/11/2016	02/12/2016	33	100
								Ensure alignment with the IBEW	Implement the Safety Absolute Process	Completed	01/11/2016	02/12/2016	33	100
								Establishing and implementing a robust,	Recruit and organize competent HSS&ER advisors for C4	Completed; all Advisors in place	01/11/2016	02/12/2016	33	100
								Engaging and retaining contractors who	Ensure senior management alignment within Valard and Quanta wrt the steps required to ensure a safe and productive workplace	To be a core discussion topic in the Steering Committee Meeting.	01/11/2016	29/02/2016	50	1
								Maintaining team awareness and	Ensure visible engagement of C4 Management in H&S activities	Action owner is Kumar Kandaswamy.	01/11/2016	29/02/2016	50	1
								Maintaining team awareness and	Establish safety culture in owner team (attitude and commitment)		01/11/2016	29/02/2016	50	1
								Establishing and implementing a robust,	Complete a reoccurring risk assessment to identify and target H&S focus areas within C4	Ongoing	01/11/2016	30/04/2016	111	25
								Engaging and retaining contractors who	Work with contractor to align on common strategies	Ongoing; intent is to establish bi-weekly on site Functional Manager meetings with Contractor With Ron Matthews	01/11/2016	30/04/2016	111	50
								Ensure alignment with the IBEW	Work with the IBEW to seek their active engagement for safety	Ongoing; have a good working relationship with IBEW officials. Attend their quarterly meetings. Bi-Weekly meetings with Kevin Mullins	01/11/2016	30/04/2016	111	50
								Establishing and implementing a robust,	Fully implement the LCP H&S Management Plan within C4	Under Assessment	01/11/2016	30/06/2016	172	25
OTLR044	Spring Break-up	If spring break-up in 2016 comes early than anticipated or last longer than normal,	Then it compromises the winter construction strategy for the interior of Labrador (S2 1 to 235) thus risking the overall delivery schedule for the line, plus adding cost exposure for LITP associated with repairs of the road post spring break-up.	M. Peddle	20	Construction	Mitigate	Labrador Contingency Plan	Agree with Valard plans for spring shutdown to avoid unnecessary damage to SPRR	Action Owner is Kumar Kandaswamy	01/11/2016	29/02/2016	50	1
								Ensure Valard has a solid plan for Labrador winter zone	Close any open technical issues	Action owner is Kumar Kandaswamy	01/11/2016	29/02/2016	50	1
								Labrador Contingency Plan	Develop and implement monitoring and remediation program for critical water crossing and other high risk access areas	SPRR maintenance plan being developed	01/11/2016	29/02/2016	50	75
								Labrador Contingency Plan	Develop contingency plan for the "What-if" spring break-up comes early or is extended	SPRR closure plan implemented	01/11/2016	29/02/2016	50	100
								Ensure Valard has a solid plan for Labrador winter zone	Ensure Valard has a solid plan for Labrador winter zone	Action owner is Kumar Kandaswamy	01/11/2016	29/02/2016	50	1
								Ensure Valard has a solid plan for Labrador winter zone	Implement advanced geotechnical data collection program to mitigate delay risk	Action owner Mark Peddle Advanced geotechnical data collection program has been implemented. In addition to the current program an additional drill rig has been mobilized (23-feb-2016) to finish geotechnical program in the winter road zone (S2-65 to S2-235) before the spring breakup	01/11/2016	29/02/2016	50	1
								Ensure Island Construction Plan considers Spring break-up restrictions	Understand and address Root Cause of Contractor's quality issues	Action owner is Kumar Kandaswamy	01/11/2016	29/02/2016	50	1
								Ensure Valard has a solid plan for Labrador winter zone	Work with AMEC to implement an appropriate forecasting approach for spring break-up		01/11/2016	29/02/2016	50	1
								Ensure Valard has a solid plan for Labrador winter zone	Work with JCL to secure beds at km83 camp for Valard use post road construction	Valard refused to use JCL camp	01/11/2016	29/02/2016	50	100

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Ensure Island Construction Plan considers Spring break-up restrictions	Work with Valard to identify preferred work locations in order to maximize workability during spring	Action owner is Kumar Kandaswamy. Environment has started to work with Valard on this.	01/11/2016	29/02/2016	50	1
OTLR046	Stakeholder Management by Valard	As a result of Valard's lack of preparedness or acceptance of responsibility to manage stakeholders on the Island (cabin owner associations, local communities, NSF, Outfitters, etc),	Then Stakeholders present a negative picture to the media on the LCP which could damage Nalcor's reputation as well as impact the positive relations established to-date.	S. Pamar	6	External	Mitigate	Develop and implement TL Stakeholder Management Plan. Assume permitting responsibility for camps.	Arrange regular dialogue with Valard to discuss Island stakeholders	P. Madden actively engaged	01/08/2016	02/08/2016	32	50
								Develop and implement TL Stakeholder Management Plan	Review Island Stakeholder Strategy with team in Q1-2016	Action Owner Rosanne Williams. Stakeholder Engagement Plan is complete, implementation is ongoing	01/11/2016	29/02/2016	50	50
								Develop and implement TL Stakeholder Management Plan	Work with Valard to confirm Valard's plan for management of identified stakeholders	Not Started. To come out of regular discussions above Working with Rosanne Williams	01/11/2016	29/02/2016	50	1
								Proactively implement all safety mitigations in the field.	Continue to stress nature of proximity and coexisting of construction to communities and recreational users to Valard Safety	ensure reminders are relayed to their crews with regard to items like vehicle speed, attention to other users (e.g. snowmobilers), interaction with public, recognition of such hazards on tailboards, Step Back cards, etc. On-going. Safety Bulletin and separate e-mails communicated to construction teams (and Valard) regarding Cain's Quest.	20/01/2016	29/02/2016	41	25
								Establish on-the-ground presence to work with and amongst Stakeholders.	Ensure construction team is documenting area conditions prior to start of construction at work fronts.	Requests made to HVdc construction teams, especially in Segment 3.	20/01/2016	29/02/2016	41	25
								Proactively implement all safety mitigations in the field.	Ensure sufficient signage is printed and distributed by Valard to all current and starting work fronts well in advance.	On-going. Cain's Quest signage put up at two HVdc RoW crossings (S2).	20/01/2016	29/02/2016	41	25
								Establish on-the-ground presence to work with and amongst Stakeholders.	Establish and nurture relationships with key stakeholders at the ground level	Participating in community meetings, town halls, etc. to understand concerns and relay messages back to LCP. On-going. Meeting to be held 10-Mar-2016 in Hawkes Bay with community on employment options.	20/01/2016	29/02/2016	41	50
								Establish on-the-ground presence to work with and amongst Stakeholders.	Establish focal point LCP resource on the ground for each work front	On-going	20/01/2016	29/02/2016	41	1
								Proactively implement all safety mitigations in the field.	Work with Communications and Stakeholder Relations teams to publish schedule, work front maps, etc.	Need to ensure material is in appropriate communities and mediums (radio, magazines, posters, public gathering areas (incl. gas stations, etc.) On-going. Cain's Quest maps sent out recently.	20/01/2016	29/02/2016	41	25
OTLR047	Valard's Performance - Leadership and PM Competencies	IF as a result of Valard's lack of strong PM leadership and implementation of the required level of PM competencies for a project of this size and scale,	Then the ability to effectively organize and undertake the construction effort in a timely and productive manner is impaired, leading to schedule exposure for LITP as well as Valard losing money, which eventually could resurface as a claim.	J. Kean	16	Commercial	Mitigate	Help Valard see the gaps	Address the Steering Committee with concerns and seek commitment to address within fixed period	Meeting held with COO and CP of Quanta on 14-January. Future meeting planned. Commercial meeting scheduled for 1-March.	01/11/2016	29/02/2016	50	1
								Protect LITP Position	Continue to insist and enforce contractual requirements and commitments.	Additional commercial resources will be added to the team in the near term.	01/11/2016	29/02/2016	50	1
								Identify solutions for Valard	Ensure any excuses for non-performance due to LCMC are eliminated	Ongoing	01/11/2016	29/02/2016	50	1
								Help Valard see the gaps	Ensure clear contractual communication of identified shortfalls and concerns	Action Owner Rosann Taylor	01/11/2016	29/02/2016	50	1
								Protect LITP Position	Ensure LITP contractual position is documented in order to fully protect its rights under the Agreement	Ongoing	01/11/2016	29/02/2016	50	1
								Protect LITP Position	Increased our oversight for all disciplines to make sure we complement where needed.	Environment. Area Manager - HVdc added; assessing field foundation staffing.	01/11/2016	29/02/2016	50	1
								Identify solutions for Valard	Outline solutions to Valard's challenges and work with Valard to implement	Pending	01/11/2016	29/02/2016	50	1
								Help Valard see the gaps	Regular meetings both structured and site level to facilitate communication.	Weekly Workface Meetings are being held each Friday and chaired by M. Peddle	01/11/2016	29/02/2016	50	1
OTLR048	Availability of ROW	IF as a result of the lack of available ROW for Valard given LCMC's decision to assume control,	Then Valard will have the basis of submitting a delay claim to LITP.	K. Sparkes	4	Commercial	Mitigate	Ensure ROW and access schedule does not impede TL construction	Aggressive completion of Blocks 9, 10, 11, 13, 14, partial 12 before winter shutdown.	All work now shutdown. Punch lists in place. Very good effort to close items before shutdown. Remaining items minimal.	01/11/2016	29/02/2016	50	100

Risk Information									Action Information					
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Ensure ROW and access schedule does not impede TL construction	Developing strategy for Long Range Mountains. On the north end, planning to get to S4-440 before winter shutdown.	Work complete to 440.	01/11/2016	29/02/2016	50	100
								Protect LITP Position	Ensure LITP contractual position is documented in order to fully protect its rights under the Agreement	Done through a series of letters by Jason.	01/11/2016	29/02/2016	50	100
								Ensure ROW and access schedule does not impede TL construction	Ensure operational planning for Blocks 15 & 16 ensures completion by dates established in the Agreement	Terra Nova winter zone being evaluated	01/11/2016	29/02/2016	50	75
								Ensure ROW and access schedule does not impede TL construction	Issue RFP for Block 17/18 clearing with intent to complete to Soldiers Pond by december 2016.	Contract awarded	01/11/2016	29/02/2016	50	100
								Transfer risk via contracting strategy	Negotiate with Valard to self-perform winter access for Shoal Cove winter zone (Segment 3, 1 - 94)	Change Order issued	01/11/2016	29/02/2016	50	100
								Transfer risk via contracting strategy	Request Valard for a self-performing plan for Blocks 17 & 18	Close. No longer self performing	01/11/2016	29/02/2016	50	0
								Protect LITP Position	Work with LCP Disputes Avoidance Team to build the necessary defense to support a ROW claim	ongoing. Led primarily by Jason	01/11/2016	29/02/2016	50	1
								Transfer risk via contracting strategy	Request Valard for a self-performing plan for Terra Nova winter zone	2016/2017 winter item	01/11/2016	30/09/2016	264	1
OTLR049	Protected Water Sheds	As a result of Valard's lack of adherence to the restrictions posed for working in Protected Water Shed areas,	THEN LITP is exposed to the impact of charges from regulators as well as negative public image.	D. Haley	6	Construction	Mitigate	Implement Project Environmental Protection Plan	Develop a resource deployment strategy to ensure adequate OSEM coverage for these higher risk areas	Public water supply areas are now flagged and monitored directly. Active engagement with contractors on increased EPP requirements. Going well	01/11/2016	29/10/2016	293	75
								Implement Project Environmental Protection Plan	Ensure Contractor's EPP align with LCP's EPP and that Contractor's are fully implementing. focus on fuel handling.	Valard has prepared a proposed revision to the fuel handling provision of the EPP. This ?less restrictive? proposal will be evaluated and tabled with t he Regulator.	01/11/2016	29/10/2016	293	75
								Implement Project Environmental Protection Plan	Work with contractors to complete a readiness review before work commences in these sensitive areas	Underway	01/11/2016	29/10/2016	293	75
OTLR050	Construction Access Cost Exposure	If due to poor on-site geotechnical conditions (poor OM or bog) in the Right of Way for Blocks 15 - 18,	Then construction techniques and productivities for access road construction must alter (e.g. rock ballasting, bypass roads, cordroy), thus slowing production and increasing the unit cost for road construction beyond plan.	K. Sparkes	15	Construction	Mitigate	Evaluate optimization opportunities	Define an access plan for Blocks 17 & 18 that leverages existing access and off highway opportunities	Plan being ground truthed. Lump sum contract reduces commercial risk	01/11/2016	29/02/2016	50	100
								Evaluate cost exposure for ROW maintenance post construction	Develop a view of "operational" cost for access following hand-over to Valard Part A	Action owner Mike Tuff. Requires updated estimate based on current plan	01/11/2016	29/02/2016	50	1
								Evaluate optimization opportunities	Develop an access plan for Blocks 15 - 16 that balances utilization of existing road networks against new bridging requirements	Terra Nova winter zone being evaluated	01/11/2016	29/02/2016	50	90
								Evaluate cost exposure for ROW maintenance post construction	Work to identify commercial strategies to optimize access maintenance cost, including use of Valard		01/11/2016	30/04/2016	111	1
OTLR051	Potential Commercial Claims from Transmission Line Contractor	If due to poor planning strategies; i.e. a lack of proactive resource planning and under-developed and inefficient execution plans	Then contractor could be forthcoming with claims.	J. Kean	15	Commercial	Mitigate	Address claims and open commercial items in a timely fashion	Address Valard's Monthly Reports - ensure timely submittal and accurate information	Action owner Rosann Taylor	01/11/2016	29/02/2016	50	1
								Address claims and open commercial items in a timely fashion	Arrange regular working meetings between LCMC and Valard management to discuss open commercial issues	Monthly Commercial Meeting to be scheduled. Quarterly Steering Committee Meetings to be reaffirmed.	01/11/2016	29/02/2016	50	1
								Address claims and open commercial items in a timely fashion	Develop a plan to address existing commercial items	Team is working through all open commercial issues via an internal weekly commercial meeting (Tuesday AM). Commercial Manager will be assigned to support the team.	01/11/2016	29/02/2016	50	20
								LCMC resources on the ground proactively monitoring Contractor's resource loading and workloads	Ensure all open actions are resolved in a timely fashion		01/11/2016	29/02/2016	50	1
								LCMC resources on the ground proactively monitoring Contractor's resource loading and workloads	Ensure LCMC field resources capture accurate records of what occurred each day in the field using Daily Construction Report	Action owner Dennis Lever	01/11/2016	29/02/2016	50	1
								LCMC resources on the ground proactively monitoring Contractor's resource loading and workloads	Instruct (and remind) team to utilize Aconex Mail as well as copy Contract Administrator	Action owner Rosann Taylor	01/11/2016	29/02/2016	50	1
								Address claims and open commercial items in a timely fashion	Publish an internal weekly contract status report	Action Owner Rosann Taylor	01/11/2016	29/02/2016	50	1

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
								Address claims and open commercial items in a timely fashion	Work with LCP Disputes Avoidance Team to build the necessary defense to support a ROW claim	Meetings held. Activities underway.	01/11/2016	29/02/2016	50	10

ATTACHMENT A.5

05. SOBI - MCT Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
MCTR001	MWS Unknown requirements	High	Low	Low	Not Set	Not Set	Not Set	Not Set	8	Mitigate	MCTadmin	10/02/2016
MCTR002	C3 Construction Interface	Very High	Low	Nil	Nil	Nil	Nil	Nil	10	Mitigate	MCTadmin	10/02/2016
MCTR003	Overarching project schedule changes	Very High	Medium	Nil	Nil	Nil	Nil	Nil	15	Mitigate	MCTadmin	10/02/2016
MCTR004	Delay to Completions/Commissioning Handover	Very High	Medium	Nil	Nil	Nil	Nil	Nil	15	Mitigate	MCTadmin	10/02/2016
MCTR005	Over-sight and Team Depth	Medium	Low	Nil	Very Low	Low	Nil	Nil	6	Retire	MCTadmin	10/02/2016
MCTR006	Protests/Vessel Interference	Medium	Low	Low	Nil	Nil	Nil	Nil	6	Mitigate	MCTadmin	10/02/2016

05. SOBI - MCT Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
MCTR007	Sea Ice Season in SOBI	Medium	Medium	Very Low	Nil	Nil	Nil	Nil	9	Mitigate	MCTadmin	10/02/2016
MCTR008	Unexpected conduit conditions	Medium	Medium	Nil	Nil	Nil	Nil	Nil	9	Mitigate	MCTadmin	10/02/2016
MCTR009	Marine Campaign Readiness	Medium	Low	Not Set	Nil	Nil	Nil	Nil	6	Mitigate	MCTadmin	10/02/2016
MCTR010	Poor weather conditions	Medium	Medium	Low	Nil	Nil	Nil	Nil	9	Mitigate	MCTadmin	10/02/2016
MCTR011	Transpooling Issues	Very Low	Low	Not Set	Nil	Nil	Nil	Nil	2	Mitigate	MCTadmin	10/02/2016
MCTR012	Pull-in Arrangement	Low	High	Low	Nil	Nil	Nil	Nil	8	Mitigate	MCTadmin	10/02/2016

05. SOBI - MCT Live Risk Index



Code	Name	Probability	Cost	Schedule	Quality	Safety	Environment	Reputation	Score	Approach	Owner	Next Review
MCTR013	Nexans Readiness	Medium	Medium	Medium	Nil	Nil	Nil	Nil	9	Mitigate	MCTadmin	10/02/2016
MCTR014	Insufficient Site Resources (contractor)	Medium	Low	Low	Nil	Nil	Nil	Nil	6	Mitigate	MCTadmin	10/02/2016
MCTR015	High volume of rock moved in short time on-site	Very High	Nil	Nil	Nil	High	Nil	Nil	20	Mitigate	MCTadmin	10/02/2016
MCTR016	Quay Degradation	Medium	Nil	Medium	Low	Nil	Nil	Nil	9	Mitigate	MCTadmin	10/02/2016
MCTR017	Excess Rock Requirements	High	Medium	Nil	Nil	Nil	Nil	Nil	12	Mitigate	MCTadmin	10/02/2016
MCTR018	Post SRI cable system test failure	Low	High	High	Nil	Nil	Nil	Nil	8	Mitigate	MCTadmin	20/02/2016

Risk Information										Action Information					
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete	
MCTR001	MWS Unknown requirements	MWS requirements, due to the tendencies of the specific MWS, are unpredictable at times.	Financial impacts for primary contractor and schedule delays.	MCTAdmin	8	Interface	Mitigate		Early Engagement	Early engagement of MWS to determine requirements; Early high level scrutiny of contractor procedures. Alternative MWS	01/11/2016	30/11/2016	325	25	
MCTR002	C3 Construction Interface	C3 construction interface at Transition Compounds during critical completions operations.	Inability or inefficiencies in completing contractual testing requirements of cable systems prior to vessel demobilization; delayed handover and acceptance	MCTAdmin	10	Interface	Mitigate		Early Identification	Early identification of Nexans/MCT requirements used as input into C3 planning; implementation of SIMOPs procedure	01/11/2016	01/11/2016	1	50	
MCTR003	Overarching project schedule changes	Overarching project schedule changes have impact on MCT contractor timelines, since MCT will complete portion of the project early.	Delays or changes to baseline MCT contractor schedules; Additional PMT required	MCTAdmin	15	Completion	Mitigate		Post-installation planning	Understand project schedule changes and ensure that it is accounted for in contractor planning	01/11/2016	31/05/2017	507	10	
MCTR004	Delay to Completions/Commissioning Handover	Delay to Completions/Commissioning Handover due to any delays in overall project schedule	Numerous impacts, inclusive of additional PMT requirements, contractor warranty periods, equipment unutilized for longer periods resulting in additional GVI and testing, additional spare storage and preservation.	MCTAdmin	15	Commissioning and Start-up	Mitigate		Extension Plans	Understand and outline the delays, build extension plans as efficiently as possible	01/11/2016	31/03/2016	81	20	
MCTR005	Over-sight and Team Depth	Over-sight and Team Depth during a busy 2016 construction/installation season.	2016 construction season is more onerous than 2015, where the team was heavily utilized/taxed.	MCTAdmin	6	Construction	Retire		Additional Resources	Mobilization of additional MFL resources to supplement current team (5 resources previously identified/allocated)	01/11/2016	31/01/2016	21	50	
MCTR006	Protests/Vessel Interference	Protests/Vessel Interference possible due to high visibility of installation campaign.	Vessel and site schedule impacts	MCTAdmin	6		Mitigate		Stakeholder Engagement	Continued stakeholder engagement; ensure site security policies are understood and working/enforced	01/11/2016	30/11/2016	325	10	
MCTR007	Sea Ice Season in SOBI	Heavy/late sea ice season in SOBI always a possibility.	Delay to complete vessel campaign in summer; exposed to additional WOW as the installation season moves into the fall	MCTAdmin	9	Construction	Mitigate		Vessel Call-off/Allowances	Work has been planned to avoid ice season (vessel call off) and no float out. Allowances included in original budget	01/11/2016	15/07/2016	187	75	
MCTR008	Unexpected conduit conditions	Unexpected conduit condition (e.g. marine growth, dislodged pig)	Additional vessel works required on CIV or other construction vessel to remediate issues	MCTAdmin	9	Construction	Mitigate		Early 2016 Survey	Early 2016 survey work planned to validate condition prior to CIV arrival. Allows time for remediation plans and equipment to be developed and procured in-time for cable installation	01/11/2016	13/06/2016	155	30	
MCTR009	Marine Campaign Readiness	Readiness for vessel campaign: heavy pre-works and engineering requirement from cable contractor	Vessel delays and inefficient installation	MCTAdmin	6	Construction	Mitigate		Engineering surveillance	High degree of company engineering surveillance and involvement in contractor execution planning	01/11/2016	30/06/2016	172	40	
MCTR010	Poor weather conditions	Poor weather conditions (wind, waves, currents) inherent with work in SOBI.	cable installation schedule duration variations result in coordination issues with SRI vessel and other transition compound works. Increase in PMT requirements	MCTAdmin	9		Mitigate		installation flexibility	Monitor weather conditions and build-in installation flexibility, where possible	01/11/2016	30/11/2016	325	5	
MCTR011	Transpooling Issues	Transpooling issues - kinking cable damage	Transpooling is a manual process and can result in damage to the cable that would require repair. Repairs can be tolerated everywhere but the borehole.	MCTAdmin	2	Construction	Mitigate		Procedures	Cable has already been transpoiled successfully and without incident. Utilize same resources, processes and lessons learned implementation	01/11/2016	25/03/2016	75	20	
MCTR012	Pull-in Arrangement	Procedure/pull-in arrangement (long distance, record-breaking pull-in)	Issues during pull-in due to length (friction, cable damage, winch loading etc?)	MCTAdmin	8	Construction	Mitigate		Extensive engineering checks	Ensure extensive engineering plans and procedures have been implemented.	01/11/2016	01/11/2016	1	75	
MCTR013	Nexans Readiness	Nexans readiness - Procurement and management of local contractors	inefficiencies in execution resulting in schedule delays and cost increases on reimbursable works	MCTAdmin	9	Construction	Mitigate		Lessons Learned employment	2015 installation lessons learned, coupled with appropriate application of MCT constructability risk analysis and oversight	01/11/2016	10/10/2016	274	10	
MCTR014	Insufficient Site Resources (contractor)	Insufficient contractor site resources has been an ongoing challenge from previous campaigns.	Inefficiencies in the work and additional MCT PDT utilization	MCTAdmin	6	Construction	Mitigate		Contractor influence	Push contractor to resource appropriately	01/11/2016	05/02/2016	113	25	
MCTR015	High volume of rock moved in short time on-site	High volume of rock moved in short time on-site	Significant volume of rock moving over a sharp inclined road in a short time frame leads to high risk from the H&S perspective	MCTAdmin	20	Construction	Mitigate		Plans, procedures and oversight	Establish appropriate plans and procedures and implement with appropriate oversight; heightened safety culture awareness	01/11/2016	30/11/2016	325	5	
MCTR016	Quay Degradation	Quay degradation prior to or during installation	Inability to load vessel results in schedule delays	MCTAdmin	9		Mitigate		Early Survey and Equipment Mobilization	Early survey of quay in spring to assess damage and repair accordingly; ensure appropriate equipment is on standby/available to expedite quay repair during installation campaign	01/11/2016	30/06/2016	172	15	

Risk Information								Action Information						
Code	Title	Description (Cause)	Impact Summary (Effect)	Owner	Score	Category	Approach	Mitigation Step	Action Name	Action Output	Action Start	Action End	Action Duration	% Complete
MCTR017	Excess Rock Requirements	Excess rock required due to free spans, route changes, unforeseen seabed conditions and subsidence	Additional rock required leading to meet the target design	MCTAdmin	12	Construction	Mitigate		Tight Tolerances during Cable Lay	Tight tolerance on cable lay procedures to minimize free spans; try to eliminate last-minute route changes; implementation of third party surveyors for validation of rock quantities; several team members executed rock placement campaigns with same vendor; leverage their lessons learned	01/11/2016	30/11/2016	325	5

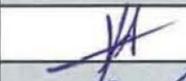
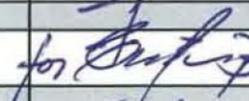
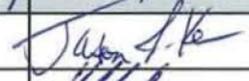
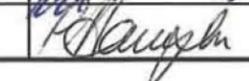
ATTACHMENT A.6

Period Ending: 25 January 2016
Currency : \$ CAD

		MF	LITL	LTA	LCP	LCP (Previous Month)
Base Estimate + Escalation	A	2,674,309,066	2,523,121,031	637,207,172	5,834,637,269	5,834,637,269
Contingency	B	226,849,222	86,627,861	54,375,314	367,852,397	367,852,397
Original Control Budget (OCB)	C = A+B	2,901,158,288	2,609,748,892	691,582,486	6,202,489,666	6,202,489,666
Approved Scope changes (PCNs)	D	940,593,383	478,012,639	222,719,292	1,641,325,314 ⁽³⁾	1,640,056,523
Current Control Budget (Excluding Contingency)	E = A+D	3,614,902,449	3,001,133,670	859,926,464	7,475,962,583	7,474,693,792
Deviations from CCB	F	5,026,978	41,867,315	-7,478,187	39,416,106 ⁽³⁾	5,425,537
Forecasted Available Contingency	G	66,036,103	46,377,174	25,109,099	137,522,376	172,781,736
Final Forecast Cost (FFC)	I = E+F+G	3,685,965,530	3,089,378,159	877,557,376	7,652,901,065 ⁽¹⁾	7,652,901,065
FFC - OCB	I - C	784,807,242	479,629,267	185,974,890	1,450,411,399	1,450,411,399

Notes:

1. The Final Forecasted Cost includes the cost impact of executed LNTP's, Contracts, PO costs and contingency
2. Refer to "Forecast Variation" documents for details

Prepared by:	Name	Signature	Date
Lead Cost Controller	George Chehab		11-Feb-2016
Reviewed by:			
Project Control Manager	Anthony Embury		11-FEB-2016
Approved by:			
Deputy General Project Manager	Jason Kean		15-FEB-2016
General Project Manager	Ron Power		15-FEB-2016
Project Director	Paul Harrington		16 Feb 2016.



Incurred highlights – January 2016

1. Monthly incurred

Planned Incurred: 206 M

Incurred: 83.6 M

Variance: (122.4) M

Main Causes:

- **MF: (28) M** (Mainly due to lower than expected progress in the Astaldi contract due to slowdown of planned concreting during Q1, delay in re-commencement of the reservoir clearing, incurred adjustment at the North Spur and the North and South Dams, lower than expected Owners' costs)
- **LTA: (13.4) M** (mainly due to lower than expected progress in the HVac TL because Valard has been performing re-work and therefore not progressing as quickly as anticipated in other activities, lower than expected progress in the civil works of the SY, lower than expected Owner's cost. Valard has confirmed a plan for achievement of substantial completion by August 2016)
- **LIL: (81) M** (Mainly due to lower than expected progress in the DC line construction (Planned productivity was too aggressive considering post Xmas ramp-up. Rework in dead end foundations is delaying stringing progress, however recent production in February is providing positive recovery trend. Delay in award of Blocks 17/18 in order to seek best price from market. Switching to winter roads in Labrador reduces unit cost and hence total incurred), schedule delays in the engineering and procurement of the Converters and SP Switchyard, lower than expected progress in the civil works of the converters and the SP Switchyard. Delays in the award of the OTN and repeater sites, however we anticipate catching up on some of the delays before year end, and we are projecting that on a yearly basis, most of the delays will go away)

2. Yearly Incurred (2016)

Yearly budget approved by Nalcor Management for 2016: 2,295 M

Incurred yearly to date: 83.6 M

Forecast for 2016: 2,395 M

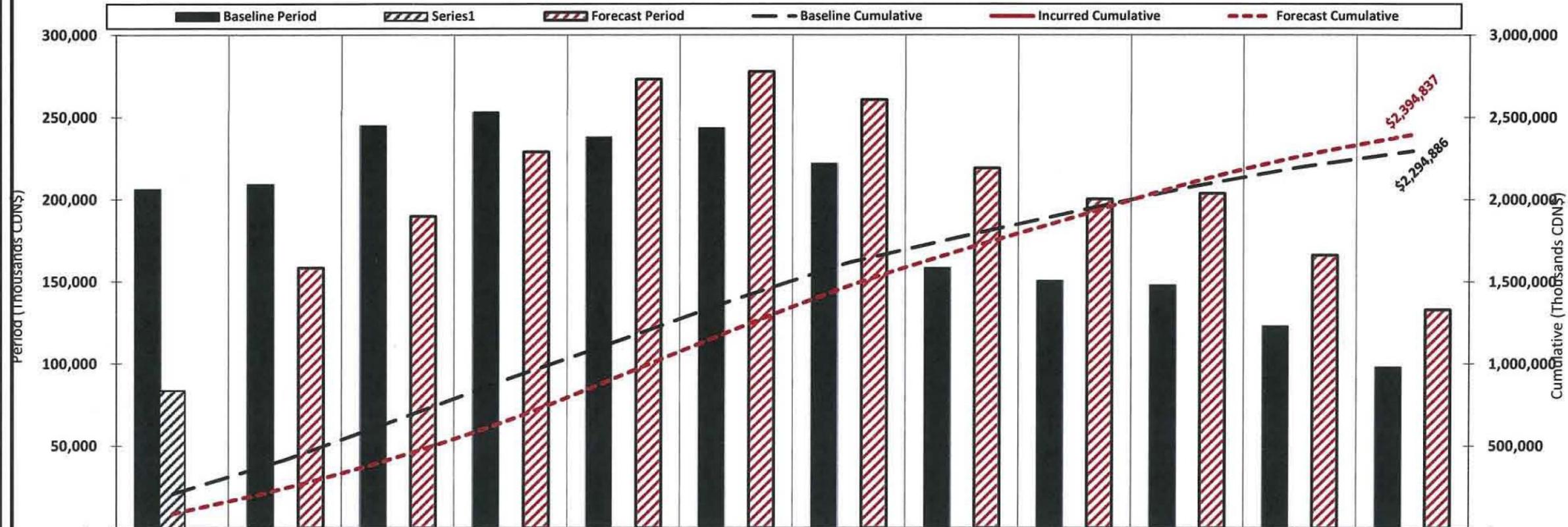
Variance (Forecast vs planned) : +100 M (+4.4%)

- **MF: +29 M** (Mainly related to higher than planned productivity in the Astaldi contract, lower than expected progress in the BoP contract due to delays in the contract award, higher than planned Owner's cost)
- **LTA: +17 M** (Mainly due to better than planned progress in the Switchyards contract to catch up on delays highlighted in 2015)
- **LIL: +54 M** (Mainly due to better than planned progress in the Converters, SP Switchyard and the Synchronous condensers contracts to catch up on delays highlighted in 2015, higher than planned Owner's cost)



LCP Phase I - Muskrat Falls Generation, Lab. Island Transmission Link, Lab Tx Asset
 Current Year Control Budget (Baseline), Incurred and Forecast Cost (Capital only)

For Period Ending: 25-January-2016



Period	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Baseline	206,167	209,228	244,818	253,029	237,764	243,385	221,964	158,556	150,509	148,076	123,144	98,246
Incurred	83,608											
Forecast		158,358	189,899	229,000	273,180	277,813	260,731	219,080	200,306	203,698	166,203	132,960
Cumulative												
Baseline ⁽¹⁾	206,167	415,395	660,212	913,241	1,151,005	1,394,390	1,616,355	1,774,911	1,925,420	2,073,496	2,196,640	2,294,886
Incurred	83,608											
Forecast		241,966	431,865	660,865	934,045	1,211,858	1,472,589	1,691,669	1,891,976	2,095,673	2,261,876	2,394,837

(1) This baseline represents the 2016 budget approved by Nalcor board on September 2015 as per the AFE rev2 values

Jan-16

Potential Deviations

C.P.	Package Description	Variation Description	Previous Cumulative	Monthly Variance	Total Potential	Comments	CM Ref.	Trend / CN / Sch. ref.
C1		Scope change						
SH0019	Security services	Adjustment to forecast (including the ERT and the recent ruling by arbitrator)	17,290,560	4,389,463	21,680,023	Estimate Security up to end of 2018.	DAN-1335 DAN-1553/PCN-0512	T-0864
SH0019	Security services	Memorandum of Settlement between Company and Contractor for meal allowances.	1,600,000	-1,204,549	395,451	Retro to Dec 2014, Forecast till end of 2018		T-0864
SH0020	Medical services	North Spur Paramedic Support		1,602,598	1,602,598	Estimate Medical up to end of 2018.		T-0786-21 T-1312-01
SH0020	Medical services	Memorandum of Settlement between Company and Contractor for meal allowances.	625,000	52,710	677,710	Retro to Dec 2014, Forecast till end of 2018		T-1312-02
SH0022	Fuel Supply	Overall increase in Fuel cost caused by price adjustments and increase in quantities, addition of Diesel for MF Site (Security shack, Camp backups, equip, light plants)	2,940,310		2,940,310	Based on latest estimate; possible back charge to Astaldi for cost of transport included in his contract scope, MF Site Consumption for Nalcor owned / rented equipment not included in forecast update	DAN-1206	T-1313
SH0040	Garbage removal and waste collection	Misc reimbursable work for sewage, garbage disposal and water distribution	1,000,000	-1,000,000	0	No cost increase is forecasted at this point		T-1311
SH0040	Garbage removal and waste collection	SH0040/SH0041 Rental of roll-off bins on site		Under Study	Under Study	CA is evaluating rates from Pencil (SH0041) to transfer roll-offs rental from Pardys (SH0040)		T-1396
SH0041	Personnel transport	Overall increase based on monthly certificate received so far	5,000,000	-5,000,000	0	Increase caused by Astaldi poor productivity, to be reviewed outside the potentials list	DAN-1336	T-1302
SH0041	Personnel transport	Additional bus direct Sheshatshiu to MF Camp, excluding transport to North Spur	2,500,000	300,000	2,800,000	Reference protest event	DAN-1562	T-1301
SH0051	Building maintenance	Expected Increase of cost after site services review	1,300,000		1,300,000		DAN-1357	T-1302
SH0018	Catering and janitorial	Increase in camp population and increase in maintenance requirements	25,800,000	-25,800,000	0	Increase caused by Astaldi poor productivity, to be reviewed outside the potentials list	DAN-1357	T-0899
CH0008	North Spur	Increase in Over burden quantities (Upstream and Downstream) Reduction in T&M Operations Shut Down in the Q6 Protestation Activities Direct Bussing of Innu Workers b/w NWR/S to NS Cut-Off Wall - Soils Conditions Optimization of Package CH0049	Under Study		Under Study	The whole North Spur package will be reviewed in the winter break	DAN-1537/1562	T-1295/ 1296/ 1297/ 1244 CN 6/8/9/10/11
CH0049	Log booms	Optimization of Package CH0049	-500,000		-500,000	Order of Magnitude estimate to be finalized. Final bid price Dec	DAN-1031	T-0942
CH0030	Turbine and generators	Cost incurred due to the protest	50,000		50,000	Delivery delays, extra storage and handling fee	DAN-1537	T-1248
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Camp Winter Readiness		74,795	74,795	CH0007 contractor performed work on Camp / Facilities in preparation for winter. Cost exceeds PCN Amount. Revision Required	DAN-1582 PCN-0524	
CH0032	Hydro-Mechanical Equipment	Alternative Power Supply for Spillway Gate MCC		381,369	381,369	Request to have each Spillway Gate MCC located in the Spillway Hoist House to be connected to an alternative mobile power source incase of major failure. AH estimate	DAN-1705	CN-041
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Maintenance of wash cars	1,900,000		1,900,000	Being re-negotiated again with Astaldi Estimate from Astaldi is ~\$300K/month in latest submission.		T-1314
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Powerhouse parking	Under Study		Under Study	Scope gap, currently being engineered	DAN-1646	
CH0007	Intake, Powerhouse, Spillway and Transition Dams	2016 / 2017 Field Work Orders		677,774	677,774	47 FWO's executed to date for \$336,830. Shortfall of \$77K to date + \$300K forecast for 2016 and \$300K for 2017	DAN-1758 PCN-0589	T-1314-11
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Realign Upstream CTD Guide Rail		50,000	50,000	Realignment of Guide Rail on CTD to accommodate power cable for Trashrack Cleaning Machine	DAN-1759	
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Overbreak at Spillway South Pier	296,000		296,000		DAN-1673	CHR1019
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Intake Rock Reconstruction	163,300		163,300			CHR2041
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Overbreak concrete	565,000		565,000	ECN 4 reduced the overbreak concrete quantity in the Intake and Powerhouse prematurely. It is a high probability to require this concrete		T-1062
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Delivery of secondary concrete	Under Study		Under Study			
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Removal of the winter works additional budget as this scope did not materialize	-15,000,000	-5,000,000	-20,000,000			
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Back charge to Astaldi for cost of transport included in his contract scope	-2,215,310	1,100,000	-1,115,310	BC#0006. 1.1 M can be backcharged at the moment; internal coordination still required to determine final amount		T-1014
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Storage and preservation of cranes (6 Months)	-180,000		-180,000		DAN-1496	T-1153

Jan-16

Potential Deviations

C.P.	Package Description	Variation Description	Previous Cumulative	Monthly Variance	Total Potential	Comments	CM Ref.	Trend / CN / Sch. ref.
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Back charge to Astaldi for Embedded Guide & Associated Hardware Storage	-1,000,000		-1,000,000		DAN-1494	T-1224
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Travel No-Shows	-500,000	-374,537	-874,537	BC#0007		T-1181
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Andritz to manage primary anchor inventory off-site	-455,428		-455,428		DAN-1101	T-1031
			41,179,432	-29,750,377	11,429,055			
		Design Development						
CH0009	Construction of North and South Dams	Contractor to only use type GU cement		Under Study	Under Study	Once conditions on CON-CH0009001-0002 are satisfied, Contractor to submit CR for cost savings		T-1381
CH0009	Construction of North and South Dams	Widening of intake cofferdam, non-craft cost only		200,913	200,913	Widening of Intake Cofferdam is not covered on the contract's Schedule of Price. Latest agreement of 20m. Craft cost included on item 104		T-1342
CH0032	Hydro-Mechanical Equipment	Construction Power to Spillway Electrical Building		75,000	75,000	Item is being reviewed by the MFG Delivery Team to validate cost impacts, it's required to have this process completed in order to formalize this item and associated potential cost.		CN-046
CH0032	Hydro-Mechanical Equipment	A7 AH Embedments - Inverted Installation		Under Study	Under Study	Item is being reviewed by the MFG Delivery Team to validate cost impacts, it's required to have this process completed in order to formalize this item and associated potential cost.		T-1390
CH0032	Hydro-Mechanical Equipment	Revised Spillway Gates Control Philosophy	157,978		157,978			T-1281
CH0032	Hydro-Mechanical Equipment	Stabilizer Bar Installation	Under Study		Under Study		DAN-1684	CN-038
CH0030	Turbine and generators	Modification to Communication Network Architecture (TS 9.6.2)	50,000		50,000			T- 1326
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Powerhouse precast panels	11,423,496	3,076,504	14,500,000	Order of Magnitude estimate received from Contractor. Unit Pricing under review.	DAN-1508 PCN-0555	CHR1048 T-1314-07
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Increase in the length of the discharge channel versus to what was assumed	1,250,000		1,250,000		DAN-1647	ECN 31/ CR1038
			12,881,474	3,352,417	16,233,891			
		Errors & Omissions						
		Purchase orders and Construction contracts execution						
CH0030	Turbine and generators	Collective Agreement Apprentice Ratio	800,000		800,000	1.8 M was added to the Rebaseline, however the C1 team is estimating additional increase of 800 K	DAN-1215	T-1068
CH0006	Bulk excavation	Increase in dispute cost	2,600,000	-2,600,000	0	14.2 M is forecasted now		T-1026
			3,400,000	-2,600,000	800,000			
		SUBTOTAL C1	57,460,906	-28,997,960	28,462,946			
C3		Scope change						
CD0510	Permanent Telecommunications	Requirement for HVdc Diverse Communications Channel (B-Path) Soldier's Pond to Muskrat Falls	Under Study	0	0	Additional costs to be captured within existing budget Final details expected February 2016	DAN-0937	T-0875
CD0510	Permanent Telecommunications	Inter-station communications between the Bottom Brook and Soldiers Pond Converters (SPS)	Under Study	0	0	Additional costs to be back charged to Emera.	DAN-0999	T-0911
CD0501/CD0502/CD0534		Soldiers Pond Water Requirements	Under Study		Under Study	Options are under evaluation	DAN-1535	T-1250
CD0501	Converters and cable transition compound	Alstom Grid Harmonic Impedance Study Results - Impacts on Converter Filter Design	10,000,000		10,000,000	The EPC Contractor has repeated the harmonic study and has come up with differing results, which lead to additional filter elements being required, beyond which were Potential savings on specified growth included in AFE 2015.	DAN-1065	T-1285
CD0501	Converters and cable transition compound	Additional grounding quantities - Muskrat Falls and Soldiers Pond	Under Study		Under Study	Potential savings on specified growth included in AFE 2015.	DAN-0928	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Soldiers Pond	Under Study		Under Study	Potential savings on specified growth included in AFE 2015.	DAN-0929	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Churchill Falls	Under Study		Under Study	Potential savings on specified growth included in AFE 2015.	DAN-0929	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Muskrat Falls	Under Study		Under Study	Potential savings on specified growth included in AFE 2015.	DAN-0929	T-1285
CD0534	Soldiers Pond Synchronous Condensers	Current Limiting Reactors		500,000	500,000	Under negotiations - Contractor likely to be liable for additional cost impact.	DAN-1710	T-1406
			10,000,000	500,000	10,500,000			
		Growth Allowance / Errors / Omissions						
CD0502-001	Construction of AC Substations	Non-Specified Growth (LIL)	-410,326		-410,326	Removal of ladder type trays.		
CD0502-001	Construction of AC Substations	Non-Specified Growth (LTA)	-519,037		-519,037	Removal of ladder type trays, Saving on SP switchyard layout changes.		
CD0534	Soldiers Pond Synchronous Condensers	Non-Specified Growth	-232,151	75,000	-157,151	Transgrid Solutions Contract for Engineering Support		

Jan-16

Potential Deviations

C.P.	Package Description	Variation Description	Previous Cumulative	Monthly Variance	Total Potential	Comments	CM Ref.	Trend / CN / Sch. ref.
XD0001	LIL	Non-Specified Growth	-11,519,945	-200,855	-11,720,800	Over run on Transition Compound civil scope, savings on engineering rework, additional savings on Converter layout changes.		
XD0001	LTA	Non-Specified Growth	-683,202	-19,406	-702,609	Under run on Tap controller cabinet and savings on engineering rework.		
SD0564	CF camp services	Non-Specified Growth	-167,298		-167,298			
			-13,531,959	-145,261	-13,677,220			
		SUBTOTAL C3	-3,531,959	354,739	-3,177,220			
C4		Scope change						
CT0327	Construction of HVdc Transmission line	Use of Micro Pile Foundation on HVdc TL	under study		under study	CR issued for 210,500 potential still remains	DAN-1446/PCN-0529	T-1235
CT0327	Construction of HVdc Transmission line	Additional HVdc Foundation on HVdc Line due to Design Weight Changes (WF1,2&3)	under study		under study	2.8M included in rebaseline, under study potential remains	DAN-1403	T-1202
CT0327	Construction of HVdc Transmission line	Additional HVdc Backfill on HVdc Line due to Design Changes (WF1, 2 & 3)	under study		under study	5.6M included in rebaseline, under study potential remains	DAN-1126	T-1202
CT0327	Construction of HVdc Transmission line	Foundation cost decrease WF1 (Segment 1 & 2)	-5,000,000		-5,000,000	preliminary analysis, ongoing assessment	TBD	T-1378
CT0327	Construction of HVdc Transmission line	Foundation increase in installation cost due to ECNs (WF1, 2 & 3)	10,000,000		10,000,000		TBD	T-1381
CT0327	Construction of HVdc Transmission line	HVdc Clearing and Access - Blocks 17/18 Execution (Port Blandford to Soldiers Pond).	34,000,000	-25,500,000	8,500,000	75% of 34 M was forecasted	DAN-1692	T-1373
CT0327	Construction of HVdc Transmission line	HVdc Clearing and Access - Block 12 (Long Range Mountains)	25,000,000	-12,500,000	12,500,000	50% of 25 M was forecasted	TBD	T-1374
CT0327	Construction of HVdc Transmission line	Additional snow clearing and spring maintenance (blocks 4,5,6)		3,000,000	3,000,000	2 M of 5 M was forecasted	TBD	T-1415
CT0327	Construction of HVdc Transmission line	Valard Part B forecast increase	25,000,000		25,000,000		TBD	T-1375
CT0327	Construction of HVdc Transmission line	Self performance on first 32km of Block 9	3,000,000	1,000,000	4,000,000		TBD	T-1376
CT0327	Construction of HVdc Transmission line	Alternate Routing for the Electrode Line in Labrador	-500,000		-500,000	cost savings expected	DAN-1463	T-1233
CT0327	Construction of HVdc Transmission line	Alternate Routing of the HVdc Line through the Long Range Mountains	-2,500,000		-2,500,000	cost savings expected	DAN-1462	T-1234
CT0327	Construction of HVdc Transmission line	Additional costs (mob,demob,storage) due to delays in the HVdc TL Gantry Connection	under study		under study	cost to be transferred from C3	DAN-1444	T-1237
CT0327	Construction of HVdc Transmission line	Potential Delay of LIL Energization Milestone	under study		under study		DAN-1676	T-1353
CT0327	Construction of HVdc Transmission line	Change in Deflection Criteria for Driven Pile Design from 16mm to 25mm. This will decrease the length of pile, hence will decrease the cost of foundations	171,675		171,675	cost savings expected in construction package	DAN-1585	T-1304
CT0327	Construction of HVdc Transmission line	Use of Local Accommodations in lieu of Valard Contractor's Camp	under study	-4,000,000	-4,000,000	preliminary analysis, ongoing assessment	DAN-1635	T-1338
CT0327	Construction of HVdc Transmission line	Pre-Foundation Selection for Winter Section of Segment 2 of HVdc Line	750,000	-750,000	0	Forecasted	DAN-1701	T-1377
CT0327	Construction of HVdc Transmission line	Pre- Foundation Selection for Island (HVdc)	250,000		250,000		TBD	T-1381
CT0327/CT031	Construction HVdc / HVac Transmission lines	HVdc and HVdc Concrete Quality Issues	under study		under study		DAN-1675	T-1354
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Lighting of top of towers 8 and 9 on HVac to meet transport Canada standards	100,000		100,000		DAN-1634	T-1339
CT0355	Marshaling Yards for Hvac Line	Inland trucking services for C4 deliveries	5,000,000		5,000,000		TBD	T-1372
CT0342	ROW Clearing Hvac line	Directive from Hydro regarding construction schedule and line design for TL 266 (230 kV line re-build at Soldiers Pond)	under study		under study	to be reimbursed by NL Hydro	DAN-1529	T-1269
PT0300	Supply of Transmission Line Conductors - 315 kV Hvac	White rust on 315kV HVac conductor reels	under study	0	0		DAN-1430	T-1243
PT0351	Supply of Transmission Line Conductors - 315 kV Hvac	Purchase of Wood Poles for Labrador Electrode Line	500,000		500,000		TBD	T-1379
PT0352	Supply of Anchor Materials - Hvac	Additional quantity of Guy Anchors (HVdc)	500,000		500,000	currently need to order 1000 additional rods	TBD	T-1380
			96,271,675	-38,750,000	57,521,675			
		Bids received and lessons learned						
			0	0	0			
		SUBTOTAL C4	96,271,675	-38,750,000	57,521,675			

Jan-16

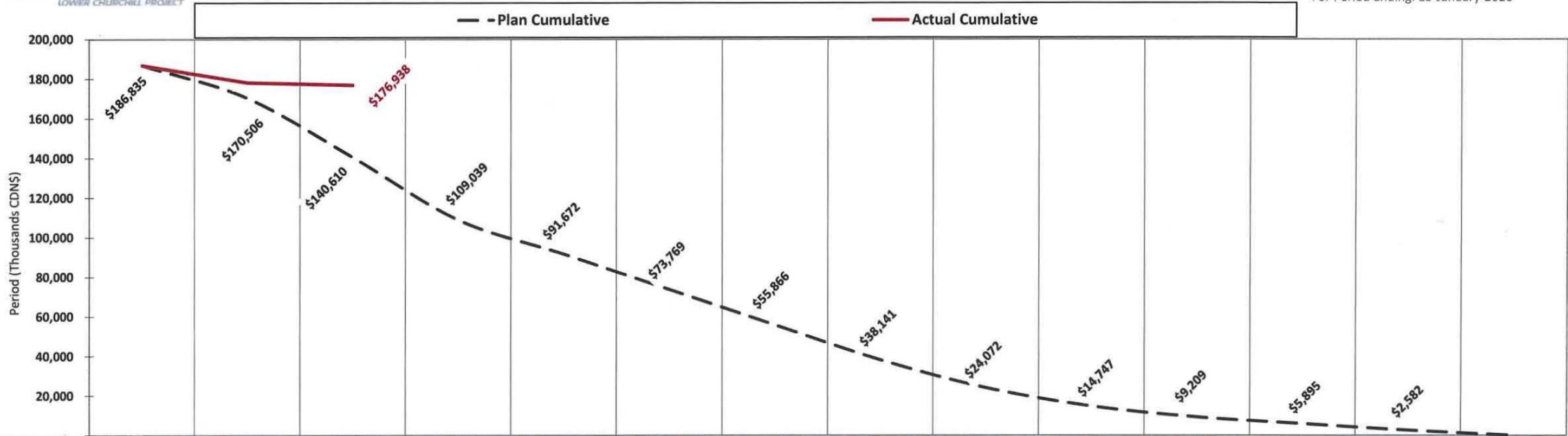
Potential Deviations

C.P.	Package Description	Variation Description	Previous Cumulative	Monthly Variance	Total Potential	Comments	CM Ref.	Trend / CN / Sch. ref.
Services								
CT0355/ SM0700	Marshaling yard - Argentina	Inland transport for DC line materials	1,006,370	-4,500,000	-3,493,630	Cancelling the LTA section, supposed to be LIL		
SUBTOTAL Services			1,006,370	-4,500,000	-3,493,630			
Other scope								
XX0100	Owner's cost	Increase in Owner's team cost	Under Study		Under Study		TBD	
SUBTOTAL other scope			0	0	0			
TOTAL AMOUNT			151,206,992	-71,893,221	79,313,771			



Lower Churchill Project Phase I Project Contingency Drawdown (CDN \$000)

For Period Ending: 25-January-2016



Period	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	-	16,329	29,896	31,570	17,368	17,903	17,903	17,725	14,069	9,325	5,538	3,313	3,313	2,582
Consumed	-	8,627	1,269	-	-	-	-	-	-	-	-	-	-	-
Cumulative														
Plan (AFE rev2)	186,835	170,506	140,610	109,039	91,672	73,769	55,866	38,141	24,072	14,747	9,209	5,895	2,582	(0)
Actual Budget	186,835	178,207	176,938	-	-	-	-	-	-	-	-	-	-	-

Note 1: AFE rev2 = Authorization for Expenditure approved by Nalcor Energy Board of Directors on September 2015

Grouped by: C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)									
CD0503 - EarthWorks at Various Power Distribution	67,511,852	-15,423,037	52,088,815	52,088,813	0	0	0	0	52,087,063	52,088,813	0	2
CD0508 - Electrodes Sites	30,324,143	-8,661,499	21,662,644	14,134,989	0	-2,264,385	6,698,760	11,290	14,134,998	18,569,364	0	3,093,280
CD0512 - Construction Power Facilities	9,222,116	3,478,259	12,700,375	12,700,375	0	0	0	0	12,700,375	12,700,375	0	-0
CD0535 - Construction of Const. Tele. Services -	7,035,756	-7,035,756	0	0	0	0	0	0	0	0	0	0
CD0538 - Accommodations Camp (CF)	17,839,372	-12,433,765	5,405,607	5,405,606	0	0	0	0	5,405,607	5,405,606	0	0
CD0566 - Supply of Construction Power	0	3,745,885	3,745,885	3,059,516	0	220,544	465,824	14,061	1,354,875	3,745,884	0	0
CD0568 - Offsite Infrastructure Upgrades	0	3,113,200	3,113,200	1,035,200	0	0	2,078,000	0	1,026,253	3,113,200	0	0
CFLCO - CFLCO Work Orders	0	-0	-0	0	0	0	0	0	0	0	0	-0
CH0002 - Accommodations Complex Buildings	66,895,398	79,807,361	146,702,759	146,691,465	-565	11,866	0	1	146,467,356	146,702,765	0	-6
CH0003 - Administrative Buildings	8,652,347	12,247,448	20,899,795	20,899,795	0	0	0	0	20,837,512	20,899,795	0	-0
CH0004 - Southside Access Road	40,359,578	15,985,199	56,344,777	56,344,777	0	0	0	0	56,344,777	56,344,777	0	0
CH0005 - Accommodation Complex Site Utilities	18,577,209	-18,577,209	0	0	0	0	0	0	0	0	0	0
CH0006 - Bulk Excavation Works	139,882,886	3,564,082	143,446,967	138,918,273	-1,471,308	14,200,000	0	1,357,924	149,917,902	151,646,966	0	-8,199,999
CH0007 - Intake, Powerhouse, Spillway & Trans Dam	751,987,716	384,538,255	1,136,525,971	1,076,761,700	-4,579,570	21,692,505	64,679,627	2,715,436	700,299,500	1,158,554,263	1,109,082	-22,028,292
CH0008 - North Spur Stabilization Works	66,427,162	76,948,846	143,376,008	143,092,425	-1,787,336	1,925,675	399,739	-5,267,704	69,541,053	143,630,503	0	-254,494
CH0023 - Reservoir Clearing South Bank	90,551,215	-90,551,215	0	0	0	0	0	0	0	0	0	0
CH0024 - Reservoir Clearing North Bank	57,310,625	71,879,775	129,190,400	129,177,962	0	0	12,438	0	81,844,211	129,190,400	0	0
CH0034 - Powerhouse Elevator	808,729	-309,733	498,996	498,996	0	0	0	0	49,886	498,996	0	0
CH0039 - McKenzie River Bridge	2,654,965	3,754,764	6,409,729	5,769,729	0	640,000	0	0	5,757,130	6,409,729	0	-0
CH0046 - Spillway Hydro-Mechanical Equipment	52,899,185	-52,899,185	0	0	0	0	0	0	0	0	0	0
CH0048 - Site Clearing Access Road and Ancillary	3,635,203	4,317,615	7,952,818	8,010,028	0	0	-57,210	0	7,952,818	7,952,818	0	0
CH0062 - Offside Roads and Bridges	0	48,000	48,000	48,000	0	0	0	0	48,000	48,000	0	0
CT0319 - Construction of HVac TL	204,427,902	72,597,497	277,025,399	270,208,100	162,868	3,715,041	2,010,941	2,918,380	224,303,528	276,096,950	-8,805,818	928,449
CT0327 - Construction of HVdc TL - 1	392,729,526	749,893,990	1,142,623,516	1,129,757,715	0	87,197,421	15,259,697	26,304,132	469,135,179	1,232,214,834	41,584,442	-89,591,317
CT0341 - Clearing of ROW HVac TL	30,703,771	14,726,656	45,430,427	42,786,329	0	2,000,000	0	-0	42,786,329	44,786,329	0	644,098
CT0342 - Construction of AC TL - Island	14,134,585	5,099,163	19,233,749	18,329,858	0	0	903,891	995,032	7,472,241	19,233,749	0	0
CT0343 - Clearing of ROW HVdc TL - 1	96,975,584	-96,975,584	0	0	0	0	0	0	0	0	0	0
CT0345 - Clearing of ROW HVdc TL - 2	57,585,444	-57,585,444	0	0	0	0	0	0	0	0	0	0

Grouped by:C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(Curr-Prev)	(6=3-5)
CT0346 - Construction of HVdc TL – 2	187,414,391	-187,414,391	-0	0	0	0	-0	0	0	-0	0	0
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	5,341,415	5,341,415	5,181,039	0	160,376	0	0	5,180,290	5,341,415	0	0
CT0355 - Marshaling Yards for HVdc Line	0	8,000,000	8,000,000	5,338,955	0	1,700,000	961,045	232,815	2,119,866	8,000,000	0	0
NLH - NLH Work Orders	0	0	0	0	0	0	0	0	0	0	0	0
PD0505 - Switchyard Equipment-AC Substations at C	98,321,259	-98,321,259	0	0	0	0	0	0	0	0	0	0
PD0513 - 138/25 kV Transformers	2,176,538	470,899	2,647,437	2,647,437	0	0	0	0	2,647,437	2,647,437	0	0
PD0514 - 138 kV and 25 kV Circuit Breakers	204,749	36,487	241,236	241,236	0	0	0	0	241,236	241,236	0	0
PD0515 - 230kV,138kV and 25kV Disconnect Switches	215,228	41,434	256,662	256,662	0	0	0	0	256,662	256,662	0	0
PD0518 - 138kV Capacitor Voltage Transformers	25,876	-1,336	24,540	24,540	0	0	0	0	24,540	24,540	0	0
PD0519 - 25 kV Vacuum Interrupters	142,352	23,409	165,761	165,761	0	0	0	0	165,761	165,761	0	0
PD0520 - 25 kV 6 x 3.6 MVAR Capacitor Banks	206,881	38,865	245,746	245,746	0	0	0	0	245,746	245,746	0	0
PD0522 - Pre-fabricated Control Room Building	822,811	284,511	1,107,322	1,107,322	0	0	0	0	1,107,322	1,107,322	0	0
PD0523 - Substation Service Transformer	18,204	32	18,236	18,236	0	0	0	0	18,236	18,236	0	0
PD0529 - 25kV Reclosers	62,751	73,611	136,362	136,362	0	0	0	0	136,362	136,362	0	0
PD0530 - 138 kV and 25 kV Surge Arresters	41,254	71	41,325	41,325	0	0	0	0	41,325	41,325	0	0
PD0531 - MV Instrument Transformer	55,410	102	55,512	55,512	0	0	0	0	55,512	55,512	0	0
PD0533 - Early Works Telecom Devices	319,443	-71,305	248,138	248,138	0	0	0	0	248,138	248,138	0	-0
PD0537 - Power Transformers, AC Substations at CF	31,093,446	6,116,746	37,210,192	37,234,609	0	315,208	0	192,342	36,667,926	37,549,817	0	-339,625
PD0561 - D20 RTU & Cabinet (CF)-Construction Powe	50,103	-13,397	36,706	36,706	0	0	0	0	36,706	36,706	0	0
PD0562 - Protection Front Panels (CF)	99,828	58,903	158,731	158,731	0	0	0	0	158,731	158,731	0	0
PD0563 - 138 kV Circuit Switcher (CF), MV Switche	116,767	-7,686	109,081	109,081	0	0	0	0	109,081	109,081	0	0
PH0014 - GSU Transformer	20,549,016	-5,336,346	15,212,670	15,012,670	0	200,000	0	0	3,257,220	15,212,670	0	0
PH0015 - Isolated Phase Bus	1,902,522	125,000	2,027,522	950,823	0	0	1,076,699	0	66,803	2,027,522	0	0
PH0016 - Generator Circuit Breakers	5,170,372	-3,455,176	1,715,196	1,715,196	0	0	0	0	358,333	1,715,196	0	0
PH0035 - Station Service Transformers	0	0	0	0	0	0	0	0	0	0	0	0
PH0036 - Auxiliary Transformers	474,712	100,066	574,778	555,808	0	18,970	0	0	555,808	574,778	0	0
PH0037 - 25 kV Switchgear	1,381,328	-1,381,328	0	0	0	0	0	0	0	0	0	0
PH0038 - Emergency Diesel Generators	1,754,986	264,677	2,019,663	2,019,663	0	0	0	0	2,019,368	2,019,663	0	1
PH0053 - P Used Camp	0	18,177,409	18,177,409	18,548,573	-11,399	0	-359,765	0	18,173,167	18,177,409	0	-0
PT0300 - Supply of Conductors – HVac	20,880,983	-7,337,371	13,543,612	13,543,612	0	0	0	0	13,543,612	13,543,612	0	0
PT0301 - Supply of Insulators - HVac	4,939,704	-2,116,621	2,823,083	2,823,082	0	0	0	0	2,823,082	2,823,082	0	1
PT0302 - Supply of Towers– HVac	24,434,086	-3,614,374	20,819,712	20,713,660	0	0	106,052	0	20,713,660	20,819,712	0	-0
PT0303 - Supply of Hardware – HVac	12,835,064	-4,032,348	8,802,716	8,754,235	0	10,880	48,481	0	8,634,007	8,813,596	0	-10,880
PT0304 - Supply of OPGW - HVac	2,472,133	-592,632	1,879,501	1,761,536	0	55,282	62,683	9,240	1,761,536	1,879,501	0	0
PT0307 - Supply of Steel Tower Foundations – HVac	5,522,873	1,999,367	7,522,241	7,523,018	0	0	188	0	7,460,097	7,523,206	-1	-965
PT0308 - Supply of Steel Tower Foundations– HVdc	24,071,995	12,270,063	36,342,058	36,252,058	0	226,086	90,000	0	29,266,403	36,568,144	226,086	-226,086
PT0326 - Supply of Steel Wires – HVac	2,885,849	704,348	3,590,197	3,586,312	0	60,166	0	0	3,586,312	3,646,477	56,280	-56,280
PT0328 - Supply of Conductors - HVdc	89,474,058	-38,019,050	51,455,008	51,429,553	4,549,560	-4,599,310	0	0	51,429,553	51,379,803	-155,838	75,205
PT0329 - Supply of Insulators - HVdc	52,513,276	-30,797,088	21,716,188	21,647,376	0	46,740	22,072	0	21,608,410	21,716,188	0	-0
PT0330 - Supply of Towers – HVdc	63,048,979	-5,569,683	57,479,296	57,248,309	0	489,308	230,987	2,221,166	48,046,639	57,968,604	0	-489,308
PT0331 - Supply of Hardware – HVdc	6,867,096	16,455,121	23,322,217	23,072,129	153,655	49,591	46,842	6,657	18,269,357	23,322,217	1	-1
PT0334 - Supply of Wires - HVdc	1,914,335	5,674,470	7,588,805	7,574,480	0	14,324	0	0	7,574,480	7,588,804	0	1

Grouped by:C.P.
 Period 055 From: 2015-12-31 To: 2016-01-27
 Report Setting: cost report custom rev1
 Project Currency: CAD
 Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(Curr-Prev)	(6=3-5)
PT0335 - Supply of Anchors - HVac	1,988,073	1,455,306	3,443,379	3,442,533	0	61,248	847	0	3,442,533	3,504,627	-10,464	-61,248
PT0336 - Supply of 25 kV Hardware	497,042	75,970	573,012	573,013	0	0	0	0	573,013	573,013	0	-1
PT0337 - Supply of 25 kV ADSS	467,173	-82,735	384,438	384,438	0	0	0	0	384,438	384,438	0	0
PT0338 - Supply of 25 kV Conductors	344,111	-28,733	315,378	315,378	0	0	0	0	315,378	315,378	0	0
PT0339 - Supply of 25 kV Insulators	65,096	-7,403	57,693	57,693	0	0	0	0	57,693	57,693	0	0
PT0340 - Supply of Poles for 138/25 KV	391,185	12,514	403,699	403,699	0	0	0	0	403,699	403,699	0	-0
PT0351 - Supply of Poles	477,982	1,221,237	1,699,219	1,261,289	0	0	437,930	0	1,261,289	1,699,219	0	0
PT0352 - Supply of Anchors - HVdc	22,878,411	-6,161,334	16,717,077	16,769,752	0	0	76	8,081	15,762,217	16,769,828	0	-52,751
PT0353 - Supply of OPGW - HVdc	4,285,092	4,560,403	8,845,495	8,758,628	0	3,919	82,948	7,466	8,548,161	8,845,495	3,919	-1
PT0356 - Supply of Dampers HVdc	0	1,379,928	1,379,928	1,379,627	0	1,060	0	0	1,379,627	1,380,687	0	-759
SD0536 - Integrated Commissioning Support Service	16,141,864	0	16,141,864	0	0	-16,141,864	16,141,864	0	0	0	-16,141,864	16,141,864
SD0564 - CF Camp Services	103,824	15,238,073	15,341,897	13,353,673	0	2,873,888	1,068,900	308,460	7,870,182	17,296,461	0	-1,954,563
SD0565 - Marine Geo-tech Electrodes	0	333,260	333,260	333,260	0	0	0	0	333,260	333,260	0	0
SD0567 - Installation of Geodetic Control Survey	0	39,179	39,179	39,179	0	0	0	0	39,179	39,179	0	0
SD0568 - C3 Site Office Supplies	0	36,400	36,400	36,400	0	0	0	0	838	36,400	0	0
SH0001 - Physical Hydraulic Model	723,100	0	723,100	723,100	0	0	0	0	723,100	723,100	0	0
SH0021 - Road Maintenance and Snow Clearing Servi	9,152,021	-9,152,021	0	0	0	0	0	0	0	0	0	0
SH0054 - Temporary Site Services	0	25,424,739	25,424,739	24,525,774	55,607	843,358	0	0	25,424,740	25,424,739	0	0
SH0063 - Provision of Site Services	0	0	0	0	0	0	0	0	0	0	0	0
SH0066 - Hydraulic Model - North Dam	0	358,670	358,670	358,670	0	0	0	0	358,670	358,670	0	0
SM0703 - Happy Valley-Goose Bay Project Office Sp	532,356	-532,356	0	0	0	0	0	0	0	0	0	0
SM0704 - Surveying Services	14,671,329	-6,854,456	7,816,873	22,924,414	105,090	-123,712	-15,088,920	0	7,652,886	7,816,873	0	0
SM0710 - IT Equipment	2,155,286	-2,155,286	0	0	0	0	0	0	0	0	0	0
SM0713 - 2012 Field Geotechnical Investigations	2,108,854	1,619,818	3,728,672	3,963,132	0	-234,461	0	0	3,714,456	3,728,671	0	1
ST0309 - Provision of Geotech - HVac	956,750	-956,750	0	0	0	0	0	0	0	0	0	0
ST0310 - Provision of Geotech - HVdc	4,018,074	-4,018,074	0	0	0	0	0	0	0	0	0	0
ST0311 - Provision of Survey - HVac	0	135,074	135,074	135,075	0	0	0	0	135,075	135,075	0	-1
ST0312 - Provision of Survey - HVdc	0	0	0	0	0	0	0	0	0	0	0	0

Grouped by:C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

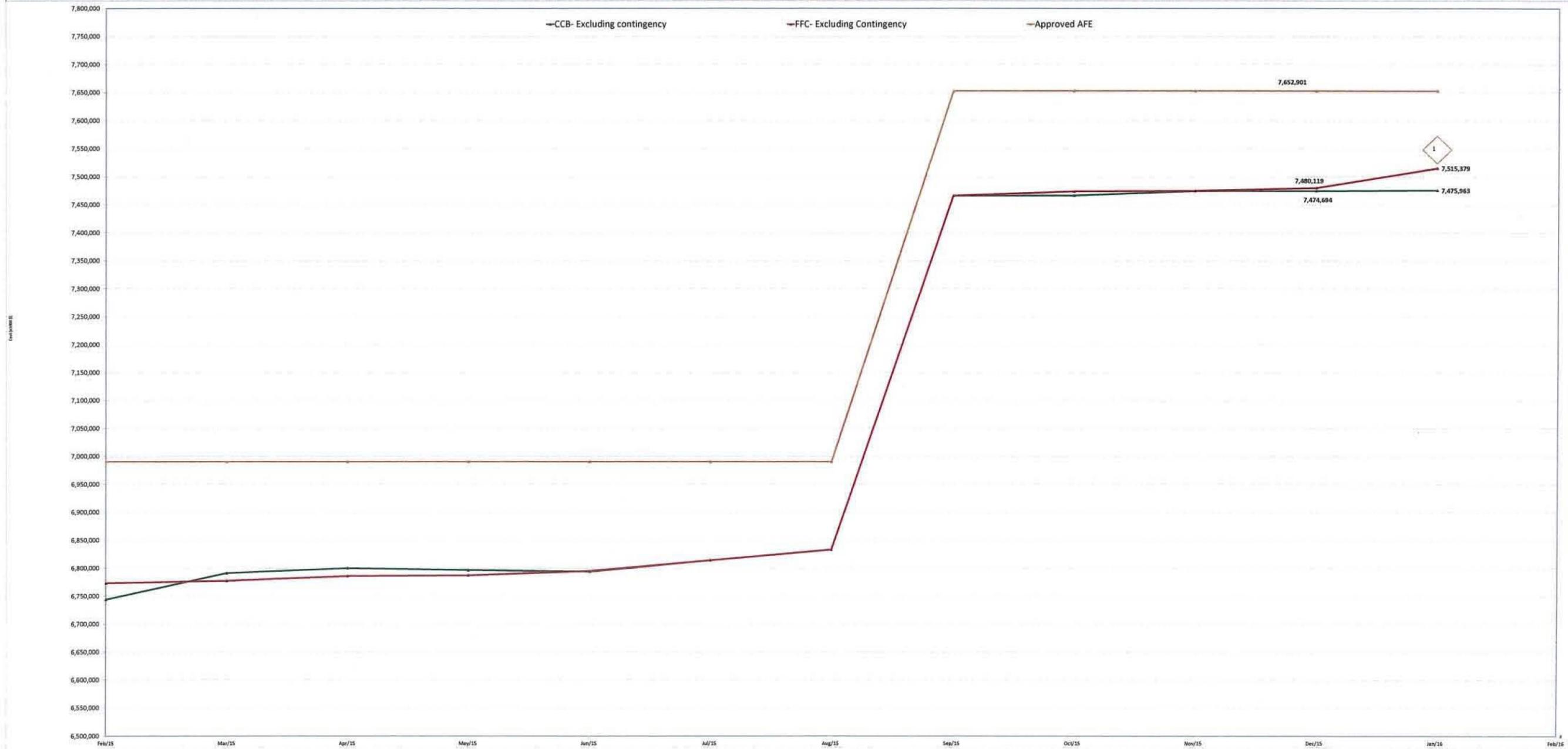
Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)				(7)	(5)	(6=3-5)		
XD0001 - AFE Estimated Growth - C3	0	21,865,264	21,865,264	0	0	-14,633,017	21,776,741	0	0	7,143,723	405,189	14,721,540
XH0001 - AFE Estimated Growth - C1	0	115,834,417	115,834,417	0	0	-115,834,417	115,834,417	0	0	0	0	115,834,417
XM0001 - AFE Estimated Growth - General	0	6,439,830	6,439,830	0	0	0	6,439,830	0	0	6,439,830	0	0
XT0001 - AFE Estimated Growth - C4	0	37,319,609	37,319,609	0	0	-59,387,893	37,319,609	0	0	-22,068,284	62,922	59,387,893
XX0001 - SOBI	352,014,204	-7,523,972	344,490,232	298,296,814	0	7,285,945	38,648,374	1,285,988	209,509,615	344,231,132	-259,100	259,099
XX0002 - Additional Scope of Work	72,490,420	-34,497,748	37,992,672	29,966,756	0	412,648	7,613,268	507,488	22,949,457	37,992,672	0	-0
XX0003 - Environmental Approval	0	0	0	0	0	0	0	0	0	0	0	0
XX0004 - Historical cost	186,083,322	-186,083,322	0	0	0	0	0	0	0	0	0	0
XX0005 - Owner Cost	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total:	6,202,489,666	1,450,411,399	7,652,901,065	6,683,211,317	4,134,921	36,340,832	929,213,995	83,608,443	4,087,112,301	7,652,901,065	1	-0

LCP COST FORECAST VARIATION



Note 1: January vs. December Forecast Variance

- 0.3 M Overbreak in separation wall / Spillway south Pier
- 0.8 M Increased embedments and rebars for Spillway Piers
- 1.1 M Increased cost related to changes in the Layout of MF SY as a result of Soil Conditions and design development
- 0.5 M Additional Geotechnical Field Investigation for HVdc Line
- 1 M Foundation Pre-selection Program - HVdc Line
- 0.2 M Conversion kit for A2 grillage and some tower shoes
- (8.7) M Saving on foundation costs and pile usage in the AC TL

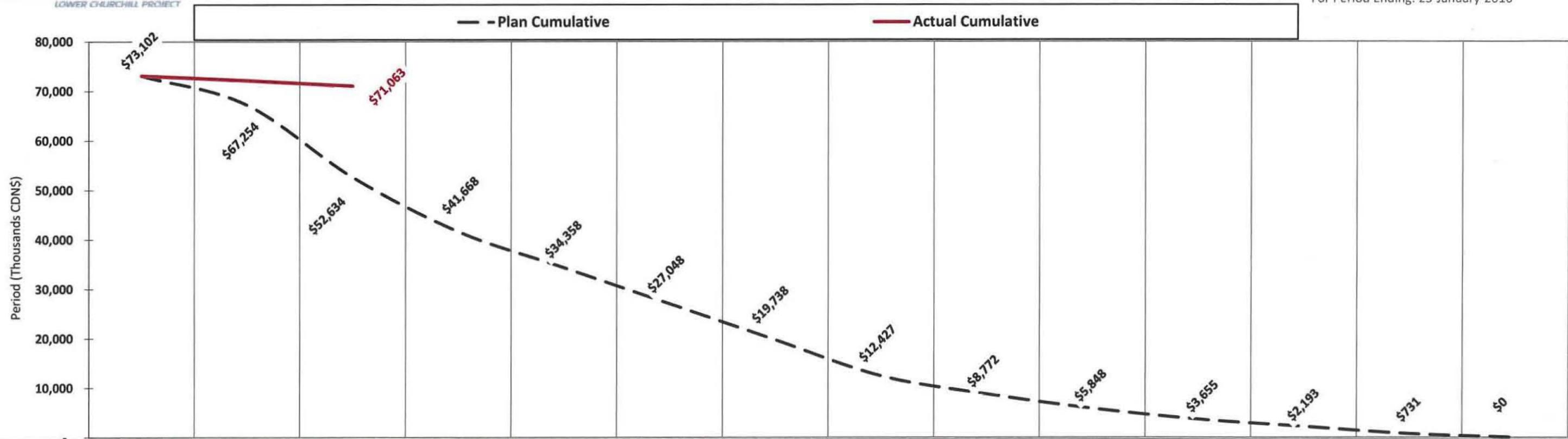
Remarks:

The FFC value of \$ 7,515,379 does not include any contingency
 The CCB value of \$ 7,475,963 does not include any contingency



LCP Phase I - Muskrat Falls Generation Project Contingency Drawdown (CDN \$000)

For Period Ending: 25-January-2016



Period	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	-	5,848	14,620	10,965	7,310	7,310	7,310	7,310	3,655	2,924	2,193	1,462	1,462	731
Consumed	-	930	1,109	-	-	-	-	-	-	-	-	-	-	-
Cumulative	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	73,102	67,254	52,634	41,668	34,358	27,048	19,738	12,427	8,772	5,848	3,655	2,193	731	0
Actual Budget	73,102	72,172	71,063	-	-	-	-	-	-	-	-	-	-	-

Note 1: AFE rev2 = Authorization for Expenditure approved by Nalcor Energy Board of Directors on September 2015

Grouped by: cost category; C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	(6=3-5)
3' - Muskrat Falls												
CD0503 - EarthWorks at Various Power Distribution	0	0	0	0	0	0	0	0	0	0	0	0
CD0508 - Electrodes Sites	0	0	0	0	0	0	0	0	0	0	0	0
CD0512 - Construction Power Facilities	9,222,116	3,478,259	12,700,375	12,700,375	0	0	0	0	12,700,375	12,700,375	0	-0
CD0535 - Construction of Const. Tele. Services -	1,105,811	-1,105,811	0	0	0	0	0	0	0	0	0	0
CD0568 - Offsite Infrastructure Upgrades	0	3,113,200	3,113,200	1,035,200	0	0	2,078,000	0	1,026,253	3,113,200	0	0
CFLCO - CFLCO Work Orders	0	0	0	0	0	0	0	0	0	0	0	0
CH0002 - Accommodations Complex Buildings	66,895,398	79,807,361	146,702,759	146,691,465	-565	11,866	0	1	146,467,356	146,702,765	0	-6
CH0003 - Administrative Buildings	8,652,347	12,247,448	20,899,795	20,899,795	0	0	0	0	20,837,512	20,899,795	0	-0
CH0004 - Southside Access Road	40,359,578	15,985,199	56,344,777	56,344,777	0	0	0	0	56,344,777	56,344,777	0	0
CH0005 - Accommodation Complex Site Utilities	18,577,209	-18,577,209	0	0	0	0	0	0	0	0	0	0
CH0006 - Bulk Excavation Works	137,362,113	-3,342,034	134,020,079	129,528,181	-1,465,097	14,200,000	0	1,357,924	140,491,014	142,263,084	0	-8,243,005
CH0008 - North Spur Stabilization Works	66,427,162	76,945,846	143,373,008	143,089,425	-1,787,336	1,925,675	399,739	-5,267,704	69,538,053	143,627,503	0	-254,494
CH0023 - Reservoir Clearing South Bank	90,551,215	-90,551,215	0	0	0	0	0	0	0	0	0	0
CH0024 - Reservoir Clearing North Bank	57,310,625	71,879,775	129,190,400	129,177,962	0	0	12,438	0	81,844,211	129,190,400	0	0
CH0034 - Powerhouse Elevator	808,729	-309,733	498,996	498,996	0	0	0	0	49,886	498,996	0	0
CH0039 - McKenzie River Bridge	2,654,965	3,754,764	6,409,729	5,769,729	0	640,000	0	0	5,757,130	6,409,729	0	-0
CH0046 - Spillway Hydro-Mechanical Equipment	52,899,185	-52,899,185	0	0	0	0	0	0	0	0	0	0
CH0048 - Site Clearing Access Road and Ancillary	3,635,203	3,923,570	7,558,773	7,615,983	0	0	-57,210	0	7,558,773	7,558,773	0	0
CH0062 - Offside Roads and Bridges	0	48,000	48,000	48,000	0	0	0	0	48,000	48,000	0	0
CT0319 - Construction of HVac TL	4,165,814	1,272,934	5,438,748	5,430,801	0	600,000	7,947	0	0	6,038,748	0	-600,000
CT0327 - Construction of HVdc TL - 1	0	0	0	0	0	0	0	0	0	0	0	0
CT0346 - Construction of HVdc TL - 2	0	-0	-0	0	0	0	-0	0	0	-0	0	0
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	0	0	0	0	0	0	0	0	0	0	0
PD0513 - 138/25 kV Transformers	2,176,538	470,899	2,647,437	2,647,437	0	0	0	0	2,647,437	2,647,437	0	0
PD0514 - 138 kV and 25 kV Circuit Breakers	204,749	36,487	241,236	241,236	0	0	0	0	241,236	241,236	0	0
PD0515 - 230kV,138kV and 25kV Disconnect Switches	215,228	41,434	256,662	256,662	0	0	0	0	256,662	256,662	0	0
PD0518 - 138kV Capacitor Voltage Transformers	25,876	-1,336	24,540	24,540	0	0	0	0	24,540	24,540	0	0
PD0519 - 25 kV Vacuum Interrupters	142,352	23,409	165,761	165,761	0	0	0	0	165,761	165,761	0	0

Grouped by: cost category; C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	
3' - Muskrat Falls												
PD0520 - 25 kV 6 x 3.6 MVAR Capacitor Banks	206,881	38,865	245,746	245,746	0	0	0	0	245,746	245,746	0	0
PD0522 - Pre-fabricated Control Room Building	822,811	284,511	1,107,322	1,107,322	0	0	0	0	1,107,322	1,107,322	0	0
PD0523 - Substation Service Transformer	18,204	32	18,236	18,236	0	0	0	0	18,236	18,236	0	0
PD0529 - 25kV Reclosers	62,751	73,611	136,362	136,362	0	0	0	0	136,362	136,362	0	0
PD0530 - 138 kV and 25 kV Surge Arresters	41,254	71	41,325	41,325	0	0	0	0	41,325	41,325	0	0
PD0531 - MV Instrument Transformer	55,410	102	55,512	55,512	0	0	0	0	55,512	55,512	0	0
PD0533 - Early Works Telecom Devices	319,443	-71,305	248,138	248,138	0	0	0	0	248,138	248,138	0	-0
PD0561 - D20 RTU & Cabinet (CF)-Construction Powe	50,103	-13,397	36,706	36,706	0	0	0	0	36,706	36,706	0	0
PD0562 - Protection Front Panels (CF)	99,828	58,903	158,731	158,731	0	0	0	0	158,731	158,731	0	0
PD0563 - 138 kV Circuit Switcher (CF), MV Switche	116,767	-7,686	109,081	109,081	0	0	0	0	109,081	109,081	0	0
PH0014 - GSU Transformer	20,549,016	-5,336,346	15,212,670	15,012,670	0	200,000	0	0	3,257,220	15,212,670	0	0
PH0015 - Isolated Phase Bus	1,902,522	125,000	2,027,522	950,823	0	0	1,076,699	0	66,803	2,027,522	0	0
PH0016 - Generator Circuit Breakers	5,170,372	-3,455,176	1,715,196	1,715,196	0	0	0	0	358,333	1,715,196	0	0
PH0035 - Station Service Transformers	0	0	0	0	0	0	0	0	0	0	0	0
PH0036 - Auxiliary Transformers	474,712	100,066	574,778	555,808	0	18,970	0	0	555,808	574,778	0	0
PH0037 - 25 kV Switchgear	1,381,328	-1,381,328	0	0	0	0	0	0	0	0	0	0
PH0038 - Emergency Diesel Generators	1,754,986	264,677	2,019,663	2,019,663	0	0	0	0	2,019,368	2,019,663	0	1
PH0053 - LCP Used Camp	0	18,177,409	18,177,409	18,548,573	-11,399	0	-359,765	0	18,173,167	18,177,409	0	-0
PT0336 - Supply of 25 kV Hardware	497,042	75,970	573,012	573,013	0	0	0	0	573,013	573,013	0	-1
PT0337 - Supply of 25 kV ADSS	467,173	-82,735	384,438	384,438	0	0	0	0	384,438	384,438	0	0
PT0338 - Supply of 25 kV Conductors	344,111	-28,733	315,378	315,378	0	0	0	0	315,378	315,378	0	0
PT0339 - Supply of 25 kV Insulators	65,096	-7,403	57,693	57,693	0	0	0	0	57,693	57,693	0	0
PT0340 - Supply of Poles for 138/25 KV	391,185	12,514	403,699	403,699	0	0	0	0	403,699	403,699	0	-0
SD0536 - Integrated Commissioning Support Service	2,172,433	0	2,172,433	0	0	-2,172,433	2,172,433	0	0	0	-2,172,433	2,172,433
SH0001 - Physical Hydraulic Model	723,100	0	723,100	723,100	0	0	0	0	723,100	723,100	0	0
SH0054 - Temporary Site Services	0	25,424,739	25,424,739	24,525,774	55,607	843,358	0	0	25,424,740	25,424,739	0	0
SH0063 - Provision of Site Services	0	0	0	0	0	0	0	0	0	0	0	0
SH0066 - Hydraulic Model - North Dam	0	358,670	358,670	358,670	0	0	0	0	358,670	358,670	0	0
SM0703 - Happy Valley-Goose Bay Project Office Sp	532,356	-532,356	0	0	0	0	0	0	0	0	0	0
SM0704 - Surveying Services	14,671,329	-6,854,456	7,816,873	22,924,414	105,090	-123,712	-15,088,920	0	7,652,886	7,816,873	0	0

Grouped by: cost category; C.P.

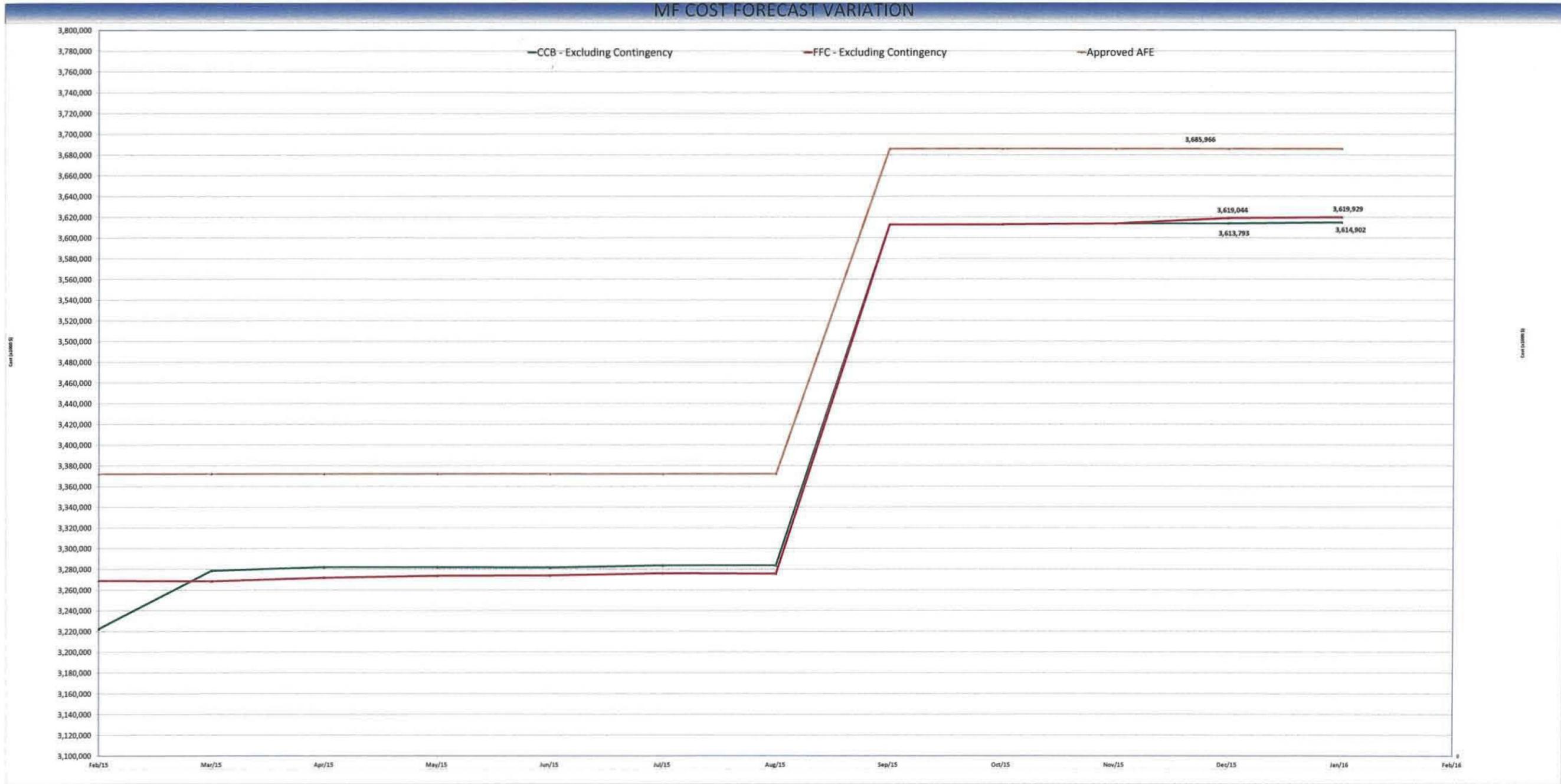
Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

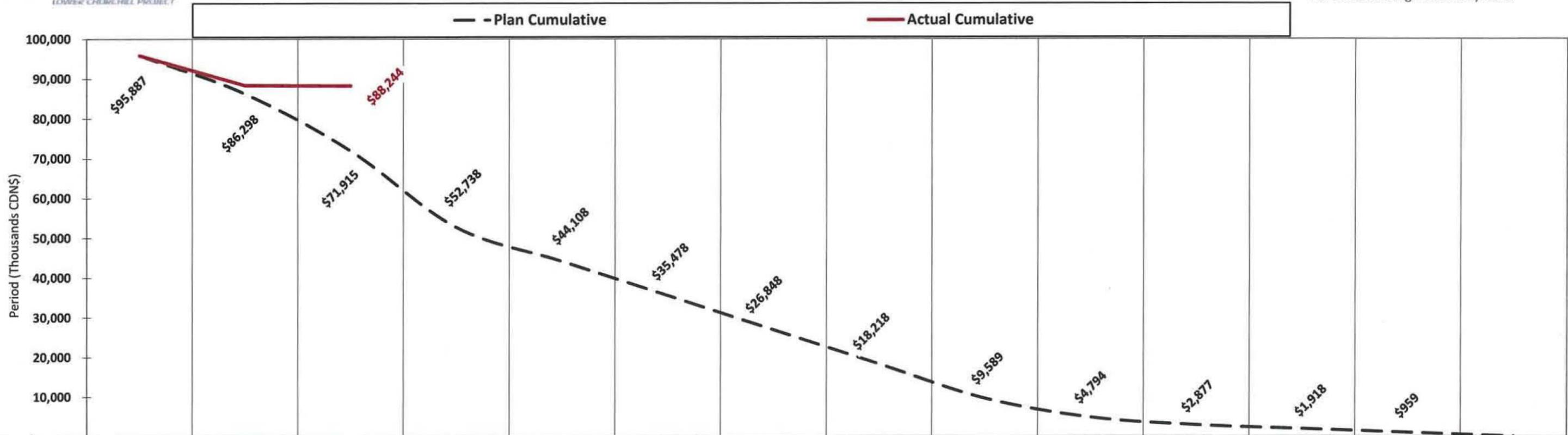
	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	
3' - Muskrat Falls												
SM0710 - IT Equipment	2,155,286	-2,155,286	0	0	0	0	0	0	0	0	0	0
SM0713 - 2012 Field Geotechnical Investigations	2,108,854	1,608,574	3,717,428	3,951,889	0	-234,461	0	0	3,703,212	3,717,428	0	0
XH0001 - AFE Estimated Growth - C1	0	107,941,801	107,941,801	0	0	-107,941,801	107,941,801	0	0	0	0	107,941,801
XM0001 - AFE Estimated Growth - General	0	800,000	800,000	0	0	0	800,000	0	0	800,000	0	0
XT0001 - AFE Estimated Growth - C4	0	600,000	600,000	0	0	-600,000	600,000	0	0	0	0	600,000
XX0002 - Additional Scope of Work	2,697,350	6,306,773	9,004,123	6,338,027	0	401,829	2,264,267	0	6,050,389	9,004,123	0	0
XX0003 - Environmental Approval	0	0	0	0	0	0	0	0	0	0	0	0
XX0004 - Historical cost	96,580,064	-96,580,064	0	0	0	0	0	0	0	0	0	0
XX0005 - Owner Cost	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total for : 3' - Muskrat Falls	2,901,158,288	784,807,242	3,685,965,529	3,213,096,777	1,675,414	23,177,340	448,015,999	17,872,618	2,055,583,988	3,685,965,529	-0	-0
Grand Total:	2,901,158,288	784,807,242	3,685,965,529	3,213,096,777	1,675,414	23,177,340	448,015,999	17,872,618	2,055,583,988	3,685,965,529	-0	-0





LCP Phase I - Labrador Island Transmission Link Project Contingency Drawdown (CDN \$000)

For Period Ending: 25-January-2016



Period	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	-	9,589	14,383	19,177	8,630	8,630	8,630	8,630	8,630	4,794	1,918	959	959	959
Consumed	-	7,482	160	-	-	-	-	-	-	-	-	-	-	-
Cumulative	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	95,887	86,298	71,915	52,738	44,108	35,478	26,848	18,218	9,589	4,794	2,877	1,918	959	(0)
Actual Budget	95,887	88,404	88,244	-	-	-	-	-	-	-	-	-	-	-

Note 1: AFE rev2 = Authorization for Expenditure approved by Nalcor Energy Board of Directors on September 2015

Grouped by: cost category; C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	(6=3-5)
4' - Labrador Island Link												
CD0503 - EarthWorks at Various Power Distribution	49,496,880	-20,811,436	28,685,444	28,685,443	0	0	0	0	28,683,693	28,685,443	0	0
CD0508 - Electrodes Sites	30,324,143	-8,661,499	21,662,644	14,134,989	0	-2,264,385	6,698,760	11,290	14,134,998	18,569,364	0	3,093,280
CD0535 - Construction of Const. Tele. Services -	3,863,886	-3,863,886	0	0	0	0	0	0	0	0	0	0
CD0566 - Supply of Construction Power	0	3,547,440	3,547,440	2,872,307	0	215,394	459,739	14,061	1,247,665	3,547,440	0	-0
CH0006 - Bulk Excavation Works	1,320,023	3,597,661	4,917,684	4,898,863	-2,564	0	0	0	4,917,684	4,896,300	0	21,384
CH0008 - North Spur Stabilization Works	0	3,000	3,000	3,000	0	0	0	0	3,000	3,000	0	0
CH0048 - Site Clearing Access Road and Ancillary	0	195,000	195,000	195,000	0	0	0	0	195,000	195,000	0	0
CT0319 - Construction of HVac TL	0	0	0	0	0	-965	0	0	0	-965	-965	965
CT0327 - Construction of HVdc TL - 1	392,729,526	749,510,697	1,142,240,223	1,129,375,022	0	87,197,421	15,259,697	26,099,507	468,752,486	1,231,832,141	41,584,442	-89,591,917
CT0342 - Construction of AC TL - Island	14,134,585	5,099,163	19,233,749	18,329,858	0	0	903,891	995,032	7,472,241	19,233,749	0	0
CT0343 - Clearing of ROW HVdc TL - 1	96,975,584	-96,975,584	0	0	0	0	0	0	0	0	0	0
CT0345 - Clearing of ROW HVdc TL - 2	57,585,444	-57,585,444	0	0	0	0	0	0	0	0	0	0
CT0346 - Construction of HVdc TL - 2	187,414,391	-187,414,391	-0	0	0	0	-0	0	0	-0	0	0
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	2,759,898	2,759,898	2,694,140	0	83,396	0	0	2,693,392	2,777,536	0	-17,638
CT0355 - Marshaling Yards for HVdc Line	0	8,000,000	8,000,000	5,338,955	0	1,700,000	961,045	232,815	2,119,866	8,000,000	0	0
NLH - NLH Work Orders	0	0	0	0	0	0	0	0	0	0	0	0
PD0505 - Switchyard Equipment-AC Substations at C	23,922,612	-23,922,612	0	0	0	0	0	0	0	0	0	0
PD0537 - Power Transformers, AC Substations at CF	7,043,291	4,268,940	11,312,231	11,203,680	0	108,551	0	0	11,203,680	11,312,231	0	0
PT0307 - Supply of Steel Tower Foundations - HVac	0	61,956	61,956	0	0	0	0	0	0	0	-62,922	61,956
PT0308 - Supply of Steel Tower Foundations- HVdc	24,071,995	11,246,313	35,318,308	35,228,308	0	226,086	90,000	0	29,266,403	35,544,394	226,086	-226,086
PT0328 - Supply of Conductors - HVdc	89,474,058	-38,019,050	51,455,008	51,429,553	4,549,560	-4,599,310	0	0	51,429,553	51,379,803	-155,838	75,205
PT0329 - Supply of Insulators - HVdc	52,513,276	-30,797,088	21,716,188	21,647,376	0	46,740	22,072	0	21,608,410	21,716,188	0	-0
PT0330 - Supply of Towers - HVdc	63,048,979	-5,569,683	57,479,296	57,248,309	0	489,308	230,987	2,221,166	48,046,639	57,968,604	0	-489,308
PT0331 - Supply of Hardware - HVdc	6,867,096	16,455,121	23,322,217	23,072,129	153,655	49,591	46,842	6,657	18,269,357	23,322,217	1	-1
PT0334 - Supply of Wires - HVdc	1,914,335	5,674,470	7,588,805	7,574,480	0	14,324	0	0	7,574,480	7,588,804	0	1
PT0351 - Supply of Poles	477,982	1,221,237	1,699,219	1,261,289	0	0	437,930	0	1,261,289	1,699,219	0	0
PT0352 - Supply of Anchors - HVdc	22,878,411	-6,161,334	16,717,077	16,769,752	0	0	76	8,081	15,762,217	16,769,828	0	-52,751
PT0353 - Supply of OPGW - HVdc	4,285,092	4,560,403	8,845,495	8,758,628	0	3,919	82,948	7,466	8,548,161	8,845,495	3,919	-1
PT0356 - Supply of Dampers HVdc	0	1,379,928	1,379,928	1,379,627	0	1,060	0	0	1,379,627	1,380,687	0	-759
SD0536 - Integrated Commissioning Support Service	3,517,934	0	3,517,934	0	0	-3,517,934	3,517,934	0	0	0	-3,517,934	3,517,934
SD0565 - Marine Geo-tech Electrodes	0	333,260	333,260	333,260	0	0	0	0	333,260	333,260	0	0
SD0567 - Installation of Geodetic Control Survey	0	39,179	39,179	39,179	0	0	0	0	39,179	39,179	0	0
SD0568 - C3 Site Office Supplies	0	22,400	22,400	22,400	0	0	0	0	838	22,400	0	0

Grouped by: cost category; C.P.

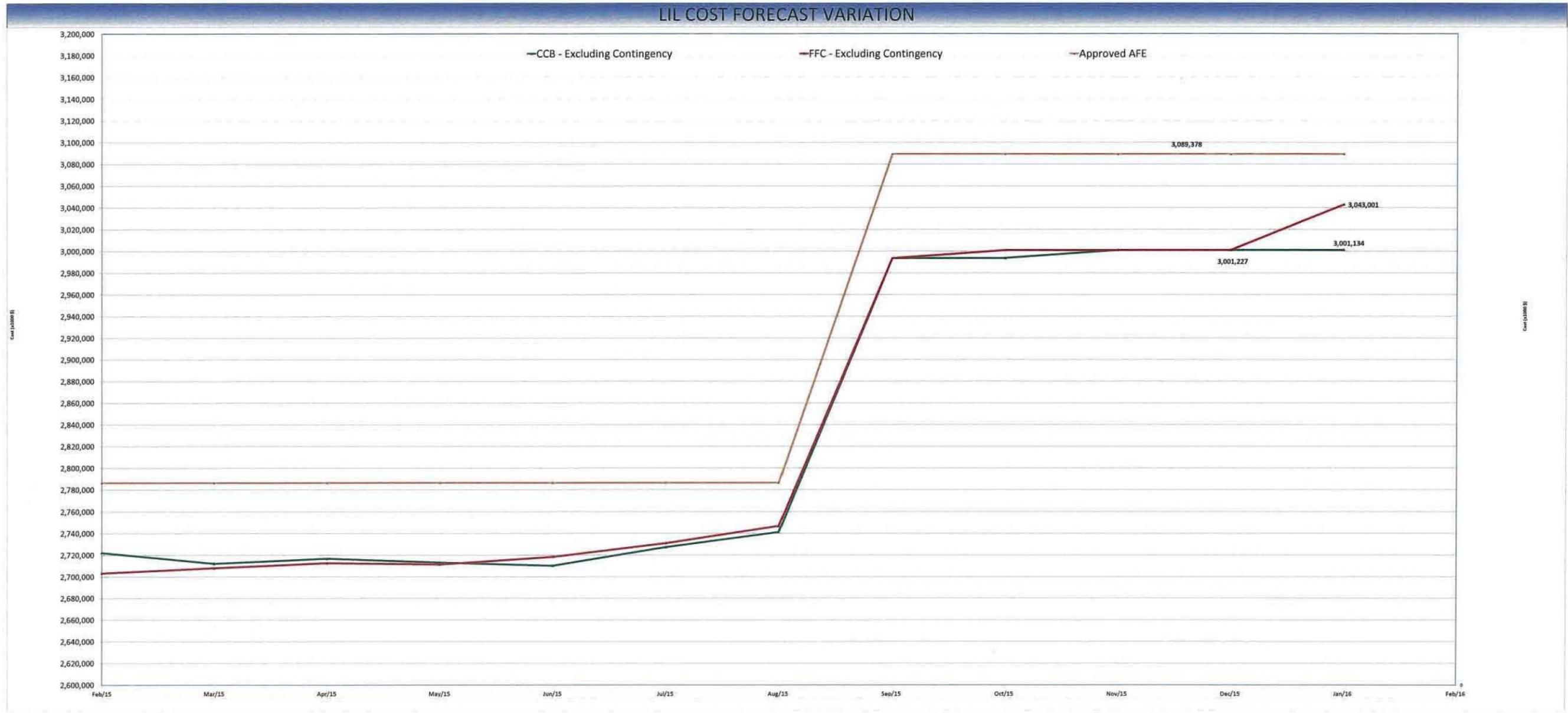
Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

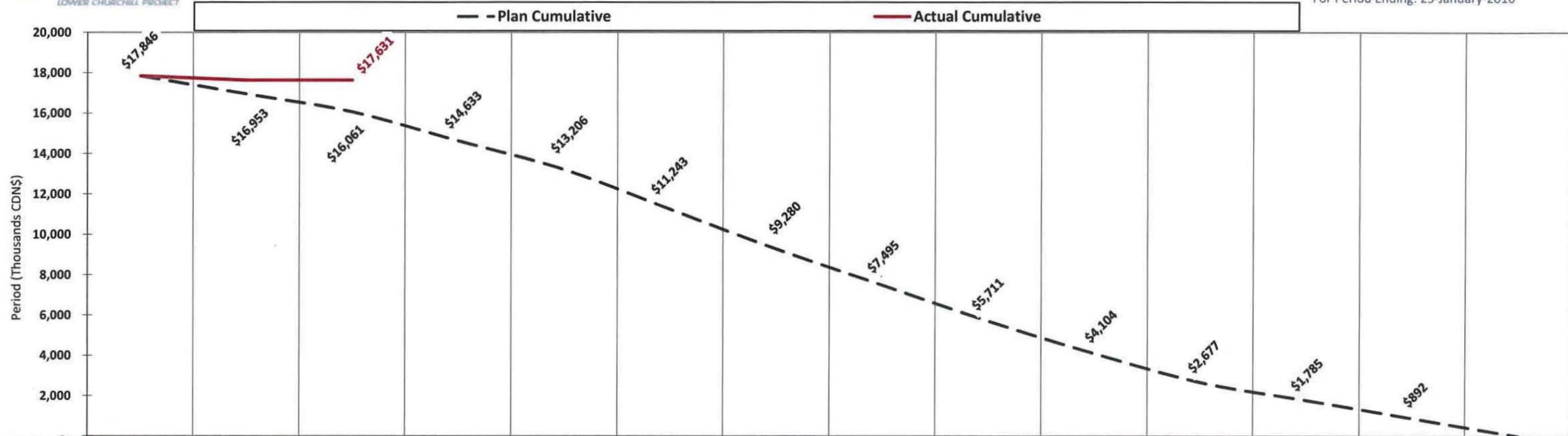
Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	
4' - Labrador Island Link												
ST0310 - Provision of Geotech - HVdc	4,018,074	-4,018,074	0	0	0	0	0	0	0	0	0	0
ST0312 - Provision of Survey - HVdc	0	0	0	0	0	0	0	0	0	0	0	0
XD0001 - AFE Estimated Growth - C3	0	26,524,249	26,524,249	0	0	-14,801,493	26,522,294	0	0	11,720,801	207,575	14,803,448
XH0001 - AFE Estimated Growth - C1	0	4,915,488	4,915,488	0	0	-4,915,488	4,915,488	0	0	0	0	4,915,488
XM0001 - AFE Estimated Growth - General	0	1,396,200	1,396,200	0	0	0	1,396,200	0	0	1,396,200	0	0
XT0001 - AFE Estimated Growth - C4	0	48,515,812	48,515,812	0	0	-48,515,812	48,515,812	0	0	0	0	48,515,812
XX0001 - SOBI	352,014,204	-7,523,972	344,490,232	298,296,814	0	7,285,945	38,648,374	1,285,988	209,509,615	344,231,132	-259,100	259,099
XX0002 - Additional Scope of Work	58,376,785	-41,160,146	17,216,639	13,499,062	0	10,819	3,706,758	507,488	8,829,445	17,216,640	0	-0
XX0003 - Environmental Approval	0	0	0	0	0	0	0	0	0	0	0	0
XX0004 - Historical cost	85,307,165	-85,307,165	0	0	0	0	0	0	0	0	0	0
XX0005 - Owner Cost	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total for : 4' - Labrador Island Link	2,609,748,892	479,691,223	3,089,440,115	2,681,189,709	3,497,868	3,548,334	401,142,248	54,785,820	1,427,484,734	3,089,378,159	1	61,956
Grand Total:	2,609,748,892	479,691,223	3,089,440,115	2,681,189,709	3,497,868	3,548,334	401,142,248	54,785,820	1,427,484,734	3,089,378,159	1	61,956



For Period Ending: 25-January-2016



Period	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	-	892	892	1,428	1,428	1,963	1,963	1,785	1,785	1,606	1,428	892	892	892
Consumed	-	215	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative														
Plan (AFE rev2)	17,846	16,953	16,061	14,633	13,206	11,243	9,280	7,495	5,711	4,104	2,677	1,785	892	(0)
Actual Budget	17,846	17,631	17,631	-	-	-	-	-	-	-	-	-	-	-

Note 1: AFE rev2 = Authorization for Expenditure approved by Nalcor Energy Board of Directors on September 2015

Grouped by: cost category; C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)				(7)	(5)	(Curr-Prev)	(6=3-5)	
6' - Labrador Transmission Asset												
CD0503 - EarthWorks at Various Power Distribution	18,014,972	5,388,399	23,403,371	23,403,369	0	0	0	0	23,403,369	23,403,369	0	1
CD0535 - Construction of Const. Tele. Services -	2,066,059	-2,066,059	0	0	0	0	0	0	0	0	0	0
CD0538 - Accommodations Camp (CF)	17,839,372	-12,433,765	5,405,607	5,405,606	0	0	0	0	5,405,607	5,405,606	0	0
CD0566 - Supply of Construction Power	0	198,445	198,445	187,210	0	5,150	6,085	0	107,210	198,445	0	0
CFLCO - CFLCO Work Orders	0	-0	-0	0	0	0	0	0	0	0	0	-0
CH0006 - Bulk Excavation Works	1,200,749	3,308,455	4,509,204	4,491,230	-3,647	0	0	0	4,509,204	4,487,582	0	21,622
CH0048 - Site Clearing Access Road and Ancillary	0	199,045	199,045	199,045	0	0	0	0	199,045	199,045	0	0
CT0319 - Construction of HVac TL	200,262,088	71,324,563	271,586,651	264,777,298	162,868	3,116,006	2,002,995	2,918,380	224,303,528	270,059,167	-8,804,853	1,527,484
CT0327 - Construction of HVdc TL - 1	0	383,293	383,293	382,693	0	0	0	204,625	382,693	382,693	0	600
CT0341 - Clearing of ROW HVac TL	30,703,771	14,726,656	45,430,427	42,786,329	0	2,000,000	0	-0	42,786,329	44,786,329	0	644,098
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	2,581,518	2,581,518	2,486,899	0	76,980	0	0	2,486,898	2,563,879	0	17,638
NLH - NLH Work Orders	0	0	0	0	0	0	0	0	0	0	0	0
PD0505 - Switchyard Equipment-AC Substations at C	74,398,647	-74,398,647	0	0	0	0	0	0	0	0	0	0
PD0537 - Power Transformers, AC Substations at CF	24,050,155	1,847,806	25,897,961	26,030,929	0	206,657	0	192,342	25,464,246	26,237,586	0	-339,625
PT0300 - Supply of Conductors - HVac	20,880,983	-7,337,371	13,543,612	13,543,612	0	0	0	0	13,543,612	13,543,612	0	0
PT0301 - Supply of Insulators - HVac	4,939,704	-2,116,621	2,823,083	2,823,082	0	0	0	0	2,823,082	2,823,082	0	1
PT0302 - Supply of Towers- HVac	24,434,086	-3,614,374	20,819,712	20,713,660	0	0	106,052	0	20,713,660	20,819,712	0	-0
PT0303 - Supply of Hardware - HVac	12,835,064	-4,032,348	8,802,716	8,754,235	0	10,880	48,481	0	8,634,007	8,813,596	0	-10,880
PT0304 - Supply of OPGW - HVac	2,472,133	-592,632	1,879,501	1,761,536	0	55,282	62,683	9,240	1,761,536	1,879,501	0	0
PT0307 - Supply of Steel Tower Foundations - HVac	5,522,873	1,937,411	7,460,285	7,523,018	0	0	188	0	7,460,097	7,523,206	62,921	-62,921
PT0308 - Supply of Steel Tower Foundations- HVdc	0	1,023,750	1,023,750	1,023,750	0	0	0	0	0	1,023,750	0	0
PT0326 - Supply of Steel Wires - HVac	2,885,849	704,348	3,590,197	3,586,312	0	60,166	0	0	3,586,312	3,646,477	56,280	-56,280
PT0335 - Supply of Anchors - HVac	1,988,073	1,455,306	3,443,379	3,442,533	0	61,248	847	0	3,442,533	3,504,627	-10,464	-61,248
SD0536 - Integrated Commissioning Support Service	10,451,497	0	10,451,497	0	0	-10,451,497	10,451,497	0	0	0	-10,451,497	10,451,497
SD0564 - CF Camp Services	103,824	15,238,073	15,341,897	13,353,673	0	2,873,888	1,068,900	308,460	7,870,182	17,296,461	0	-1,954,563
SD0568 - C3 Site Office Supplies	0	14,000	14,000	14,000	0	0	0	0	0	14,000	0	0

Grouped by: cost category; C.P.

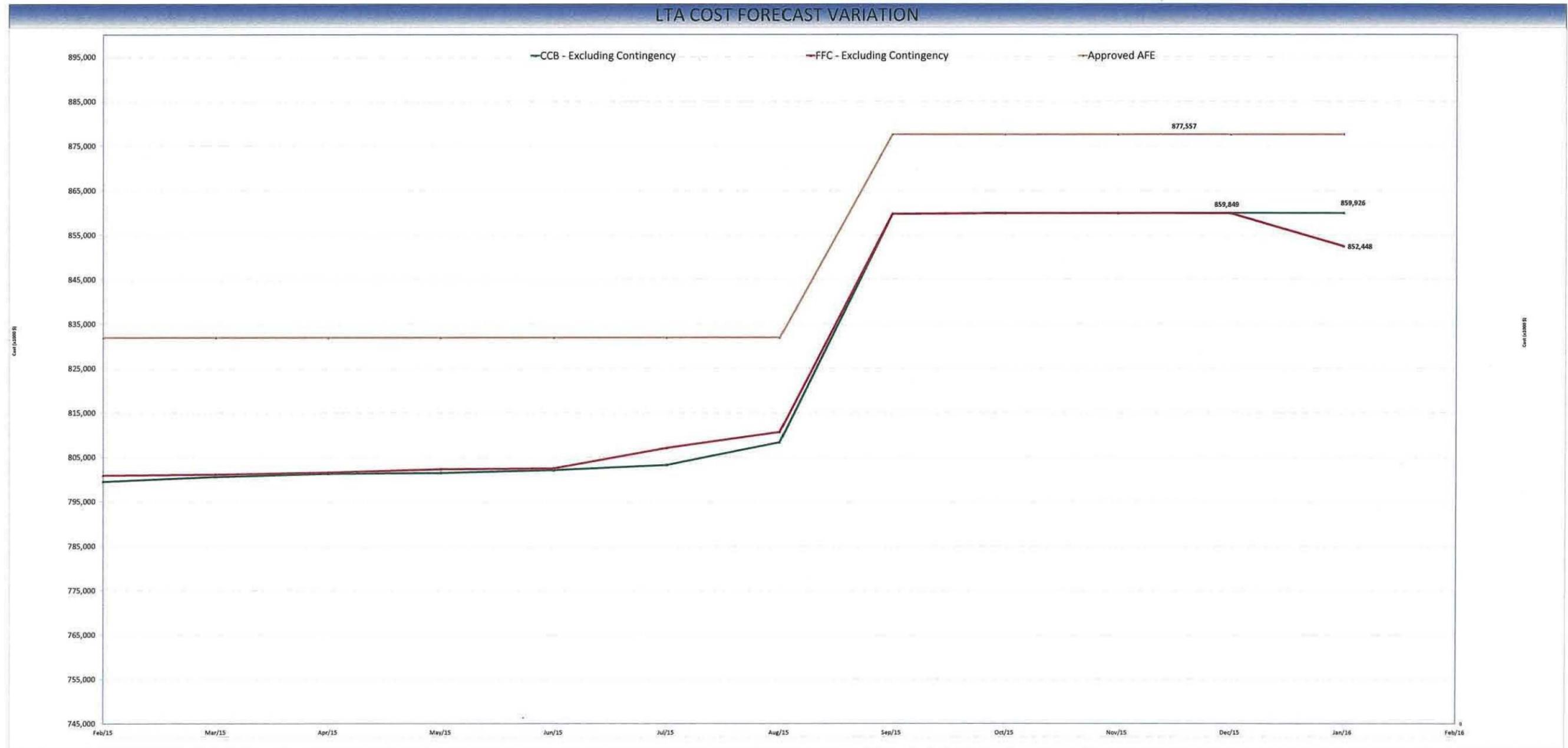
Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
6' - Labrador Transmission Asset												
SM0713 - 2012 Field Geotechnical Investigations	0	11,244	11,244	11,244	0	0	0	0	11,244	11,244	0	0
SM0714 - EPCM Services	71,332,365	-34,133,307	37,199,058	37,199,058	0	0	0	0	37,199,059	37,199,058	0	-0
ST0309 - Provision of Geotech - HVac	956,750	-956,750	0	0	0	0	0	0	0	0	0	0
ST0311 - Provision of Survey - HVac	0	135,074	135,074	135,075	0	0	0	0	135,075	135,075	0	-1
XD0001 - AFE Estimated Growth - C3	0	-4,658,985	-4,658,985	0	0	168,476	-4,745,553	0	0	-4,577,077	197,613	-81,908
XH0001 - AFE Estimated Growth - C1	0	2,977,128	2,977,128	0	0	-2,977,128	2,977,128	0	0	0	0	2,977,128
XM0001 - AFE Estimated Growth - General	0	4,243,630	4,243,630	0	0	0	4,243,630	0	0	4,243,630	0	0
XT0001 - AFE Estimated Growth - C4	0	-11,796,203	-11,796,203	0	0	-10,272,081	-11,796,203	0	0	-22,068,284	62,922	10,272,081
XX0002 - Additional Scope of Work	11,416,285	355,625	11,771,910	10,129,667	0	0	1,642,243	0	8,069,624	11,771,910	0	0
XX0003 - Environmental Approval	0	0	0	0	0	0	0	0	0	0	0	0
XX0004 - Historical cost	4,196,093	-4,196,093	0	0	0	0	0	0	0	0	0	0
XX0005 - Owner Cost	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total for : 6' - Labrador Transmission Asset	691,582,486	185,912,934	877,495,420	788,924,830	-1,038,361	9,615,159	80,055,749	10,950,006	604,043,579	877,557,376	0	-61,956
Grand Total:	691,582,486	185,912,934	877,495,420	788,924,830	-1,038,361	9,615,159	80,055,749	10,950,006	604,043,579	877,557,376	0	-61,956



Grouped by:C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)									
CH0004 - Southside Access Road	40,359,578	15,985,199	56,344,777	56,344,777	0	0	0	0	56,344,777	56,344,777	0	0
CH0005 - Accommodation Complex Site Utilities	18,577,209	-18,577,209	0	0	0	0	0	0	0	0	0	0
CH0006 - Bulk Excavation Works	139,882,886	3,564,082	143,446,967	138,918,273	-1,471,308	14,200,000	0	1,357,924	149,917,902	151,646,966	0	-8,199,999
CH0008 - North Spur Stabilization Works	66,427,162	76,948,846	143,376,008	143,092,425	-1,787,336	1,925,675	399,739	-5,267,704	69,541,053	143,630,503	0	-254,494
CH0034 - Powerhouse Elevator	808,729	-309,733	498,996	498,996	0	0	0	0	49,886	498,996	0	0
CH0039 - McKenzie River Bridge	2,654,965	3,754,764	6,409,729	5,769,729	0	640,000	0	0	5,757,130	6,409,729	0	-0
CH0046 - Spillway Hydro-Mechanical Equipment	52,899,185	-52,899,185	0	0	0	0	0	0	0	0	0	0
CH0048 - Site Clearing Access Road and Ancillary	3,635,203	4,317,615	7,952,818	8,010,028	0	0	-57,210	0	7,952,818	7,952,818	0	0
CH0062 - Offside Roads and Bridges	0	48,000	48,000	48,000	0	0	0	0	48,000	48,000	0	0
PH0014 - GSU Transformer	20,549,016	-5,336,346	15,212,670	15,012,670	0	200,000	0	0	3,257,220	15,212,670	0	0
PH0015 - Isolated Phase Bus	1,902,522	125,000	2,027,522	950,823	0	0	1,076,699	0	66,803	2,027,522	0	0
PH0016 - Generator Circuit Breakers	5,170,372	-3,455,176	1,715,196	1,715,196	0	0	0	0	358,333	1,715,196	0	0
PH0035 - Station Service Transformers	0	0	0	0	0	0	0	0	0	0	0	0
PH0036 - Auxiliary Transformers	474,712	100,066	574,778	555,808	0	18,970	0	0	555,808	574,778	0	0
PH0037 - 25 kV Switchgear	1,381,328	-1,381,328	0	0	0	0	0	0	0	0	0	0
PH0038 - Emergency Diesel Generators	1,754,986	264,677	2,019,663	2,019,663	0	0	0	0	2,019,368	2,019,663	0	1
PH0053 - LCP Used Camp	0	18,177,409	18,177,409	18,548,573	-11,399	0	-359,765	0	18,173,167	18,177,409	0	-0
SH0001 - Physical Hydraulic Model	723,100	0	723,100	723,100	0	0	0	0	723,100	723,100	0	0
SH0054 - Temporary Site Services	0	25,424,739	25,424,739	24,525,774	55,607	843,358	0	0	25,424,740	25,424,739	0	0
SH0063 - Provision of Site Services	0	0	0	0	0	0	0	0	0	0	0	0
SH0066 - Hydraulic Model - North Dam	0	358,670	358,670	358,670	0	0	0	0	358,670	358,670	0	0
SM0704 - Surveying Services	14,671,329	-6,854,456	7,816,873	22,924,414	105,090	-123,712	-15,088,920	0	7,652,886	7,816,873	0	0

Grouped by:C.P.

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)									
SM0713 - 2012 Field Geotechnical Investigations	2,108,854	1,619,818	3,728,672	3,963,132	0	-234,461	0	0	3,714,456	3,728,671	0	1
XH0001 - AFE Estimated Growth - C1	0	115,834,417	115,834,417	0	0	-115,834,417	115,834,417	0	0	0	0	115,834,417
Grand Total:	2,024,167,660	915,259,395	2,939,427,055	2,624,197,769	1,669,203	27,561,059	291,249,329	14,267,724	1,575,012,874	2,944,677,360	1,109,082	-5,250,306



Grouped by:C.P.
Period 055 From: 2015-12-31 To: 2016-01-27
Report Setting: cost report custom rev1
Project Currency: CAD
Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	
CD0503 - EarthWorks at Various Power Distribution	67,511,852	-15,423,037	52,088,815	52,088,813	0	0	0	0	52,087,063	52,088,813	0	2
CD0508 - Electrodes Sites	30,324,143	-8,661,499	21,662,644	14,134,989	0	-2,264,385	6,698,760	11,290	14,134,998	18,569,364	0	3,093,280
CD0512 - Construction Power Facilities	9,222,116	3,478,259	12,700,375	12,700,375	0	0	0	0	12,700,375	12,700,375	0	-0
CD0535 - Construction of Const. Tele. Services -	7,035,756	-7,035,756	0	0	0	0	0	0	0	0	0	0
CD0538 - Accommodations Camp (CF)	17,839,372	-12,433,765	5,405,607	5,405,606	0	0	0	0	5,405,607	5,405,606	0	0
CD0566 - Supply of Construction Power	0	3,745,885	3,745,885	3,059,516	0	220,544	465,824	14,061	1,354,875	3,745,884	0	0
CD0568 - Offsite Infrastructure Upgrades	0	3,113,200	3,113,200	1,035,200	0	0	2,078,000	0	1,026,253	3,113,200	0	0
PD0505 - Switchyard Equipment-AC Substations at C	98,321,259	-98,321,259	0	0	0	0	0	0	0	0	0	0
PD0513 - 138/25 kV Transformers	2,176,538	470,899	2,647,437	2,647,437	0	0	0	0	2,647,437	2,647,437	0	0
PD0514 - 138 kV and 25 kV Circuit Breakers	204,749	36,487	241,236	241,236	0	0	0	0	241,236	241,236	0	0
PD0515 - 230kV,138kV and 25kV Disconnect Switches	215,228	41,434	256,662	256,662	0	0	0	0	256,662	256,662	0	0
PD0518 - 138kV Capacitor Voltage Transformers	25,876	-1,336	24,540	24,540	0	0	0	0	24,540	24,540	0	0
PD0519 - 25 kV Vacuum Interrupters	142,352	23,409	165,761	165,761	0	0	0	0	165,761	165,761	0	0
PD0520 - 25 kV 6 x 3.6 MVAR Capacitor Banks	206,881	38,865	245,746	245,746	0	0	0	0	245,746	245,746	0	0
PD0522 - Pre-fabricated Control Room Building	822,811	284,511	1,107,322	1,107,322	0	0	0	0	1,107,322	1,107,322	0	0
PD0523 - Substation Service Transformer	18,204	32	18,236	18,236	0	0	0	0	18,236	18,236	0	0
PD0529 - 25kV Reclosers	62,751	73,611	136,362	136,362	0	0	0	0	136,362	136,362	0	0
PD0530 - 138 kV and 25 kV Surge Arresters	41,254	71	41,325	41,325	0	0	0	0	41,325	41,325	0	0
PD0531 - MV Instrument Transformer	55,410	102	55,512	55,512	0	0	0	0	55,512	55,512	0	0
PD0533 - Early Works Telecom Devices	319,443	-71,305	248,138	248,138	0	0	0	0	248,138	248,138	0	-0
PD0537 - Power Transformers, AC Substations at CF	31,093,446	6,116,746	37,210,192	37,234,609	0	315,208	0	192,342	36,667,926	37,549,817	0	-339,625
PD0561 - D20 RTU & Cabinet (CF)-Construction Powe	50,103	-13,397	36,706	36,706	0	0	0	0	36,706	36,706	0	0
PD0562 - Protection Front Panels (CF)	99,828	58,903	158,731	158,731	0	0	0	0	158,731	158,731	0	0
PD0563 - 138 kV Circuit Switcher (CF), MV Switche	116,767	-7,686	109,081	109,081	0	0	0	0	109,081	109,081	0	0
SD0536 - Integrated Commissioning Support Service	16,141,864	0	16,141,864	0	0	-16,141,864	16,141,864	0	0	0	-16,141,864	16,141,864
SD0564 - CF Camp Services	103,824	15,238,073	15,341,897	13,353,673	0	2,873,888	1,068,900	308,460	7,870,182	17,296,461	0	-1,954,563
SD0565 - Marine Geo-tech Electrodes	0	333,260	333,260	333,260	0	0	0	0	333,260	333,260	0	0
SD0567 - Installation of Geodetic Control Survey	0	39,179	39,179	39,179	0	0	0	0	39,179	39,179	0	0
SD0568 - C3 Site Office Supplies	0	36,400	36,400	36,400	0	0	0	0	838	36,400	0	0
XD0001 - AFE Estimated Growth - C3	0	21,865,264	21,865,264	0	0	-14,633,017	21,776,741	0	0	7,143,723	405,189	14,721,540
Grand Total:	990,008,577	183,608,907	1,173,617,484	980,787,965	-2,400,365	-8,487,183	192,546,153	23,853,917	428,250,732	1,162,446,570	-14,774,648	11,170,914

C3 COST FORECAST VARIATION



Grouped by:C.P.

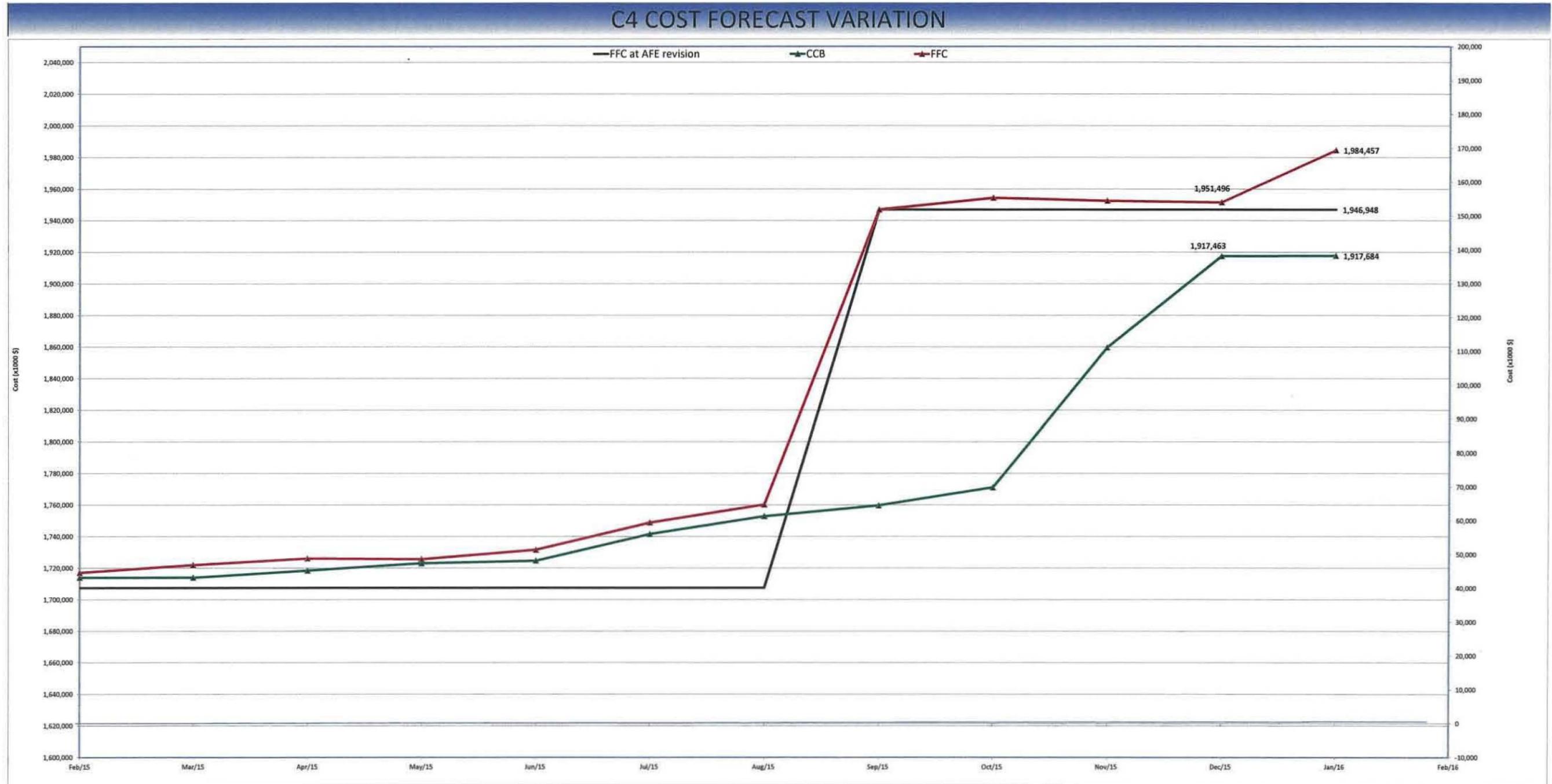
Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)				(7)	(5)	(Curr-Prev)	(6=3-5)	
CH0024 - Reservoir Clearing North Bank	57,310,625	71,879,775	129,190,400	129,177,962	0	0	12,438	0	81,844,211	129,190,400	0	0
CT0319 - Construction of HVac TL	204,427,902	72,597,497	277,025,399	270,208,100	162,868	3,715,041	2,010,941	2,918,380	224,303,528	276,096,950	-8,805,818	928,449
CT0327 - Construction of HVdc TL - 1	392,729,526	749,893,990	1,142,623,516	1,129,757,715	0	87,197,421	15,259,697	26,304,132	469,135,179	1,232,214,834	41,584,442	-89,591,317
CT0341 - Clearing of ROW HVac TL	30,703,771	14,726,656	45,430,427	42,786,329	0	2,000,000	0	-0	42,786,329	44,786,329	0	644,098
CT0342 - Construction of AC TL - Island	14,134,585	5,099,163	19,233,749	18,329,858	0	0	903,891	995,032	7,472,241	19,233,749	0	0
CT0343 - Clearing of ROW HVdc TL - 1	96,975,584	-96,975,584	0	0	0	0	0	0	0	0	0	0
CT0345 - Clearing of ROW HVdc TL - 2	57,585,444	-57,585,444	0	0	0	0	0	0	0	0	0	0
CT0346 - Construction of HVdc TL - 2	187,414,391	-187,414,391	-0	0	0	0	-0	0	0	-0	0	0
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	5,341,415	5,341,415	5,181,039	0	160,376	0	0	5,180,290	5,341,415	0	0
CT0355 - Marshaling Yards for HVdc Line	0	8,000,000	8,000,000	5,338,955	0	1,700,000	961,045	232,815	2,119,866	8,000,000	0	0
PT0300 - Supply of Conductors - HVac	20,880,983	-7,337,371	13,543,612	13,543,612	0	0	0	0	13,543,612	13,543,612	0	0
PT0301 - Supply of Insulators - HVac	4,939,704	-2,116,621	2,823,083	2,823,082	0	0	0	0	2,823,082	2,823,082	0	1
PT0302 - Supply of Towers- HVac	24,434,086	-3,614,374	20,819,712	20,713,660	0	0	106,052	0	20,713,660	20,819,712	0	-0
PT0303 - Supply of Hardware - HVac	12,835,064	-4,032,348	8,802,716	8,754,235	0	10,880	48,481	0	8,634,007	8,813,596	0	-10,880
PT0304 - Supply of OPGW - HVac	2,472,133	-592,632	1,879,501	1,761,536	0	55,282	62,683	9,240	1,761,536	1,879,501	0	0
PT0307 - Supply of Steel Tower Foundations - HVac	5,522,873	1,999,367	7,522,241	7,523,018	0	0	188	0	7,460,097	7,523,206	-1	-965
PT0308 - Supply of Steel Tower Foundations- HVdc	24,071,995	12,270,063	36,342,058	36,252,058	0	226,086	90,000	0	29,266,403	36,568,144	226,086	-226,086
PT0326 - Supply of Steel Wires - HVac	2,885,849	704,348	3,590,197	3,586,312	0	60,166	0	0	3,586,312	3,646,477	56,280	-56,280
PT0328 - Supply of Conductors - HVdc	89,474,058	-38,019,050	51,455,008	51,429,553	4,549,560	-4,599,310	0	0	51,429,553	51,379,803	-155,838	75,205
PT0329 - Supply of Insulators - HVdc	52,513,276	-30,797,088	21,716,188	21,647,376	0	46,740	22,072	0	21,608,410	21,716,188	0	-0
PT0330 - Supply of Towers - HVdc	63,048,979	-5,569,683	57,479,296	57,248,309	0	489,308	230,987	2,221,166	48,046,639	57,968,604	0	-489,308
PT0331 - Supply of Hardware - HVdc	6,867,096	16,455,121	23,322,217	23,072,129	153,655	49,591	46,842	6,657	18,269,357	23,322,217	1	-1
PT0334 - Supply of Wires - HVdc	1,914,335	5,674,470	7,588,805	7,574,480	0	14,324	0	0	7,574,480	7,588,804	0	1
PT0335 - Supply of Anchors - HVac	1,988,073	1,455,306	3,443,379	3,442,533	0	61,248	847	0	3,442,533	3,504,627	-10,464	-61,248
PT0336 - Supply of 25 kV Hardware	497,042	75,970	573,012	573,013	0	0	0	0	573,013	573,013	0	-1
PT0337 - Supply of 25 kV ADSS	467,173	-82,735	384,438	384,438	0	0	0	0	384,438	384,438	0	0
PT0338 - Supply of 25 kV Conductors	344,111	-28,733	315,378	315,378	0	0	0	0	315,378	315,378	0	0
PT0339 - Supply of 25 kV Insulators	65,096	-7,403	57,693	57,693	0	0	0	0	57,693	57,693	0	0
PT0340 - Supply of Poles for 138/25 KV	391,185	12,514	403,699	403,699	0	0	0	0	403,699	403,699	0	-0
PT0351 - Supply of Poles	477,982	1,221,237	1,699,219	1,261,289	0	0	437,930	0	1,261,289	1,699,219	0	0
PT0352 - Supply of Anchors - HVdc	22,878,411	-6,161,334	16,717,077	16,769,752	0	0	76	8,081	15,762,217	16,769,828	0	-52,751
PT0353 - Supply of OPGW - HVdc	4,285,092	4,560,403	8,845,495	8,758,628	0	3,919	82,948	7,466	8,548,161	8,845,495	3,919	-1
PT0356 - Supply of Dampers HVdc	0	1,379,928	1,379,928	1,379,627	0	1,060	0	0	1,379,627	1,380,687	0	-759
ST0309 - Provision of Geotech - HVac	956,750	-956,750	0	0	0	0	0	0	0	0	0	0
ST0310 - Provision of Geotech - HVdc	4,018,074	-4,018,074	0	0	0	0	0	0	0	0	0	0
ST0311 - Provision of Survey - HVac	0	135,074	135,074	135,075	0	0	0	0	135,075	135,075	0	-1
ST0312 - Provision of Survey - HVdc	0	0	0	0	0	0	0	0	0	0	0	0
XT0001 - AFE Estimated Growth - C4	0	37,319,609	37,319,609	0	0	-59,387,893	37,319,609	0	0	-22,068,284	62,922	59,387,893
Grand Total:	1,389,511,249	565,492,292	1,955,003,540	1,890,190,442	4,866,083	31,804,239	57,596,728	32,702,970	1,099,821,913	1,984,457,491	32,961,529	-29,453,951



Grouped by:C.P.; Nalcor Code; Physical component

Period 055 From: 2015-12-31 To: 2016-01-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment (4)	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date (7)	Current Forecast (5)	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
XX0001 - SOBI												
4 - Labrador Island Transmission Link (LITL)												
0000 - No Physical Component	352,014,204	-352,014,204	-0	0	0	0	0	0	0	0	0	-0
Sub Total for : 4 - Labrador Island Transmission Link (LITL)	352,014,204	-352,014,204	-0	0	0	0	0	0	0	0	0	-0
4230200000 - Geotechnical Investigations - LITL												
8510 - Transition Compound - Labrador	0	44,031	44,031	49,758	0	0	0	0	49,109	49,758	0	-5,727
8520 - Transition Compound - Northern Peninsula	0	83,965	83,965	83,965	0	0	0	0	83,315	83,965	0	0
Sub Total for : 4230200000 - Geotechnical Investigations - LITL	0	127,996	127,996	133,723	0	0	0	0	132,424	133,723	0	-5,727
4290000001 - SOBI subsea cable and installation												
8100 - dc Specialties - Marine Crossings	0	154,749,971	154,749,971	139,078,896	0	5,261,364	12,420,922	947,357	79,339,099	156,761,182	0	-2,011,211
Sub Total for : 4290000001 - SOBI subsea cable and installation	0	154,749,971	154,749,971	139,078,896	0	5,261,364	12,420,922	947,357	79,339,099	156,761,182	0	-2,011,211
4290000002 - SOBI subsea protection												
8100 - dc Specialties - Marine Crossings	0	72,511,006	72,511,006	54,512,235	0	0	15,981,833	74,079	33,285,715	70,494,068	0	2,016,938
Sub Total for : 4290000002 - SOBI subsea protection	0	72,511,006	72,511,006	54,512,235	0	0	15,981,833	74,079	33,285,715	70,494,068	0	2,016,938
4290000003 - SOBI Landfall												
8100 - dc Specialties - Marine Crossings	0	87,362,184	87,362,184	82,610,514	0	-259,100	4,751,671	16,383	76,625,615	87,103,085	-259,100	259,099
Sub Total for : 4290000003 - SOBI Landfall	0	87,362,184	87,362,184	82,610,514	0	-259,100	4,751,671	16,383	76,625,615	87,103,085	-259,100	259,099
4290000008 - Project Engineering and Misc works												
8100 - dc Specialties - Marine Crossings	0	11,835,974	11,835,974	9,613,425	0	0	2,222,549	0	8,507,440	11,835,974	0	0
Sub Total for : 4290000008 - Project Engineering and Misc works	0	11,835,974	11,835,974	9,613,425	0	0	2,222,549	0	8,507,440	11,835,974	0	0
4290114000 - Third party inspections												
8100 - dc Specialties - Marine Crossings	0	3,211,567	3,211,567	2,241,157	0	0	970,410	248,169	1,514,130	3,211,567	0	0
Sub Total for : 4290114000 - Third party inspections	0	3,211,567	3,211,567	2,241,157	0	0	970,410	248,169	1,514,130	3,211,567	0	0
4500030102 - Labrador Electrode Line Construction												
8610 - Electrode Labrador	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total for : 4500030102 - Labrador Electrode Line Construction	0	0	0	0	0	0	0	0	0	0	0	0
4500030103 - Transition Compound Construction												
8510 - Transition Compound - Labrador	0	2,294,091	2,294,091	0	0	31,320	2,262,771	0	0	2,294,091	0	0
8520 - Transition Compound - Northern Peninsula	0	2,294,091	2,294,091	0	0	2,252,361	41,730	0	0	2,294,091	0	0
Sub Total for : 4500030103 - Transition Compound Construction	0	4,588,182	4,588,182	0	0	2,283,681	2,304,501	0	0	4,588,182	0	0
4521030100 - LITL DC Specialties & Switchyard Civil Works												
8510 - Transition Compound - Labrador	0	7,967,306	7,967,306	7,967,306	0	0	0	0	7,967,306	7,967,306	0	0
8520 - Transition Compound - Northern Peninsula	0	2,136,046	2,136,046	2,139,558	0	0	-3,512	0	2,137,887	2,136,046	0	0
Sub Total for : 4521030100 - LITL DC Specialties & Switchyard Civil Works	0	10,103,352	10,103,352	10,106,864	0	0	-3,512	0	10,105,193	10,103,352	0	0
Sub Total for : XX0001 - SOBI	352,014,204	-7,523,972	344,490,232	298,296,814	0	7,285,945	38,648,374	1,285,988	209,509,615	344,231,132	-259,100	259,099
Grand Total:	352,014,204	-7,523,972	344,490,232	298,296,814	0	7,285,945	38,648,374	1,285,988	209,509,615	344,231,132	-259,100	259,099

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
C1		Approved Scope change:						
CH0003	Administrative Buildings	Addition of a sports complex	5,000,000		5,000,000		PCN-0066	SC0005
CH0003	Administrative Buildings	Purchase of washcars	581,111		581,111		PCN-0229	SC0215
SH0051	Building maintenance	Impact of extension of CH0007 by 6 months	2,400,000		2,400,000		PCN-0137	SC0118
SH0040	Garbage removal and disposal	Impact of extension of CH0007 by 6 months	250,000		250,000		PCN-0137	SC0118
SH0019	Security services	Impact of the collective agreement	9,000,000		9,000,000		PCN-0153	SC0101
SH0020	Medical services	Impact of the collective agreement	1,000,000		1,000,000		PCN-0153	SC0101
SH0019	Security services	Impact of extension of CH0007 by 6 months	1,500,000		1,500,000		PCN-0137	SC0118
CH0003	Administrative Buildings	Relocation of concrete lab and tech offices	99,250		99,250		PCN-0195	SC0151
CH0006	Bulk Excavations works	Relocation of concrete lab and tech offices	205,369		205,369		PCN-0195	SC0151
CH0006	Bulk Excavations works	Additional quantities at the switchyard and converter stations	4,300,955		4,300,955		PCN-0194	SC0230
SH0020	Medical services	Impact of extension of CH0007 by 6 months	1,500,000		1,500,000		PCN-0137	SC0118
SH0041	Personnel Transport	Impact of extension of CH0007 by 6 months	1,270,000		1,270,000		PCN-0137	SC0118
CH0002	Accommodations complex Buildings	Adjustment to cover a low estimate	40,994,428		40,994,428		PCN-0119	SC0068/254
CH0002	Accommodations complex Buildings	Crawlspace remediation at the camp	1,500,000		1,500,000		PCN-0486	SC0501/528/ 542
CH0003	Administrative buildings	Claim for relocation of Admin. Bldg	500,000		500,000			SC0528
CH0003	Accommodations complex Buildings	Budget adjustments to align with AFE	700,332		700,332			SC0542
CH0006	Bulk Excavations works	Quantity adjustment to final contract values	-4,735,764		-4,735,764			SC0542
CH0006/XH0001	Bulk Excavations works	Increasing the claim final settlement	3,000,000		3,000,000			SC0528
CH0003	Administrative Buildings	additional cost to relocate the admin buildings	3,915,566		3,915,566			SC0005/254
CH0004	Southside Access Road	Claim for SSAR and budget reduction on the road upgrade	3,925,699		3,925,699			SC0254
CH0006	Bulk Excavations works	Scope adjustment, claim	912,521		912,521			SC0254
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Remove LMAX from Budget, cancel credit on the NS and Dams, adjust growth	-20,900,000		-20,900,000			SC0254
CH0008	North Spur Stabilization Works	Additional cost due to changes in quantities and shcedule extension	18,400,000		18,400,000			SC0256
CH0008	North Spur Stabilization Works	North Spur dam break analysis work	15,000		15,000		PCN-0288	SC0285
CH0008	North Spur Stabilization Works	Revision to Power Supply for Group Gilbert and Internet Philosophy	200,000		200,000		PCN-0474	SC0496
CH0009	North and South Dams	Additional cost due to changes in quantities and shcedule extension	61,110,985		61,110,985			SC0256
CH0030	Turbine and generators	Forecast adjustment due to favorable bid prices	-26,781,181		-26,781,181			SC0256
CH0030	Turbine and generators	Increase in cost of the storage	1,021,243		1,021,243		PCN-0386	SC0386
CH0032	Hydro mechanical equipment	multiple Design changes	1,600,125		1,600,125			SC0256
CH0033	Powerhouse Cranes	Reduction of the rated capacity of cranes from 700 to 650 TM	-1,467		-1,467			SC0256
CH0034	Powerhouse elevator	Forecast adjustment to bid prices and latest RFA	-293,313		-293,313			SC0256
CH0052	Habitat compensation	Increase of quantities for the construction works of the fish habitat compensation and provision for wet lands	6,125,000		6,125,000			SC0256
PH0014	GSU Transformer	Forecast adjustment to bid prices	-5,297,366		-5,297,366			SC0256
PH0016	Generator Circuit Breakers	Saving due to favaarable bid values	-2,730,176		-2,730,176			SC0256

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PH0036	Auxiliary Transformers	Additional transfos required	100,065		100,065			SC0256
PH0053	LCP Used Camp	Alignment to final contract price	-165,156		-165,156			SC0256
SH0019	Security Services	Alignment to bids received	-1,653,412		-1,653,412			SC0254
SH0022	Fuel Dispensing services	Alignment to bids received	1,722,435		1,722,435			SC0254
SH0040	Garbage removal and disposal services	Operational impact caused by the relocation of the Admin. Bldg, cost increase to align with bid received	6,251,575		6,251,575			SC0254
SH0054	Temporary site services	Extension of some services till end of April	1,217,016		1,217,016			SC0254
CH0048	Site Clearing Access Road and Ancillary Areas	Clearing for additional laydown areas and spoil disposal areas, widening the ROW of the construction power, several FWI	3,984,272		3,984,272			SC0254
PH0038	Emergency Diesel Generators	Increase in the capacity of Generators from 3MW to 4 MW	214,047		214,047			SC0256
SH0018/XH0001	Catering, housekeeping and janitorial	services for C3 team	12,450,000		12,450,000		PCN-0480	SC0518/528
SH0018/XH0001	Catering, housekeeping and janitorial	Additional cost for labor maintenance	4,945,750		4,945,750			SC0528
SH0019/XH0001	Security services	Additional cost required due to increase in number of hours in the security contract	2,000,000		2,000,000			SC0528
SH0022	Fuel Dispensing services	services for C3 team	175,000		175,000		PCN-0468	SC0527/528
SH0040/XH0001	Garbage removal and disposal services	services for C3 team	2,762,989		2,762,989		PCN-0468	SC0528
SH0041	Personnel Transport	Travel allowance for unionised employees (change request #1)	94,568		94,568			SC0542
SH0051	Building maintenance	Site entrance flag poles	8,475		8,475			SC0537
SH0051/XH0001	Building maintenance	Renovate the old camp to make it re-usable	491,525		491,525			SC0528
SH0051/XH0001	Building maintenance	Increase in maintenance cost	1,000,000		1,000,000			SC0528
SH0054	Temporary site services	Budget adjustments to align with AFE	889,691		889,691			SC0542
SH0018	Catering, housekeeping and janitorial	Overall saving between bids and revised budget	-7,455,183		-7,455,183			SC0254
SH0020	Medical services	re evaluation of CA impact, drug tests and vehicules strategy	-4,498,010		-4,498,010			SC0254
CH0002	Accommodations complex Buildings	Additional funds required to execute the camp utilities under the CH0002 contract; Liannu's bid was higher than the estimated budget	22,900,000		22,900,000		PCN-0158	SC0099
SH0054	Temporary site services	Additional TV's for the temporary camp	126,750		126,750		PCN-0136	SC0072
CH0062	Offsite Roads and Bridges	Demonstration Pad	48,000		48,000		PCN-0106	SC0018
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Additional funds to cover the shortfall between the award value and the budget	387,574,315		387,574,315		PCN-0209	SC0208/528
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Growth reduction	-5,000,000		-5,000,000			SC0528
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Estimate on highlighted engineering changes to date	1,050,000		1,050,000			SC0528
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Concrete supply for C3	-2,112,500		-2,112,500			SC0528
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Budget adjustments to align with AFE	-2,860,877		-2,860,877			SC0542
CH0007/XH0001	Intake, Powerhouse, Spillway and Transition Dams	Estimate on highlighted engineering changes to date	2,112,500		2,112,500			SC0528
CH0007/XH0001	Intake, Powerhouse, Spillway and Transition Dams	Cancelling the cleaning and maintenance of wash cars	7,500,000		7,500,000			SC0528/CR#4
CH0007/XH0001	Intake, Powerhouse, Spillway and Transition Dams	Enhancement for winter conditions	20,000,000		20,000,000			SC0528
SH0022	Fuel Dispensing services	Budget adjustments to align with AFE	20,000		20,000			SC0542
SH0041	Personnel Transport	Additional funds required due to change in shift and extra bussing and unionizing the workers	8,219,713		8,219,713		PCN-0240	SC0213
PH0053	LCP Used Camp	Supply and install temporary camp from Manitoba Hydro	15,921,000		15,921,000		PCN-0087	SC0041/SC0132
CH0004	Southside Access Road	Caroline brook resource road upgrade	12,000,000		12,000,000		PCN-0196	SC0131
CH0004	Southside Access Road	Closing of SSAR contract	-900,685		-900,685		PCN-0460	SC0482

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
SH0066	Hydraulic Model - North Dam	North RCC dam physical hydraulic model study	400,000		400,000		PCN-0109	SC0084
CH0009	North and South Dams	Elimination of concrete and replacing it by vertical steps in RCC dam	-9,000,000		-9,000,000		PCN-0109	SC0061
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Extending the schedule by 6 months - indirects cost	20,845,286		20,845,286		PCN-0137	SC0118
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Discharge Channel	7,600,000		7,600,000		PCN-0058	SC0017
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Spillway Low Level Gates - civil	1,850,000		1,850,000		PCN-0055	SC0004
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Reducing the length of the spillway discharge channel	-7,500,000		-7,500,000		PCN-0377	SC0413/ 528
SH0022	Fuel Supply	Forecast increase due to Conversion error in O&M cost from bid to contract in addition to price adjustment	3,922,809		3,922,809		PCN-0426	SC0453
CH0008	North Spur Stabilization Works	Confirmation of Quantities at North Spur	2,503,042		2,503,042		PCN-0200	SC0177
SH0066	Hydraulic model - North Dam	Adjustment to final contract value	-39,470		-39,470			SC0538
CH0008	North Spur Stabilization Works	Re-routing of construction power at the North Spur	250,000		250,000		PCN-0084	SC0019
CH0008	North Spur Stabilization Works	Dynamic and Hydrogeological studies	600,000		600,000		PCN-0206	SC0186
CH0039	Mckenzie river bridge	Alignment of forecast with contract value	198,776		198,776		PCN-0291	SC0306
CH0068	MF Construction power- remaining works	Additional funds required to finalize construction power at MF	1,370,000		1,370,000		PCN-0331	SC0310
PH0016	Generator Circuit Breakers	Funds transferred to CH0008 to cover Dynamic and Hydrogeological studies	-600,000		-600,000		PCN-0206	SC0186
CH0008	North Spur Stabilization Works	Additional Stabilization works because of risk of slope instability and breaching in the area	1,400,000		1,400,000		PCN-0141	SC0089
CH0030	S/I Turbine and Generators	Milestone revision due to extending the schedule of CH0007 by 6 months	2,000,000		2,000,000		PCN-0137	SC0118
CH0008	North Spur Stabilization Works	Additional geotechnical works at the NS	625,000		625,000		PCN-0405	SC0426/539
CH0008/XH0001	North Spur Stabilization Works	LT-124 - Non-Working OE Apprentices	200,000		200,000			SC0491
CH0009	North and South Dams	Budget increase to align with contract value	108,000,000		108,000,000			SC0528
CH0009/XH0001	North and South Dams	Budget increase to align with contract value	4,000,000		4,000,000			SC0528
CH0030	Turbine and generators	Transfer of traveling cost to SM0709	-1,940,209		-1,940,209			SC0491
CH0030/XH0001	Turbine and generators	Additional Storage Requirements	13,500,000		13,500,000			SC0491
CH0030/XH0001	Turbine and generators	Miscellaneous engineering changes	2,792,418		2,792,418			SC0491
CH0030/XH0001	Turbine and generators	Compensation for apprentices ratio	1,800,000		1,800,000		DAN-1215	SC0491
CH0031/XH0001	Mechanical and Electrical Auxiliaries (MF)	Alignment with the projected contract price of 160 M	73,300,000		73,300,000			SC0491
CH0031/XH0001	Mechanical and Electrical Auxiliaries (MF)	Projected Value engineering saving	-4,000,000		-4,000,000		DAN-1151	SC0491
CH0031/XH0001	Mechanical and Electrical Auxiliaries (MF)	Multiple engineering changes	663,512		663,512			SC0491
CH0032	Hydro mechanical equipment	Adjustment to existing budget	100,000		100,000			SC0491
CH0032	Hydro mechanical equipment	Schedule Acceleration	5,370,314		5,370,314		PCN-0545	SC0587
CH0032/XH0001	Hydro mechanical equipment	Additional Anchorage storage (beyond June) due to schedule delays	500,000		500,000			SC0491
CH0032/XH0001	Hydro mechanical equipment	Remedial works for as built anchor position, Spillway Maintenance Gallery Lighting	200,000		200,000		DAN 1100	CN012/18 SC0491
CH0032/XH0001	Hydro mechanical equipment	Embedded Guide & Associated Hardware Storage	1,000,000		1,000,000		DAN-1494	SC0491
CH0033	Powerhouse cranes	Storage and preservation of cranes	180,000		180,000			SC0491
CH0039	Mackenzie river	Alignment with final contract cost	371,024		371,024			SC0542
CH0048	Site Clearing Access Road and Ancillary Areas	Contract closeout reconciliation	-57,210		-57,210			SC0528
CH0068	MF Construction power- remaining works	Budget adjustments to align with AFE	-808		-808			SC0542

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PH0014	GSU Transformer	Adjustment to existing budget	-37,800		-37,800			SC0491
SH0018	Catering, housekeeping and janitorial	MF Main Gate - Sign and Flag Poles	41,770		41,770		PCN-0513	SC0537
SH0018	Catering, housekeeping and janitorial	Budget adjustments to align with AFE	-904,389		-904,389			SC0542
CH0030	Turbine and generators	Adjustment to collective Agreement (CHR-0245)	347,215		347,215		PCN-0336	SC0437
CH0030	T&G Contract	Storage of circular passage liners	\$79,999		\$79,999		PCN-0412	SC0438
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Ad-hoc professional concrete services	\$60,000		\$60,000		PCN-0518	SC0553
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Overbreak in separation wall / Spillway south Pier		\$296,957	\$296,957		PCN-0567	SC0614
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Increased embedments and rebars for Spillway Piers		\$812,125	\$812,125		PCN-0561	SC0622
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Intake vent pipes	400,000		400,000		PCN-0422	SC0444
SH0019	Security services	Security at the North Spur	600,000		600,000		PCN-0415	SC0432
SH0020	Medical services	Medical services at the North Spur	1,450,000		1,450,000		PCN-0415	SC0432
CH0008	North Spur Stabilization Works	Forecast alignment with value of bids received	53,600,000		53,600,000		PCN-0399	SC0431
CH0032	Hydro mechanical equipment	Adjustment to bid price	52,663,427		52,663,427		PCN-0218	SC0197
PH0058	Supply of 600 V switchgear	S/I of 600 V switchgear	924,196		924,196		PCN-0185	SC0142
CH0039	Mackenzie river	Additional cost for the mackenzie river due to engineering constraints	2,000,000		2,000,000		PCN-0291	SC0352
CH0032	Powerhouse and Spillway hydro mechanical Equipment	Spillway Low Level Gates - Hydromechanical	8,500,000		8,500,000		PCN-0055	SC0004
			953,551,082	1,109,082	954,660,164			
		Pending Scope change:						
CH0006	Bulk Excavations works	Increase in claim value	5,200,000		5,200,000			T-1319
CH0030	Turbine and generators	Turbine Servomotor Long-term Protection (CR-287)	50,297		50,297		DAN-1495	CN-062
			5,250,297	0	5,250,297			
		Design Development						
		Errors & Omissions						
		Bids Received						
		Purchase orders and Construction contracts execution						
Misc.			0	0	0			
		SUBTOTAL C1	958,801,379	1,109,082	959,910,461			
C3		Approved Scope change:						
CD0503	Earth works at various power distribution	Removal of FP transition compound from CD0503	-3,458,952		-3,458,952		PCN-0062	SC0009
CD0501	Converters and cable transition compound	MF converter and AC switchyard geotechnical investigation	300,000		300,000		PCN-0112	SC0098
CD0501	Converters and cable transition compound	washcars for sites	85,176		85,176		PCN-0468	SC0527
CD0504	Civil Works for the Converter Stations and Switchyards	Site Services for Component 3 Contractors - maintenance, cleaning and consumables of the wash car at MF and SP	309,011		309,011		PCN-0468	SC0527
CD0502	Construction of AC Substations	A separate control and protection shelter at CF SY to accommodate the protection panels	372,000		372,000		PCN-0145	SC0090
PD0533	S/I Early works telecom devices	Additional cell and SAT phones to increase safety for workers, deployment of a stand alone LMRS	177,876		177,876		PCN-0126	SC0073
SD0560	Early works construction communications services (MF)	Additional cell and SAT phones to increase safety for workers, deployment of a stand alone LMRS	169,932		169,932		PCN-0136	SC0074
PD0537	Power Transformers, AC Substations at CF, MF and SP	Additional spare transformers and grounding reactors at CF and SP SY	5,740,997		5,740,997		PCN-0113	SC0063

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
SD0565	Marine Geotech Investigation	Investigation to ensure soil conditions for breakwater at both electrode sites	380,000		380,000		PCN-0068	SC0053
CD0512	Construction Power Facilities	MF change of scope, medical services and CF Accommodations	969,000		969,000		PCN-0095	SC0031/55
CD0534	Soldiers Pond Synchronous Condensers	EPC Contract Strategy Change for Synchronous Condensers	8,424,109		8,424,109		PCN-0148	SC0107
CD0512	Construction Power Facilities	Construction Power Extra Claims	3,200,000		3,200,000		PCN-0165	SC0113
CD0566	Supply of Construction Power	Issue Constuction power to various sites (FP, SC, CF, SP, LDE, DPE)	4,000,000		4,000,000		PCN-0138	SC0126
SD0567	Installation of Geodetic Control Survey	Installation of geodetic control survey for FP, LAD,SC,DP and SP	49,326		49,326		PCN-0168	SC0116/155
CD0504	Civil Works for the Converter Stations and Switchyards	CD0502/CD0504 - Transfer of Supply / Install of Substation Control Buildings from CW Baseline budget (CD0504) to EPC Contractor (CD0502)	-5,862,248		-5,862,248		PCN-0519	SC0555
CD0502	Construction of AC Substations	CD0502/CD0504 - Transfer of Supply / Install of Substation Control Buildings from CW Baseline budget (CD0504) to EPC Contractor (CD0502) and 5% mark up	6,155,361		6,155,361		PCN-0519	SC0555
CD0502	Construction of AC Substations	Estimate premium for the change in contract strategy from EPCM to EPC for CD0502	47,448,738		47,448,738		PCN-0163	SC0135
PD0537	Power Transformers	Forecast Over Run as per RFA	3,079,909		3,079,909		PCN-0067	SC0205
CD0534	Soldiers Pond Synchronous Condensers	Increase in Synchronous condenser capacity from 150 to 175 MVAR	4,300,000		4,300,000		PCN-0067	SC0205
PD0537	Power Transformers	Forecast Over Run as per RFA	240,751		240,751		PCN-0226	SC0206
CD0502	Construction of AC Substations	Reduction of the SP switchyard by 2 feeders for a total of 13 instead of 15 feeders	-12,359,240		-12,359,240		PCN-0174	SC0159
CD0503	Earthworks at Various Power Distribution Site	Reduction of the SP switchyard by 2 feeders for a total of 13 instead of 15 feeders	156,975		156,975		PCN-0174	SC0159
CD0502	Construction of AC Substations	Reduction in the size and amount of equipment required at CF switchyard	-9,010,806		-9,010,806		PCN-0175	SC0158
CD0503	Earthworks at Various Power Distribution Site	Optimization for Churchill Falls and Solider Ponds site	-22,690,931		-22,690,931		PCN-0175	SC0158/257
CD0503	Earthworks at Various Power Distribution Site	Re-routing of the 13.8 kV distribution line at CF to travel parallel to the existing 138 kV transmission line	617,000		617,000		PCN-0173	SC0163
CD0535	Construction of Const. Tele. Services	Transfer of Telecoms Scope from CD0535 to SD0560	-7,035,756		-7,035,756		PCN-0162	SC0123
CD0501	Converters and cable transition compound	Optimization and Contract strategy changes for the converter station and the transition compounds.	25,204,634		25,204,634		PCN-258	SC0259
CD0501	Converters and cable transition compound	Budget alignment to final contract value for Geotech work	-30,543		-30,543		Rebaseline	SC0257/265
CD0502	Construction of AC Substations	Funds to cover the shortfall between the award value and the budget (Includes additional equipment for revenue & statistical metering and civil scope)	61,756,260		61,756,260		Rebaseline	SC0257
CD0502	Construction of AC Substations	Cost of the HVGB line to Gull Island	-10,203,988		-10,203,988		Rebaseline	SC0257
CD0512	Construction Power Facilities	Budget alignment to final contract value	-676,331		-676,331		Rebaseline	SC0257
CD0534	Soldiers Pond Synchronous Condensers	Alignment to contract forecast - Includes additional budget for equipment, civil work and increased market condition costs.	45,000,000		45,000,000		Rebaseline	SC0257
CD0538	Accommodation Camp (CF)	Budget alignment to final contract value	-5,227		-5,227		Rebaseline	SC0257
CD0566	Supply of Construction Power	Budget alignment to contract forecast -Saving on installation of infrastruture at Soldiers Pond and Forteau Point	-659,608		-659,608		Rebaseline	SC0257
PD0513	138/25 kV Transformers	Budget alignment to final contract value	471,329		471,329		Rebaseline	SC0257
PD0514	138 kV and 25 kV Circuit Breakers	Budget alignment to final contract value	40,351		40,351		Rebaseline	SC0257
PD0515	230 kV, 138 kV and 25 kV Disconnect Switches	Budget alignment to final contract value	41,558		41,558		Rebaseline	SC0257
PD0518	138 kV Capacitor Voltage Transformers	Budget alignment to final contract value	-1,336		-1,336		Rebaseline	SC0257
PD0519	25 kV Vacuum Interrupters	Budget alignment to final contract value	50,110		50,110		Rebaseline	SC0257
PD0520	25 KV 6 x 3.6 MVAR Capacitor Banks	Budget alignment to final contract value	38,865		38,865		Rebaseline	SC0257
PD0522	Pre-fabricated Control Room Building	Budget alignment to final contract value	330,897		330,897		Rebaseline	SC0257
PD0523	Substation Service Transformers	Budget alignment to final contract value	32		32		Rebaseline	SC0257
PD0529	25 kV Reclosers	Budget alignment to final contract value	74,893		74,893		Rebaseline	SC0257
PD0530	138 kV and 25 Kv Surge Arresters	Budget alignment to final contract value	71		71		Rebaseline	SC0257

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PD0531	MV Instrument Transformers	Budget alignment to final contract value	102		102		Rebaseline	SC0257
PD0537	Power Transformers, AC Substations at CF, MF and SP	Budget alignment to final contract value	-2,721,868		-2,721,868		Rebaseline	SC0257
PD0537	Power Transformers, AC Substations at CF, MF and SP	Cost of the HVGB line to Gull Island	-3,047,600		-3,047,600		Rebaseline	SC0257
PD0561	D20 RTU & Cabinet (CF) - Construction Power	Budget alignment to Final contract value	1,246		1,246		Rebaseline	SC0257
CD0503-002	Earth Works at Soldiers Pond	Increase in Quantities Due to Site Conditions. (Terrafix Erosion Control Blanket, Slope protection , Rock fill)	288,150		288,150		PCN-0312	SC0298
CD0502	Construction of AC Substations	Reduction in CVTs at CF	-118,642		-118,642		PCN-0304	SC0311
CD0502	Construction of AC Substations	Change to GIS - savings on base price for package	-5,071,642		-5,071,642		PCN-0305	SC0312
CD0501-001	Converters and cable transition compound	Creepage Distance for Equipment in ac Terminal Stations	288,000		288,000		PCN-0311	SC0313
CD0502	Construction of AC Substations	Creepage Distance for Equipment	258,567		258,567		PCN-0311	SC0313
CD0502	Construction of AC Substations	Growth allowance for Additional O&M Assistance, optimization of controls buildings, underrun on supply of granular at CF, etc.	2,099,409		2,099,409		PCN-0314	SC0314
CD0502	Construction of AC Substations	Change in Civil Contracting Strategy	-11,600,000		-11,600,000		PCN-0307	SC0315
CD0501-001	Converters and cable transition compound	Removal of MF substation breakers due to GIS	-2,789,507		-2,789,507		PCN-0305	SC0312
PD0562	Protection Front Panels (CF)	Budget alignment to Final contract value	58,903		58,903		Rebaseline	SC0257
PD0563	138 kV Circuit Switcher (CF), MV Switcher	Budget alignment to Final contract value	2,064		2,064		Rebaseline	SC0257
SD0564	CF camp services	FWO issued during Mobilization of Camp	52,059		52,059		Rebaseline	SC0257
CD0503-002	Earth Works at Soldiers Pond	Increased bog quantities and other additional costs.	2,007,391		2,007,391		PCN-0298	SC0284
CD0503-002	Earthworks at SP	Soldiers Pond Earthworks - Increase in Contract Quantities	3,222,500		3,222,500		PCN-0330	SC0329
CD0503-002	Earthworks at SP	Soldiers Pond - Siltation Control plus 10% growth.	44,305		44,305		PCN-0341	SC0333
SD0564	CF camp services	CF Camp Trailers	169,686		169,686		PCN-0338	SC0332
CD0568	Offsite Infrastructure Upgrades	Offsite Infrastructure Upgrades - Cartwright to MF and Bay Bulls to SOP. Required scope of work reduced as a result of the route study.	-7,677,149		-7,677,149		PCN-0319	SC0335
CD0501-001	Converters and cable transition compound	Arc Flash Design to Cat 2	226,000		226,000		PCN-0315	SC0336
CD0501-001	Converters and cable transition compound	Addition of PA/GA, Internet/telephones and SACS to Contract	300,000		300,000		PCN-0339	SC0337
CD0502	Construction of AC Substations	Transfer of common site services budget from CD0502 to CD0503-002 for paving and CD0534 for snow maintenance	-750,000		-750,000		PCN-0356/0359	SC0348 / SC0356
CD0534	Soldiers Pond Synchronous Condensers	Transfer of common site services budget for snow maintenance from CD0502 to CD0534	419,500		419,500		PCN-0359	SC0356
CD0504	Civil Works for the Converter Stations and Switchyards	Transfer of Scope from CW Baseline Budget - Site offices and Temporary Trailers	-872,073		-872,073		PCN-0506	SC0540
CD0501	Converters and cable transition compound	Transfer of Scope from CW Baseline Budget - Site offices and Temporary Trailers - MF and SP	531,955		531,955		PCN-0506	SC0540
CD0502	Construction of AC Substations	Transfer of Scope from CW Baseline Budget - Site offices and Temporary Trailers - CF	340,118		340,118		PCN-0506	SC0540
XD00001	AFE Estimated Growth - C3	Estimated growth as per approved AFE 2015 - Includes Credit from NL Hydro for HVBG	23,565,264	-1,700,000	21,865,264		Rebaseline	SC0524
CD0510	Permanent Telecommunications	Budget for Potential over run Repeaters - Permanent Phase Optical Transport Network		1,700,000	1,700,000		PCN-0355 Rev 01	SC0613
CD0501	Converters and cable transition compound	Foreign exchange budget added to commitment package for conversion of unpaid portion of the contract to Canadian dollars at contract signing.	18,788,865		18,788,865		PCN-0297 / Rebaseline 2015	SC0524
CD0501	Converters and cable transition compound	Removal of non specified growth and specified growth for RDTS	-7,050,437		-7,050,437		Rebaseline	SC0524
CD0502	Construction of AC Substations	Budget alignment to match contract value - Removal of credit from commitment package for NL Hydro for HVBG	10,203,988		10,203,988		Rebaseline	SC0524
CD0502	Construction of AC Substations	Removal of non specified growth and specified growth for creepage distance (included in contract price)	-7,732,922		-7,732,922		Rebaseline	SC0524
CD0502	Construction of AC Substations	Additional LCP Trailer requirements for Muskrat Falls and Churchill Falls	153,996		153,996		PCN-0511	SC0551
CD0504	Civil Works for the Converter Stations and Switchyards	Additional budget to align with Converter Civil Target Price (Muskrat Falls and Soldiers Pond)	10,123,799		10,123,799		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Additional budget to align with Soldiers Pond Switchyard Target Price	-1,509,748		-1,509,748		Rebaseline	SC0524

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
CD0504	Civil Works for the Converter Stations and Switchyards	Additional budget to align with Churchill Falls Switchyard Target Price	2,726,177		2,726,177		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Additional budget to align with Muskrat Falls Switchyard Target Price	25,091		25,091		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Removal of non specified growth as per approved AFE 2015	-3,180,106		-3,180,106		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Additional LCP Trailer requirements for Muskrat Falls and Churchill Falls	164,388		164,388		PCN-0511	SC0551
CD0508	Electrode Sites	Removal of non specified growth as per approved AFE 2015	-1,288,585		-1,288,585		Rebaseline	SC0524
CD0534	Soldiers Pond Synchronous Condensers	Foreign exchange budget added to commitment package for conversion of unpaid portion of the contract to Canadian dollars at contract signing.	1,092,428		1,092,428		Rebaseline	SC0524
CD0534	Soldiers Pond Synchronous Condensers	Removal of non specified growth as per approved AFE 2015	-3,910,379		-3,910,379		Rebaseline	SC0524
PD0537	Power Transformers, AC Substations at CF, MF and SP	Budget to align with contract value - Removal of credit from commitment package for NL Hydro for HVBG	2,824,557		2,824,557		Rebaseline	SC0524
CD0508	Electrode Sites	Access Road Maintenance and Environmental Requirements at Soldiers Pond	30,000		30,000		PCN-0449	SC0494
CD0508	Electrode Sites	Contract Under run as per approved RFA	-7,960,863		-7,960,863		PCN-0414	SC0455
CD0503	Converters and cable transition compound	Final Contract value - Close out	-1,553,050		-1,553,050		PCN-0366	SC0409
CD0503-002	Earthworks at SP	Transfer of common site services budget for paving from CD0502 to CD0503-002	330,500		330,500		PCN-0356	SC0348
CD0502	Construction of AC Substations	Transfer from CD0502 to CD0503-001 for common fill and supply of granular at CF (currently in CD0503-001 scope)	-355,000		-355,000		PCN-0300	SC0351
CD0503-003	Earth Work remediation at SY and converter at MF	MF Switchyard/Converter Outstanding Work Prior to Handover to HVdc Specialties	1,019,576		1,019,576		PCN-0309	SC0297
CD0566	Supply of Construction Power	Construction Power hook up at Churchill Falls	104,410		104,410		PCN-0370	SC0379
SD0564	CF camp services	SD0564 - Maintenance Labor - CF Camp - Remaining Duration of Camp	786,720		786,720		PCN-0392	SC0421
CD0510	Permanent Telecommunications	Requirement for Repeaters - Permanent Phase Optical Transport Network	3,657,000		3,657,000		PCN-0355	SC0381
PD0513 - PD0563	MF Construction Power Procurement Packages	MF Construction Power Procurement Packages under run. Budget transferred to MF Contingency.	-103,179		-103,179		PCN-0349	SC384
SD0565	Marine Geotech Investigation	Budget alignment to Final contract value	-46,740		-46,740		Rebaseline	SC0257
SD0567	Installation of Geodetic Control Survey	Budget alignment to Final contract value	-10,147		-10,147		Rebaseline	SC0257
CD0501	Converters and cable transition compound	Alstom Grid Harmonic Impedance Study Results - Impacts on Converter Filter Design	5,000,000		5,000,000		PCN-0538	SC0598
CD0502	Construction of AC Substations	Triple Circuit Tower Redesign - Soldiers Pond	1,980,000		1,980,000		PCN-0543	SC0599
CD0502	Construction of AC Substations	Addition of mimic panels to local control cubicles - Churchill Falls and Muskrat Falls	288,573		288,573		PCN-0571	SC0603
CD0502	Construction of AC Substations	Bedrock and Boulders Encountered at Soldiers Pond	11,000		11,000		PCN-0566	SC0605
CD0501	Converters and cable transition compound	Bedrock and Boulders Encountered at Soldiers Pond	30,000		30,000		PCN-0566	SC0605
CD0504	Civil Works for the Converter Stations and Switchyards	Bedrock and Boulders Encountered at Soldiers Pond	769,000		769,000		PCN-0566	SC0605
CD0534	Soldiers Pond Synchronous Condensers	Additional Costs and Schedule Delay Associated with Piling for Synchronous Condensers	340,000		340,000		PCN-0574	SC0604
SD0560	Early works construction communications services (MF)	Transfer of Telecoms Scope from CD0535 to SD0560	5,535,756		5,535,756		PCN-0162	SC0123
			177,701,601	0	177,701,601			
		Pending Scope change:	0	0	0			
		Errors & Omissions						
		Purchase orders and Construction contracts execution						
CD0501	Converters and cable transition compound	Additional grounding quantities - Muskrat Falls and Soldiers Pond	7,000,000		7,000,000		DAN-0928 / Rebaseline	T-1285
CD0501	Converters and cable transition compound	Change to MF and SP Converter Layouts as a result of Soil Conditions and design development	4,405,638	-899,264	3,506,374	Updated price received from contractor, pending change order.	DAN-1035 / DAN-1036 / Rebaseline	T-1285
CD0501	Converters and cable transition compound	HVdc Line Fundamental Frequency Resonance Issue	1,000,000		1,000,000		DAN-1220 / Rebaseline	T-1285

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
CD0501	Converters and cable transition compound	Transition Compounds - Washrooms	800,000		800,000		DAN-1477 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Change to MF and SP Switchyard due to changes to the converter Layouts as a result of Soil Conditions and design development	-3,350,831	925,909	-2,424,922	Updated price received from contractor, pending change order.	DAN-1035 / DAN-1036 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Add & Upgrade Disconnect Switches - Churchill Falls, Muskrat Falls and Soldiers Pond	230,584	4,000	234,584	Change Request received from Alstom - Price under Review	DAN-0863 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Soldiers Pond	1,500,000		1,500,000		DAN-0929 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Churchill Falls	2,421,922		2,421,922		DAN-0929 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Muskrat Falls	1,758,210		1,758,210		DAN-0929 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Structured Cabling - Churchill Falls, Muskrat Falls and Soldiers Pond	151,456		151,456		DAN-1167 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Bedrock / Boulders Encountered at Churchill Falls	494,109		494,109		DAN-1548 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Engineering Rework - Auxiliary Relay Configuration - Churchill Falls, Muskrat Falls and Soldiers Pond	23,192	-23,192	0	Change request rejected.	DAN-1332 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Tap Changer Controller - Muskrat Falls	34,263	-11,885	22,378	Price received from Alstom - Under Review	DAN-1557 / Rebaseline	T-1285 / CN-0009
CD0502	Construction of AC Substations	Grounding reactors and Resistors at CF and MF	100,000		100,000		DAN-1348 / Rebaseline	T-1285
CD0508	Electrode Sites	Foundations for passive filters at Dowden's Point	200,000		200,000		DAN-1219 / Rebaseline	T-1285
CD0510	Permanent Telecommunications	Budget for Potential over run Repeaters - Permanent Phase Optical Transport Network	1,700,000	-1,700,000	0	Now approved Scope Change	DAN-0946 / Rebaseline	T-1285
CD0504	Civil Works for the Converter Stations and Switchyards	Janitorial Services - Churchill Falls	14,534		14,534		DAN-1648	FWO001(CF)
CD0502	Construction of AC Substations	Janitorial Services - Churchill Falls (Credit From Prime Contract)	-14,535		-14,535		DAN-1648	FWO001(CF)
CD0504	Civil Works for the Converter Stations and Switchyards	Removal of Boulder - Muskrat Falls Switchyard	2,000		2,000		DAN-1442 / Rebaseline	FWO-001
CD0502	Civil Works for the Converter Stations and Switchyards	Removal of Boulder - Muskrat Falls Switchyard (5% Mark Up)	100		100		DAN-1442 / Rebaseline	FWO-001
CD0504	Civil Works for the Converter Stations and Switchyards	Additional Resources to Off Load Transportation	16,000		16,000		DAN-1649	FWO003(MF)
CD0502	Civil Works for the Converter Stations and Switchyards	Additional Resources to Off Load Transportation (Credit from Prime Contract)	-16,000		-16,000		DAN-1649	FWO003(MF)
CD0508	Electrode Sites	Final Quantities - Completion of CD0508-001	-803,895		-803,895		DAN-1703	T-1278 / CO-008
CD0508	Electrode Sites	Completion of CD0508-001: Savings on Specified Growth Allowance	-2,489,385		-2,489,385		DAN-1703	T-1368
CD0501	Converters and cable transition compound	Over run on Transition Compounds Civil Scope	3,300,000	707,359	4,007,359	Based on current RFA	DAN-1706	T-1369
XD0001	AFE Estimated Growth - C3	C3 Estimated growth - Pending budget transfers to commitment packages	-16,828,193	2,105,189	-14,723,004		Rebaseline	T-1286
			1,649,168	1,108,116	2,757,284			
Misc.			0	0	0			
		SUBTOTAL C3	179,350,770	1,108,116	180,458,886			
C4		Approved Scope change:						
Various Packages in HVac		Increase in the length of the 735 kV line to the final location of the CF switchyard	2,600,000		2,600,000		PCN-0093	SC0066
PT0328/PT0330/CT0327		Reoptimization of the HVdc conductor	144,324		144,324		PCN-0093	SC0078
PT0307	Supply of Steel Tower Foundations- Hvac	Corrosion protection of foundations (ac)	60,000		60,000		PCN-0130	SC0076
CT0342	Construction of Hvac Transmission line - Island	ADSS cable on wood pole electrode lines because the original estimate is low	480,000		480,000		PCN-0091	SC0007
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Re-routing Hvac line outside corridor at lower brook	-150,000		-150,000		PCN-0070	SC0054
PT0307	Supply of Steel Tower Foundations- Hvac	Increase in deep rock foundations/grillage foundations	39,626		39,626		PCN-0476	SC0503
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Additional survey costs	100,000		100,000		PCN-0455	SC0509
PT0330	Supply of Towers - HVdc	Reduction in HVdc Tower types	-148,061		-148,061		PCN-0099	SC0015
CT0342	Construction of AC Transmission Lines - Island	Transpositions of 230kV HVac re-termination lines at Soldier's Pond	374,638		374,638		PCN-0207	SC0240

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	735 kv Line Tower and Foundation Supply and Construction	2,107,399		2,107,399		PCN-0271	SC0512
	Various Packages in HVdc	Re-routing HVdc line next to MF access road and TLH phase 2 at MF	10,000,000		10,000,000		PCN-0096	SC0016
PT0353	Supply of OPGW HVdc	alignment with the bid price of 10.5 M	2,993,921		2,993,921		PCN-0256	SC0235
PT0335	Supply of Anchors - HVac	Rock anchors unit cost more than originally estimated due to change in technical requirements / Additional Rock Anchors for 315 kV HVac Lines	1,402,577		1,402,577		PCN-0142 /419	SC0096 / 443
PT0330	Supply of Towers - HVdc	Change in Step Bolt Size	270,000		270,000		PCN-0156	SC0104
ST0311	Survey - Hvac	Not included in original estimate	1,200,000		1,200,000		PCN-0171	SC0115
ST0312	Survey - HVdc	Not included in original estimate	2,900,000		2,900,000		PCN-0171	SC0115
ST0311	Survey - Hvac	Installation of Geodetic Survey Control Network	31,674		31,674		PCN-0168	SC0116
PT0334	Supply of Steel Wires- HVdc	Forecast overrun at time of the Recommendation for Award	4,729,527		4,729,527		PCN-0250	SC0218
Various	Various packages	Remove all variances on completed packages	-30,387		-30,387		PCN-0252	T-0649
PT0330	Supply of towers - HVdc	Design criteria change - reduction from 0-6° to 0-3°	335,000		335,000		PCN-0147	SC0121
CT0327	Construction of HVcd line section 1	HVdc Access Road Ballasting S1- to S1-400	4,098,717		4,098,717		PCN-0456	SC0504
CT0327	Construction of HVcd line section 1	HVdc Clearing and Access - Block 7 and Partial 6 (C&T Enterprises) Contract Value Increase. Relocation of access road at CF switchyard	10,025,000		10,025,000		PCN-0481/494	SC0507/523
CT0342	Construction of Hvac Transmission line - Island	Removal of the ADSS fibre optic cable from the Wood Pole Electrode Line between Soldiers Pond and Holyrood Plant (BCC)	-432,154		-432,154		PCN-0448	SC0514
CT0342	Construction of Hvac Transmission line - Island	Budget increase to align with contract value	8,945,975		8,945,975		PCN-0497	SC0515
CT0327	Construction of HVcd line section 1	Additional Guy Anchor Bottom Bars, Couplers and Centralizers for HVdc Line	2,981,338		2,981,338		PCN-0452	SC0508
PT0352	Supply of anchors - HVdc	Additional Guy Anchor Bottom Bars, Couplers and Centralizers for HVdc Line	1,000,406		1,000,406		PCN-0452	SC0508
CT0327	Construction of HVcd line section 1	Creation of Marshalling yard packages	-1,560,000		-1,560,000			SC0024
CT0354	Marshaling Yards for Hvac Line (HVGB)	Creation of Marshalling yard packages	1,560,000		1,560,000			SC0024
CT0354	Marshaling Yards for Hvac Line (HVGB)	Increase in budget to accommodate most recent estimate and bid price for construction	1,409,829		1,409,829		PCN-0184	SC0122
PT0330	Supply of Towers - HVdc	Include Low Temperature Rated Steel for HVdc Towers	872,560		872,560		PCN-0198	SC0153
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Reassignment of the Provision of Geotech Investigation Services for 315 kV Hvac	956,750		956,750		PCN-0187	SC0165
ST0309	Provision of Geotech - Hvac	Reassignment of the Provision of Geotech Investigation Services for 315 kV Hvac	-956,750		-956,750		PCN-0187	SC0165
PT0329	Supply of insulators - HVdc	Increase in Insulators quantity for electrode conductors as a result of new study of "Electrode Insulation & Clearance" report	108,039		108,039		DAN-0411 / PCN-0191	SC0134
ST0311	Survey - Hvac	Verification survey requirements for CF	53,525		53,525		PCN-0212	SC0183
PT0356	Supply of Damper - HVdc	Increase in quantities	1,646,194		1,646,194		PCN-0219	SC0184
PT0302	Supply of Steel Towers - Hvac	Tower weight increase	1,024,191		1,024,191		PCN-0155	SC0185/268
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Tower weight increase	24,500,000		24,500,000		PCN-0155	SC0185
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	clearing for 2 towers/Rework of structure 3101-142 & 3101-143	149,091		149,091		PCN-0472/458	SC0529/534
ST0312	Provision of Survey - HVdc	Cancelling of Package - Survey requirements to be completed by lands group.	-1,377,300		-1,377,300		PCN-0230	SC0200
PT0300	Supply of Conductors - Hvac	Estimate unit price was higher than the bid price	-4,048,702		-4,048,702			SC0268
PT0301	Supply of Insulator - Hvac	Underrun on the budget compared to contract value	-359,067		-359,067		PCN-0402	SC0268/422
PT0303	Supply of Hardware - Hvac	Underrun on the budget compared to contract value	-3,742,358		-3,742,358			SC0268
PT0304	Supply of OPGW - Hvac	Underrun on the budget compared to contract value	-460,842		-460,842			SC0268
PT0307	Supply of Steel Foundation- Hvac	Additional quantities	178,218		178,218			SC0268

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PT0307	Supply of Steel Foundation- Hvac	Corrosion protection/quantity adjustment/increase in deep rock foundations	-454,848		-454,848		PCN-0130/323/396	SC0076/268/387
PT0308	Supply of Steel Foundation - HVdc	Underrun on the budget compared to contract value	-2,746,175		-2,746,175			SC0268
PT0308	Supply of Steel Foundation - HVdc	Additional foundations required to avoid construction delays, Brace Extensions for HVdc Rock Foundations	3,366,548		3,366,548		PCN-0429 /432	SC0268 / 465 / 470
PT0326	Supply of Steel Wires- HVdc	Bid unit rates higher than budgeted	419,348		419,348		PCN-0395	SC0268/405
PT0328	Supply of Conductor - HVdc	Underrun on the budget compared to contract value	-6,622,857		-6,622,857			SC0268
PT0329	Supply of Insulator - HVdc	Underrun on the budget compared to contract value	-18,801,303		-18,801,303			SC0268
PT0330	Supply of Steel Tower - HVdc	Underrun on the budget compared to contract value	-492,362		-492,362			SC0268
PT0330	Supply of Steel Tower - HVdc	Geometry changes/dessicants(white rust mitigation)/Redesign of 2 zones (max wind load requirements)	1,198,946		1,198,946		PCN-0496 /500 / 394	SC0533/536/552
PT0331	Supply of Hardware - HVdc	Underrun on the budget compared to contract value	-9,359,408		-9,359,408			SC0268/497
PT0334	Supply of Steel Wires- HVdc	Under run on package and Change from steel to wooden reels	-1,129,373		-1,129,373			SC0268
PT0353	Supply of OPGW - HVdc	Underrun on the budget compared to contract value	-424,616		-424,616			SC0268
PT0329	Supply of Insulator - HVdc	Funds required for additional insulator testing	45,000		45,000		PCN-0302	SC0295
PT0356	Supply of Damper - HVdc	Underrun on the budget compared to contract value	-711,974		-711,974			SC0268
CT0327	HVdc	Extension of the TL due to new location of Forteau transition station	352,000		352,000		PCN-0308	SC0368
CT0327	HVdc	Install additional anchors&bars	850,000		850,000		PCN-0394	SC0552
CT0327	HVdc	Move rockpile/backfill requirements	358,293		358,293		PCN-0472/510	SC0529/535
PT0352	Supply of Anchor Materials - Hvac	Decrease in # of anchors	-532,883		-532,883			SC0270
ST0311	Provision of Survey - Hvac	Change in package strategy	-247,665		-247,665			SC0267
CH0024	Reservoir Clearing	Cost saving due to the change in execution strategy	-16,009,090		-16,009,090			SC0266
CT0319	Construction of Hvac Transmission line	Cost of the HVGB line to Gull Island	-7,696,000	-61,956	-7,757,956			SC0266
XT0001 (for CT0319)	Construction of Hvac Transmission line	Micropiles, foundations, mudslabs, stringingdelays of tie-ins and interconnection, stringing, downlead clamps/cotter keys	9,934,037		9,934,037			SC0497
PT0302	Supply of Steel Tower - Hvac	Tower weight increase/Metallurgical testing on tower washers/extra fasteners/735kV/ Tower quantity change	616,000		616,000		PCN-326 / 420	SC0339 / 467
PT0302	Supply of Steel Tower - Hvac	Extra fasteners are required so they are readily available to avoid any shortages or delays in tower installation	54,272		54,272		PCN-0326	SC0339
PT0307	Supply of Steel Foundation- Hvac	HVdc Grillage Foundation Quantity Adjustment (Additional foundations and conversion kits)	746,370	61,956	808,326		PCN-0323/573	SC0325/619
PT0307	Supply of Steel Foundation- Hvac	Extra Self Support Foundation	444,100		444,100		PCN-0501	SC0530
PT0335	Supply of Anchor Materials - HVdc	Additional bottom bars and centralizers	103,200		103,200		PCN-0347	SC0345
PT0335	Supply of Anchor Materials - HVdc	Anchor materials for driven pile foundations	33,119		33,119		PCN-0436	SC0531
PT0356	Supply of Damper - HVdc	Price increase to perform radiographic examination on 20 pieces of each clamp and keeper	217		217		PCN-0329	SC0340
PT0356	Supply of Damper - HVdc	Additional dampers	49,240		49,240		PCN-0503	SC0564
CT0327	Construction of HVdc Transmission line	Geotechnical Field Investigation for HVdc Line	275,000		275,000		PCN-0531	SC0572
CT0327	Construction of HVdc Transmission line	Micro Pile Foundation Application for HVdc Line	210,500		210,500		PCN-0529	SC0575
CT0327	Construction of HVdc Transmission line	Additional cost of Clearing Blocks 15&16, bridging materials, clearing blocks 4,5,6,7,8,9,10,11,13,14	135,981,632		135,981,632		PCN-0530/536 / 552/ 558/559 /562	SC0577/583 / 588/591 / 592 /597
PT0308	Supply of Steel Tower Foundations - 350 kV HVdc	Extra Foundations and Segment 5 Foundations for HVdc Line.	9,071,466		9,071,466		PCN-0541	SC0584
XT0001 (for PT0356)	Supply of Damper - HVdc	Additional quantities	760		760			SC0497
PT0352	Supply of Anchor Materials - Hvac	Bearing Plates and Nuts for Anchor Installation (HVdc Deep Rock Self-surported Towers)	136,922		136,922		PCN-0325	SC0344

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PT0352	Supply of Anchor Materials - Hvdc	Additional rock anchor	686,393		686,393		PCN-0499	SC0532
PT0335	Supply of Anchor Materials - HVdc	Rock anchors unit cost more (technical req)/Bottom bars & centralizers/increase in deep rock foundations	56,413		56,413		PCN-0142/347/396 /	SC0096/345/387 / 471/477
PT0352	Supply of Anchor Materials - Hvdc	Quantity change for HVdc Anchors due to Line Optimization, Williams Site Visit for Technical Assistance for Installation of HVdc Anchors	106,087		106,087		PCN-0345 /430 / 433	SC0341 /460/469
PT0330	Supply of Steel Tower - HVdc	Funds transferred to quality surveillance for location change	-400,500		-400,500		PCN-0294	SC0350
PT0330	Supply of Steel Tower - HVdc	Increase in transportation cost	401,976		401,976		PCN-0560	SC0593
XT0001 (for PT0330)	Supply of Steel Tower - HVdc	Additional quantities	489,305		489,305			SC0497
PT0330	Supply of Steel Tower - HVdc	supply of fasteners/Strengthening of Guy Cross arm A2 and A4/OPGQ bracket change/construction spares	598,738		598,738		PCN-425/496/493/453	SC0520/521/522 /519
PT0352	Supply of Anchor Materials - Hvdc	Foundations/Anchors and Segment 5 Foundations for HVdc Line (OOM)		159,709	159,709		PCN-0541rev1	T-1366
PT0352	Supply of Anchor Materials - Hvdc	Additional funds for the change in quantities and anchors	138,072		138,072		PCN-0322	SC0324
CT0327	Construction of HVdc Transmission line	Additional funds required for package to align with the negotiated price /Extension of TL Forteau transition station/Weight increase in foundations	236,277,149		236,277,149		PCN-0308/400/422	SC0266/368/448 / 466
XT0001 (for CT0327)	Construction of HVdc Transmission line	Foundations, backfill, steel tower punching, clipping, re-galvanizing, labor trade escalation, Valard Part B	41,581,189		41,581,189			SC0497
CT0327	Construction of HVdc Transmission line	Forecasted Cost Increase (Blocks #4, 5 and partial #6)	11,190,160		11,190,160		PCN-0502	SC0563
XT0001 (for CT0327)	Construction of HVdc Transmission line	Clearing and access, additional roads	6,444,558		6,444,558		PCN-0533	SC0497
PT0307	Supply of Steel Foundation- Hvac	Additional 220 kN Insulators required for 735 kV Tower Hardware Type Tests	258,433		258,433		PCN-0411	SC0445
PT0308	Supply of Steel Foundations - HVdc	HVdc Pile foundation Tower Shoe to be added to the supplier 's scope / Extra guy tower foundations / extra grillage foundations for HVdc	2,288,628		2,288,628		PCN-0407/418/450	SC0449/450/489
PT0308	Supply of Steel Foundations - HVdc	Connection between foundation and tower for out of tolerance foundations	100,000		100,000		PCN-0522	SC0565
PT0328	Supply of Conductor - HVdc	Replacement of damaged and stolen reels / insurance refund	4,273		4,273		PCN-0409	SC0451/478
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	More guy anchors due to poor soil conditions at the 735 KV line	625,000		625,000		PCN-0131/305/363/27	SC0266/312/371/39 1/397
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Additional cost of Import backfill & type A-2 & B-2 foundations	2,742,791		2,742,791		PCN-0379/451	SC0398/476
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Increase in guy anchors due to soil conditions	6,000,000		6,000,000		PCN-0363	SC0371
CT0341	Clearing of Right-of-Way for HVac Transmission Line	Funds added to cover overrun due to contract being cancelled and awarded to new contractor	15,051,411		15,051,411			SC0266
XT0001 (for CT0341)	Clearing of Right-of-Way for HVac Transmission Line	second pass mulching	1,000,000		1,000,000			SC0497
XT0001 (for CT0341)	Clearing of Right-of-Way for HVac Transmission Line	GWF Bond recuperation	-15,000,000		-15,000,000			SC0497
CT0354	Marshaling Yards for Hvac Line (HVGB)	Additional funds required to align with commitments values	246,587		246,587			SC0266
CT0319	Construction of Hvac Transmission line - Island	Additional cost for relocating tower(s) due to C-3 change to GIS	200,000		200,000		PCN-0306	SC0312
PT0302	Supply of Steel Towers - Hvac	Tower weight increase	847		847		PCN-0313	SC0301
PT0329	Supply of Insulator - HVdc	Funds for air freight for samples due to time constraints	2,700		2,700		PCN-0310	SC0302
CT0355	Marshaling Yards for Hvdc Line	Additional funds required to align with latest forecast	4,000,000		4,000,000			SC0266
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Market conditions and poor productivity than estimated, additional medical services, boarding and lodging, growth	36,460,005		36,460,005		PCN-0199	SC0191
		Pending Scope change:	527,491,226	159,709	527,650,935			
CT0327	Construction of HVdc Transmission line	Second OHSW Required on HVdc Slack Span to Gantries	40,000		40,000		DAN-1577/PCN-0547	T-1351
CT0327	Construction of HVdc Transmission line	Additional funds to cover clearing and accesses costs (for LRM, blocks 17/18 and CT0327-015 in Labrador)		40,000,000	40,000,000		DAN-1692	T-1418
CT0327	Construction of HVdc Transmission line	Cost Increase for Northern Peninsula (Blocks #9, 10, 11 and 12)		109,443	109,443		PCN-0580rev1	T-1402
CT0327	Construction of HVdc Transmission line	Additional Geotechnical Field Investigation for HVdc Line		475,000	475,000		PCN-0531rev1	T-1414
CT0327	Construction of HVdc Transmission line	Foundation Pre-selection Program - HVdc Line		1,000,000	1,000,000		DAN-1701/PCN-0580	T-1408
PT0352	Supply of Anchor Materials - Hvdc	Foundations/Anchors and Segment 5 Foundations for HVdc Line (OOM)	159,709	-159,709	0	PCN approved	PCN-0541rev1	T-1366

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
SM0714	EPCM services	Reduction in EPCM services due to change from EPCM to EPC strategy CD0534	-3,550,915		-3,550,915		PCN-0148	SC0107
SM0704	Surveying services	Execution module modification of the surveying services in MF	-14,588,920		-14,588,920		PCN-0375	SC0419
SM0714	EPCM services	Change to diversion timeline at MF	10,000,000		10,000,000		PCN-0137	SC0118
SM0705	Laboratory services	Impact of the collective agreement	400,000		400,000		PCN-0153	SC0101
SM0713	Field Geotechnical Investigations	Change from Helicopter to trail access	97,446		97,446		PCN-0159	SC0092
SM0713	Field Geotechnical Investigations	Cost growth for archeological monitoring and recovery costs	300,000		300,000		PCN-0181	SC0111
SM0713	Field Geotechnical Investigations	Scope reduction	-835,000		-835,000		PCN-0073	SC0058
			-13,800,039	0	-13,800,039			
		Pending Scope change:						
SM0700	Freight Forwarding Services	Saving on final contract value of SM0700-009	0	0	0			
		Errors & Omissions						
		Bids Received						
		Purchase orders and Construction contracts execution						
			0	0	0			
		Misc.						
		Other scope						
		Approved Scope change:						
XX0300	EA (Environmental)	Cost growth for archeological monitoring and recovery costs	175,000		175,000		PCN-0181	SC0111
XX0300	EA (Environmental)	Financing of environmental monitors for the gov of NL	488,000		488,000		PCN-0238	SC0228
XX0300	EA (Environmental)	Saving on the LIL Regulatory Compliance cost	-4,000,000		-4,000,000		PCN-0398	SC0485
XX0002	Additional scope of work	River management	575,000		575,000		PCN-0293	SC0291
XX0100	Owner cost	Additional funds required to finalize construction power at MF	324,800		324,800		PCN-0331	SC0310
XX0300	EA (Environmental)	Saving on the LIL environmental cost	-2,983,342		-2,983,342			SC0538
XX0100	Owner cost	Additional funds required for Owner's team	65,275,112		65,275,112			SC0538
XX0400	Aboriginal affairs	Transfer from XX0300	439,372		439,372			SC0538
ZZ0999	Unallocated scope	Budget adjustment for non required scope in LIL	-106,856		-106,856			SC0538
XXSMFG	MF site purchase orders	MF site cameras	155,000		155,000		PCN-0364	SC0361
XH0001(for XXSMFG)	MF site purchase orders	Additional funds for site purchase orders	250,000		250,000			SC0528
XM0001(for XX0900)	Commercial and Legal	Legal costs fro GWF	750,000		750,000			SC0538
XX0002	Additional scope of work	Additional funds fro ECC upgrades and circuit breakers	1,104,330		1,104,330		PCN-0483	SC0569
XM0001(for XX0002)	Additional scope of work	Additional funds fro ECC upgrades and circuit breakers	1,396,200		1,396,200			SC0538
XX0002	Additional scope of work	Reconciliation with financial data	4,861,132		4,861,132			SC0538
XXSMFG	MF site purchase orders	Additional funds for site purchase orders	250,000		250,000		PCN-0272	SC0427
XX0100	Owner cost	Follow on Engineering studies	250,000		250,000		PCN-0316	SC0316
XX0001	SOBI	Budget adjustment after forecast reevaluation	-800,815		-800,815			SC0538
XX0001	SOBI	Adjustment of old scope changes approved for SOBI	11,379,201		11,379,201			SC0169
XX0001	SOBI	Addition of FP transition compound from CD0503	3,458,952		3,458,952		PCN-0062	SC0009
XX0001	SOBI	Saving from the drag free fishing agreement which results in less rock cover over the cables	-7,000,000		-7,000,000		PCN-0085	SC0236
		SUBTOTAL Services	-13,800,039	0	-13,800,039			

Jan-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
XX0100	Owner cost	Alignment with rebaseline values and reduction of helicopter costs	-34,938,158		-34,938,158			SC0260
XX0200	Feasibility Engineering	Alignment with Final costs	-2,978,945		-2,978,945			SC0260
ZZ0999	Unallocated scope	Alignment of power consumption with forecast	-4,356,788		-4,356,788			SC0260
XX0900	Commercial and Legal	Additional funds required to cover insurance costs	643,816		643,816			SC0260
XX0001	SOBI	Saving from the route reduction (subsea rock protection and submarine cable design), additional funds for FP civil works	-5,210,170		-5,210,170			SC0260
XX0002	ASOW	cancel Soldier's pond access road	-3,793,573		-3,793,573			SC0260
XX0100	Owner cost	Additional funds required for the dc line QC survey resources	227,300		227,300		PCN-0230	SC0200
XX0001	SOBI	Saving in the drilling scope	-10,000,000		-10,000,000		PCN-0416	SC0429
XX0001	SOBI	Saving in the S/I of fiber optics	-17,100,000		-17,100,000		PCN-0210	SC0209
XX0002	Additional scope of work	Upgrade Line protection	252,914		252,914		PCN-0223	SC0221
XX0002	Additional scope of work	Adjustment of old approved scope changes	276,397		276,397		PCN-0118/135	SC0174
XX0100	Owner cost	Change to diversion timeline at MF	10,000,000		10,000,000		PCN-0137	SC0118
XX0100	Owner cost	Adjustment of old approved scope changes	17,330,142		17,330,142		various	SC0170
XX0200	Feasibility Engineering	Adjustment of old approved scope changes	863,500		863,500		various	SC0171
XX0300	EA (Environmental)	Adjustment of old approved scope changes	2,210,000		2,210,000		various	SC0172
XX0900	Commercial and Legal	Adjustment of old approved scope changes	1,877,139		1,877,139		various	SC0173
XX0002	Additional scope of work	Cost reduction at Holyrood due to increase of Syn. condenser by 25 MVAR	-36,451,994		-36,451,994		PCN-0067	SC0119
		Pending Scope change:	-4,907,334	0	-4,907,334			
Misc.			0	0	0			
		SUBTOTAL Other Scope	-4,907,334	0	-4,907,334			
		TOTAL AMOUNT	1,645,482,061	35,259,361	1,680,741,422			

ATTACHMENT A.7

Integrated Project Schedule (IPS) Monthly Schedule and Progress Analysis

Cut off Date: 27 Jan 2016

Boundless Energy



Project Stewardship:
IPS Monthly Schedule & Progress Analysis

TABLE of CONTENTS

1.0 Overall Summary

- a) Overall Analysis – Information
- b) Target Milestone Schedule
- c) Overall Summary Schedule
 - Actual and forecast dates with no baseline
- d) Overall 6 Month Look Ahead
- e) Overall Progress Curve
- f) Overall Progress Table
- h) Float Watch:
 - C1 - Diversion/Head Pond/Impoundment
 - C3/C4 – 1st Power Transfer Lab-Nfld
 - C3 - [Converters/Switchyards/Synch Cond](#)
 - C4 - Transmission lines/SOP Line Rebuilds

2.0 Labrador Transmission Asset (LTA)

- LTA Analysis – Observations
- LTA Summary Schedule
- LTA Progress Curve
- LTA Progress Table
- LTA Critical Path

3.0 Labrador Island Transmission Link (LITL)

- LITL Analysis – Observations
- LITL Summary Schedule

LITL Progress Curve

LITL Progress Table

LITL Critical Path

4.0 Muskrat Falls Generation (MFGen)

MFGen Analysis – Observations

MFGen Summary Schedule

MFGen Progress Curve

MFGen Progress Table

5.0 Entire IPS Schedule – Project based (Attached PDF)

6.0 Critical/SubCritical Paths for Overall, LTA, LITL (Attached PDFs)

1.0 Overall Summary Overall Analysis – Information page 1 of 4

1) Target Milestones

- * Target Milestone Overall = LTA Ready for Power Transmission (Power Available) = 04 July 2017
 Tracking Milestone = 18 May 2017 forecast date **(no change this month)**
- * Target Key Date Overall=LITL-1st Power Transfer Lab to Nfld = 3 Sep 2017 (Tracking Milestone)
 6 days earlier than last month (See page 16)
- * Target Milestone Overall=LITL-Ready for Sustainable Power Transfer Labrador to Newfoundland= 11 Nov 2017
 4 days earlier than last month
- * Target Milestone Overall = MFGen First Power from Muskrat Falls = **(On hold, see below for details)**
 Tracking Milestone removed pending resolution of CH0007 remediation of schedule

NOTE: A tracking milestone simply indicates this month forecast completion date.

2) Overall Engineering/Construction/Commissioning Progress

Period Planned Progress:	3.0%	Cumulative Planned Progress:	52.4%
Period Forecast Progress	1.2%		
Period Earned Progress:	1.2%	Cumulative Earned Progress:	41.7%

NOTE: This month a float watch page has been included for SOP Synch Cond. (page 19)

1.0 Overall Summary Overall Analysis – Information page 2 of 4**LTA****1) Target Milestone**

Target Milestone Overall = LTA Ready for Power Transmission (Power Available) = 04 July 2017

Tracking Milestone = 18 May 2017 forecast date (no change from last month)

NOTE: A tracking milestone simply indicates this month forecast completion date.

2) Overall Engineering/Construction/Commissioning Progress

Period Planned Progress:	2.5%	Cumulative Planned Progress:	66.0%
Period Forecast Progress	1.6%		
Period Earned Progress:	0.6%	Cumulative Earned Progress:	69.6%

3) Critical Path: : no change from last month

- CF Switchyard continues to be on critical path to LTA Power Available forecast for May 2017.

4) Switchyards: no change from last month

- No change to completion date of static commissioning for either switchyard (CF, MF).

5) 315kV HVac Lines CF-MF: no change from last month

- HVac Seg 1/2 - line construction/stringing progressing with no change this month to HVac Seg 1/2 final inspection date which is end of line construction.

6) 735kV HVac CF Interconnection (Bus Extension): no change from last month

- CF 735kV -bus extension - TL construction start (foundations) not planned until June 2016.

1.0 Overall Summary Overall Analysis – Information page 3 of 4**LITL****1) Target Milestone**

- Target Key Date Overall=LITL-1st Power Transfer Lab to Nfld = **3 Sep 2017 (Tracking Milestone)**
6 days earlier than last month (See page 16)
- Target Milestone Overall=LITL-Ready for Sustainable Power Transfer Labrador to Newfoundland= **11 Nov 2017**
4 days earlier than last month

NOTE: A tracking milestone simply indicates this month forecast completion date.

2) Overall Engineering/Construction/Commissioning Progress

Period Planned Progress:	4.2%	Cumulative Planned Progress:	42.1%
Period Forecast Progress	2.2%		
Period Earned Progress:	2.6%	Cumulative Earned Progress:	36.3%

Forecast progress variance from last month due to ongoing progress shortfalls in hvdc, converters and synch cond..

3) Critical Path for 1st Power Transfer Lab to Nfld: No change from last month

- MF Converter is driving the LITL critical path . (see page 31)

4) SOBI Crossing

- Arrival of cable laying vessel forecast for June 2016

5) HVdc Line

- HVdc Lab Seg 1/2 = **no change this month** to final inspection dates in Sep 2016.
- HVdc Nfld Seg 3/4/5 = **no change this month** to final inspection dates in March 2017 -> July 2017 period

6) Converters / Switchyards / Sych Cond

- Converters: Review of SOP schedule resulted in a 28 day later static commission completion date.
- Switchyard: No forecasted delay to static commissioning completion date.
- Sych Cond: Delays to static commissioning complete date this month for Units 1/2/3, but still inside float. (see page 19)

7) SOP Transmission Line Rebuilds

- Work continues with reliance on outages. (see pages 21)

8) Transition Compounds / Grounding (Electrode) Stations

- Grounding stations work to resume Apr 2016. No delay on completion date of static commissioning.
- Lab & Nfld Transition compound no change to completion date of static commissioning.

1.0 Overall Summary Overall Analysis – Information page 4 of 4

MFG

1) Target Milestone

Target Milestone: MFGen 1st power from Muskrat Falls = **(On hold)**

2) Overall Engineering/Construction/Commissioning Progress

Period Planned Progress:	1.9%	Cumulative Planned Progress:	52.4%
Period Forecast Progress:	0.2%		
Period Earned Progress:	0.1%	Cumulative Earned Progress:	41.7%

3) Critical Path(s):

- [Diversion - River Closure \(priority 1a\) - see page 13](#)
- On schedule for start on 6 July 2016
- [Diversion - Winter Headpond El. 25m \(priority 1b\) - see page 14](#)
- On schedule for start on 26 Oct 2016
- [Diversion - Impoundment Full Supply Level El. 39m \(priority 1c\) - see page 15](#)
- **(On hold, see below for details)**

4) Reservoir Clearing:

- Labour transferred to ROW clearing in LITL, forecast for restart in July 2016 with completion in Dec 2016.

5) North Spur:

- Contractor demobilized for winter.

6) Spillway

- Work continues towards planned river diversion

7) Transition Dams/North & South Dams

- North and South Dams contractor demobilized for winter.

8) Powerhouse:

- A review of the C1 (Muskrat Falls Generation) work plan is underway, and implementation of an updated C1 schedule will remain on hold pending acceptance of agreed actions and mitigations plan.
- Minimal progress during January period due to ICS removal and suspension of concreting activities until February.

1.0 Overall Summary = Target Milestone page 1 of 2

		Integrated Project Schedule 030 IPS Target Milestones				LCP Project Control Updated: 27-Jan-16																	
Activity Name		Start	Delta-Last Month Start	Finish	Delta-Last Month Finish	2014			2015			2016			2017			2018			2019		
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Lower Churchill Project General																							
LCP Overall																							
Target MIL=Overall-LCP Project Phase 1 - Project Sanction			0	17-Dec-12 A	0																		
Target MIL=Overall-MFG Bulk Excavation - Construction Start		13-Jan-13 A	0		0																		
Target MIL=Overall-LITL-EA Release		21-Jun-13 A	0		0																		
Target MIL=Overall-LITL-SOBI Cable Systems - Ready			0	11-Oct-16	0																		
Target MIL= Overall-LTA-Ready for Power Transmission (Power Available)			0	04-Jul-17	0																		
Target Key Date=Overall-LITL-1st Power Transfer Labrador to Newfoundland - Tracking Forecast		03-Sep-17	6		6																		
Target MIL=Overall-LITL-Ready for Sustainable Power Transfer Labrador to Newfoundland			4	11-Nov-17	4																		
Target MIL=Overall-Muskrat Falls Powerhouse - First Power from Muskrat Falls			0	20-Dec-17	0																		
Target MIL=Overall-LCP Phase 1 - READY FOR SYSTEM INTEGRATION TEST (Final)			0	27-Mar-18	0																		
Target MIL=Overall-Muskrat Falls Powerhouse - Full Power from Muskrat Falls			0	12-Apr-18	0																		
Target MIL=Overall-LCP Phase 1 - Comm Certificate Issued (Integration Test Complete)			0	01-Jun-18	0																		
Target MIL=Overall-LCP Phase 1 - Date Certain			0	28-Feb-19	0																		
LTA																							
Target MIL= LTA-Hvac Transmission Line - Right of Way (ROW) Clearing - Start		15-Aug-13 A	0		0																		
Target MIL= LTA-Hvac Transmission Line - Construction Complete			0	12-Oct-16	0																		
Target MIL= LTA-Muskrat Falls Switchyard - Ready to Energize (Initial)			0	01-Mar-17	0																		
Target MIL= LTA-Churchill Falls Switchyard - Ready to Energize (Initial)			0	01-Mar-17	0																		
Target MIL= LTA-Ready for Power Transmission (Power Available) - Tracking Forecast			0	18-May-17	0																		
LITL																							
Target MIL= LITL-SOBI Landfall Protection (HDD) - Start		19-Nov-13 A	0		0																		
Target MIL= LITL-HVdc Transmission Line Right of Way (ROW) Clearing - Start		16-Jun-14 A	0		0																		
Target MIL= LITL-SOBI Landfall Protection (HDD) - Complete			0	20-Oct-14 A	0																		
Target MIL= LITL-SOBI Cable Systems - Ready for Power Transmission			0	11-Oct-16	0																		
Target MIL= LITL-Soldiers Pond Synchronous Condensor - Testing 1/2/3 Complete			-23	31-Jul-17	-23																		
Target MIL= LITL-Soldiers Pond Switchyard & Converter Station - (Stand Alone Testing)			-28	11-Aug-17	-28																		
Target MIL= LITL-Muskrat Falls Switchyard & Converter Station - (Stand Alone Testing)			6	19-Aug-17	6																		
Target MIL= LITL-HVdc Transmission Line Construction - Complete and Connected			6	26-Aug-17	6																		
Target MIL= LITL-Ready for Sustainable Power Transfer Labrador to Newfoundland-Tracking Forecast			6	08-Nov-17	6																		
MF Gen																							
Target MIL= MFG-MF Access Road - Ready for Use		30-Nov-12 A	0		0																		
Target MIL= MFG-North Spur Stabilization Works - Start		14-Mar-15 A	0		0																		
Target MIL= MFG-South Dam - Construction Start		18-Apr-16	0		0																		
Target MIL= MFG-Powerhouse Crane - Commissioned			-28	18-Apr-16	-28																		
Target MIL= MFG-River Diversion (priority 1a- River closure) - Complete			0	05-Aug-16	0																		
Target MIL= MFG-North Spur - Ready for Winter Headpond (EL 25m)(priority 1b- winter head pond esta			0	15-Sep-16	0																		
Target MIL= MFG-South Dam - Construction Complete			0	31-Oct-16	0																		
Target MIL= MFG-Reservoir Clearing - Complete			0	16-Dec-16	0																		

Under review

<--- Under review --->

1.0 Overall Summary = Target Milestone page 2 of 2

	Integrated Project Schedule				LCP Project Control																					
	030 IPS Target Milestones				Updated: 27-Jan-16																					
Activity Name	Start	Delta-Last Month Start	Finish	Delta-Last Month Finish	2014				2015				2016				2017				2018				2019	
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Target MIL= MFG-Powerhouse - Unit 1 Ready to Turn		-28	14-Aug-17	-28																						
Target MIL= MFG-North Spur Stabilization Works - Complete		0	15-Aug-17	0																						
Target MIL= MFG-North Dam (RCC/CVC) - Complete		0	03-Nov-17	0																						
Target MIL= MFG-Reservoir Impoundment EL39m (priority 1c- Impoundment to Full Service Level) - Con		0	14-Dec-17	0																						
Target MIL= MFG-Muskrat Falls Powerhouse - Unit 1 Ready for Operation		0	20-Dec-17	0																						
Target MIL= MFG-Muskrat Falls Powerhouse - First Power		0	20-Dec-17	0																						
Target MIL= MFG-Muskrat Falls Powerhouse - Unit 2 Ready for Operation		0	04-Jan-18	0																						
Target MIL= MFG-Muskrat Falls Powerhouse - Unit 3 Ready for Operation		0	25-Feb-18	0																						
Target MIL= MFG-Muskrat Falls Powerhouse - Unit 4 Ready for Operation		0	12-Apr-18	0																						
Target MIL= MFG-Muskrat Falls Powerhouse - Full Power		0	12-Apr-18	0																						

Under review

1.0 Overall Summary = Overall 6 Month Look Ahead

		Integrated Project Schedule TASK filter: 6 month look ahead - Summary.				LCP project Control - Stewardship Updated: 27-Jan-16		
Activity Name	delta - Last Month Start	Jan	Feb	Mar	2016 Apr	May	Jun	Jul
Lower Churchill Project General	-27							
Target Milestones	-27							
Labrador Transmission Asset (LTA)	0							
LCP Telecoms-Lab	0							
LTA CF Switchyard	0							
LTA-735kV Interconnect at CF	0							
LTA (L3101/L3102) 315kV TL Seg1/2 MF-CF	0							
LTA (MFATS2) MF Terminal Station (Switchyard)	0							
Labrador Island Transmission Link (LITL)	0							
LCP Telecoms-Lab	0							
LCP Telecoms-Nfld	0							
LITL (MFACS) MF Converter Station	0							
LITL-Lab Electrode Line (L'Anse-au-Diable)	0							
LITL-Lab HVdc Seg1/2	0							
LITL Lab Transition Compound	-28							
LITL SOBI Crossing	0							
LITL Nfld Transition Compound	0							
LITL-Nfld HVdc TL Seg 3/4/5	0							
LITL (SOPCS) SOP Converter Station	0							
LITL-Nfld Electrode Line (Dowden's Point)	0							
LITL (SOPTS) Soldiers Pond Terminal Station (Switchyard)	0							
LITL-Nfld SOP ac Line Rebuilds	0							
LITL (SOPSC) SOP Synchronous Condenser	0							
Muskkrat Falls - Generation (MFGen)	0							
MFGen Reservoir Preparation	0							
MFGen North Spur Stabilization	0							
MFGen Spillway/Diverson	0							
MFGen Power House & Intake	0							
MFGen North RCC Dam	0							
MFGen-315kV Collector Line (PH->MF Swyd)	0							
MFGen South Dam	0							
MFGen Offsite Logistics and Infrastructure Upgrades	0							

◆ Current Key Dates
 — Current Activities

1.0 Overall Summary = Overall Engineering/Construction/Commissioning Progress Curve

Overall progress curve will return when
Muskrat Falls Generation review complete

1.0 Overall Summary = Overall Engineering/Construction/Commissioning Progress Table

LCP - Overall 2016 Jan									
This Reporting Period									Next Month
	Weight	Period %				Cumulative % *2			Forecast %
	Factor %	Plan *1	Forecast	Earned	Var-Forecast	Plan	Earned	Variance	Period %
	A	B	B1	C	C-B1	E	F	F-E	G
Labrador Transmission Asset (LTA)	11.1%	2.5%	1.6%	0.6%	-1.0%	66.0%	69.6%	3.6%	1.4%
Labrador Island Transmission Link (LITL)	42.2%	4.2%	2.2%	2.6%	0.4%	42.1%	36.3%	-5.8%	1.4%
Muskrat Falls Generation (MFGen)	46.7%	1.9%	0.2%	0.1%	-0.1%	58.5%	39.9%	-18.6%	0.3%
LCP-Overall	100.0%	3.0%	1.2%	1.2%	0.0%	52.4%	41.7%	-10.7%	0.9%
Last Reporting Period									
	Weight	Period %			Cumulative %				
	Factor %	Plan		Earned		Plan	Earned		
	A	B		C		E	F		
Labrador Transmission Asset (LTA)	11.1%	2.6%		2.5%		63.5%	69.0%		
Labrador Island Transmission Link (LITL)	42.2%	2.7%		1.3%		37.9%	33.8%		
Muskrat Falls Generation (MFGen)	46.7%	1.9%		0.1%		56.6%	39.7%		
LCP-Overall	100.0%	2.3%		0.9%		49.5%	40.5%		

1.0 Overall Summary Float Watch: C1: Diversion - River Closure – priority P1a

		Integrated Project Schedule Float Watch: Diversion - River Closure				LCP Project Controls - Stewardship Process Updated: 27-Jan-16															
Activity Name		Start	Delta last month Start Date	Finish	Delta last month Finish Date	2015							2016								
						M	Jun	Jul	A	S	Oct	N	D	Jan	F	M	A	M	Jun	Jul	A
Muskrat Falls - Generation (MFGen)																					
MFGen Reservoir Preparation																					
KD=MFG Reservoir-River Diversion - Start # (priority 1a- River closure)		06-Jul-16	0		0	River Diversion - Start # (priority 1a- River closure)															
KD=MFG Reservoir-River Diversion - Complete # (priority 1a- River closure)			0	05-Aug-16	0	River Diversion - Complete # (priority 1a- River closure)															
MFGen Spillway/Diversion																					
MFG-SpilDiv1 Civil: Ph1 Structures - Center Trans dam & slab for Elect Bldg ** (priority 1a river closure)		20-Aug-14 A	0	01-Mar-16	-13	[Gantt bar from Aug 2014 to Mar 2016]															
MFG-SpilDiv1 Civil: Ph1 Structures - Discharge channel ** (priority 1a river closure)		23-Aug-15 A	0	01-Jun-16	-116	[Gantt bar from Aug 2015 to Jun 2016]															
MFG-SpilDiv1 Install: Hydro-Mech Spillway (D/S stoplog guides) **(priority 1a river closure)		09-Sep-15 A	0	24-May-16	-70	[Gantt bar from Sep 2015 to May 2016]															
MFG-SpilDiv1 Civil: Ph1 Structures - Upstream Temp bridge & access ramp CH000!		06-Oct-15 A	0	03-Jun-16	0	[Gantt bar from Oct 2015 to Jun 2016]															
MFG-SpilDiv1 Install: Hydro-Mech Spillway (U/S Stoplogs/gate guides/hoists/etc) ** (priority 1a river closure)		12-Nov-15 A	48	04-Jun-16	0	[Gantt bar from Nov 2015 to Jun 2016]															
MFG-SpilDiv1 Install: Hydro-Mech Spillway (Electrical Bldg) **(priority 1a river closure)		15-Mar-16	-13	28-May-16	0	[Gantt bar from Mar 2016 to May 2016]															
MFG-SpilDiv1 Completions: Hydro-Mech (static/dynamic-gates/etc) ** (priority 1a river closure)		08-Apr-16	10	14-Jun-16	0	[Gantt bar from Apr 2016 to Jun 2016]															
KD=MFG Spillway Phase I - Ready for River Closure (Diversion)**(priority 1a- River closure)			0	14-Jun-16	0	River Closure (Diversion)**(priority 1a- River closure)															
KD=MFG Reservoir-End of Spring Flood (June 15 2016)		15-Jun-16*	0		0	Reservoir-End of Spring Flood (June 15 2016)															
MFG-SpilDiv1: Civil Works:Cofferdams 1 & 2 Removed**		15-Jun-16	0	06-Jul-16	0	[Gantt bar from Jun 2016 to Jul 2016]															
KD=MFG-SpilDiv1: Cofferdams 1 & 2 - Removed**			0	06-Jul-16	0	KD=MFG-SpilDiv1: Cofferdams 1 & 2 - Removed**															
MFGen North RCC Dam																					
MFG-North Dam: Upstream Cofferdam (5) Groins 1&2 to EL 17m (2016 scope) **		06-Jul-16	0	05-Aug-16	0	[Gantt bar from Jul 2016 to Aug 2016]															

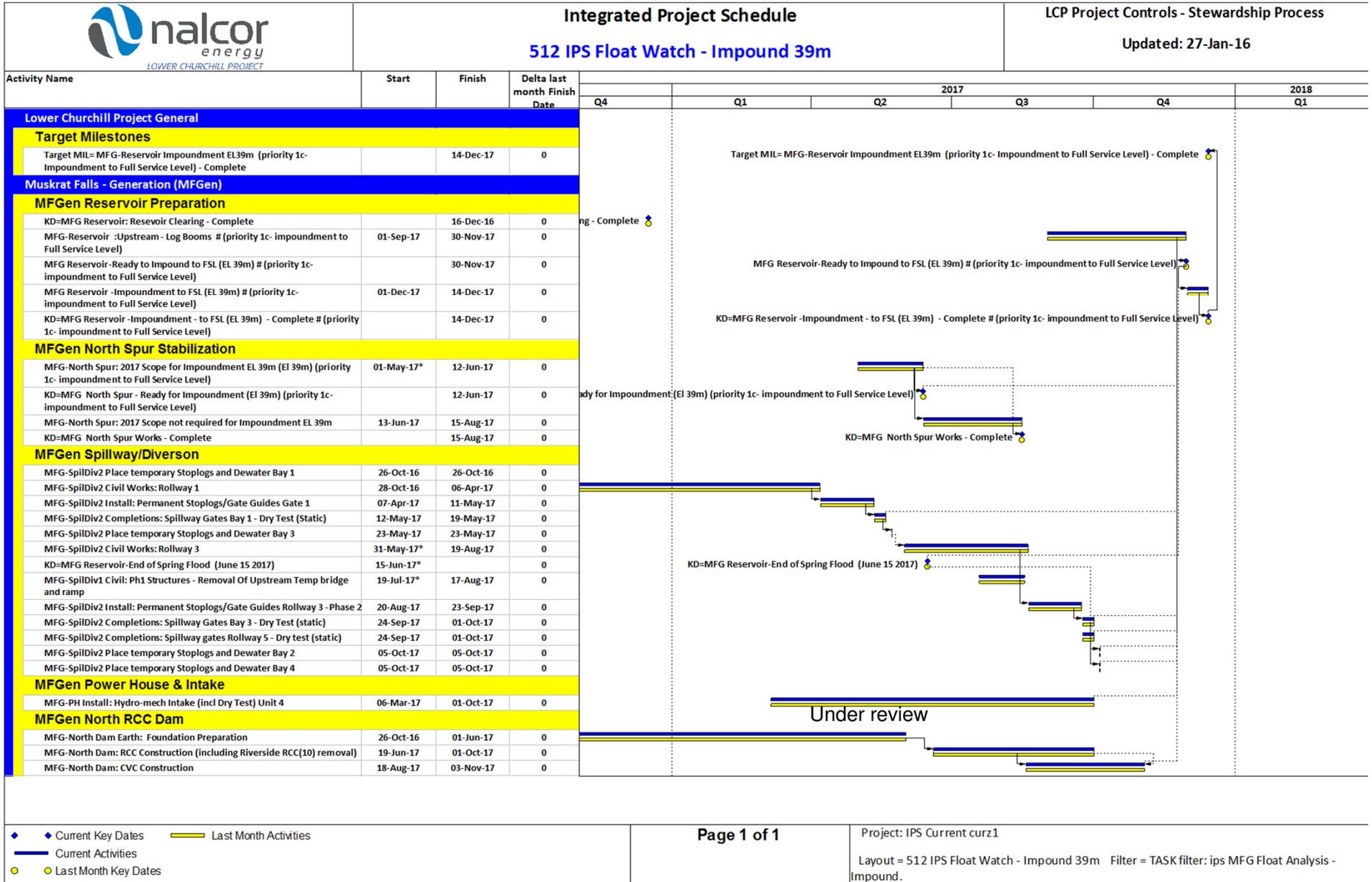
◆ Current Key Dates — Last Month Activities
 — Current Activities
 ○ Last Month Key Dates

1.0 Overall Summary Float Watch: C1: Diversion- Winter Head Pond (25m) Priority P1b

		Integrated Project Schedule 511 IPS Float Watch-Winter Head Pond 25m				LCP Project Controls - Stewardship Process Updated: 27-Jan-16						
Activity Name	Start	Delta last month Start Date	Finish	Delta last month Finish Date	2016							
					Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
HeadPond												
MFGGen Reservoir Preparation												
MFG-Reservoir :Upstream & Downstream- Log Booms # (priority 1b- winter head pond establishment)	15-Jun-16	0	23-Aug-16	0								
MFG Reservoir - Ready for Winter Headpond (EL 25m) # (priority 1b- winter head pond establishment)		0	25-Oct-16	0								
KD=MFG Reservoir-Ready for Winter Headpond (EL 25m) # (priority 1b- winter head pond establishment)		0	25-Oct-16	0								
MFG Reservoir - Winter Head Pond (EL 25m) # (priority 1b- winter head pond establishment)	26-Oct-16	0	09-Nov-16	0								
KD=MFG Reservoir-Winter Headpond (EL 25m) - Complete # (priority 1b- winter head pond establishment)		0	09-Nov-16	0								
MFGGen North Spur Stabilization												
MFG-North Spur: 2016 Scope for Winter Head Pond EL 25m (priority 1b- winter head pond establishment)	01-May-16*	0	15-Sep-16	0								
KD=MFG North Spur - Ready for Winter Headpond (EL 25m) (priority 1b- winter head pond establishment)		0	15-Sep-16	0								
MFGGen Power House & Intake												
MFG-PH Powerhouse: Install Intake Channel Cofferdam (9) EL 26m(priority 1b- winter head pond establishment)	09-Oct-15 A	0	25-Oct-16	0								
MFGGen North RCC Dam												
MFG-North Dam: Upstream Cofferdam(5) to EL 26	05-Aug-16	0	25-Oct-16	0								
MFG-North Dam: Downstream Cofferdam(6) EL 9m - Install	05-Aug-16	0	02-Sep-16	0								
KD=MFG North Dam - Upstream Cofferdam(5) Complete to EL 26m		0	25-Oct-16	0								
Diversion												
MFGGen Reservoir Preparation												
KD=MFG Reservoir-River Diversion - Complete # (priority 1a- River closure)		0	05-Aug-16	0								
MFGGen Spillway/Diversion												
KD=MFG Reservoir-End of Spring Flood (June 15 2016)	15-Jun-16*	0		0								
MFG-SpilDiv1: Civil Works:Cofferdams 1 & 2 Removed**	15-Jun-16	0	06-Jul-16	0								
KD=MFG-SpilDiv1: Cofferdams 1 & 2 - Removed**		0	06-Jul-16	0								
MFGGen North RCC Dam												
MFG-North Dam: Upstream Cofferdam (5) Groins 1&2 to EL 17m (2016 scope) **	06-Jul-16	0	05-Aug-16	0								

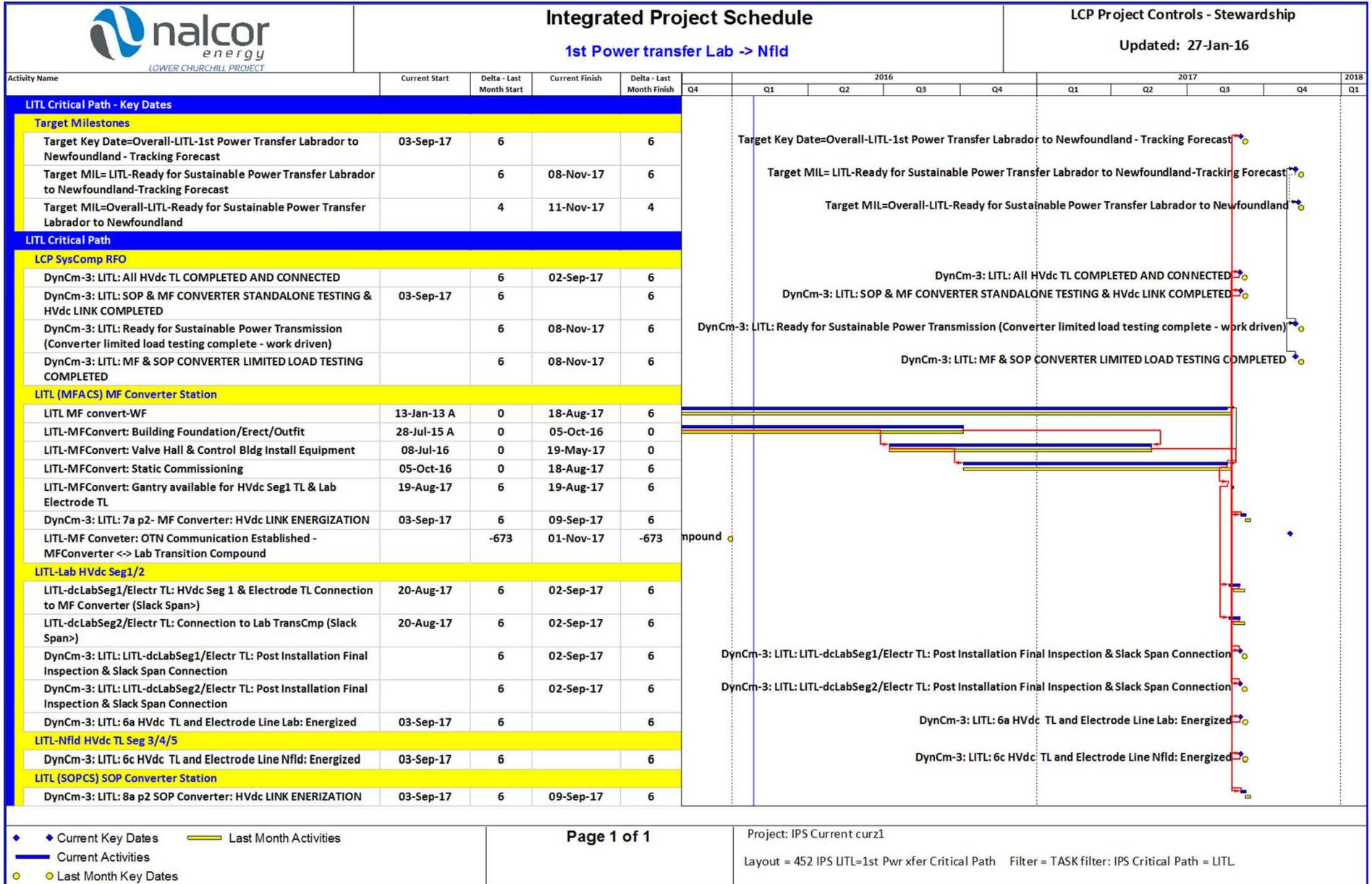
◆ Current Key Dates — Last Month Activities
 — Current Activities
 ● Last Month Key Dates

1.0 Overall Summary Float Watch: C1: Diversion - Impoundment (39m) Priority P1c

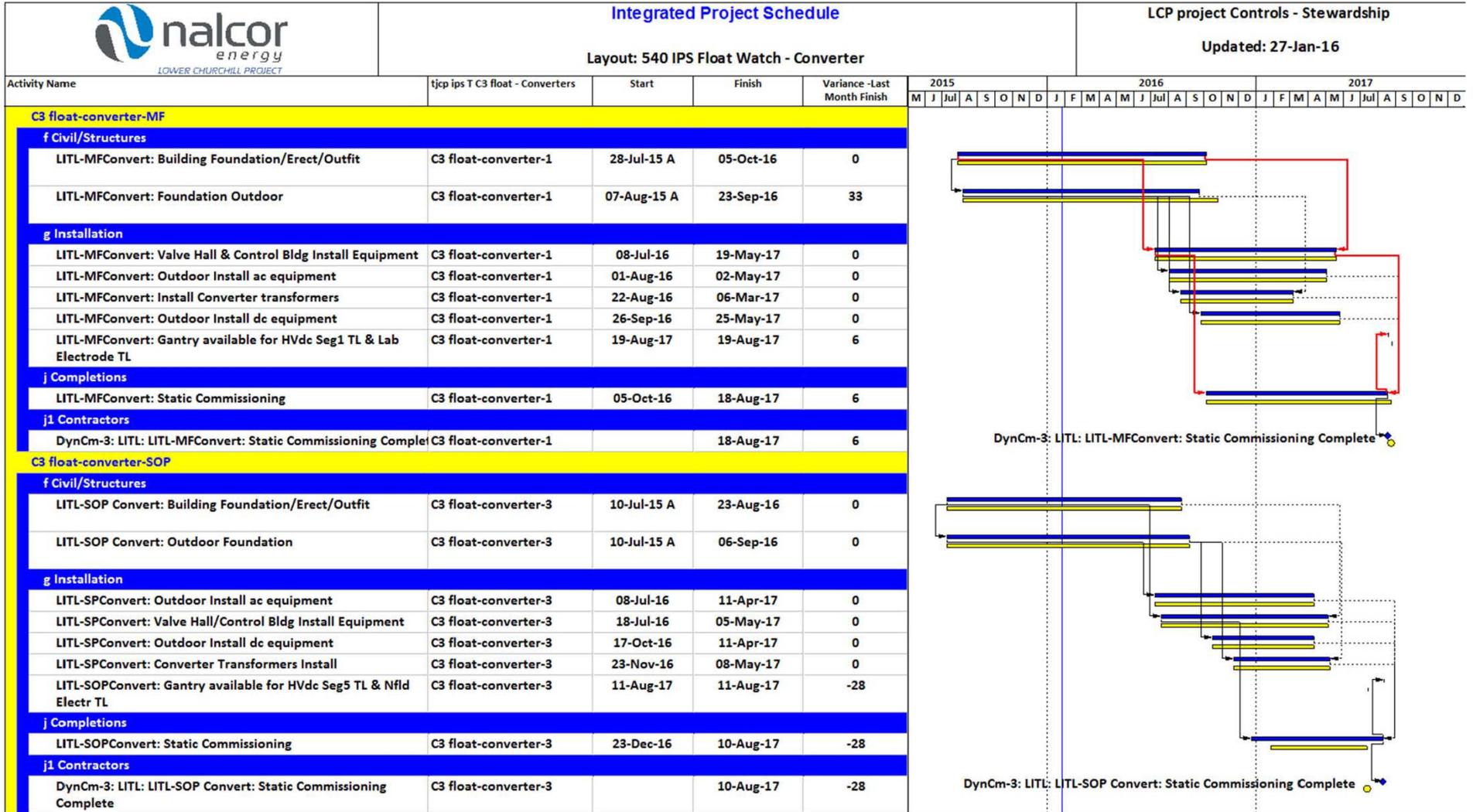


- ◆ Current Key Dates
- ◆ Last Month Activities
- ◆ Current Activities
- ◆ Last Month Key Dates

1.0 Overall Summary Float Watch: C3-C4 – 1st Power Transfer Lab - Nfld



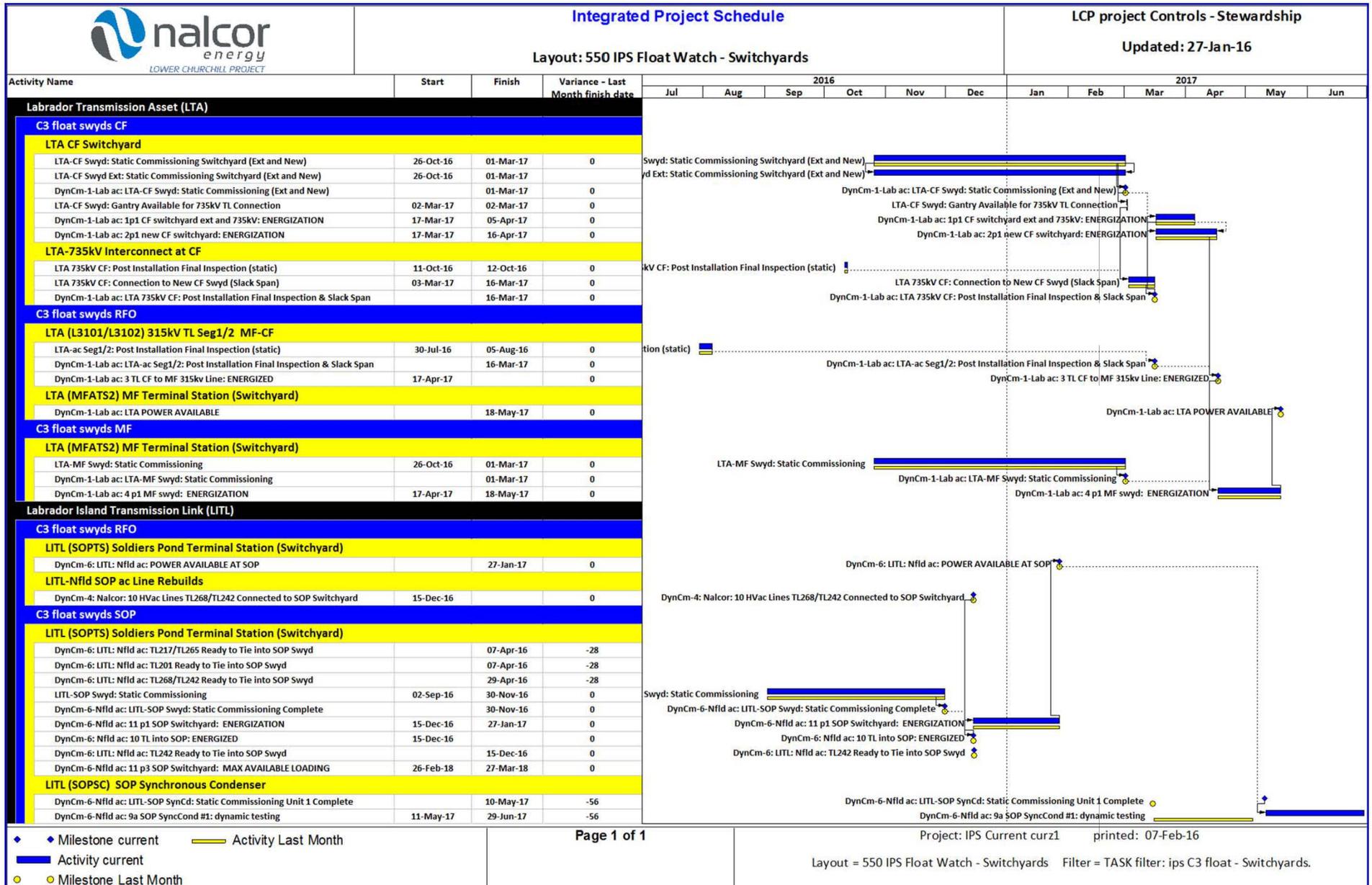
1.0 Overall Summary Float Watch: C3 Converters



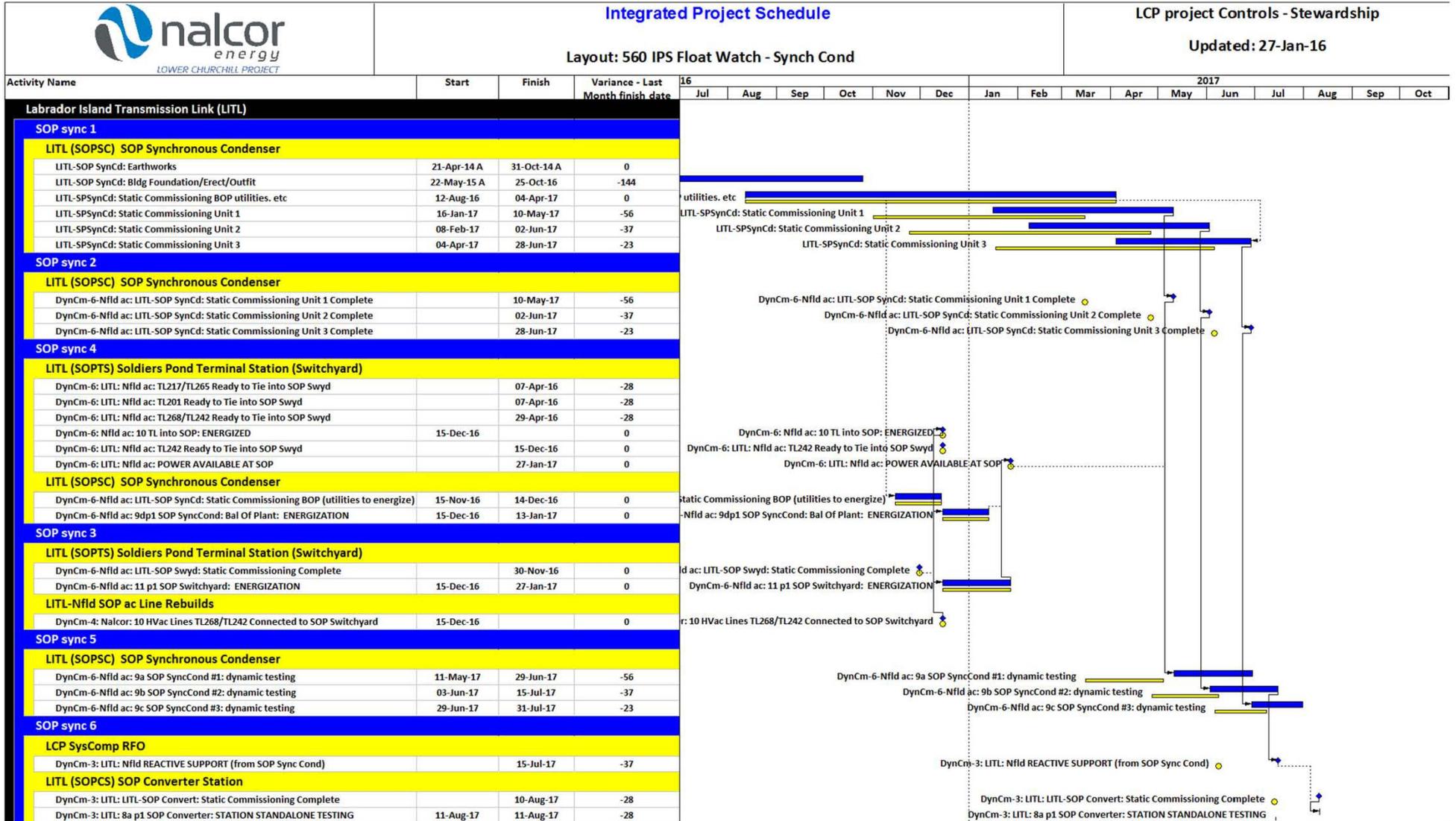
◆ Milestone current Activity Last Month
 — Activity current
 ○ Milestone Last Month

Page 1 of 1 Project: IPS Current curz1 printed: 07-Feb-16
 Layout = 540 IPS Float Watch - Converter Filter = TASK filter: ipsC3 float - Converters.

1.0 Overall Summary Float Watch: C3 – Switchyards



1.0 Overall Summary Float Watch: C3 – Synch Cond



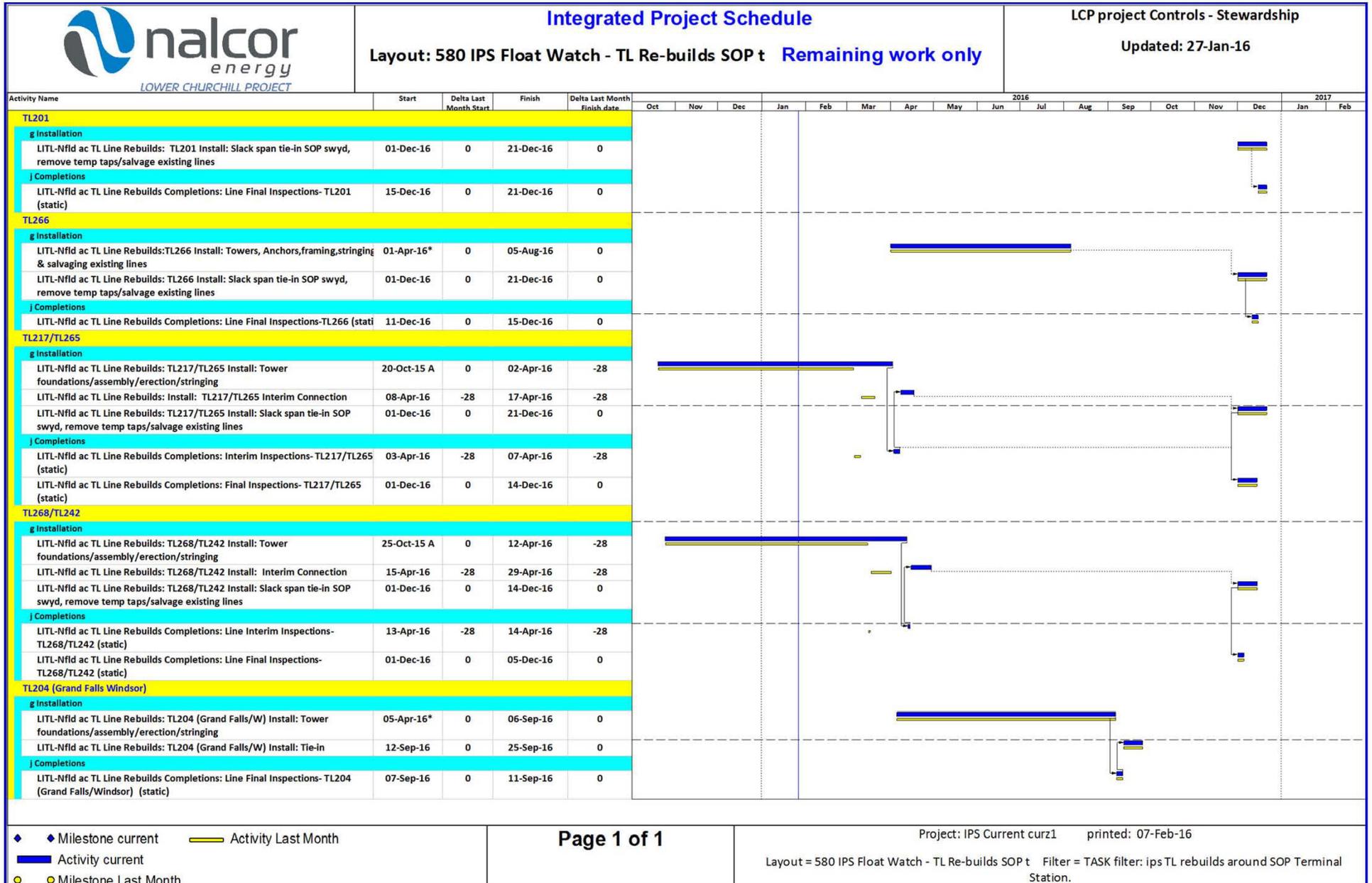
◆ Milestone current — Activity Last Month
 ■ Activity current
 ● Milestone Last Month



1.0 Overall Summary Float Watch: C4 – transmission Lines

		Integrated Project Schedule Layout: 570 IPS Float Watch - Transmission lines												LCP project Controls - Stewardship Updated: 27-Jan-16																		
Activity Name		Start	Finish	Delta Last Month Finish date	2016												2017															
					Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct					
MFGen-315kV Collector Line (PH->MF Swyd)																																
MFGen-315 PH-SY TL: Post Installation Final Inspection (static)		11-Oct-16	12-Oct-16	0	PH-SY TL: Post Installation Final Inspection (static) !																											
MFGen-315 PH-SY TL: Connection to PH (Slack Span)		03-Mar-17	16-Mar-17	0	MFGen-315 PH-SY TL: Connection to PH (Slack Span)																											
MFGen-315 PH-SY TL: Connection to MF Swyd (Slack Span)		03-Mar-17	16-Mar-17	0	MFGen-315 PH-SY TL: Connection to MF Swyd (Slack Span)																											
LTA-735kV Interconnect at CF																																
LTA 735kV CF: Post Installation Final Inspection (static)		11-Oct-16	12-Oct-16	0	735kV CF: Post Installation Final Inspection (static) !																											
LTA 735kV CF: Connection to Existing CF Swyd (Slack Span)		03-Mar-17	16-Mar-17	0	LTA 735kV CF: Connection to Existing CF Swyd (Slack Span)																											
LTA 735kV CF: Connection to New CF Swyd (Slack Span)		03-Mar-17	16-Mar-17	0	LTA 735kV CF: Connection to New CF Swyd (Slack Span)																											
LTA (L3101/L3102) 315kV TL Seg1/2 MF-CF																																
LTA-ac Seg1/2: Post Installation Final Inspection (static)		30-Jul-16	05-Aug-16	0	Post Installation Final Inspection (static)																											
LTA-ac Seg1/2: Connection to MF & CF Switchyard (Slack Span)		03-Mar-17	16-Mar-17	0	LTA-ac Seg1/2: Connection to MF & CF Switchyard (Slack Span)																											
LITL-Lab Electrode Line (L'Anse-au-Diable)																																
LITL Lab Electr. TL: Post installation Final Inspection (static) (from HVdc TL to E Site)		10-Sep-16	23-Sep-16	0	Final Inspection (static) (from HVdc TL to E Site)																											
LITL Lab Electr. TL: Connection to MF Conveter/Grounding Site (slack span>)		20-Aug-17	26-Aug-17	6	LITL Lab Electr. TL: Connection to MF Conveter/Grounding Site (slack span>)																											
LITL-Lab HVdc Seg1/2																																
LITL-dcLabSeg2/Electr TL: Post Installation Final Inspection (static)		31-Aug-16	13-Sep-16	0	TL: Post Installation Final Inspection (static)																											
LITL-dcLabSeg1/Electr TL: Post Installation Final Inspection (static)		16-Sep-16	22-Sep-16	0	Electr TL: Post Installation Final Inspection (static)																											
LITL-dcLabSeg1/Electr TL: HVdc Seg 1 & Electrode TL Connection to MF Converter (Slack Span>)		20-Aug-17	02-Sep-17	6	LITL-dcLabSeg1/Electr TL: HVdc Seg 1 & Electrode TL Connection to MF Converter (Slack Span>)																											
LITL-dcLabSeg2/Electr TL: Connection to Lab TransCmp (Slack Span>)		20-Aug-17	02-Sep-17	6	LITL-dcLabSeg2/Electr TL: Connection to Lab TransCmp (Slack Span>)																											
LITL-Nfld HVdc TL Seg 3/4/5																																
LITL-dcNfSeg3: Installation Final Inspection Nfld (static)		08-Mar-17	21-Mar-17	0	LITL-dcNfSeg3: Installation Final Inspection Nfld (static)																											
LITL-dcNfSeg4: Installation Final Inspection Nfld (static)		01-Jun-17	14-Jun-17	0	LITL-dcNfSeg4: Installation Final Inspection Nfld (static)																											
LITL-dcNfSeg5: Installation Final Inspection Nfld (static)		20-Jun-17	03-Jul-17	0	LITL-dcNfSeg5: Installation Final Inspection Nfld (static)																											
LITL-dcNfSeg3: Connection to Nfld TransCmp (Slack Span>)		12-Aug-17	25-Aug-17	-28	LITL-dcNfSeg3: Connection to Nfld TransCmp (Slack Span>)																											
LITL-dcNfSeg5: Connection to SP Converter (Slack Span>)		12-Aug-17	25-Aug-17	-28	LITL-dcNfSeg5: Connection to SP Converter (Slack Span>)																											
LITL-Nfld Electrode Line (Dowden's Point)																																
LITL Nfld Electr. TL: Post installation Final Inspection (static)		20-Jun-16	24-Jun-16	0	Installation Final Inspection (static)																											
LITL Nfld Electr. TL: Connection to Grounding Site (slack span>)		12-Aug-17	18-Aug-17	-28	LITL Nfld Electr. TL: Connection to Grounding Site (slack span>)																											

1.0 Overall Summary Float Watch: C4 – Line Rebuilds Soldiers Pond Area



◆ Milestone current Activity Last Month
 Activity current
 Milestone Last Month



2.0 Labrador Transmission Asset (LTA) LTA Analysis – Observations

1) Target Milestone

Target Milestone Overall = LTA Ready for Power Transmission (Power Available) = 04 July 2017

Tracking Milestone = 18 May 2017 forecast date (no change from last month)

NOTE: A tracking milestone simply indicates this month forecast completion date.

2) Overall Engineering/Construction/Commissioning Progress

Period Planned Progress:	2.5%	Cumulative Planned Progress:	66.0%
Period Forecast Progress	1.6%		
Period Earned Progress:	0.6%	Cumulative Earned Progress:	69.6%

3) Critical Path: : no change from last month

- CF Switchyard continues to be on critical path to LTA Power Available forecast for May 2017.

4) Switchyards: no change from last month

- No change to completion date of static commissioning for either switchyard (CF, MF).

5) 315kV HVac Lines CF-MF: no change from last month

- HVac Seg 1/2 - line construction/stringing progressing with no change this month to HVac Seg 1/2 final inspection date which is end of line construction.

6) 735kV HVac CF Interconnection (Bus Extension): no change from last month

- CF 735kV -bus extension - TL construction start (foundations) not planned until June 2016.

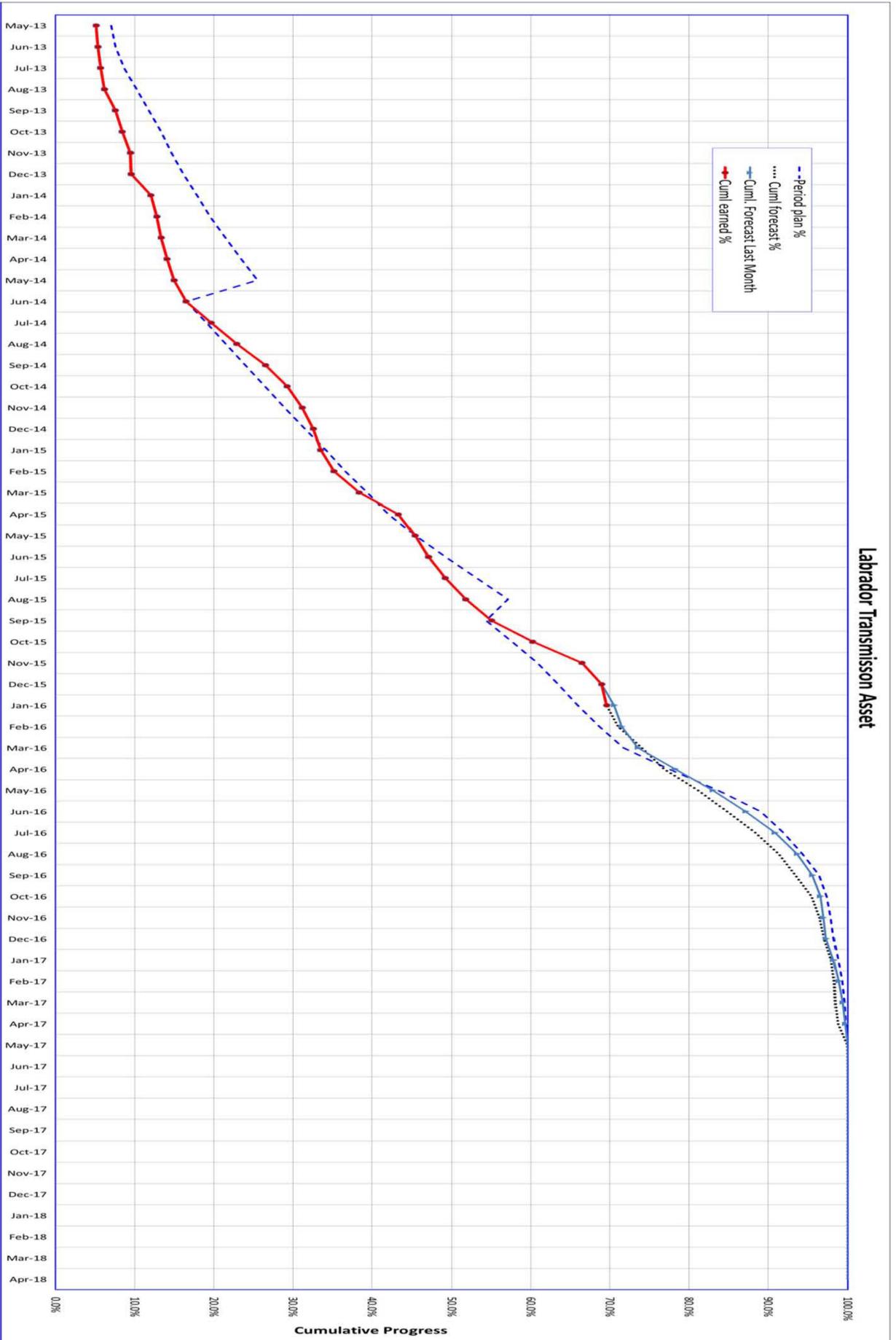
2.0 Labrador Transmission Asset (LTA)

LTA Summary Schedule

		Integrated Project Schedule Layout: 211 IPS Summary - LTA												LCP project Control - Stewardship Updated: 27-Jan-16														
Activity Name		delta - Last Month Start	delta - Last Month Finish	12	2013				2014				2015				2016				2017				2018			
				Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	
Labrador Transmission Asset (LTA)		0	0																									
LTA CF Accommodations		0	0																									
LTA-CF Camp		0	0																									
LTA CF Switchyard		0	0																									
LTA-CF Swyd EXT		350	0																									
LTA-CF Switchyard		0	0																									
LTA-735kV Interconnect at CF		0	0																									
LTA-735kV ac Intercon CF		0	0																									
LTA (L3101/L3102) 315kV TL Seg1/2 MF-CF		0	0																									
LTA (L3101/L3102) 315kV TL Segment 1/2		0	0																									
LTA (MFATS2) MF Terminal Station (Switchyard)		0	0																									
LTA-MF Switchyard		0	0																									

 Current Construction
  Last Month Construction
 Current Commissioning
  Last Month Commissioning

2.0 Labrador Transmission Asset (LTA) - LTA Engineering/Construction/Commissioning Progress Curve



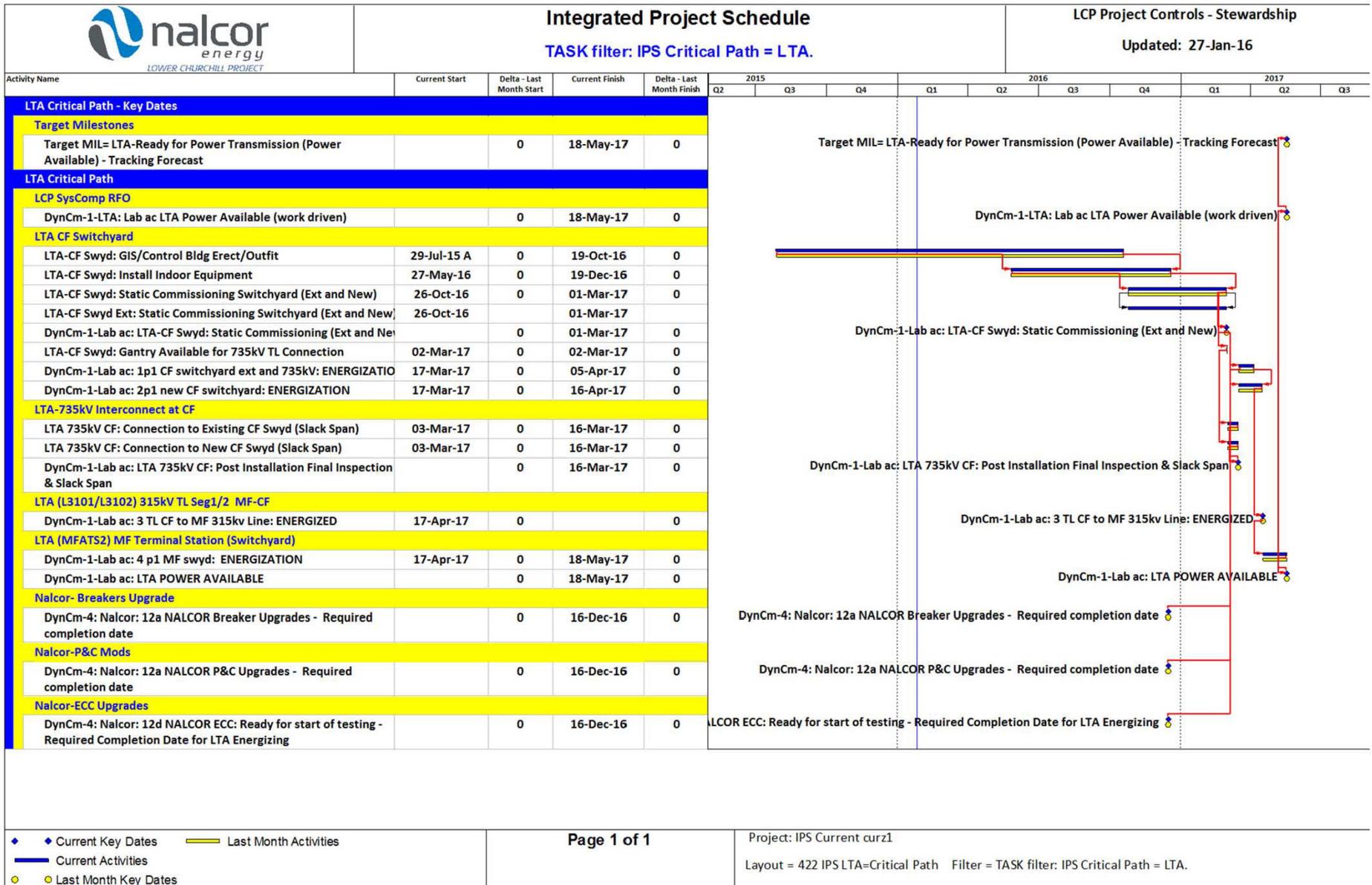
Labrador Transmission Asset

2.0 Labrador Transmission Asset (LTA) - Engineering/Construction/Commissioning Progress Table

LTA Progress Table 2016 Jan								
This Reporting Period								
	Weight	Period %			Cumulative %			
	Factor %	Plan	Earned	Variance	Plan	Earned	Variance	
	A	B	C	C-B	E	F	F-E	
LTA CF Accommodations	1.1%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	
LTA HVac Transmission Line Seg1/2 - MF to CF	56.0%	3.2%	1.0%	-2.2%	82.3%	84.7%	2.4%	
LTA Churchill Falls Switchyard	20.9%	0.9%	0.0%	-0.9%	36.7%	48.4%	11.7%	
LTA Muskrat Falls Switchyard	14.0%	3.3%	0.6%	-2.7%	27.4%	27.5%	0.1%	
LTA Misc	8.0%	1.0%	0.0%	-1.0%	91.2%	89.2%	-2.0%	
LTA TOTAL	100.0%	2.5%	0.6%	-1.9%	66.0%	69.6%	3.6%	
Last Reporting Period								
	Weight	Period %			Cumulative %			
	Factor %	Plan	Earned	Variance	Plan	Earned	Variance	
	A	B	C	C-B	E	F	F-E	
LTA CF Accommodations	1.1%	0.0%	0.0%	0.0%	100.0%	100.0%	0.0%	
LTA HVac Transmission Line Seg1/2 - MF to CF	56.0%	3.1%	2.3%	-0.8%	79.1%	83.7%	4.6%	
LTA Churchill Falls Switchyard	20.9%	1.6%	2.5%	0.9%	35.8%	48.4%	12.6%	
LTA Muskrat Falls Switchyard	14.0%	3.3%	4.7%	1.4%	24.1%	26.9%	2.8%	
LTA Misc	8.0%	0.7%	0.0%	-0.7%	90.2%	89.2%	-1.0%	
LTA TOTAL	100.0%	2.6%	2.5%	-0.1%	63.5%	69.0%	5.5%	

2.0 Labrador Transmission Asset (LTA) LTA Critical Path

NOTE: For complete Critical / Subcritical path schedule see attachment



3.0 Labrador Island Transmission Link (LITL) LITL Analysis – Observations

1) Target Milestone

- Target Key Date Overall=LITL-1st Power Transfer Lab to Nfld = **3 Sep 2017 (Tracking Milestone)**
6 days earlier than last month (See page 16)
- Target Milestone Overall=LITL-Ready for Sustainable Power Transfer Labrador to Newfoundland= **11 Nov 2017**
4 days earlier than last month

NOTE: A tracking milestone simply indicates this month forecast completion date.

2) Overall Engineering/Construction/Commissioning Progress

Period Planned Progress:	4.2%	Cumulative Planned Progress:	42.1%
Period Forecast Progress	2.2%		
Period Earned Progress:	2.6%	Cumulative Earned Progress:	36.3%

Forecast progress variance from last month due to ongoing progress shortfalls in hvdc, converters and synch cond..

3) Critical Path for 1st Power Transfer Lab to Nfld: No change from last month

- MF Converter is driving the LITL critical path . (see page 31)

4) SOBI Crossing

- Arrival of cable laying vessel forecast for June 2016

5) HVdc Line

- HVdc Lab Seg 1/2 = **no change this month** to final inspection dates in Sep 2016.
- HVdc Nfld Seg 3/4/5 = **no change this month** to final inspection dates in March 2017 -> July 2017 period

6) Converters / Switchyards / Sych Cond

- Converters: Review of SOP schedule resulted in a 28 day later static commission completion date.
- Switchyard: No forecasted delay to static commissioning completion date.
- Sych Cond: Delays to static commissioning complete date this month for Units 1/2/3, but still inside float. (see page 19)

7) SOP Transmission Line Rebuilds

- Work continues with reliance on outages. (see pages 21)

8) Transition Compounds / Grounding (Electrode) Stations

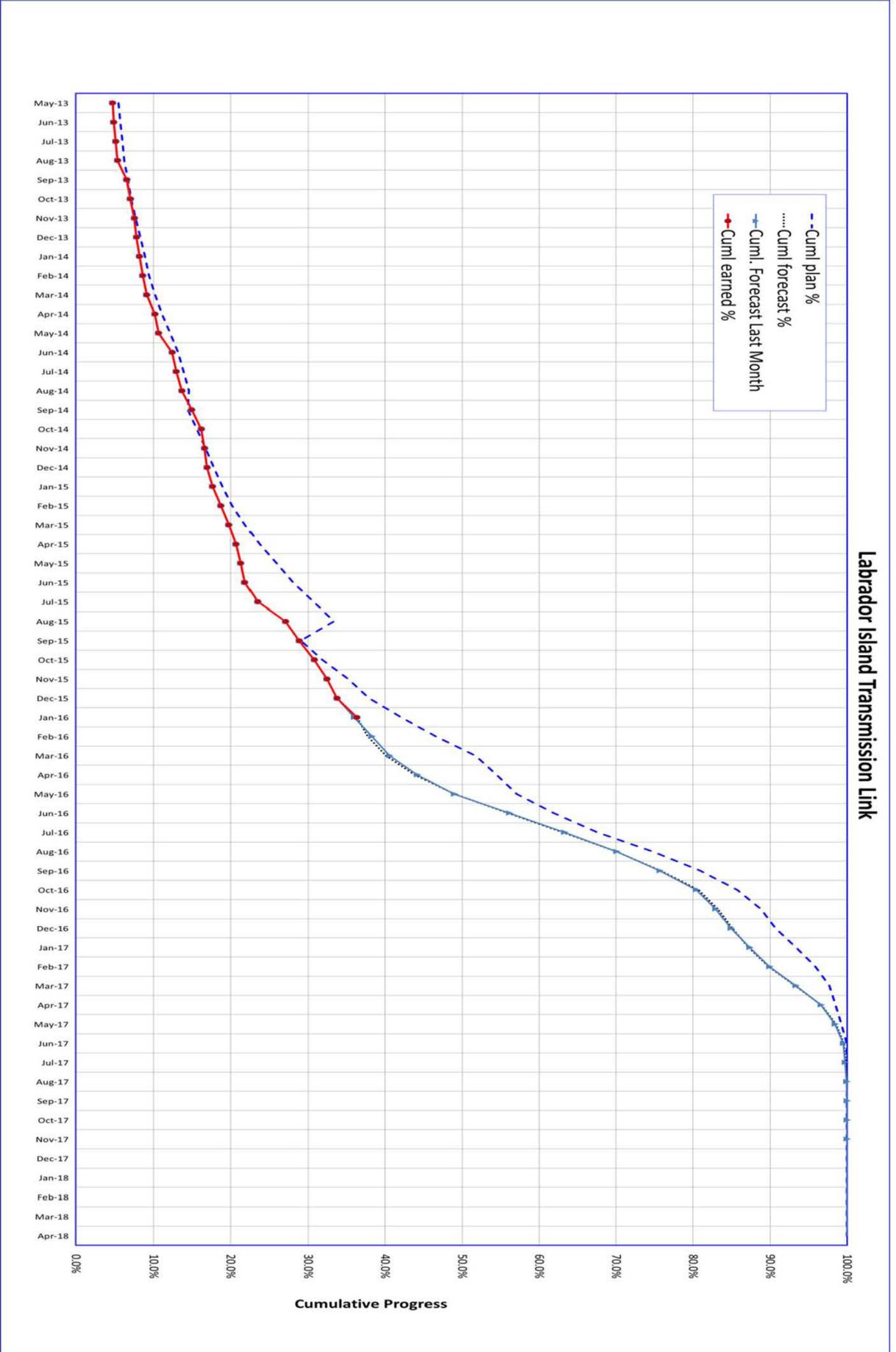
- Grounding stations work to resume Apr 2016. No delay on completion date of static commissioning.
- Lab & Nfld Transition compound no change to completion date of static commissioning.

3.0 Labrador Island Transmission Link (LITL)

		Integrated Project Schedule Layout: 212 IPS Summary - LITL												LCP project Control - Stewardship Updated: 27-Jan-16												
Activity Name	delta - Last Month Start	delta - Last Month Finish	12		2013				2014				2015				2016				2017				2018	
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Labrador Island Transmission Link (LITL)	0	0																								
LCP SysComp RFO	0	0																								
LITL (MFACS) MF Converter Station	0	0																								
LITL-Lab Electrode Line (L'Anse-au-Diable)	0	6																								
LITL Lab Grounding Station (L'Anse-au-Diable)	0	6																								
LITL-Lab HVdc Seg1/2	0	6																								
LITL-HVdc LAB Seg1 MF	0	6																								
LITL-HVdc LAB Seg2 SOBI	0	6																								
LITL-HVdc Lab	6	6																								
LITL Lab Transition Compound	0	6																								
LITL SOBI Crossing	0	6																								
LITL Nfld Transition Compound	0	6																								
LITL-Nfld HVdc TL Seg 3/4/5	0	6																								
LITL-HVdc NFLD Seg3 SOBI	0	-28																								
LITL-HVdc NFLD Seg4	0	0																								
LITL-HVdc NFLD Seg5 SP	-68	-28																								
LITL-HVdc Nfld	6	6																								
LITL (SOPCS) SOP Converter Station	0	0																								
LITL-Nfld Electrode Line (Dowden's Point)	0	-28																								
LITL Nfld Grounding Station (Dowden's Point)	0	6																								
LITL (SOPTS) Soldiers Pond Terminal Station (Swit	0	0																								
LITL-Nfld SOP ac Line Rebuilds	0	0																								
LITL (SOPSC) SOP Synchronous Condenser	0	0																								

 Current Construction
  Last Month Construction
 Current Commissioning
  Last Month Commissioning

3.0 Labrador Island Transmission Link (LITL) - LITL Engineering/Construction/Commissioning Progress Curve



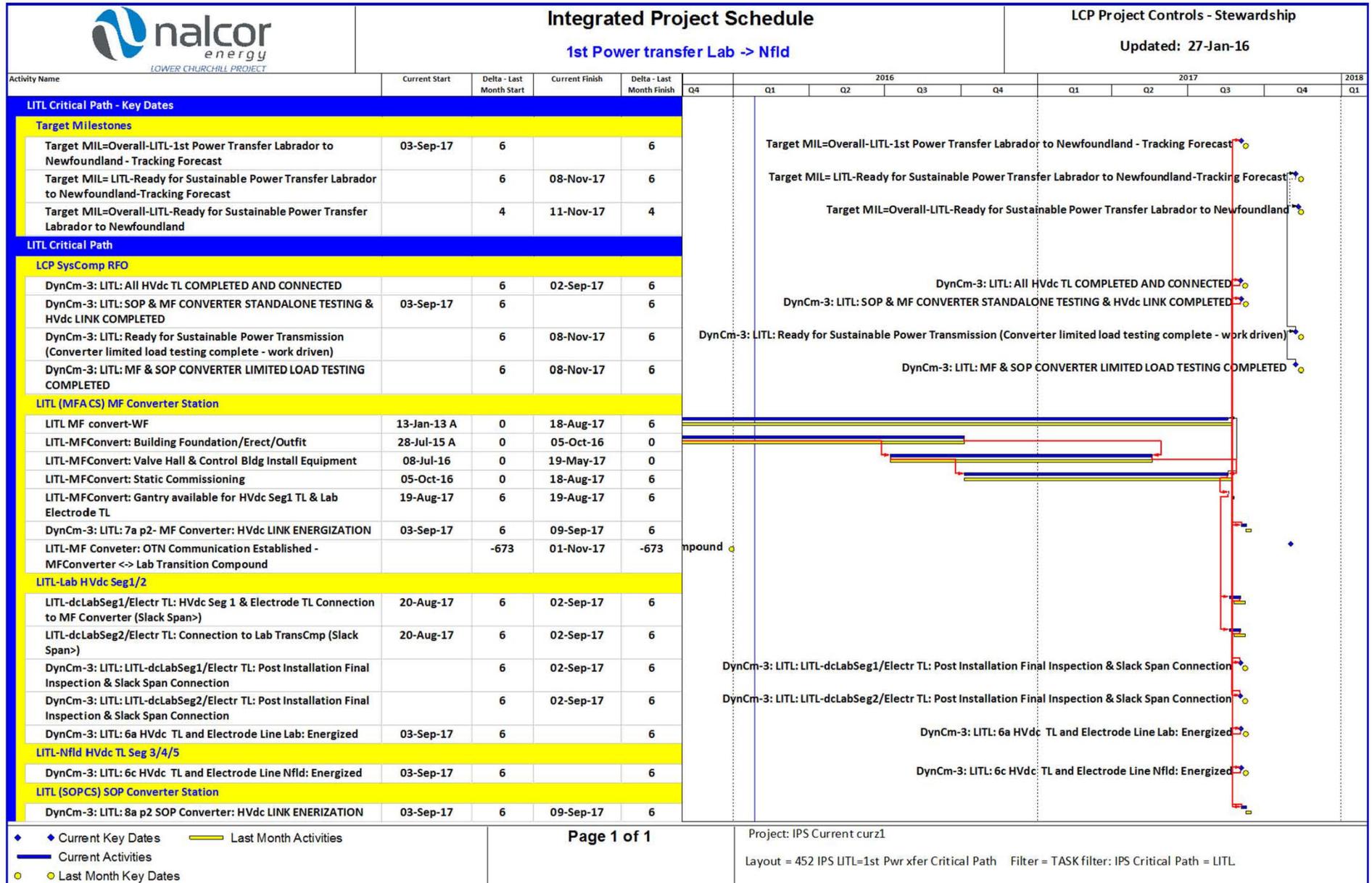
3.0 Labrador Island Transmission Link (LITL) - Engineering/Construction/Commissioning Progress Table

LITL Progress Table 2016 Jan								
This Reporting Period								
	Weight	Period %			Cumulative %			
	Factor %	Plan	Earned	Variance	Plan	Earned	Variance	
	A	B	C	C-B	E	F	F-E	
LITL Muskrat Falls Converter	5.7%	1.0%	1.6%	0.6%	14.4%	10.1%	-4.3%	
LITL Soldiers Pond Converter	5.8%	0.1%	1.8%	1.7%	24.3%	20.0%	-4.3%	
LITL HVdc Transmission Line Seg 1/2	19.3%	6.2%	6.5%	0.3%	53.6%	51.3%	-2.3%	
LITL HVdc Transmission Line Seg 3/4/5	35.3%	6.8%	0.4%	-6.4%	20.9%	8.4%	-12.5%	
LITL Grounding (Electrode) Sites	1.7%	1.6%	0.0%	-1.6%	75.0%	75.0%	0.0%	
LITL Transition Compounds	1.8%	0.0%	0.0%	0.0%	32.9%	32.9%	0.0%	
LITL SOBI Cable Crossing	18.0%	1.2%	4.9%	3.7%	72.9%	74.9%	2.0%	
LITL Soldiers Pond Switchyard	3.2%	0.7%	1.3%	0.6%	37.7%	39.1%	1.4%	
LITL Soldiers Pond Synchronous Condensers	4.9%	5.8%	0.0%	-5.8%	48.2%	28.6%	-19.6%	
LITL Misc	4.3%	0.5%	1.2%	0.7%	79.6%	82.3%	2.7%	
LITL TOTAL	100.0%	4.2%	2.6%	-1.7%	42.1%	36.3%	-5.8%	
Last Reporting Period								
	Weight	Period %			Cumulative %			
	Factor %	Plan	Earned	Variance	Plan	Earned	Variance	
	A	B	C	C-B	E	F	F-E	
LITL Muskrat Falls Converter	5.7%	1.4%	0.4%	-1.0%	13.4%	8.5%	-4.9%	
LITL Soldiers Pond Converter	5.8%	0.8%	0.4%	-0.4%	24.2%	18.2%	-6.0%	
LITL HVdc Transmission Line Seg 1/2	19.3%	5.0%	4.9%	-0.1%	47.4%	44.8%	-2.6%	
LITL HVdc Transmission Line Seg 3/4/5	35.3%	2.7%	0.4%	-2.3%	14.1%	8.0%	-6.1%	
LITL Grounding (Electrode) Sites	1.7%	3.9%	0.0%	-3.9%	73.4%	75.0%	1.6%	
LITL Transition Compounds	1.8%	0.0%	0.0%	0.0%	32.9%	32.9%	0.0%	
LITL SOBI Cable Crossing	18.0%	1.2%	0.1%	-1.1%	71.7%	70.0%	-1.7%	
LITL Soldiers Pond Switchyard	3.2%	2.2%	3.0%	0.8%	37.0%	37.8%	0.8%	
LITL Soldiers Pond Synchronous Condensers	4.9%	5.0%	0.0%	-5.0%	42.4%	28.6%	-13.8%	
LITL Misc	4.3%	3.6	0.8%	0.8%	79.1%	81.1%	2.0%	
LITL TOTAL	100.0%	2.7%	1.3%	-1.4%	37.9%	33.8%	-4.1%	

3.0 Labrador Island Transmission Link (LITL)

LITL Critical Path 1st Power transfer Lab-> Nfld

NOTE: For complete Critical / Subcritical path schedule see attachment



4.0 Muskrat Falls Generation (MFGGen) MFGGen Analysis – Observations

1) Target Milestone

Target Milestone: MFGGen 1st power from Muskrat Falls = (**On hold**)

2) Overall Engineering/Construction/Commissioning Progress

Period Planned Progress:	1.9%	Cumulative Planned Progress:	52.4%
Period Forecast Progress:	0.2%		
Period Earned Progress:	0.1%	Cumulative Earned Progress:	41.7%

3) Critical Path(s):

- [Diversion - River Closure \(priority 1a\) - see page 13](#)
- On schedule for start on 6 July 2016
- [Diversion - Winter Headpond El. 25m \(priority 1b\) - see page 14](#)
- On schedule for start on 26 Oct 2016
- [Diversion - Impoundment Full Supply Level El. 39m \(priority 1c\) - see page 15](#)
- (**On hold**, see below for details)

4) Reservoir Clearing:

- Labour transferred to ROW clearing in LITL, forecast for restart in July 2016 with completion in Dec 2016.

5) North Spur:

- Contractor demobilized for winter.

6) Spillway

- Work continues towards planned river diversion

7) Transition Dams/North & South Dams

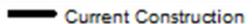
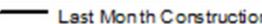
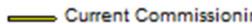
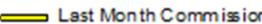
- North and South Dams contractor demobilized for winter.

8) Powerhouse:

- A review of the C1 (Muskrat Falls Generation) work plan is underway, and implementation of an updated C1 schedule will remain on hold pending acceptance of agreed actions and mitigations plan.
- Minimal progress during January period due to ICS removal and suspension of concreting activities until February.

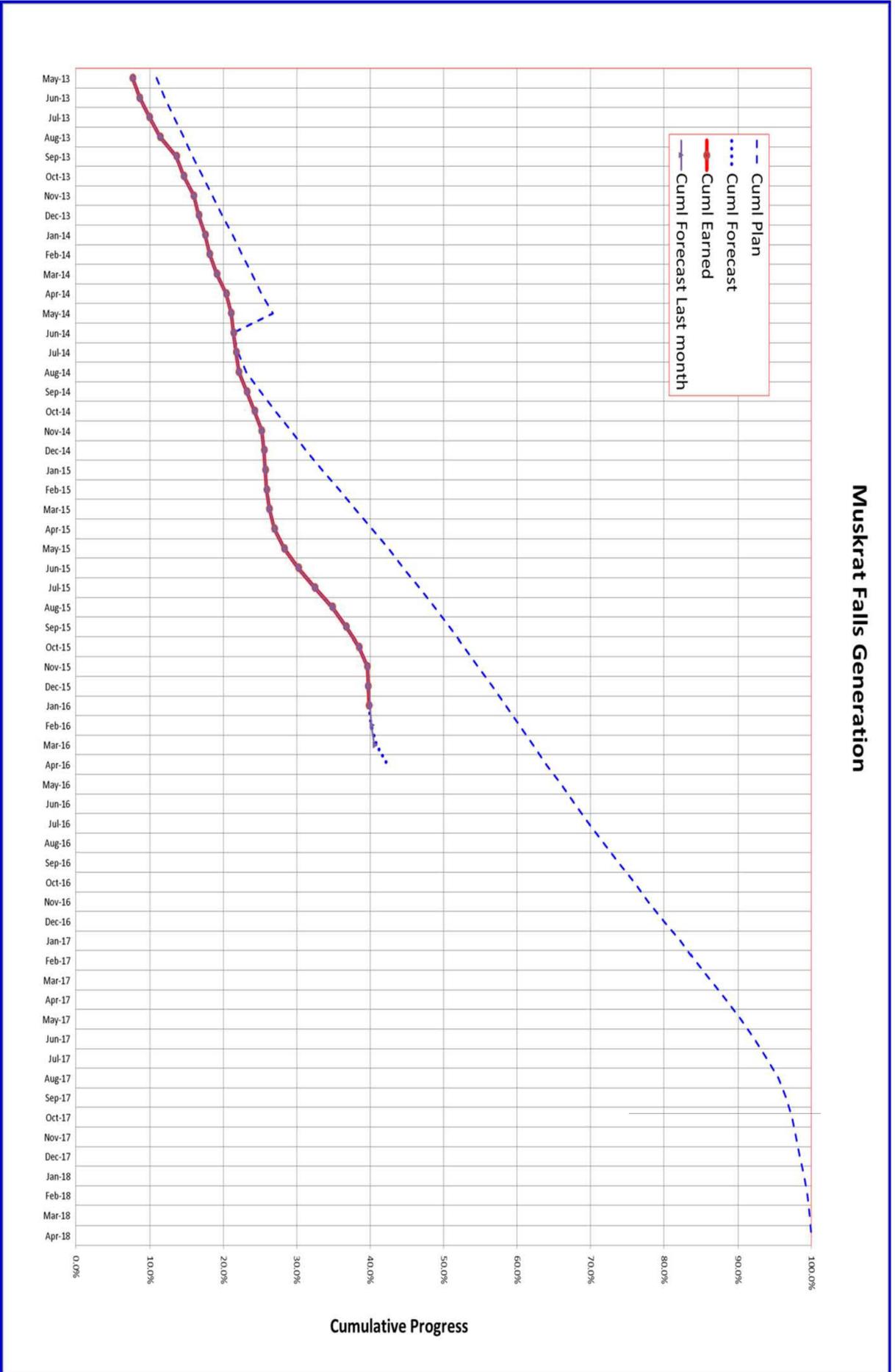
4.0 Muskrat Falls Generation (MFGGen)

		Integrated Project Schedule Layout: 212 IPS Summary - MFG				LCP project Control - Stewardship Updated: 27-Jan-16																
Activity Name	delta - Last Month Start	delta - Last Month Finish	2012		2013			2014			2015			2016			2017			2018		
			Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
Muskrat Falls - Generation (MFGGen)	0	0																				
MFGGen Access Road	0	0																				
MFGGen Construction Power	0	1																				
MFGGen Accommodations	0	0																				
MFGGen Reservoir Preparation	0	0																				
MFGGen North Spur Stabilization	0	0																				
MFGGen Spillway/Diverson	0	0																				
MF Bulk Excavation	0	0																				
Spillway/Div Ph 1	0	0																				
Spillway Ph2-Bay 1	0	0																				
Spillway Ph2-Bay 3	0	0																				
Spillway Ph2-Bay 5	0	0																				
Spillway Ph2-Bay 2	0	0																				
Spillway Ph2-Bay 4	0	0																				
MFGGen Power House & Intake	← Under review	0																				
MFGGen North RCC Dam	0	0																				
MFGGen-315kV Collector Line (PH->MF Swyd)	0	0																				
MFGGen South Dam	0	0																				
MFGGen Site Restoration	0	0																				
MFGGen Offsite Logistics and Infrastructure Upgrad	0	0																				

 Current Construction
  Last Month Construction
 Current Commissioning
  Last Month Commissioning

4.0 Muskrat Falls Generation (MFGen) - MFGen Engineering/Construction/Commissioning Progress Curve

Muskrat Falls Generation



4.0 Muskrat Falls Generation (MFGGen) - MFGGen Engineering/Construction/Commissioning Progress Table

MFGGen Progress Table 2016 Jan								
This Reporting Period								
	Weight	Period %			Cumulative %			
	Factor %	Plan	Earned	Variance	Plan	Earned	Variance	
	A	B	C	C-B	E	F	F-E	
MFG Road/Camp/Constr. Power	7.9%	0.0%	0.0%	0.0%	100.0%	99.8%	-0.2%	
MFG Reservoir Preparation	6.5%	0.0%	0.0%	0.0%	60.8%	60.8%	0.0%	
MFG Spillway & Gates	11.4%	2.0%	0.5%	-1.5%	65.0%	66.6%	1.6%	
MFG North Spur Stabilization	4.2%	0.0%	0.0%	0.0%	39.2%	43.6%	4.4%	
MFG North Dam (incl North Transition Dam)	7.5%	0.0%	0.0%	0.0%	0.0%	4.1%	4.1%	
MFG Powerhouse & intake	54.9%	2.5%	0.1%	-2.4%	54.7%	23.3%	-31.4%	
MFG South Dam (incl South Transition Dam)	1.1%	0.0%	1.3%	1.3%	0.0%	10.4%	10.4%	
MFG Misc:Eng/ 315kV/Site Rest./logistic	6.5%	0.0%	0.0%	0.0%	83.5%	83.5%	0.0%	
MFGGen TOTAL	100.0%	1.9%	0.1%	-1.8%	58.5%	39.9%	-18.6%	
Last Reporting Period								
	Weight	Period %			Cumulative %			
	Factor %	Plan	Earned	Variance	Plan	Earned	Variance	
	A	B	C	C-B	E	F	F-E	
MFG Road/Camp/Constr. Power	7.9%	0.0%	0.0%	0.0%	100.0%	99.8%	-0.2%	
MFG Reservoir Preparation	6.5%	0.0%	0.0%	0.0%	60.8%	60.8%	0.0%	
MFG Spillway & Gates	11.4%	2.0%	0.3%	-1.7%	63.0%	66.1%	3.1%	
MFG North Spur Stabilization	4.2%	2.2%	0.3%	-1.9%	39.2%	43.6%	4.4%	
MFG North Dam (incl North Transition Dam)	7.5%	0.0%	0.0%	0.0%	0.0%	4.1%	4.1%	
MFG Powerhouse & intake	54.9%	2.5%	0.1%	-2.4%	52.2%	23.2%	-29.0%	
MFG South Dam (incl South Transition Dam)	1.1%	0.0%	1.9%	1.9%	0.0%	9.1%	9.1%	
MFG Misc:Eng/ 315kV/Site Rest./logistic	6.5%	0.0%	0.0%	0.0%	83.5%	83.5%	0.0%	
MFGGen TOTAL	100.0%	1.9%	0.1%	-1.8%	56.6%	39.8%	-17.0%	

End of Report

Lower Churchill Project Delivery Team Project Controls

ATTACHMENT A.8

Activity Name	Current Start	Current Finish	Current Float	2016				2017			
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
LITL Critical Path - Key Dates											
Target Milestones											
Target Key Date=Overall-LITL-1st Power Transfer Labrador to Newfoundland - Tracking Forecast	03-Sep-17		0	Target Key Date=Overall-LITL-1st Power Transfer Labrador to Newfoundland - Tracking Forecast							
LITL Critical Path											
LCP SysComp RFO											
DynCm-3: LITL: All HVdc TL COMPLETED AND CONNECTED		02-Sep-17	0	DynCm-3: LITL: All HVdc TL COMPLETED AND CONNECTED							
DynCm-3: LITL: SOP & MF CONVERTER STANDALONE TESTING & HVdc LINK COMPLETED	03-Sep-17		0	DynCm-3: LITL: SOP & MF CONVERTER STANDALONE TESTING & HVdc LINK COMPLETED							
LITL (MFACS) MF Converter Station											
LITL MF convert-WF	13-Jan-13 A	18-Aug-17	0								
LITL-MFConvert: Building Foundation/Erect/Outfit	28-Jul-15 A	05-Oct-16	0								
LITL-MFConvert: Valve Hall & Control Bldg Install Equipment	08-Jul-16	19-May-17	0								
LITL-MFConvert: Static Commissioning	05-Oct-16	18-Aug-17	0								
LITL-MFConvert: Gantry available for HVdc Seg1 TL & Lab Electrode TL	19-Aug-17	19-Aug-17	0								
DynCm-3: LITL: 7a p2- MF Converter: HVdc LINK ENERGIZATION	03-Sep-17	09-Sep-17	0								
LITL-Lab HVdc Seg1/2											
LITL-dcLabSeg1/Electr TL: HVdc Seg 1 & Electrode TL Connection to MF Converter (Slack Span>)	20-Aug-17	02-Sep-17	0								
LITL-dcLabSeg2/Electr TL: Connection to Lab TransCmp (Slack Span>)	20-Aug-17	02-Sep-17	0								
DynCm-3: LITL: LITL-dcLabSeg1/Electr TL: Post Installation Final Inspection & Slack Span Connection		02-Sep-17	0	DynCm-3: LITL: LITL-dcLabSeg1/Electr TL: Post Installation Final Inspection & Slack Span Connection							
DynCm-3: LITL: LITL-dcLabSeg2/Electr TL: Post Installation Final Inspection & Slack Span Connection		02-Sep-17	0	DynCm-3: LITL: LITL-dcLabSeg2/Electr TL: Post Installation Final Inspection & Slack Span Connection							
DynCm-3: LITL: 6a HVdc TL and Electrode Line Lab: Energized	03-Sep-17		0	DynCm-3: LITL: 6a HVdc TL and Electrode Line Lab: Energized							
LITL-Nfid HVdc TL Seg 3/4/5											
DynCm-3: LITL: 6c HVdc TL and Electrode Line Nfid: Energized	03-Sep-17		0	DynCm-3: LITL: 6c HVdc TL and Electrode Line Nfid: Energized							
LITL (SOPCS) SOP Converter Station											
DynCm-3: LITL: 8a p2 SOP Converter: HVdc LINK ENERGIZATION	03-Sep-17	09-Sep-17	0								
LITL Sub-Critical Path 1											
LITL-Lab Electrode Line (L'Anse-au-Diable)											
LITL Lab Electr. TL: Connection to MF Converter/Grounding Site (slack span>)	20-Aug-17	26-Aug-17	7								
DynCm-3: LITL: LITL Lab Electr. TL: Post Installation Final Inspection & Slack Span Connection		26-Aug-17	7	DynCm-3: LITL: LITL Lab Electr. TL: Post Installation Final Inspection & Slack Span Connection							
LITL Sub-Critical Path 2											
LITL-Nfid HVdc TL Seg 3/4/5											
LITL-dcNfSeg3: Connection to Nfid TransCmp (Slack Span>)	12-Aug-17	25-Aug-17	8								
LITL-dcNfSeg5: Connection to SP Converter (Slack Span>)	12-Aug-17	25-Aug-17	8								
DynCm-3: LITL: LITL-dcNfSeg3: Post Installation Final Inspection & Slack Span Connection		25-Aug-17	8	DynCm-3: LITL: LITL-dcNfSeg3: Post Installation Final Inspection & Slack Span Connection							
DynCm-3: LITL: LITL-dcNfSeg5: Post Installation Final Inspection & Slack Span Connection		25-Aug-17	8	DynCm-3: LITL: LITL-dcNfSeg5: Post Installation Final Inspection & Slack Span Connection							
LITL (SOPCS) SOP Converter Station											
LITL SOP convert-WF	21-Apr-14 A	10-Aug-17	8								
LITL-SOP Convert: Building Foundation/Erect/Outfit	10-Jul-15 A	23-Aug-16	8								
LITL-SPConvert: Valve Hall/Control Bldg Install Equipment	18-Jul-16	05-May-17	8								
LITL-SOPConvert: Static Commissioning	23-Dec-16	10-Aug-17	8								
LITL-SOPConvert: Gantry available for HVdc Seg5 TL & Nfid Electr TL	11-Aug-17	11-Aug-17	8								
LITL Sub-Critical Path 3											
LITL (MFACS) MF Converter Station											
DynCm-3: LITL: LITL-MFConvert: Static Commissioning Complete		18-Aug-17	15	DynCm-3: LITL: LITL-MFConvert: Static Commissioning Complete							
DynCm-3: LITL: 7a p1- MF Converter: STATION STAND ALONE TESTING	19-Aug-17	19-Aug-17	15	DynCm-3: LITL: 7a p1- MF Converter: STATION STAND ALONE TESTING COMPLETED							
DynCm-3: LITL: 7a p1- MF Converter: STATION STAND ALONE TESTING COMPLETED		19-Aug-17	15								
LITL-Nfid Electrode Line (Dowden's Point)											
LITL Nfid Electr. TL: Connection to Grounding Site (slack span>)	12-Aug-17	18-Aug-17	15								
DynCm-3: LITL: LITL Nfid Electr. TL: Post Installation Final Inspection & Slack Span Connection		18-Aug-17	15	DynCm-3: LITL: LITL Nfid Electr. TL: Post Installation Final Inspection & Slack Span Connection							
LITL Sub-Critical Path 4											
LITL (SOPCS) SOP Converter Station											
DynCm-3: LITL: LITL-SOP Convert: Static Commissioning Complete		10-Aug-17	23	DynCm-3: LITL: LITL-SOP Convert: Static Commissioning Complete							
DynCm-3: LITL: 8a p1 SOP Converter: STATION STANDALONE TESTING	11-Aug-17	11-Aug-17	23	DynCm-3: LITL: 8a p1 SOP Converter: STATION STANDALONE TESTING COMPLETE							
DynCm-3: LITL: 8a p1 SOP Converter: STATION STANDALONE TESTING COMPLETE		11-Aug-17	23								
LITL Sub-Critical Path 5											
LITL-Nfid HVdc TL Seg 3/4/5											
LITL-Nfid dc TL-WF	02-Jan-15 A	03-Jul-17	47								
LITL-dcNfSeg5: ROW Clearing / Survey & Tower Spotting	15-Mar-16*	21-Sep-16	47								
LITL-dcNfSeg5: Civil Works - foundations	30-Jun-16	21-Jan-17	47								
LITL-dcNfSeg5: Tower Assembly / Install	21-Jul-16	07-Mar-17	47								
LITL-dcNfSeg5: Conductor/OPGW Install	15-Feb-17	19-Jun-17	47								
LITL-dcNfSeg5: Installation Final Inspection Nfid (static)	20-Jun-17	03-Jul-17	47								
LITL Sub-Critical Path 6											
LCP SysComp RFO											
DynCm-3: LITL: Nfid REACTIVE SUPPORT (from SOP Sync Cond)		15-Jul-17	49	DynCm-3: LITL: Nfid REACTIVE SUPPORT (from SOP Sync Cond)							
LITL (SOPSC) SOP Synchronous Condenser											
LITL-SOP SynCd: Bldg Foundation/Erect/Outfit	22-May-15 A	25-Oct-16	49								
LITL-SPSynCd: Indoor Installation of 1st Unit	26-Oct-16	20-Mar-17	49								
LITL-SPSynCd: Indoor Installation of 2nd Unit	08-Nov-16	12-Apr-17	49								
LITL-SPSynCd: Static Commissioning Unit 2	08-Feb-17	02-Jun-17	49								
DynCm-6-Nfid ac: LITL-SOP SynCd: Static Commissioning Unit 2 Complete		02-Jun-17	49	DynCm-6-Nfid ac: LITL-SOP SynCd: Static Commissioning Unit 2 Complete							
DynCm-6-Nfid ac: 9b SOP SynCond #2: dynamic testing	03-Jun-17	15-Jul-17	49								
LITL Sub-Critical Path 7											
LITL (MFACS) MF Converter Station											
LITL-MFConvert: Foundation Outdoor	07-Aug-15 A	23-Sep-16	64								
LITL-MFConvert: Outdoor Install dc equipment	26-Sep-16	25-May-17	64								
LITL Lab Grounding Station (L'Anse-au-Diable)											
LITL Lab Grounding-WF	18-May-15 A	15-Jun-17	64								
LITL Lab Grounding: Install Electrodes and Terminal Structure	01-Mar-17*	15-May-17	64								
LITL Lab Grounding: Static Commissioning	16-May-17	15-Jun-17	64								
LITL Lab Grounding: Gantry available for Lab Electrode TL	16-Jun-17	16-Jun-17	64								
LITL Sub-Critical Path 8											
LITL-Nfid HVdc TL Seg 3/4/5											
LITL-dcNfSeg4: Civil Works - foundations	01-Apr-16*	31-Jan-17	66								
LITL-dcNfSeg4: Tower Assembly / Install	02-May-16	07-Mar-17	66								
LITL-dcNfSeg4: Conductor/OPGW Install	28-Dec-16	31-May-17	66								
LITL-dcNfSeg4: Installation Final Inspection Nfid (static)	01-Jun-17	14-Jun-17	66								
LITL Sub-Critical Path 9											
LITL Lab Transition Compound											
LITL-LabTrnComp: Civil Works - Switchgear Foundation/Erect/Outfit	01-Apr-16*	30-Jul-16	71								
LITL-LabTrnComp: Civil Works - Outdoor Equipment Foundations/Structures	01-Apr-16	30-Jul-16	71								
LITL-LabTrnComp: Install Indoor/Outdoor Equipment	13-Sep-16	27-Apr-17	71								
LITL-LabTrnComp: Completions - Static Commissioning	28-Apr-17	08-Jun-17	71								
LITL-LabTrnComp: Gantry available for HVdc Seg 2 TL Connection	09-Jun-17	09-Jun-17	71								
LITL Nfid Transition Compound											
LITL-NfidTrnComp: Civil Works - Switchgear Bldg Foundation/Erect/Outfit	01-Apr-16*	30-Jul-16	71								
LITL-NfidTrnComp: Civil Works - Outdoor Equipment Foundations/Structures	01-Apr-16	30-Jul-16	71								
LITL-NfidTrnComp: Install Indoor/Outdoor Equipment	13-Sep-16	27-Apr-17	71								
LITL-NfidTrnComp: Completions - Static Commissioning	28-Apr-17	08-Jun-17	71								
LITL-NfidTrnComp: Gantry available for HVdc Seg 3 TL Connection	09-Jun-17	09-Jun-17	71								
LITL Nfid Grounding Station (Dowden's Point)											
LITL Nfid Grounding Site: Install Electrodes and terminal Structure	01-Mar-17*	15-May-17	71								
LITL Nfid Grounding Site: Static Commissioning	16-May-17	15-Jun-17	71								
LITL Nfid Grounding Site: Gantry available for Electrode Line	16-Jun-17	16-Jun-17	71								

Activity Name	Current Start	Current Finish	Current Float	2015				2016				2017		
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
LTA Critical Path - Key Dates														
Target Milestones														
Target MIL= LTA-Ready for Power Transmission (Power Available) - Tracking Fore		18-May-17	0	L= LTA-Ready for Power Transmission (Power Available) - Tracking Forecast										
LTA Critical Path														
LCP SysComp RFO														
DynCm-1-LTA: Lab ac LTA Power Available (work driven)		18-May-17	0	DynCm-1-LTA: Lab ac LTA Power Available (work driven)										
LTA CF Switchyard														
LTA-CF Swyd: GIS/Control Bldg Erect/Outfit	29-Jul-15 A	19-Oct-16	0											
LTA-CF Swyd: Install Indoor Equipment	27-May-16	19-Dec-16	0											
LTA-CF Swyd: Static Commissioning Switchyard (Ext and New)	26-Oct-16	01-Mar-17	0											
LTA-CF Swyd Ext: Static Commissioning Switchyard (Ext and New)	26-Oct-16	01-Mar-17	0											
DynCm-1-Lab ac: LTA-CF Swyd: Static Commissioning (Ext and New)		01-Mar-17	0	DynCm-1-Lab ac: LTA-CF Swyd: Static Commissioning (Ext and New)										
LTA-CF Swyd: Gantry Available for 735kV TL Connection	02-Mar-17	02-Mar-17	0											
DynCm-1-Lab ac: 1p1 CF switchyard ext and 735kV: ENERGIZATION	17-Mar-17	05-Apr-17	0											
DynCm-1-Lab ac: 2p1 new CF switchyard: ENERGIZATION	17-Mar-17	16-Apr-17	0											
LTA-735kV Interconnect at CF														
LTA 735kV CF: Connection to Existing CF Swyd (Slack Span)	03-Mar-17	16-Mar-17	0											
LTA 735kV CF: Connection to New CF Swyd (Slack Span)	03-Mar-17	16-Mar-17	0											
DynCm-1-Lab ac: LTA 735kV CF: Post Installation Final Inspection & Slack Span		16-Mar-17	0	1-Lab ac: LTA 735kV CF: Post Installation Final Inspection & Slack Span										
LTA (L3101/L3102) 315kV TL Seg1/2 MF-CF														
DynCm-1-Lab ac: 3 TL CF to MF 315kv Line: ENERGIZED	17-Apr-17		0	DynCm-1-Lab ac: 3 TL CF to MF 315kv Line: ENERGIZED										
LTA (MFATS2) MF Terminal Station (Switchyard)														
DynCm-1-Lab ac: 4 p1 MF swyd: ENERGIZATION	17-Apr-17	18-May-17	0											
DynCm-1-Lab ac: LTA POWER AVAILABLE		18-May-17	0	DynCm-1-Lab ac: LTA POWER AVAILABLE										
Nalcor- Breakers Upgrade														
DynCm-4: Nalcor: 12a NALCOR Breaker Upgrades - Required completion date		16-Dec-16	0	r: 12a NALCOR Breaker Upgrades - Required completion date										
Nalcor-P&C Mods														
DynCm-4: Nalcor: 12a NALCOR P&C Upgrades - Required completion date		16-Dec-16	0	nalcor: 12a NALCOR P&C Upgrades - Required completion date										
LTA Sub- Critical Path 1														
LTA CF Switchyard														
LTA-CF Swyd: Gantry Available for HVac Seg 1/2 TL Connection	02-Mar-17	02-Mar-17	1											
LTA (L3101/L3102) 315kV TL Seg1/2 MF-CF														
LTA-ac Seg1/2: Connection to MF & CF Switchyard (Slack Span)	03-Mar-17	16-Mar-17	1											
DynCm-1-Lab ac: LTA-ac Seg1/2: Post Installation Final Inspection & Slack Span		16-Mar-17	1	-Lab ac: LTA-ac Seg1/2: Post Installation Final Inspection & Slack Span										
LTA (MFATS2) MF Terminal Station (Switchyard)														
LTA-MF Swyd: GIS/Control Bldg Erect/Outfit	03-Aug-15 A	19-Oct-16	1											
LTA-MF Swyd: Foundations/Structures for Outdoor Equipment	05-Aug-15 A	26-Nov-16	1											
LTA-MF Swyd: Install Outdoor equipment	21-Mar-16	20-Oct-16	1											
LTA-MF Swyd: Static Commissioning	26-Oct-16	01-Mar-17	1											
DynCm-1-Lab ac: LTA-MF Swyd: Static Commissioning		01-Mar-17	1	DynCm-1-Lab ac: LTA-MF Swyd: Static Commissioning										
LTA-MF Swyd: Gantry Available for TL Connection	02-Mar-17	02-Mar-17	1											
LTA Sub- Critical Path 2														
LTA CF Switchyard														
LTA-CF Swyd Ext: AIS Outdoor equip/Control Bldg Foundations	01-Apr-16*	19-Aug-16	31											
LTA-CF Swyd Ext: AIS Outdoor equip/Control Bldg: Install	31-May-16	31-Oct-16	31											
LTA Sub- Critical Path 3														
Nalcor-P&C Mods														
NALCOR System P&C: PETS Forecast completion date TL201,TL217 & TL242		18-Oct-16	59	P&C: PETS Forecast completion date TL201,TL217 & TL242										
NALCOR System P&C: TL242 In Service		18-Oct-16*	59	NALCOR System P&C: TL242 In Service										
NALCOR System P&C: TL242 Complete		18-Oct-16	59	NALCOR System P&C: TL242 Complete										
LTA Sub- Critical Path 4														
Nalcor- Breakers Upgrade														
Nalcor: Breaker replacement HRD B12L42 - in service		17-Oct-16*	61	Nalcor: Breaker replacement HRD B12L42 - in service										
LTA Sub- Critical Path 5														
Nalcor-P&C Mods														
NALCOR System P&C: TL242 Planned Outage	06-Sep-16*	18-Oct-16	71											
NALCOR System P&C: TL242 HRD Construction/Comm	06-Sep-16	21-Sep-16	71											
NALCOR System P&C: TL242 HWD Construction/Comm	22-Sep-16	06-Oct-16	71											
LTA Sub- Critical Path 6														
LTA CF Switchyard														
LTA-CF Swyd: Foundations/Structure for Outdoor Equipment	28-Jul-15 A	25-May-16	86											
LTA-CF Swyd: Install Outdoor Equipment	11-Apr-16	05-Dec-16	86											
LTA Sub- Critical Path 7														
LTA (MFATS2) MF Terminal Station (Switchyard)														
LTA-MF Swyd: Install Telecom (OTN)	20-Oct-16*	18-Dec-16	91											
LTA-MF Swyd: Telecoms Static Commissioning (OTN)	02-Nov-16	01-Dec-16	91											
LTA Sub- Critical Path 8														
LTA (MFATS2) MF Terminal Station (Switchyard)														
LTA-MF Swyd: Install Indoor equipment	28-Apr-16	16-Nov-16	92											

ATTACHMENT A.9

Integrated Project Schedule (IPS) LITL Low Load Testing as of December 2016

Boundless Energy



Content:**➤ Milestones**

- Establishment of LTA & LITL Target Milestones
- Current Target Milestones

➤ LTA

- LTA Summary Schedule
- LTA Critical Path

➤ LITL

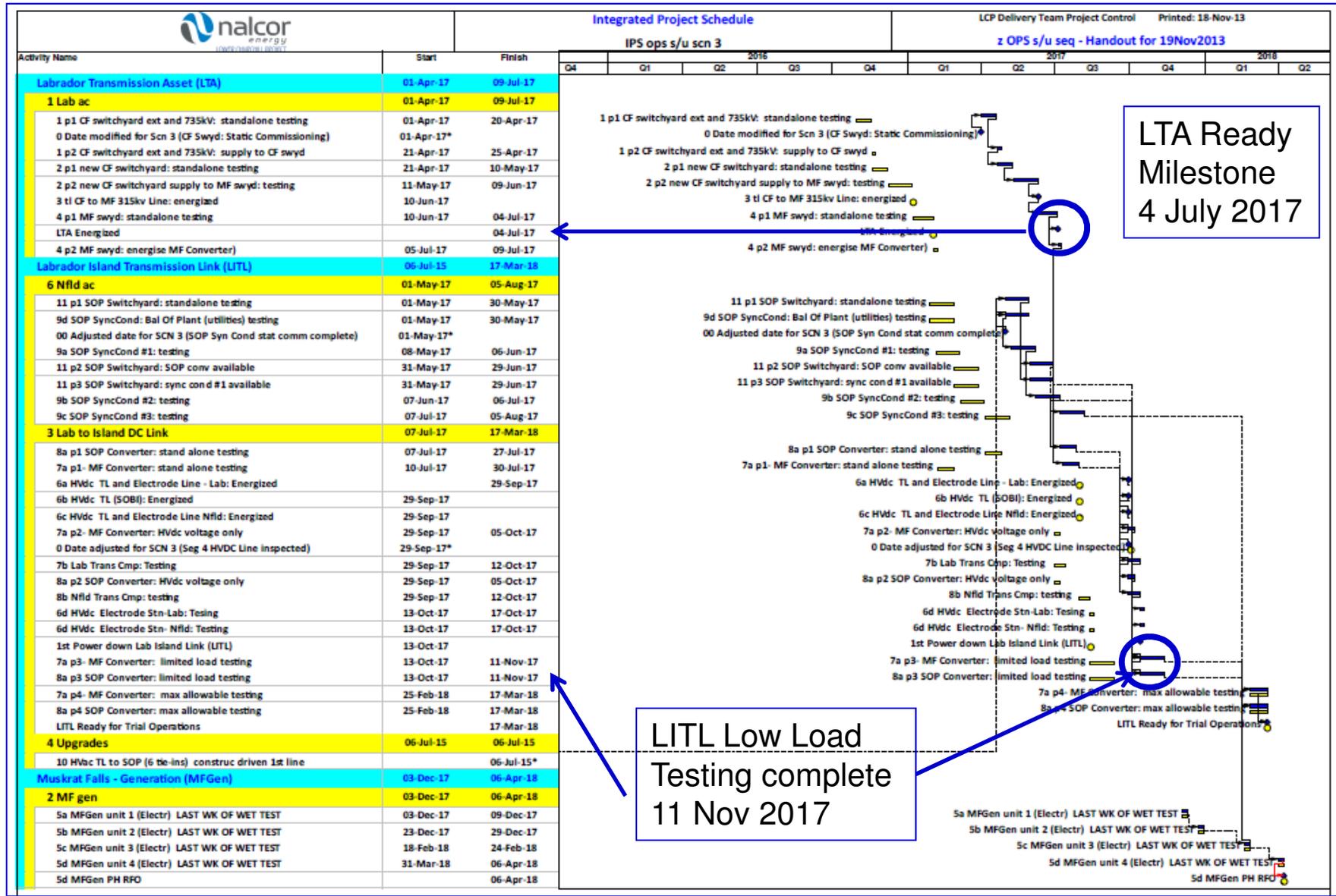
- LITL Summary Schedule
- LITL Critical Path

➤ Start-Up Sequence

- Overall
- LTA
- Island reactive Support
- Low Load Testing

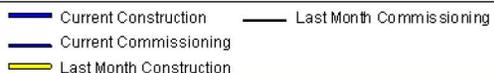
➤ Questions

➤ Establishment of LTA & LITL Target Milestones at Meeting 19 Nov 2013

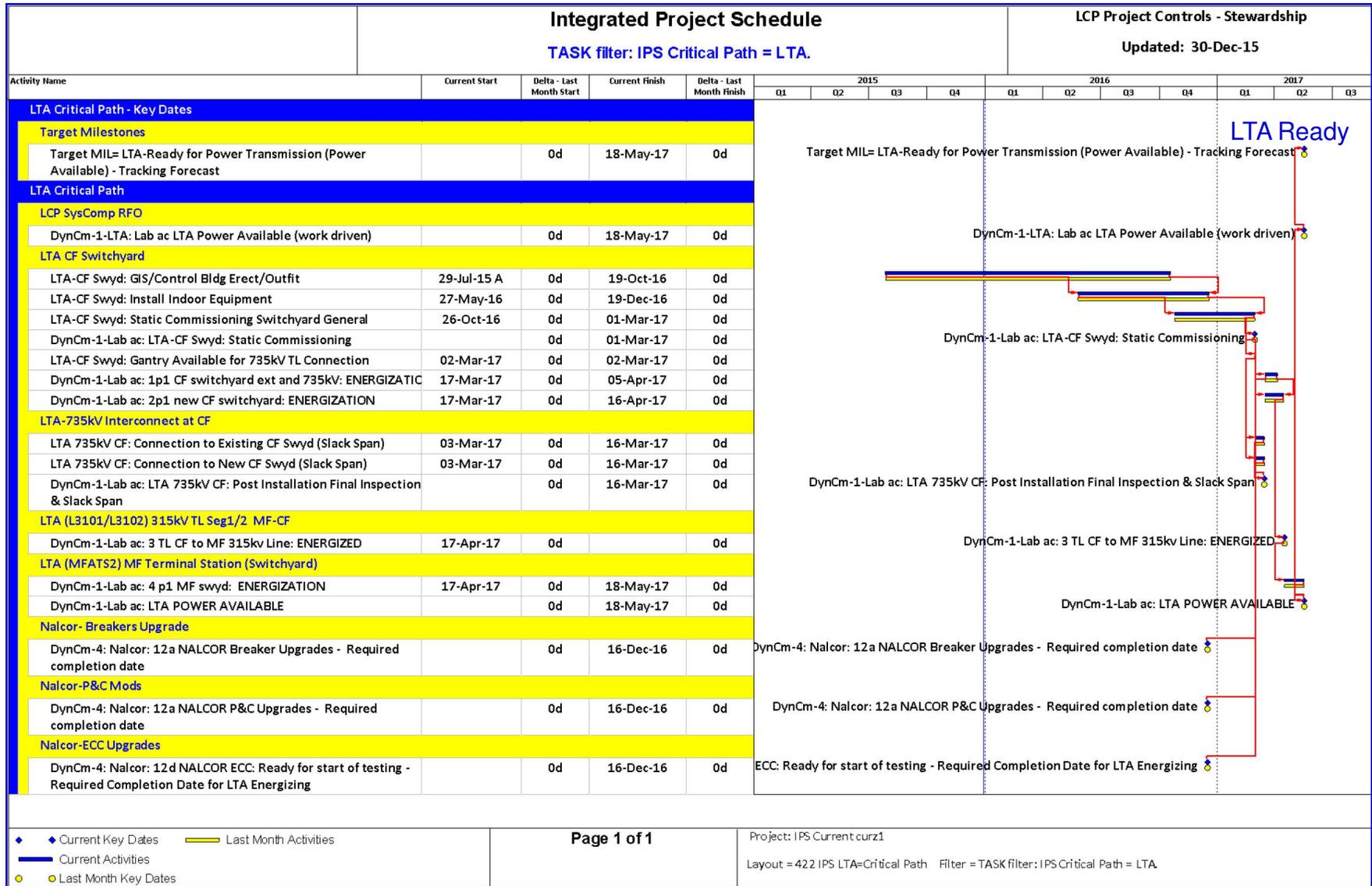


➤ LTA Summary Schedule

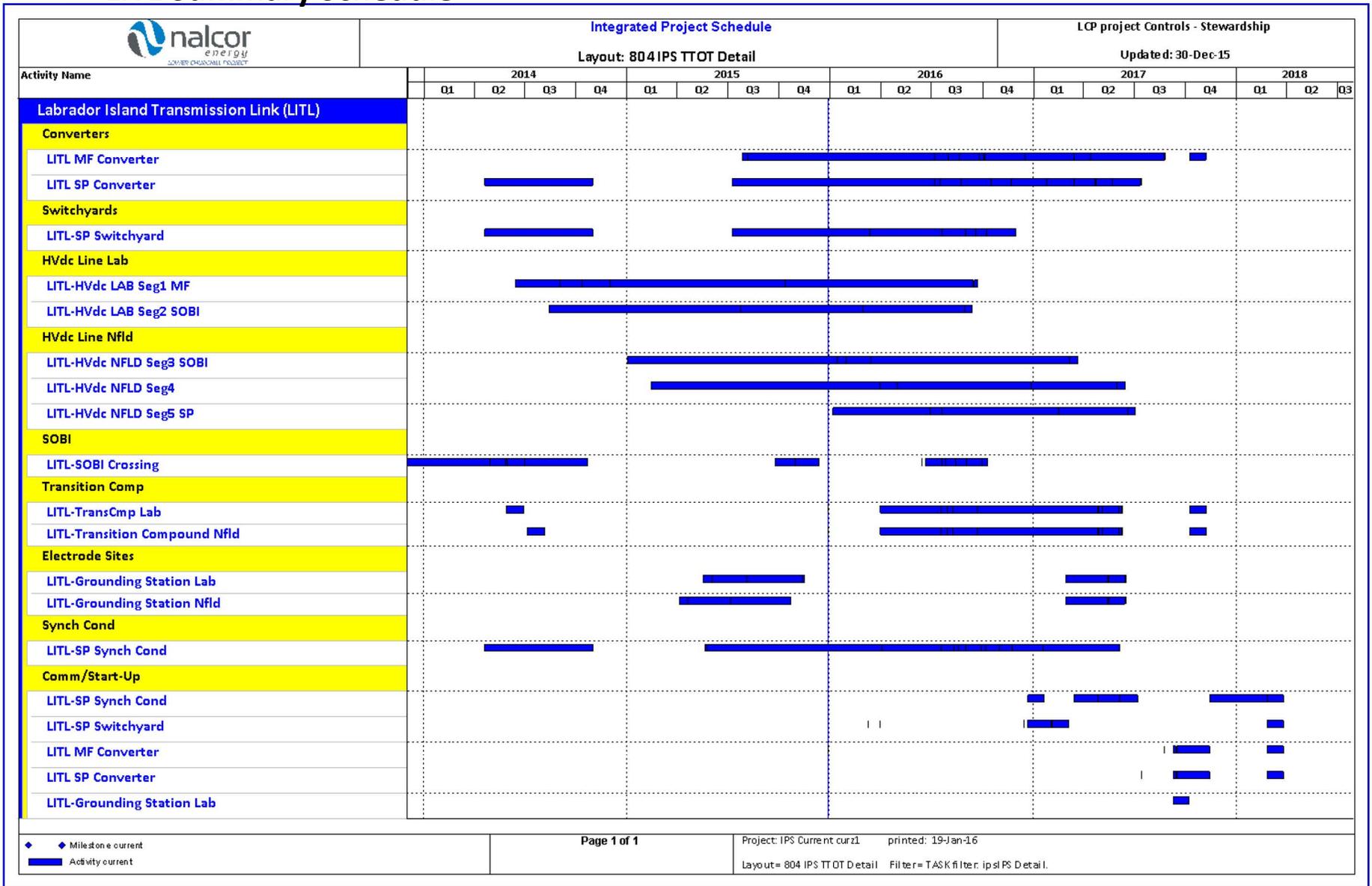
		Integrated Project Schedule Layout: 220 IPS Summary - LTA				LCP project Control - Stewardship Process Updated: 30-Dec-15																						
Activity Name	delta - Last Month Start	delta - Last Month Finish	L2	2013				2014				2015				2016				2017				2018				
			Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Labrador Transmission Asset (LTA)	0d	0d																										
LTA CF Accommodations	0d	0d																										
LTA-CF Camp	0d	0d																										
LTA CF Switchyard	0d	0d																										
LTA-CF Swyd EXT	0d	0d																										
LTA-CF Switchyard	0d	0d																										
LTA-735kV Interconnect at CF	0d	0d																										
LTA-735kV ac Intercon CF	0d	0d																										
LTA (L3101/L3102) 315kV TL Seg1/2 MF-CF	0d	0d																										
LTA (L3101/L3102) 315kV TL Segment 1/2	0d	0d																										
LTA (MFATS2) MF Terminal Station (Switchyard)	0d	0d																										
LTA-MF Switchyard	0d	0d																										


 ■ Current Construction — Last Month Commissioning
 ■ Current Commissioning — Last Month Construction

• LTA Critical Path



➤ LITL Summary Schedule

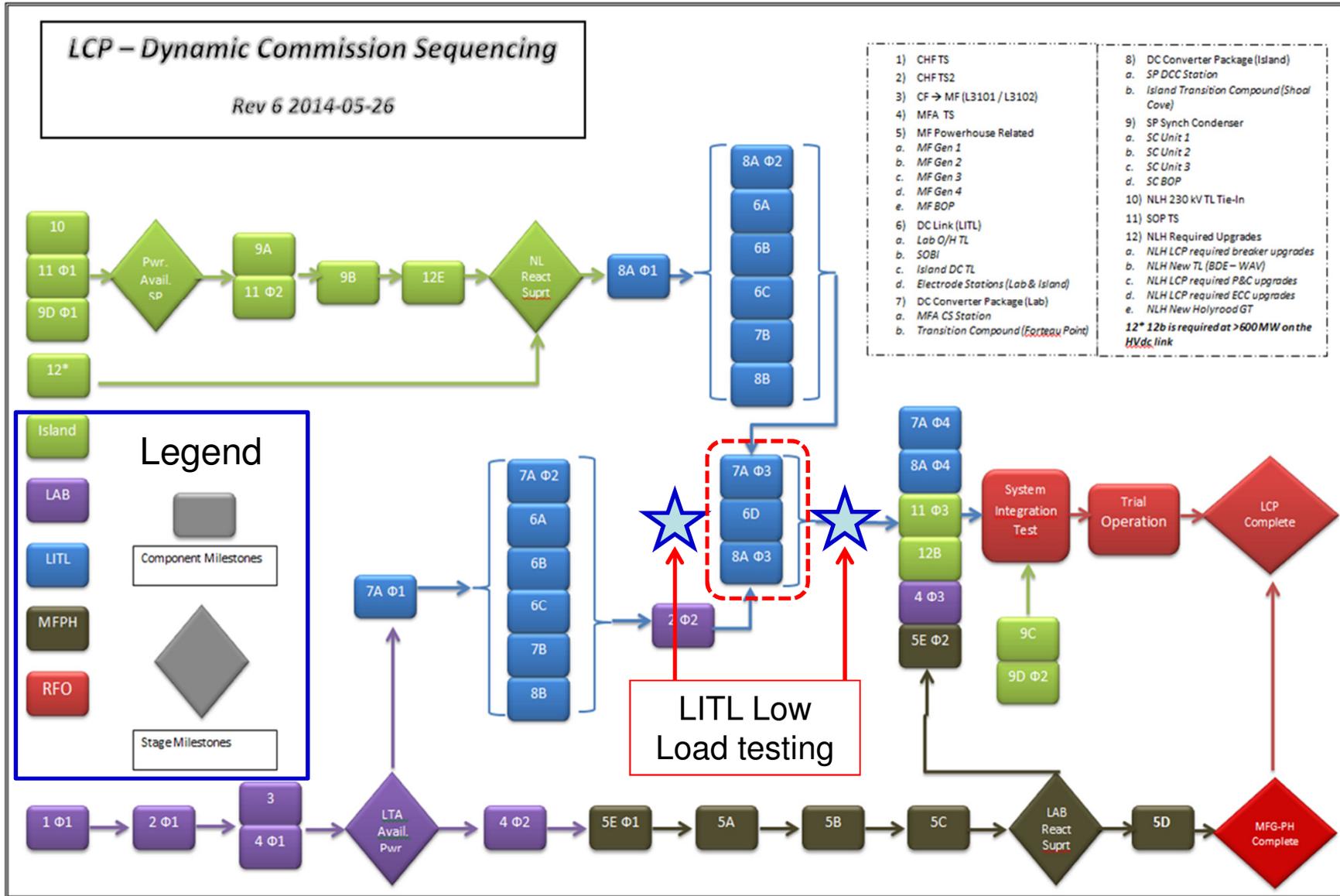


LITL Critical Path

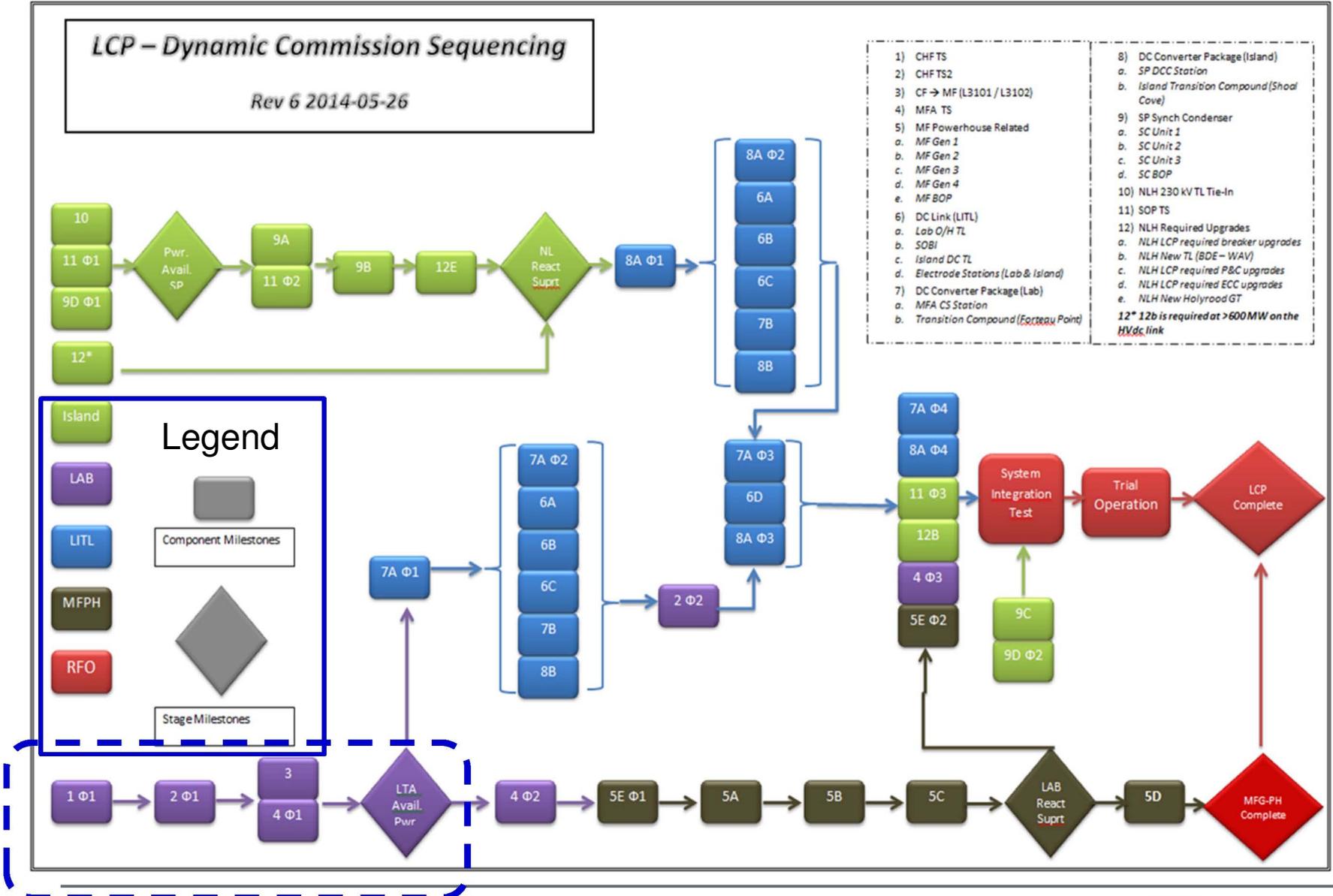
		Integrated Project Schedule 1st Power transfer Lab -> Nfld				LCP Project Controls - Stewardship Updated: 30-Dec-15															
Activity Name		Current Start	Delta - Last Month Start	Current Finish	Delta - Last Month Finish	2015				2016				2017							
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
1st Power Transfer-CP-KD																					
Target Milestones																					
Target MIL=Overall-LITL-1st Power Transfer Labrador to Newfoundland - Tracking Forecast		09-Sep-17	0d		0d	-1st Power Transfer Labrador to Newfoundland - Tracking Forecast															
1st Power Transfer-CP																					
LCP SysComp RFO																					
DynCm-3: LITL: All HVdc TL COMPLETED AND CONNECTED			0d	08-Sep-17	0d	DynCm-3: LITL: All HVdc TL COMPLETED AND CONNECTED															
DynCm-3: LITL: SOP & MF CONVERTER STANDALONE TESTING & HVdc LINK COMPLETED		09-Sep-17	0d		0d	& MF CONVERTER STANDALONE TESTING & HVdc LINK COMPLETED															
LITL (MFACS) MF Converter Station																					
LITL-MFConvert: Building Foundation/Erect/Outfit		28-Jul-15 A	0d	05-Oct-16	13d																
LITL-MFConvert: Valve Hall & Control Bldg Install Equipment		08-Jul-16	-128d	19-May-17	0d																
LITL-MFConvert: Static Commissioning		05-Oct-16	1d	24-Aug-17	0d																
LITL-MFConvert: Gantry available for HVdc Seg1 TL & Lab Electrode TL		25-Aug-17	0d	25-Aug-17	0d																
DynCm-3: LITL: 7a p2- MF Converter: HVdc LINK ENERGIZATION		09-Sep-17	0d	15-Sep-17	0d																
LITL-Lab HVdc Seg1/2																					
LITL-dcLabSeg1/Electr TL: HVdc Seg 1 & Electrode TL Connection to MF Converter (Slack Span>)		26-Aug-17	0d	08-Sep-17	0d																
LITL-dcLabSeg2/Electr TL: Connection to Lab TransCmp (Slack Span>)		26-Aug-17	0d	08-Sep-17	0d																
DynCm-3: LITL: LITL-dcLabSeg1/Electr TL: Post Installation Final Inspection & Slack Span Connection			0d	08-Sep-17	0d	Electr TL: Post Installation Final Inspection & Slack Span Connection															
DynCm-3: LITL: LITL-dcLabSeg2/Electr TL: Post Installation Final Inspection & Slack Span Connection			0d	08-Sep-17	0d	Electr TL: Post Installation Final Inspection & Slack Span Connection															
DynCm-3: LITL: 6a HVdc TL and Electrode Line Lab: Energized		09-Sep-17	0d		0d	DynCm-3: LITL: 6a HVdc TL and Electrode Line Lab: Energized															
LITL-Nfld HVdc TL Seg 3/4/5																					
DynCm-3: LITL: 6c HVdc TL and Electrode Line Nfld: Energized		09-Sep-17	0d		0d	DynCm-3: LITL: 6c HVdc TL and Electrode Line Nfld: Energized															
LITL (SOPCS) SOP Converter Station																					
DynCm-3: LITL: 8a p2 SOP Converter: HVdc LINK ENERIZATION		09-Sep-17	0d	15-Sep-17	0d																

◆ Current Key Dates — Last Month Activities
 — Current Activities
 ● Last Month Key Dates

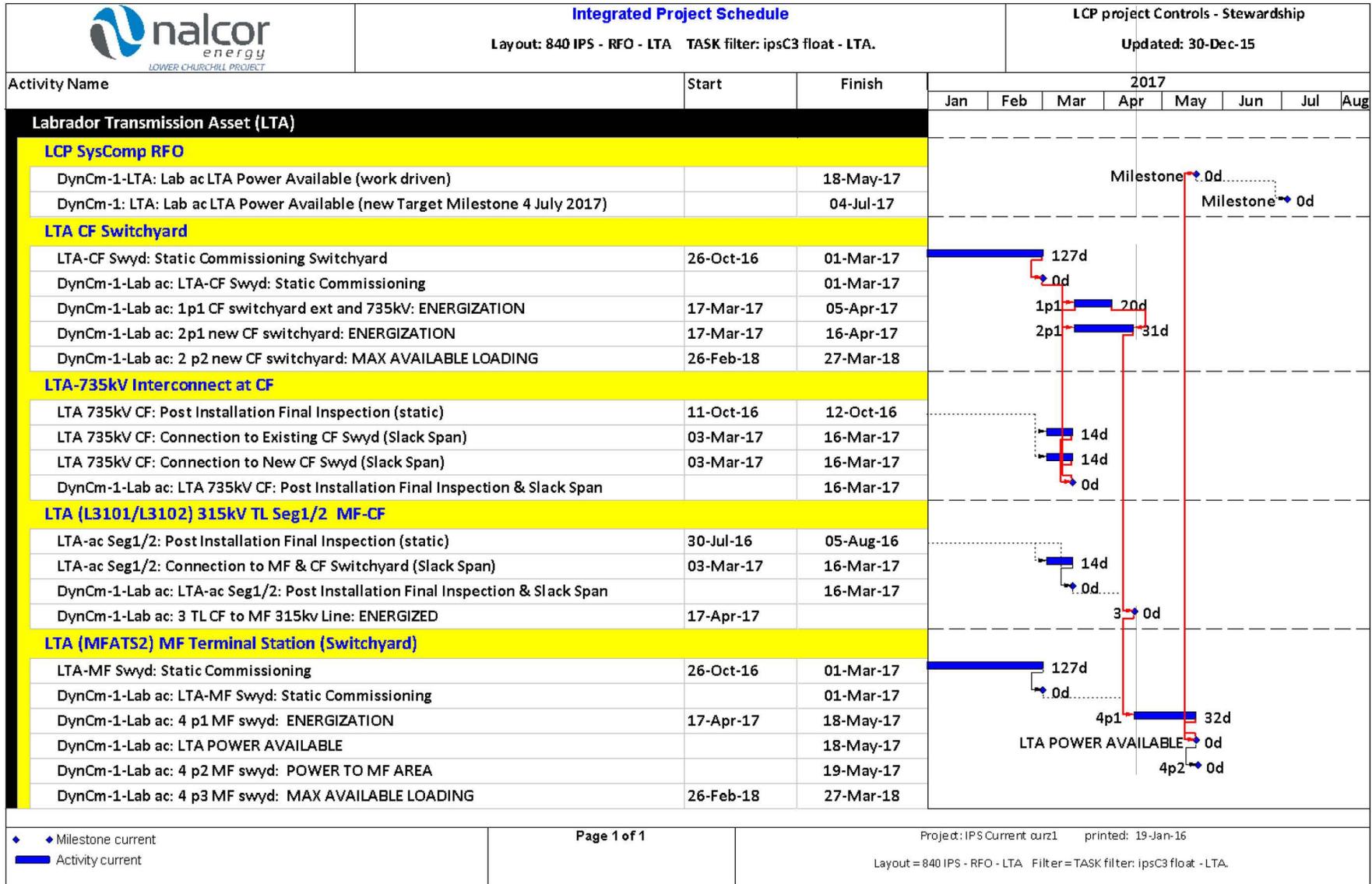
➤ Start-Up Sequence



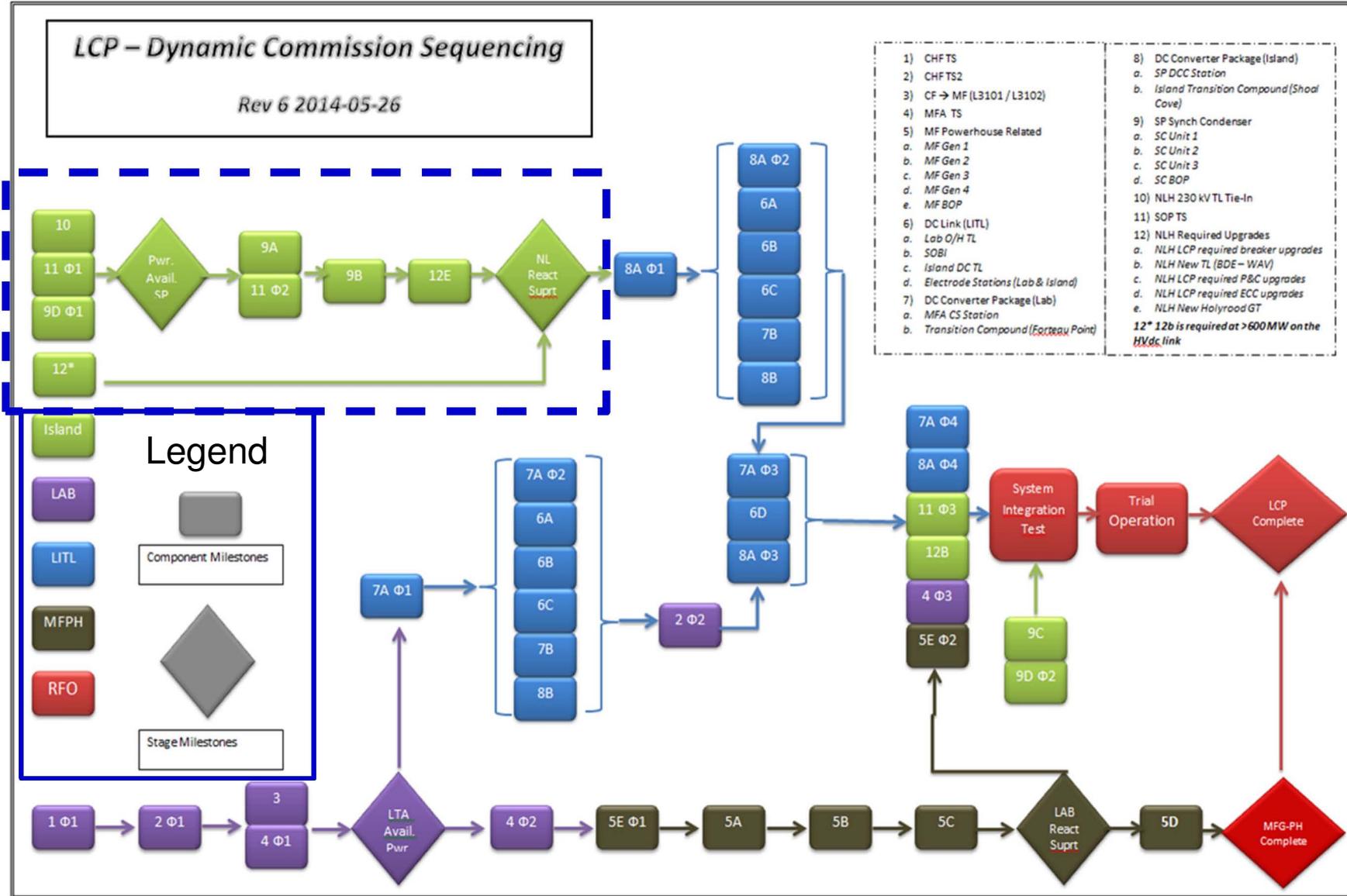
➤ Start-Up Sequence - LTA



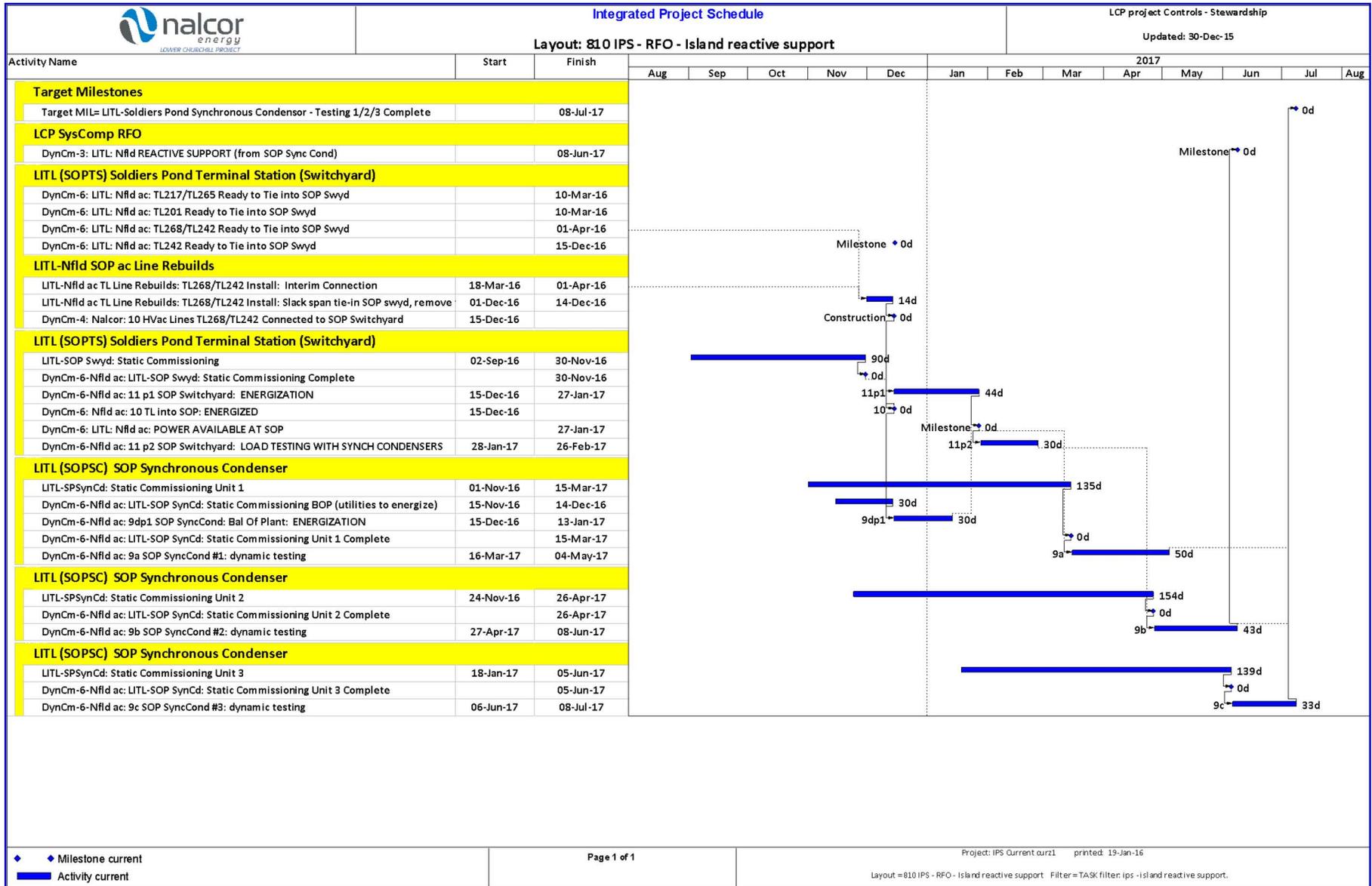
➤ Start-Up Sequence - LTA



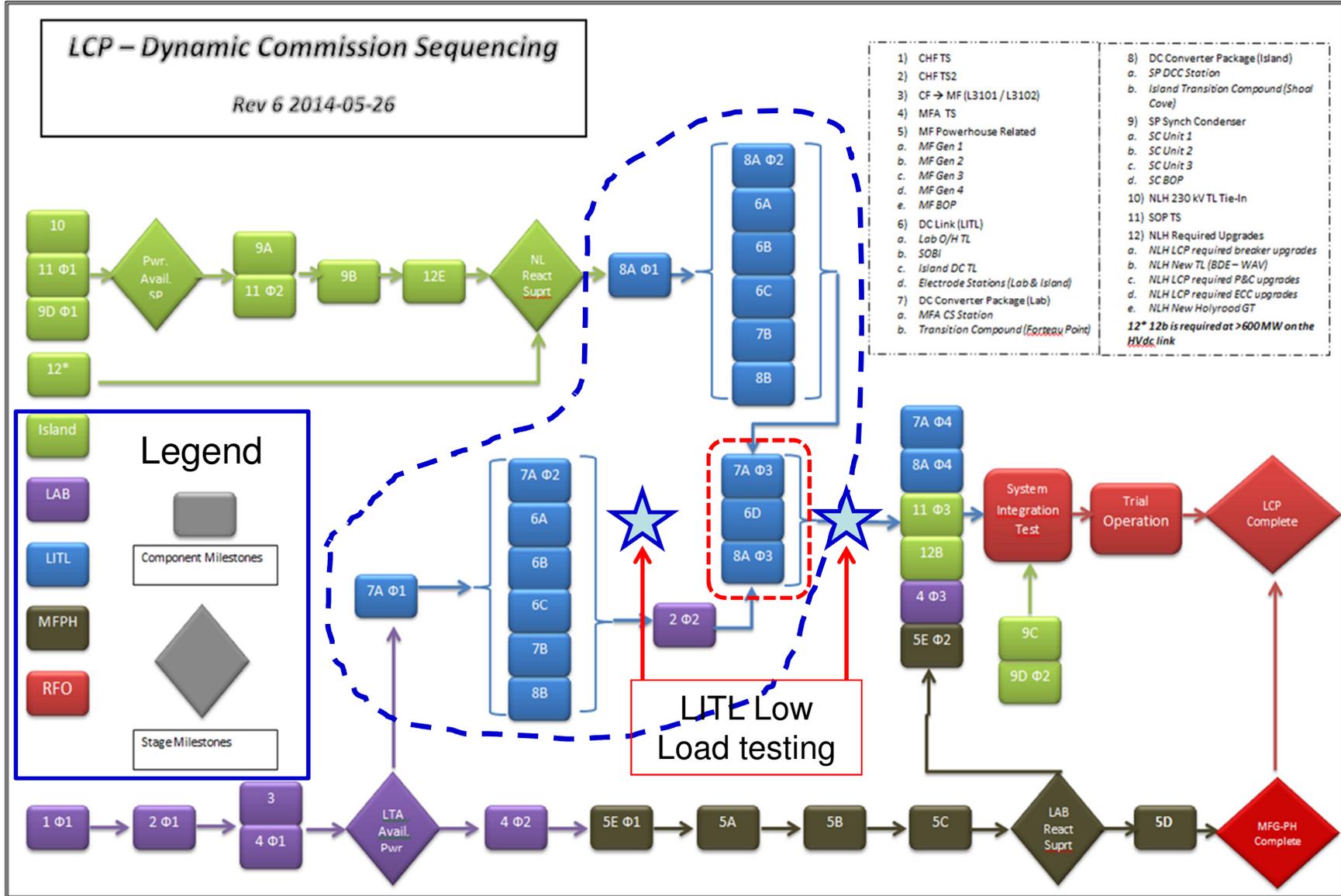
➤ Start-Up Sequence – Island Reactive Support



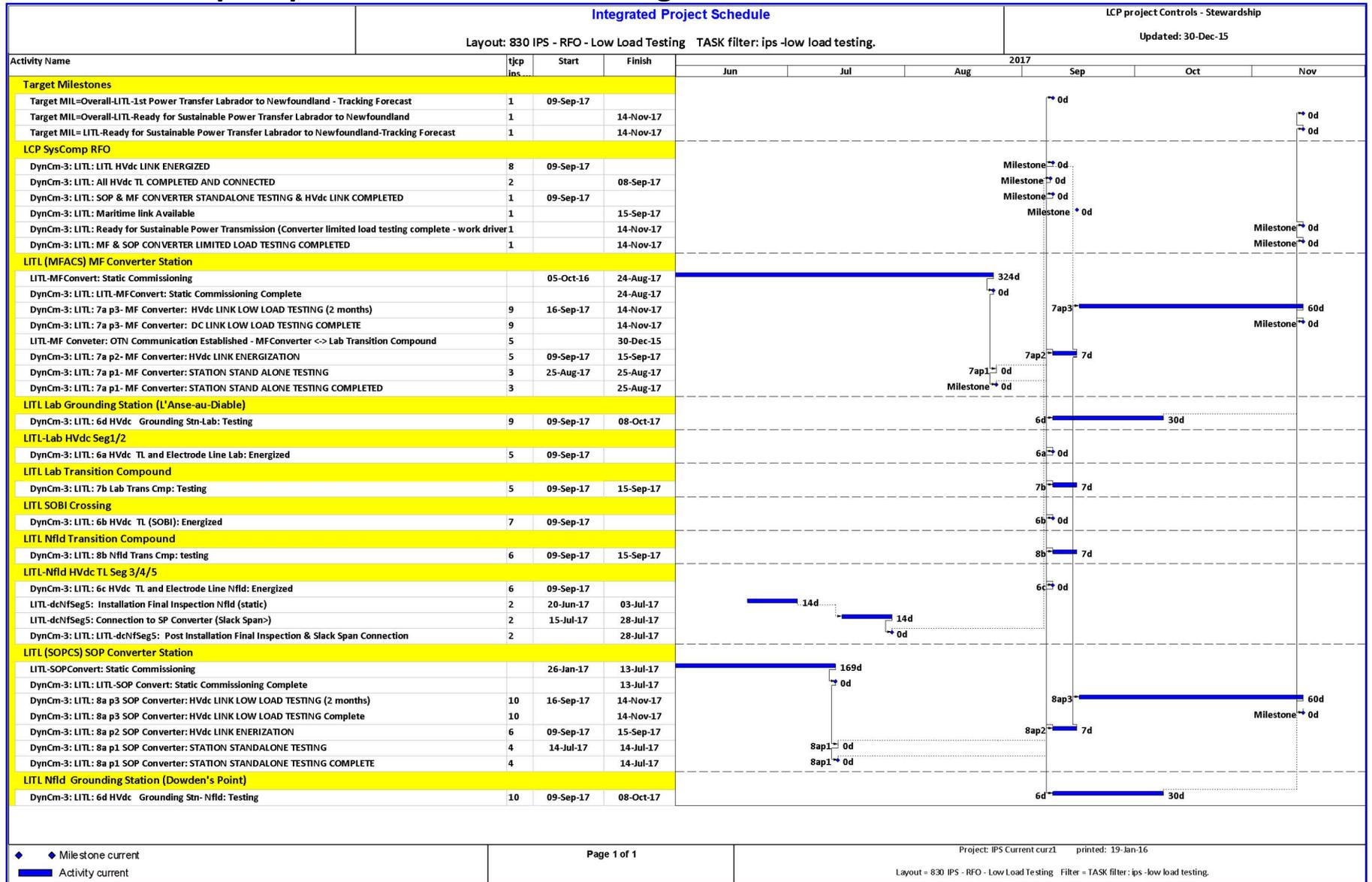
Start-Up Sequence – Island Reactive Support



➤ Start-Up Sequence – Low Load Testing



Start-Up Sequence – Low Load Testing



The end

Any questions contact

**Tom Chudy
Project Controls
PROJECT DELIVERY TEAM
Lower Churchill Project
t. 709 737-1285
TomChudy@lowerchurchillproject.ca**

ATTACHMENT A.10

LTA Cost Model Template

Cost Category	AFE	Best Case	Worst Case
ROW Clearing 315 kV Hvac Transmission Line (MF to CF)	31.6	0.0	0.0
Construction of 315 kV Hvac Transmission Line (MF to CF)	277.0	0.0	0.0
Transmission Line Material (Hvac)	85.3	0.0	0.0
Churchill Falls Switchyard	179.9	0.0	0.0
Muskrat Falls Switchyard	103.4	0.0	0.0
Telecommunications (LTA)	16.3	0.0	0.0
Owner's Project Team	146.6	0.0	0.0
General	9.2	0.0	0.0
Integrated Commissioning Support Services	10.5	0.0	0.0
Total	859.7	0.0	0.0
Contingency	17.8		
Current AFE	877.6	877.6	

Labrador Transmission Assets Cost Model

Cost Category	AFE Rev2 (C\$ MM)	Current Published Final Forecast Cost		Internal FFC Range				Risk Range				Notes	Totals		
		Value (C\$MM)	Basin	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID#	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)		Scenario Supporting Worst Cost	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
C.b - Construction of 815 kV HVac Transmission Line (MF to CF)	277.0	274.4	2.2 M shortage in 795 KV budget 2 M transferred to CS for CF camp services 4 M installing additional foundations 5 M micropiles 0.3 M Additional mud slabs with welded wire fabric for structures 7 & 8 Includes (7.1) M recruitment for the HVGB line											0.0	0.0
C.c - Supply of Foundations and Steel Towers - 815 kV HVac	32.6	32.7	0.1 M general growth											0.0	0.0
C.d - Conductor, OPGW, Insulators and Other Hardware - 815 kV HVac	30.6	30.6	0.2 M general growth											0.0	0.0
C.x - Spares	0.0	0.0	They were added in T1 procurement											0.0	0.0
Total, C\$ MM	671.4	671.6												0.0	0.0
General - LTA															
D.b - Integrated Commissioning Support Services	16.5	16.5	DG3 values											0.0	0.0
D.c - Project Vehicles	0.9	0.9	Revised budget at AFE rev2											0.0	0.0
D.d - Helicopter Services	0.6	0.6												0.0	0.0
D.e - Insurance	3.4	1.4	Revised budget at AFE rev2											0.0	0.0
D.f - Financing and Commercial	2.5	2.5	0.75 M for QWF legal											0.0	0.0
D.g - Owner's Project Team	146.6	146.7	latest budget at AFE rev2 (OK, possible saving of 10 M as per latest MFL)											0.0	0.0

Labrador Transmission Assets Cost Model

Cost Category	AFE Rev2 (C\$ MM)	Current Published Final Forecast Cost		Internal FFC Range				Risk Range				Notes	TOTAL		
		Value (C\$MM)	Basis	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID#	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)		Scenario Supporting Worst Cost	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
D.h - Land Acquisition and Permits	1.1	1.1	Existing budget											0.0	0.0
D.i - Third Party Quality Surveillance & Inspection Services	1.7	1.7	Existing budget											0.0	0.0
D.j - Freight Forwarding Services	22.1	21.9	Existing budget											0.0	0.0
D.k - Environmental	0.8	0.8	Existing budget											0.0	0.0
D.l - Aboriginal	0.2	0.2	Existing budget											0.0	0.0
Total, C\$ MM	109.3	109.7		0.0		0.0			0.0		0.0			0.0	0.0
Contingency - LTA	17.8	17.6													
Total LTA, C\$ MM	872.6	877.6		0.0		0.0			0.0		0.0			0.0	0.0

LIL Cost Model Template

Cost Category	AFE	Best Case	Worst Case
Converters - MF and Soldier's Pond	509.1	0.0	0.0
Transition Compounds	41.0	0.0	0.0
Synchronous Condensers	168.3	0.0	0.0
Soldier's Pond Switchyard	105.2	0.0	0.0
Electrode Sites	22.2	0.0	0.0
Island System Upgrades	37.8	0.0	0.0
ROW Clearing for HVdc Transmission Line	360.0	0.0	0.0
Construction of 350 kV HVdc Transmission Line	840.2	0.0	0.0
Transmission Line Material (HVdc)	261.2	0.0	0.0
SOBI Crossing	314.8	0.0	0.0
Telecommunications (LIL)	29.1	0.0	0.0
Owner's Project Team	232.7	0.0	0.0
General	68.4	0.0	0.0
Integrated Commissioning Support Services	3.5	0.0	0.0
Total	2993.5	0.0	0.0
Contingency	95.9		

Current AFE	3089.4	3089.4
--------------------	---------------	---------------

Note: Privileged and Confidential Information Prepared in Contemplation of Litigation

Labrador Island Transmission Link Cost Model

Cost Category	PFE Best (C\$ MM)	Current Published Final Forecast Cost		Internal PFC Range				Risk Range				Totals				
		Value (C\$ MM)	Base	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID#	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes	Best Cost (C\$ MM)	Worst Cost (C\$ MM)	
B.A - Converters - MI and Soldier's Pond - EPC															0.0	0.0
B.B - Cable Transition Components - EPC															0.0	0.0
B.C - Synchronous Condensers - Supply & Install															0.0	0.0
B.D - Soldier's Pond Switchyard															0.0	0.0
B.E - Electrode Sites															0.0	0.0
B.F - Island System Upgrades - Holbrook Conversion + Breakers + AC Rebuild	87.8	87.8	58.2 M construction of the AC line on the island 55 M EOC upgrades, and breakers at Bay O'Espoir												0.0	0.0
B.G - Clearing of Right of Way for HVDC Transmission Line	365.6	365.0	288 M of Clearing compared to 265 M in the real PFC The 365 M includes 30 M for Long range mountains & 54 M for blocks 17/18 62 M for Island part & compared to 85.5 M in the real PFC												0.0	0.0
B.H - Construction of 550 KV HVDC Transmission Line	840.2	840.8	2 M labor trade escalation for 1 year 3.8 M for foundation cost increase due to design changes 5 M for increase in backfill quantities 5 M for Argents NY												0.0	0.0
B.I - Material Supply - 550 KV HVDC	218.8	225.9	0.5M growth allowance for towers 7.1 M growth for hardware 0.5 M growth for pole supply 0.1 M growth for OP&W												0.0	0.0

Labrador Island Transmission Link Cost Model

Cost Category	APE Best (C\$ MM)	Current Published Final Forecast Cost		Internal PFC Range				Risk Range				Total			
		Value (C\$ MM)	Basis	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID#	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes:	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
B.1 - SDB Lendell / APE Scope	22.5	22.5												0.0	0.0
B.2 - SDB Cable Supply & Install	134.8	134.8												0.0	0.0
B.3 - SDB Insulation Protection	87.4	87.4												0.0	0.0
B.4 - Support														0.0	0.0
General - 10														0.0	0.0
D.3 - Integrated Commissioning Support Services	5.5	5.5	2022 revised											0.0	0.0
D.4 - Project Vehicles	5.0	5.0	Revised budget at APE rev2											0.0	0.0
D.5 - Helicopter Services	5.8	5.8	Revised budget at APE rev2											0.0	0.0
D.6 - Insurance	5.8	5.8	Revised budget at APE rev2											0.0	0.0
D.7 - Training and Commercial	5.8	5.8	Revised budget at APE rev2											0.0	0.0
D.8 - Owner's Project Team	332.7	232.8	Revised budget at APE rev2 (short by more than 60 M compared to actual MF2)											0.0	0.0
D.9 - Land Acquisition and Permits	28.8	28.8	Revised budget at APE rev2											0.0	0.0
D.1 - Third Party Quality Surveillance & Inspection Services	4.8	4.8	Revised budget at APE rev2											0.0	0.0
D.2 - Freight Forwarding Services	40.8	40.8	Revised budget at APE rev2											0.0	0.0
D.3 - Environmental	14.8	14.8	Revised budget at APE rev2											0.0	0.0
D.7 - Aboriginal	3.7	3.7	Revised budget at APE rev2											0.0	0.0
Contingency - 10														0.0	0.0
Total (C\$ MM)	547.0	547.0		0.0		0.0			0.0		0.0			0.0	0.0

LTA LITL Integrated Project Schedule - Time Model Template										
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule										
Project Schedule Critical Activities and Logs as Represented by Time Risk Model					Notes	Relevant Risks Significantly Influencing Outcome	Risk Adjusted Scenario			
ID	Task Description	Duration	Start	Finish			Best	Supporting Scenario	Worst	Supporting Scenario
01	IPS Sub Proj: LCP General	180 d	17-May-2017	13-Nov-2017						
02	IPS Sub B Site: Target Milestones	180 d	17-May-2017	13-Nov-2017						
03	LTA Ready for Power Transmission (Power Available) - Tracking Forecast	0 d	17-May-2017	17-May-2017						
04	Overall- Int Power Transfer Labrador to Newfoundland - Tracking Forecast	0 d	08-Sep-2017	08-Sep-2017						
05	Ready for Sustainable Power Transfer Labrador to Newfoundland-Tracking Forecast	0 d	13-Nov-2017	13-Nov-2017						
06	IPS Sub Proj: LTL	483 d	01-Jan-2016	13-Nov-2017						
07	IPS Sub B Site: LCP Systems Completion-RFD	0 d	07-Sep-2017	08-Sep-2017						
08	AE HV/LV COMPLETED AND CONNECTED	0 d	07-Sep-2017	07-Sep-2017						
09	LTL HV/LV LINK ENERGIZED	0 d	08-Sep-2017	08-Sep-2017						
10	IPS Sub B Site: LTL Labrador Grounding Station	221 d	01-Mar-2017	07-Oct-2017						
11	LTL Labrador Grounding Station: Construction/Start Commissioning	107 d	01-Mar-2017	15-Jun-2017						
12	LTL Labrador Grounding Station: Testing	30 d	08-Sep-2017	07-Oct-2017						
13	IPS Sub B Site: LTL Labrador Transition Compound	582 d	01-Apr-2016	14-Sep-2017						
14	LTL Labrador Transition Compound: Construction/Start Commissioning	168 d	01-Apr-2016	07-Apr-2017						
15	LTL Labrador Transition Compound: Testing	7 d	08-Sep-2017	14-Sep-2017						
16	IPS Sub B Site: LTL Muskrat Falls Converter	681 d	01-Jan-2016	13-Nov-2017						
17	LTL Muskrat Falls Converter: Construction/Start Commissioning	602 d	01-Jan-2016	24-Aug-2017						
18	LTL Muskrat Falls Converter: STATION STAND ALONE TESTING and EMERGIZATION	31 d	25-Aug-2017	14-Sep-2017						
19	LTL Muskrat Falls Converter: HV/LV LINK LOW LOAD TESTING (2 months)	60 d	15-Sep-2017	13-Nov-2017						
20	IPS Sub B Site: LTL Island Grounding Station	221 d	01-Mar-2017	07-Oct-2017						
21	LTL Island Grounding Station: Construction/Start Commissioning	107 d	01-Mar-2017	15-Jun-2017						
22	LTL Island Grounding Station: Testing	30 d	08-Sep-2017	07-Oct-2017						
23	IPS Sub B Site: LTL Island Transition Compound	582 d	01-Apr-2016	14-Sep-2017						
24	LTL Island Transition Compound: Construction/Commissioning	168 d	01-Apr-2016	07-Apr-2017						
25	LTL Island Transition Compound: Testing	7 d	08-Sep-2017	14-Sep-2017						
26	IPS Sub B Site: LTL SOB Crossing	119 d	15-Jun-2016	11-Oct-2016						
27	LTL SOB: Subsea Cable 1/3/3 Installation & Hook Placement & Testing	219 d	15-Jun-2016	13-Oct-2016						
28	IPS Sub B Site: LTL Soldier's Pond Converter	681 d	01-Jan-2016	13-Nov-2017						
29	LTL Soldier's Pond Converter: Construction/Start Commissioning	580 d	01-Jan-2016	02-Aug-2017						
30	LTL Soldier's Pond Converter: STATION STANDALONE TESTING	14 d	08-Aug-2017	18-Aug-2017						
31	LTL Soldier's Pond Converter: HV/LV LINK LOW LOAD TESTING (2 months)	67 d	08-Sep-2017	13-Nov-2017						
32	IPS Sub B Site: LTL Soldier's Pond Switchyard	681 d	01-Jan-2016	13-Nov-2017						
33	LTL Soldier's Pond Switchyard: Construction/Start Commissioning	193 d	01-Jan-2016	30-Nov-2016						
34	LTL Soldier's Pond Switchyard: ENERGIZATION	44 d	19-Dec-2016	27-Jan-2017						
35	LTL Soldier's Pond Switchyard: as POWER AVAILABLE AT SOP - from SF Power	0 d	27-Jan-2017	27-Jan-2017						
36	IPS Sub B Site: LTL SOP Synchronous Condenser	129 d	05-Jan-2016	08-Jun-2017						

ATTACHMENT A.11

**Transmittal #1 to Westney: High-level Schedule for LTA/LIL**

Jason Kean to: Meade, Aidan

01/13/2016 10:16 AM

Client - Solicitor Privileged and Confidential Information Prepared in Contemplation of Litigation

Aiden,

Please forward the attached email to Keith Dodson at Westney .

Tks,

Keith,

Below is a summary level extract from our LTA and LIL Transmission System Schedule . We are presently preparing a time model in MS Project which should be available later today .

Regards,

Jason

Jason R. Kean, P.Eng., MBA, PMP
Deputy General Project Manager (Consultant to LCMC)
PROJECT DELIVERY TEAM
Lower Churchill Project
t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787
e. jasonkean@lowerchurchillproject.ca
w. muskratfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

----- Forwarded by Jason Kean/NLHydro on 01/13/2016 10:11 AM -----

From: Tom Chudy/NLHydro
To: Jason Kean/NLHydro@NLHydro
Cc: Anthony Embury/NLHydro@NLHYDRO, Tony Scott/NLHydro@NLHYDRO
Date: 01/08/2016 09:01 AM
Subject: Schedule Risk Model LITL Low level test - Ready to send

Jason

Ready to send:

1) by site



risk lta litl - by site.pdf

2) by Critical / subcritical paths



risk lta litl - crit sub crit.pdf

3) data file



Risk LTA LITL LowLevel Test - 08 jan 2015.xls

regards

tom

Tom Chudy

Project Controls

PROJECT DELIVERY TEAM

Lower Churchill Project

t. 709 737-1285

e. TomChudy@lowerchurchillproject.ca

w. muskratfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

Jason Kean	Thanks Tom. Let's you and I get together and review t...	01/07/2016 01:21:05 PM
From:	Jason Kean/NLHydro	
To:	Tom Chudy/NLHydro@NLHYDRO	
Cc:	Anthony Embury/NLHydro@NLHYDRO, Tony Scott/NLHydro@NLHYDRO	
Date:	01/07/2016 01:21 PM	
Subject:	Re: Schedule Risk Model for target Milestone: "ready for sustainable power transfer Lab to Nfld" - Completed	

Thanks Tom. Let's you and I get together and review the copy you left in my office so that I may appreciate the intricacies.

JK

Jason R. Kean, P.Eng., MBA, PMP

Deputy General Project Manager (Consultant to LCMC)

PROJECT DELIVERY TEAM

Lower Churchill Project

t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787

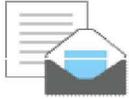
e. jasonkean@lowerchurchillproject.ca

w. muskratfalls.nalcoreenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

Tom Chudy	Jason Here is risk schedule as requested. Who sends t...	01/07/2016 08:53:55 AM
Jason Kean	Tom, Your answers:	01/05/2016 05:30:52 PM
Tom Chudy	Jason I can quickly make this schedule risk model if I g...	01/05/2016 02:24:31 PM

ATTACHMENT A.12



Transmittal #6 to Westney: Time Model for LTA + LIL

Jason Kean to: Meade, Aidan

01/14/2016 04:54 PM

Client - Solicitor Privileged and Confidential Information Prepared in Contemplation of Litigation

Transmittal #6 to Westney: Time Model for LTA + LIL

Aiden,

Please forward the attached email to Keith Dodson at Westney .

Tks,

Keith,

Attached is the preliminary time model for each of LTA and LIL . It reflects a simplistic view of our Integrated Project Schedule .

Regards,

Jason



20160114 LTA LITL Integration Summary.mpp



20160114 LTA LITL Integration Summary Network Diagram.pdf



20160114 LTA LITL Integration Summary.pdf

Jason R. Kean, P.Eng., MBA, PMP

Deputy General Project Manager (Consultant to LCMC)

PROJECT DELIVERY TEAM

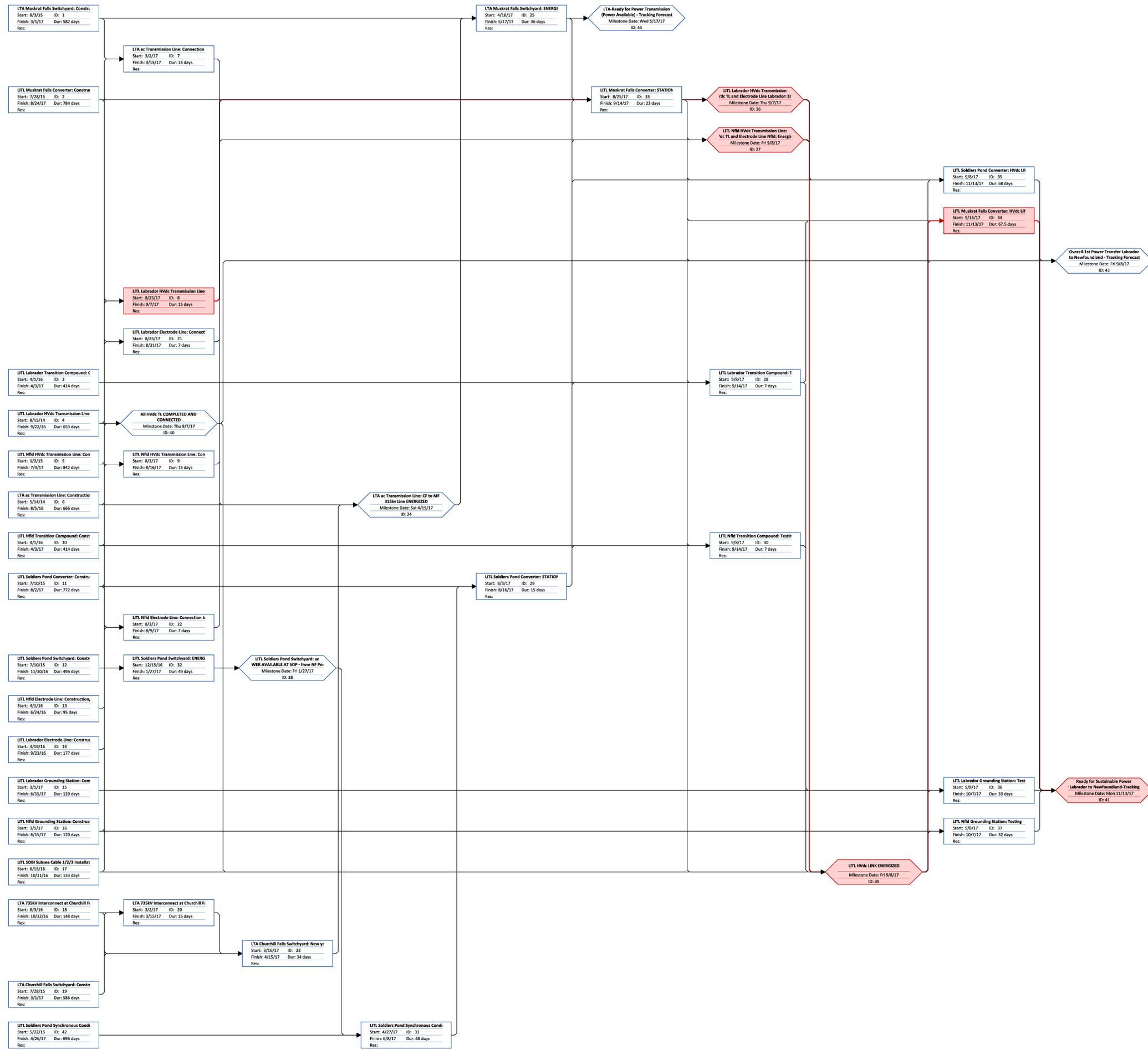
Lower Churchill Project

t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787

e. jasonkean@lowerchurchillproject.ca

w. muskratfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?



LTA + LITL IPS Summary
(Source Data 08-Jan-2016)

ID	Task Name	Start	Finish	2nd Half						1st Half					
				Qtr 4, 2014			Qtr 3, 2015			Qtr 2, 2016		Qtr 1, 2017		Qtr 4, 2017	
				May	Sep	Jan	May	Sep	Jan	May	Sep	Jan	May	Sep	Jan
IPS Sub Proj: LCP General															
IPS Sub B Site: Target Milestones															
44	LTA-Ready for Power Transmission (Power Available) - Tracking Forecast	Wed 5/17/17	Wed 5/17/17	◆ 5/17											
43	Overall-1st Power Transfer Labrador to Newfoundland - Tracking Forecast	Fri 9/8/17	Fri 9/8/17	◆ 9/8											
41	Ready for Sustainable Power Transfer Labrador to Newfoundland-Tracking Forecast	Mon 11/13/17	Mon 11/13/17	◆ 11/13											
IPS Sub Proj: LITL															
IPS Sub B Site: LCP SysComp RFO															
40	All HVdc TL COMPLETED AND CONNECTED	Thu 9/7/17	Thu 9/7/17	◆ 9/7											
39	LITL HVdc LINK ENERGIZED	Fri 9/8/17	Fri 9/8/17	◆ 9/8											
IPS Sub B Site: LITL Lab Grounding															
15	LITL Labrador Grounding Station: Construction/Static Commissioning	Wed 3/1/17	Thu 6/15/17	[Task Bar]											
36	LITL Labrador Grounding Station: Testing	Fri 9/8/17	Sat 10/7/17	[Task Bar]											
IPS Sub B Site: LITL Lab TransComp															
3	LITL Labrador Transition Compound: Construction/Static Commissioning	Fri 4/1/16	Mon 4/3/17	[Task Bar]											
28	LITL Labrador Transition Compound: Testing	Fri 9/8/17	Thu 9/14/17	[Task Bar]											
IPS Sub B Site: LITL MF convert															
2	LITL Muskrat Falls Converter: Construction/Static Commissioning	Tue 7/28/15	Thu 8/24/17	[Task Bar]											
33	LITL Muskrat Falls Converter: STATION STAND ALONE TESTING and ENERGIZATION	Fri 8/25/17	Thu 9/14/17	[Task Bar]											
34	LITL Muskrat Falls Converter: HVdc LINK LOW LOAD TESTING (2 months)	Fri 9/15/17	Mon 11/13/17	[Task Bar]											
IPS Sub B Site: LITL Nfld Grounding															
16	LITL Nfld Grounding Station: Construction/Static Commissioning	Wed 3/1/17	Thu 6/15/17	[Task Bar]											
37	LITL Nfld Grounding Station: Testing	Fri 9/8/17	Sat 10/7/17	[Task Bar]											
IPS Sub B Site: LITL Nfld TransComp															
10	LITL Nfld Transition Compound: Construction/Commissioning	Fri 4/1/16	Mon 4/3/17	[Task Bar]											
30	LITL Nfld Transition Compound: Testing	Fri 9/8/17	Thu 9/14/17	[Task Bar]											
IPS Sub B Site: LITL SOBI Crossing															
17	LITL SOBI Subsea Cable 1/2/3 Installation & Rock Placement & Testing	Wed 6/15/16	Tue 10/11/16	[Task Bar]											
IPS Sub B Site: LITL SOP convert															
11	LITL Soldiers Pond Converter: Construction/Static Commissioning	Fri 7/10/15	Wed 8/2/17	[Task Bar]											
29	LITL Soldiers Pond Converter: STATION STANDALONE TESTING	Thu 8/3/17	Wed 8/16/17	[Task Bar]											
35	LITL Soldiers Pond Converter: HVdc LINK LOW LOAD TESTING (2 months)	Fri 9/8/17	Mon 11/13/17	[Task Bar]											
IPS Sub B Site: LITL SOP Swyd															
12	LITL Soldiers Pond Switchyard: Construction/Static Commissioning	Fri 7/10/15	Wed 11/30/16	[Task Bar]											
32	LITL Soldiers Pond Switchyard: ENERGIZATION	Thu 12/15/16	Fri 1/27/17	[Task Bar]											
38	LITL Soldiers Pond Switchyard: ac POWER AVAILABLE AT SOP - from NF Power	Fri 1/27/17	Fri 1/27/17	◆ 1/27											
IPS Sub B Site: LITL SOP SynchCon															

Project: 20160114 LTA LITL Integr
Date: Thu 1/14/16

Task [Bar] Milestone ◆

LTA + LITL IPS Summary
(Source Data 08-Jan-2016)

ID	Task Name	Start	Finish	Timeline											
				2nd Half 14			1st Half			2nd Half			1st Half		
				May	Sep	Jan	May	Sep	Jan	May	Sep	Jan	May	Sep	Jan
42	LITL Soldiers Pond Synchronous Condensers: Construction/Static Commissioning Unit 1 & 2	Fri 5/22/15	Wed 4/26/17												
31	LITL Soldiers Pond Synchronous Condensers: Dynamic Testing Units 1 & 2 (remaining)	Thu 4/27/17	Thu 6/8/17												
IPS Sub B Site: LITL-Lab dc TL															
4	LITL Labrador HVdc Transmission Line: HVdc TL Construction/Final Inspection	Fri 8/15/14	Thu 9/22/16												
8	LITL Labrador HVdc Transmission Line: HVdc TL Connection to MF Converter & Transition Compound (Slack Span)	Fri 8/25/17	Thu 9/7/17												
26	LITL Labrador HVdc Transmission Line: HVdc TL and Electrode Line Labrador: Energized	Thu 9/7/17	Thu 9/7/17												
IPS Sub B Site: LITL-Lab Electr Line															
14	LITL Labrador Electrode Line: Construction/Inspection	Tue 4/19/16	Fri 9/23/16												
21	LITL Labrador Electrode Line: Connection to MF Converter & Grounding Station (Slack Span)	Fri 8/25/17	Thu 8/31/17												
IPS Sub B Site: LITL-Nfld dc TL															
5	LITL Nfld HVdc Transmission Line: Construction/Inspection	Fri 1/2/15	Mon 7/3/17												
9	LITL Nfld HVdc Transmission Line: Connection to Nfld Transition Compound & Soldiers Pond Converter (Slack Span)	Thu 8/3/17	Wed 8/16/17												
27	LITL Nfld HVdc Transmission Line: HVdc TL and Electrode Line Nfld: Energized	Fri 9/8/17	Fri 9/8/17												
IPS Sub B Site: LITL-NfldElectr Line															
13	LITL Nfld Electrode Line: Construction/Inspection (static)	Fri 4/1/16	Fri 6/24/16												
22	LITL Nfld Electrode Line: Connection to Grounding Site (slack span)	Thu 8/3/17	Wed 8/9/17												
IPS Sub Proj: LTA															
IPS Sub B Site: LTA CF Swyd															
19	LTA Churchill Falls Switchyard: Construction/Commissioning Switchyard (new yard & extension to existing)	Tue 7/28/15	Wed 3/1/17												
23	LTA Churchill Falls Switchyard: New yard + CF extension + 735kV: ENERGIZATION	Thu 3/16/17	Sat 4/15/17												
IPS Sub B Site: LTA MF Swyd															
1	LTA Muskrat Falls Switchyard: Construction/Static Commissioning	Mon 8/3/15	Wed 3/1/17												
25	LTA Muskrat Falls Switchyard: ENERGIZATION	Sun 4/16/17	Wed 5/17/17												
IPS Sub B Site: LTA-735 Int															
18	LTA 735kV Interconnect at Churchill Falls: Construction/Final Inspection	Fri 6/3/16	Wed 10/12/16												
20	LTA 735kV Interconnect at Churchill Falls: Connection to New and Existing CF Swyd (Slack S	Thu 3/2/17	Wed 3/15/17												
IPS Sub B Site: LTA-AC Seg1/2 MF-CF															
6	LTA ac Transmission Line: Construction/Final Inspection	Wed 5/14/14	Fri 8/5/16												
7	LTA ac Transmission Line: Connection to MF & CF Switchyard (Slack Span)	Thu 3/2/17	Wed 3/15/17												
24	LTA ac Transmission Line: CF to MF 315kv Line ENERGIZED	Sat 4/15/17	Sat 4/15/17												

Project: 20160114 LTA LITL Integrr
Date: Thu 1/14/16

Task Milestone

ATTACHMENT A.13

27-Jan-2016



LTA LITL Time-Risk Model

Jack Evans

to:

JasonKean@lowerchurchillproject.ca

01/27/2016 04:02 PM

Cc:

Justin Dahl, Pete Oppenheim, Keith Dodson

Hide Details

From: Jack Evans <j_evans@westney.com>

To: "JasonKean@lowerchurchillproject.ca" <JasonKean@lowerchurchillproject.ca>

Cc: Justin Dahl <j_dahl@westney.com>, Pete Oppenheim <p_oppenheim@westney.com>, Keith

Dodson <k_dodson@westney.com>

1 Attachment



LCP LTA LITL Base Case_v2 23Jan2016.mpp

Jason,

Attached is the Microsoft Project file for the LTA LITL Time-Risk model.

Regards,

Jack

From: Keith Dodson

Sent: Wednesday, January 27, 2016 1:21 PM

To: JasonKean@lowerchurchillproject.ca

Cc: Justin Dahl; Jack Evans; Pete Oppenheim

Subject: Re: LTA/LIL

Jack

Please send Jason the MSPProject version of this network.

Thanks

Keith

On Jan 27, 2016, at 12:59 PM, Pete Oppenheim <p_oppenheim@westney.com> wrote:

Jason,

Per your request, we have inserted your model into our format and it is attached . Westney has not analyzed this model and offer no opinion at this time.

Pete

<LCP LTA LITL Base Case_v2 23Jan2016.pdf>

Keith Dodson

Westney Consulting Group, Inc.

Office 713-861-0800

Cell 713-825-2730

LTA and LITL Integrated Project Schedule



Time Risk Model



Printed: 1/23/16

Task		Milestone		Roll Up Critical Task		Split		Group By Summary	
Critical Task		Summary		Roll Up Milestone		External Tasks		Deadline	
Progress		Roll Up Task		Roll Up Progress		Project Summary			

LTA and LITL Integrated Project Schedule



Time Risk Model

ID	Name	Duration	Start	Finish	Predecessors	Successors	2017												2018			
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
0	LTA and LITL IPS - Base Case	683 d	1/1/16	11/13/17																		
1	IPS Sub Proj: LCP General	180 d	5/17/17	11/13/17																		
2	IPS Sub B Site: Target Milestones	180 d	5/17/17	11/13/17																		
3	LTA-Ready for Power Transmission (Power Available) - Tracking Forecast	0 d	5/17/17	5/17/17	5BFF																	
4	Overall-1st Power Transfer Labrador to Newfoundland - Tracking Forecast	0 d	9/8/17	9/8/17	8,9,16SS+14 d,31SS																	
5	Ready for Sustainable Power Transfer Labrador to Newfoundland-Tracking Forecast	0 d	11/13/17	11/13/17	12,19,22,31																	
6	IPS Sub Proj: LITL	683 d	1/1/16	11/13/17																		
7	IPS Sub B Site: LCP SysComp RFO	0 d	9/7/17	9/7/17																		
8	All HVdc TL COMPLETED AND CONNECTED	0 d	9/7/17	9/7/17	27,40,44,47,51	9,4																
9	LITL HVdc LINK ENERGIZED	0 d	9/8/17	9/8/17	8,16SS+14 d,25SS,27,42,49	12,31,4,19,22																
10	IPS Sub B Site: LITL Lab Grounding	221 d	3/1/17	10/7/17																		
11	LITL Labrador Grounding Station: Construction/Static Commissioning	107 d	3/1/17	6/15/17		12																
12	LITL Labrador Grounding Station: Testing	30 d	9/8/17	10/7/17	9,11,15SS	5																
13	IPS Sub B Site: LITL Lab TransComp	532 d	4/1/16	9/14/17																		
14	LITL Labrador Transition Compound: Construction/Static Commissioning	368 d	4/1/16	4/3/17		15																
15	LITL Labrador Transition Compound: Testing	7 d	9/8/17	9/14/17	14,16SS+14 d,90	12SS,19																
16	IPS Sub B Site: LITL MF convert	683 d	1/1/16	11/13/17																		
17	LITL Muskrat Falls Converter: Construction/Static Commissioning	602 d	1/1/16	8/24/17		18,41,45																
18	LITL Muskrat Falls Converter: STATION STAND ALONE TESTING and ENERGIZATION	21 d	8/25/17	9/14/17	17,30,59	25SS+14 d,48SS+14 d,48SS+14 d,15SS+14 d,9SS+14 d,16,31FS-34%,42SS+14 d																
19	LITL Muskrat Falls Converter: HVdc LINK LOW LOAD TESTING (2 months)	60 d	9/15/17	11/13/17	9,15,18	5																
20	IPS Sub B Site: LITL Nfld Grounding	221 d	3/1/17	10/7/17																		
21	LITL Nfld Grounding Station: Construction/Static Commissioning	107 d	3/1/17	6/15/17		52,22																
22	LITL Nfld Grounding Station: Testing	30 d	9/8/17	10/7/17	9,21	5																
23	IPS Sub B Site: LITL Nfld TransComp	532 d	4/1/16	9/14/17																		
24	LITL Nfld Transition Compound: Construction/Commissioning	368 d	4/1/16	4/3/17		48,25																
25	LITL Nfld Transition Compound: Testing	7 d	9/8/17	9/14/17	18SS+14 d,24,30	96S																

Printed: 1/23/16

Task		Milestone		Roll Up Critical Task		Split		Group By Summary	
Critical Task		Summary		Roll Up Milestone		External Tasks		Deadline	
Progress		Roll Up Task		Roll Up Progress		Project Summary			

LTA LITL Integrated Project Schedule - Time Model Template										
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule										
Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Notes	Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish		Baseline Risk Significantly Influencing Outcome	Incremental Change in Duration (Days)			
							Best	Supporting Scenario	Worst	Supporting Scenario
37	LTL Soldiers Pond Synchronous Condensers: Construction/Static Commissioning Unit 1 & 2	482 d	01-Jan-2016	26-Apr-2017						
38	LTL Soldiers Pond Synchronous Condensers: Dynamic Testing Units 1 & 2 (preloading)	43 d	27-Apr-2017	08-Jun-2017						
39	IPS Sub B Site: LTL Labrador 250kV HVdc TL	424 d	01-Jan-2016	07-Sep-2017						
40	LTL Labrador HVdc Transmission Line: HVdc TL Construction/Final Inspection	206 d	01-Jan-2016	22-Sep-2016						
41	LTL Labrador 250kV HVdc TL: HVdc TL Connection to MF Converter & Transit, Compound (Dark Span)	14 d	25-Aug-2017	07-Sep-2017						
42	LTL Labrador 250kV HVdc TL: HVdc TL and Electrode Line Labrador: Energized	9 d	07-Sep-2017	07-Sep-2017						
43	IPS Sub B Site: LTL Labrador Electrode Line	506 d	29-Apr-2016	02-Aug-2017						
44	LTL Labrador Electrode Line: Construction/Inspection	158 d	29-Apr-2016	23-Sep-2016						
45	LTL Labrador Electrode Line: Connection to MF Converter & Grounding Station (Dark Span)	7 d	25-Aug-2017	01-Aug-2017						
46	IPS Sub B Site: LTL Island 250kV HVdc TL	436 d	01-Jan-2016	07-Sep-2017						
47	LTL Island 250kV HVdc Transmission Line: Construction/Inspection	100 d	01-Jan-2016	01-Jul-2017						
48	LTL Island 250kV HVdc TL: Connection to NML Transit, Compound & Soldiers Pond Converter (Dark Span)	14 d	03-Aug-2017	16-Aug-2017						
49	LTL Island 250kV HVdc Transmission Line: HVdc TL and Electrode Line NML: Energized	9 d	07-Sep-2017	07-Sep-2017						
50	IPS Sub B Site: LTL Island Electrode Line	496 d	01-Apr-2016	09-Aug-2017						
51	LTL Island Electrode Line: Construction/Inspection (Main)	83 d	01-Apr-2016	14-Jun-2016						
52	LTL Island Electrode Line: Connection to Grounding Site (Dark Span)	7 d	01-Aug-2017	08-Aug-2017						
53	IPS Sub Proj: LTA	509 d	01-Jan-2016	17-May-2017						
54	IPS Sub B Site: LTA Churchill Falls Switchyard	471 d	01-Jan-2016	15-Apr-2017						
55	LTA Churchill Falls Switchyard: Construction/Commissioning Switchyard (new yard & extension to existing)	476 d	01-Jan-2016	01-Mar-2017						
56	LTA Churchill Falls Switchyard: New yard + CF Extension + 750kV ENERGIZATION	31 d	16-Mar-2017	15-Apr-2017						
57	IPS Sub B Site: LTA MF Switchyard	509 d	01-Jan-2016	17-May-2017						
58	LTA Muskrat Falls Switchyard: Construction/Static Commissioning	436 d	01-Jan-2016	01-Mar-2017						
59	LTA Muskrat Falls Switchyard: ENERGIZATION	32 d	16-Apr-2017	17-May-2017						
60	IPS Sub B Site: LTA 750kV HVdc Interline	286 d	08-Jan-2016	15-Mar-2017						
61	LTA 750kV HVdc Interconnect at Churchill Falls: Construction/Final Inspection	182 d	08-Jan-2016	12-Oct-2016						
62	LTA 750kV HVdc Interconnect at Churchill Falls: Connection to New and Existing CF Bay (Dark Span)	14 d	02-Mar-2017	16-Mar-2017						
63	IPS Sub B Site: LTA 215kV HVdc Line 1 & 2 Muskrat Falls to Churchill Falls	471 d	01-Jan-2016	15-Apr-2017						
64	LTA 215kV HVdc Transmission Line: Construction/Final Inspection	218 d	01-Jan-2016	05-Aug-2016						
65	LTA 215kV HVdc Transmission Line: Connection to MF & CF Switchyard (Dark Span)	14 d	02-Mar-2017	15-Mar-2017						
66	LTA 215kV HVdc Transmission Line: CF to MF 215kV Line ENERGIZED	9 d	15-Apr-2017	15-Apr-2017						
	Last Line									

LTA LTL IPS Time Model Template.xlsx

ATTACHMENT A.14

**Inputs into LTA - LITL Time Model****Jason Kean** to: Jack Evans

Cc: "Meade, Aidan"

02/02/2016 04:05 PM

Privileged and Confidential Information Prepared in Contemplation of Litigation

Jack,

Attached is the first cut at our input into the LTA - LITL time model.

Please let me know if you have any questions .

Jason



LTA LITL IPS Ranging Sheet_v2 28Jan2016 - LCMC Input 2-Feb-2016.xlsx

Jason R. Kean, P.Eng., MBA, PMP**Deputy General Project Manager (Consultant to LCMC)****PROJECT DELIVERY TEAM****Lower Churchill Project**

t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787

e. jasonkean@lowerchurchillproject.caw. muskatfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

LTA LITL Integrated Project Schedule - Base Case
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule
Privileged and Confidential Information Prepared in Contemplation of Litigation

Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Notes	Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish		Relevant Risks Significantly Influencing	Incremental Change in Duration (Days)			
							Best	Supporting Scenario	Worst	Supporting Scenario
01	IPS Sub Proj: LCP General	180 d	17-May-2017	13-Nov-2017						
02	IPS Sub B Site: Target Milestones	180 d	17-May-2017	13-Nov-2017						
03	LTA-Ready for Power Transmission (Power Available) - Tracking Forecast	0 d	17-May-2017	17-May-2017						
04	Overall-1st Power Transfer Labrador to Newfoundland - Tracking Forecast	0 d	08-Sep-2017	08-Sep-2017						
05	Ready for Sustainable Power Transfer Labrador to Newfoundland-Tracking Forecast	0 d	13-Nov-2017	13-Nov-2017						
06	IPS Sub Proj: LITL	683 d	01-Jan-2016	13-Nov-2017						
07	IPS Sub B Site: LCP Systems Completions RFO	0 d	07-Sep-2017	08-Sep-2017						
08	All HVdc TL COMPLETED AND CONNECTED	0 d	07-Sep-2017	07-Sep-2017						
09	LITL HVdc LINK ENERGIZED	0 d	08-Sep-2017	08-Sep-2017						
10	IPS Sub B Site: LITL Labrador Grounding Station	221 d	01-Mar-2017	07-Oct-2017						
11	LITL Labrador Grounding Station: Construction/Static Commissioning	107 d	01-Mar-2017	15-Jun-2017	Minimal risk as scope of work is within LCP control. Some risk on LCP resources and winter work.	DCSR007	0	Assumes all scope defined during Q2/Q3 2016 and Contract awarded by end of 2016.	30	Late award due to lack of sufficient LCP resources and later start due to late spring access to site.
12	LITL Labrador Grounding Station: Testing	30 d	08-Sep-2017	07-Oct-2017	Low risk as testing scope is minimal at this site.	DCSR114 DCSR116	0	Assumes no issues with LCP completions personnel	10	Delay in LCP resources testing the facility
13	IPS Sub B Site: LITL Labrador Transition Compound	532 d	01-Apr-2016	14-Sep-2017						
14	LITL Labrador Transition Compound: Construction/Static Commissioning	368 d	01-Apr-2016	03-Apr-2017	Alstom's current forecast is 08-Jun-2017. Additional risk due to coordination of LCP Contractor (Civil) and Alstom's Contractor (electro-mech) on site at the same time in Q3 2016.	DCSR017 DCSR116	60	Assumes Alstom's current forecast completion date is correct	105	Potential delay to Alstom equipment installation start or impact on productivity due to LCP Civil Works Contractor (DCSR017). Assume 6 weeks impact.
15	LITL Labrador Transition Compound: Testing	7 d	08-Sep-2017	14-Sep-2017	Duration of this activity should be changed to 60 days to align with Converter station testing duration (Alstom shows this is tested as one system).	DCSR116 DCSR114 DCSR118	53	Alignment with Converter station testing - all one system	83	Assumes 3 month duration for dynamic commissioning of converter station rather than current plan of 2 months due to lack of planning and sufficiently competent Completions personnel.

LTA LITL Integrated Project Schedule - Base Case
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule
Privileged and Confidential Information Prepared in Contemplation of Litigation

Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Notes	Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish		Relevant Risks Significantly Influencing	Incremental Change in Duration (Days)			
							Best	Supporting Scenario	Worst	Supporting Scenario
16	IPS Sub B Site: LITL Muskrat Falls Converter	683 d	01-Jan-2016	13-Nov-2017						
17	LITL Muskrat Falls Converter: Construction/Static Commissioning	602 d	01-Jan-2016	24-Aug-2017	Alstom's current forecast is 18-Aug-2017; current construction and procurement status makes it unlikely that we'll see any improvement on forecast schedule.	DCSR010 DCSR113 DCSR116	0	Assumes that Alstom meets the current forecast date.	90	Assumes another 3 months delay due to current status of construction, late equipment delivery and lack of planning and sufficiently competent Completions personnel.
18	LITL Muskrat Falls Converter: STATION STAND ALONE TESTING and ENERGIZATION	21 d	25-Aug-2017	14-Sep-2017	This is not an activity that Alstom has identified; believe this is from Start-up team, cannot comment on risks or duration.	DCSR114 DCSR003 DCSR110	-21	Activity may not be required; not currently identified by Alstom.	0	Assumes that NLH will require Alstom to complete this stand alone testing.
19	LITL Muskrat Falls Converter: HVdc LINK LOW LOAD TESTING (2 months)	60 d	15-Sep-2017	13-Nov-2017	The scope and duration within this activity is susceptible to significant change as RFI further develop their integration strategies.	LCPR003 LCPR004 LCPR012 LCPR037 DCSR118 DCSR114 DCSR116	0	Assumes that 2 months duration provided by Alstom in their schedule is sufficient to complete dynamic commissioning at low power.	120	Assumes 6 months duration for dynamic commissioning of converter station rather than current plan of 2 months due to lack of planning and sufficiently competent Completions personnel and/or issues with connection to the Island Grid.
20	IPS Sub B Site: LITL Island Grounding Station	221 d	01-Mar-2017	07-Oct-2017						
21	LITL Island Grounding Station: Construction/Static Commissioning	107 d	01-Mar-2017	15-Jun-2017	Same as Item 11	DCSR116	0	Assumes all scope defined during Q2/Q3 2016 and Contract awarded by end of 2016.	30	Late award due to lack of sufficient LCP resources and later start due to late spring access to site.
22	LITL Island Grounding Station: Testing	30 d	08-Sep-2017	07-Oct-2017	Same as item 12	DCSR114 DCSR116	0	Assumes no issues with LCP completions personnel	10	Delay in LCP resources testing the facility
23	IPS Sub B Site: LITL Island Transition Compound	532 d	01-Apr-2016	14-Sep-2017						
24	LITL Island Transition Compound: Construction/Commissioning	368 d	01-Apr-2016	03-Apr-2017	Same as item 14	DCSR017 DCSR116	60	Assumes Alstom's current forecast completion date is correct	105	Potential delay to Alstom equipment installation start or impact on productivity due to LCP Civil Works Contractor (DCSR017). Assume 6 weeks impact.
25	LITL Island Transition Compound: Testing	7 d	08-Sep-2017	14-Sep-2017	Same as item 15	DCSR116 DCSR114 DCSR118	53	Alignment with Converter station testing - all one system	83	Assumes 3 month duration for dynamic commissioning of converter station rather than current plan of 2 months due to lack of planning and sufficiently competent Completions personnel.
26	IPS Sub B Site: LITL SOBI Crossing	119 d	15-Jun-2016	11-Oct-2016						
27	LITL SOBI Subsea Cable 1/2/3 Installation & Rock Placement & Testing	119 d	15-Jun-2016	11-Oct-2016			4	Additional exposure for weather.	64	Worst case is 15-Dec-2016 as driven by weather windows.
28	IPS Sub B Site: LITL Soldier's Pond Converter	683 d	01-Jan-2016	13-Nov-2017						

LTA LITL Integrated Project Schedule - Base Case
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule
Privileged and Confidential Information Prepared in Contemplation of Litigation

Project Schedule Critical Activities and Logic as Represented by Time-Risk Model										
ID	Task Description	Duration	Start	Finish	Notes	Relevant Risks Significantly Influencing	Risk-Adjusted Scenario			
							Incremental Change in Duration (Days)			
							Best	Supporting Scenario	Worst	Supporting Scenario
29	LITL Soldiers Pond Converter: Construction/Static Commissioning	580 d	01-Jan-2016	02-Aug-2017	Alstom's current forecast is 10-Aug-2017; current procurement status makes it unlikely that we'll see any improvement on forecast schedule.	DCSR116	0	Assumes that Alstom meets the current forecast date.	60	Assumes another 2 months delay due to late equipment delivery and lack of planning and sufficiently competent Completions personnel.
30	LITL Soldiers Pond Converter: STATION STANDALONE TESTING	14 d	03-Aug-2017	16-Aug-2017	This is not an activity that Alstom has identified; believe this is from Start-up team, cannot comment on risks or duration.	DCSR003	-21	Activity may not be required; not currently identified by Alstom.	0	Assumes that NLH will require Alstom to complete this stand alone testing.
31	LITL Soldiers Pond Converter: HVdc LINK LOW LOAD TESTING (2 months)	67 d	08-Sep-2017	13-Nov-2017	The scope and duration within this activity is susceptible to significant change as RFI further develop their integration strategies.	LCPR003 LCPR004 LCPR012 LCPR037 DCSR118 DCSR114 DCSR116	0	Assumes that 2 months duration provided by Alstom in their schedule is sufficient	120	Assumes 6 months duration for dynamic commissioning of converter station rather than current plan of 2 months due to lack of planning and sufficiently competent Completions personnel and/or issues with connection to the Island Grid.
32	IPS Sub B Site: LITL Soldier's Pond Switchyard	393 d	01-Jan-2016	27-Jan-2017						
33	LITL Soldiers Pond Switchyard: Construction/Static Commissioning	335 d	01-Jan-2016	30-Nov-2016	High risk that that end date will not be held due to current construction status and equipment delivery	DCSR116	60	Assumes 2 month minimum delay due to current status of construction.	120	Assumes a 4 month delay due to current construction status
34	LITL Soldiers Pond Switchyard: ENERGIZATION	44 d	15-Dec-2016	27-Jan-2017	Duration should be sufficient; however, could be risk during connection to the Grid. Other relevant risks listed will impact start date rather than duration.	DCSR118 DCSR114 DCSR003 DCSR117	0	Assumes current duration is sufficient	45	Assumes duration will be 3 months rather than 6 weeks currently planned due to connection to Island Grid
35	LITL Soldiers Pond Switchyard: ac POWER AVAILABLE AT SOP - from NF Power	0 d	27-Jan-2017	27-Jan-2017						
36	IPS Sub B Site: LITL SOP Synchronous Condenser	525 d	01-Jan-2016	08-Jun-2017						
37	LITL Soldiers Pond Synchronous Condensers: Construction/Static Commissioning Unit 1 & 2	482 d	01-Jan-2016	26-Apr-2017	Alstom's current forecast is 03-Jun-2017.	DCSR116	30	Assumes mitigation measures implemented by Alstom to reduce payment of LDs	90	Assumes mitigation measures are not completely successful as well lack of sufficiently competent Completions personnel.
38	LITL Soldiers Pond Synchronous Condensers: Dynamic Testing Units 1 & 2 (remaining)	43 d	27-Apr-2017	08-Jun-2017	Duration should be sufficient; however, could be risk during connection to the Grid. Other relevant risks listed will impact start date rather than duration.	DCSR114 DCSR117 DCSR118	0	Assumes current duration is sufficient	60	Assumes duration will be 3.5 months rather than 6 weeks currently planned primarily due to NLH personnel availability and connection to the Island Grid
39	IPS Sub B Site: LITL-Labrador 350kV HVdc TL	616 d	01-Jan-2016	07-Sep-2017						
40	LITL Labrador HVdc Transmission Line: HVdc TL Construction/Final Inspection	266 d	01-Jan-2016	22-Sep-2016	Critical winter section in Segment 2, Structures 1 to 235 planned to be completed in winter 2016. Section has consider risk of slippage. Extension of this activity into winter 2017 could have significant repercussions on the Island portion of the line.	OTLR018 OTLR029 OTLR030 OTLR044 OTLR047	90	Best case scenario is that Valard are able to get out of Labrador by 2016. Assumes re-focus on winter zone and spring break-up is late, plus they get themselves re-organized.	180	Protest occurs by Quebec Innu causing 1 week loss of production (OTLR018) Geotechnical conditions hamper dead-end foundation assembly (OTLR029) Early and long spring break-up creates significant impact on SPRR (OTLR044)

LTA LITL Integrated Project Schedule - Base Case
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule
Privileged and Confidential Information Prepared in Contemplation of Litigation

Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Notes	Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish		Relevant Risks Significantly Influencing	Incremental Change in Duration (Days)			
							Best	Supporting Scenario	Worst	Supporting Scenario
41	LITL Labrador 350kV HVdc TL: HVdc TL Connection to MF Converter & Transit. Compound (Slack Span)	14 d	25-Aug-2017	07-Sep-2017	Minimal risk - dependant on MF converter availability		-3.5	Assume 50% of duration at best.	-	Same as plan.
42	LITL Labrador 350kV HVdc TL: HVdc TL and Electrode Line Labrador: Energized	0 d	07-Sep-2017	07-Sep-2017						
43	IPS Sub B Site: LITL-Labrador Electrode Line	500 d	19-Apr-2016	31-Aug-2017						
44	LITL Labrador Electrode Line: Construction/Inspection	158 d	19-Apr-2016	23-Sep-2016	Low risk activity - duration is quite sufficient for wood pole section, while risk for portion carried on steel towers is captured as part of Activity 40.	Same as for Activity 40	30		60	
45	LITL Labrador Electrode Line: Connection to MF Converter & Grounding Station (Slack Span)	7 d	25-Aug-2017	31-Aug-2017	Minimal risk - dependant on MF converter availability. Base case duration is robust.	None identified	-3.5	Assume 50% of duration at best.	-	Same as plan.
46	IPS Sub B Site: LITL- Island 350kV HVdc TL	616 d	01-Jan-2016	07-Sep-2017						
47	LITL Island 350kV HVdc Transmission Line: Construction/Inspection	550 d	01-Jan-2016	03-Jul-2017	High time exposure in this activity.	OTLR018 OTLR029 OTLR030 OTLR039 OTLR044 OTLR047 OTLR049	30	Valard will not conclude stringing in Labrador until end of November at best, while we are able to significantly advance access in the LRM by June 2016, with Valard coming behind. Assumes Valard are able to present a realistic recovery plan and there are no delays related to ROW access, while we have two favourable springs.	240	Valard continue to be "unorganized" and are not able to effectively implement a recovery plan to allow them to get out of Labrador by end of 2016, thereby de-focusing efforts on the Island. Foundation conditions continue to be unfavorable, while an early spring break-up hampers two winter zones on the Island.
48	LITL Island 350kV HVdc TL: Connection to Nfld Transit. Compound & Soldiers Pond Converter	14 d	03-Aug-2017	16-Aug-2017	Base Case duration is robust.	None identified	-3.5	Assume 25% of duration is required.	-	Same as plan.
49	LITL Island 350kV HVdc Transmission Line: HVdc TL and Electrode Line Nfld: Energized	0 d	07-Sep-2017	07-Sep-2017						
50	IPS Sub B Site: LITL- Island Electrode Line	496 d	01-Apr-2016	09-Aug-2017						
51	LITL Island Electrode Line: Construction/Inspection (static)	85 d	01-Apr-2016	24-Jun-2016		None identified	0	Proceeds per schedule	90	Assume extension in work schedule by Locke's by choice.
52	LITL Island Electrode Line: Connection to Grounding Site (slack span)	7 d	03-Aug-2017	09-Aug-2017		None identified	-3.5	Assume 50% of duration is required.	-	Same as plan
53	IPS Sub Proj: LTA	503 d	01-Jan-2016	17-May-2017		N/A				
54	IPS Sub B Site: LTA Churchill Falls Switchyard	471 d	01-Jan-2016	15-Apr-2017		N/A				

LTA LITL Integrated Project Schedule - Base Case Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule <i>Privileged and Confidential Information Prepared in Contemplation of Litigation</i>										
Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Notes	Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish		Relevant Risks Significantly Influencing	Incremental Change in Duration (Days)			
							Best	Supporting Scenario	Worst	Supporting Scenario

LTA LITL IPS Ranging Sheet_v2 28Jan2016 - LCMC Input 2-Feb-2016.xlsx

ATTACHMENT A.15



Draft Results for the LTA LITL Time-Risk and Cost-Risk Analyses

Jack Evans

to:

JasonKean@lowerchurchillproject.ca

02/05/2016 01:23 PM

Cc:

"aidan.meade@mcinnescooper.com", "Keith Dodson", Justin Dahl

Hide Details

From: Jack Evans <j_evans@westney.com>

To: "JasonKean@lowerchurchillproject.ca" <JasonKean@lowerchurchillproject.ca>

Cc: "aidan.meade@mcinnescooper.com" <aidan.meade@mcinnescooper.com>, "Keith Dodson" <k_dodson@westney.com>, Justin Dahl <j_dahl@westney.com>

3 Attachments



LTA LITL Draft Time- and Cost-Risk Results 05Feb2016.docx LTA LITL Time-Risk_v4 4Feb2016.pdf



LTA LITL IPS Ranging Sheet_v4 4Feb2016 - LCMC Input.xlsx

Privileged and Confidential Information Prepared in Contemplation of Litigation

Jason,

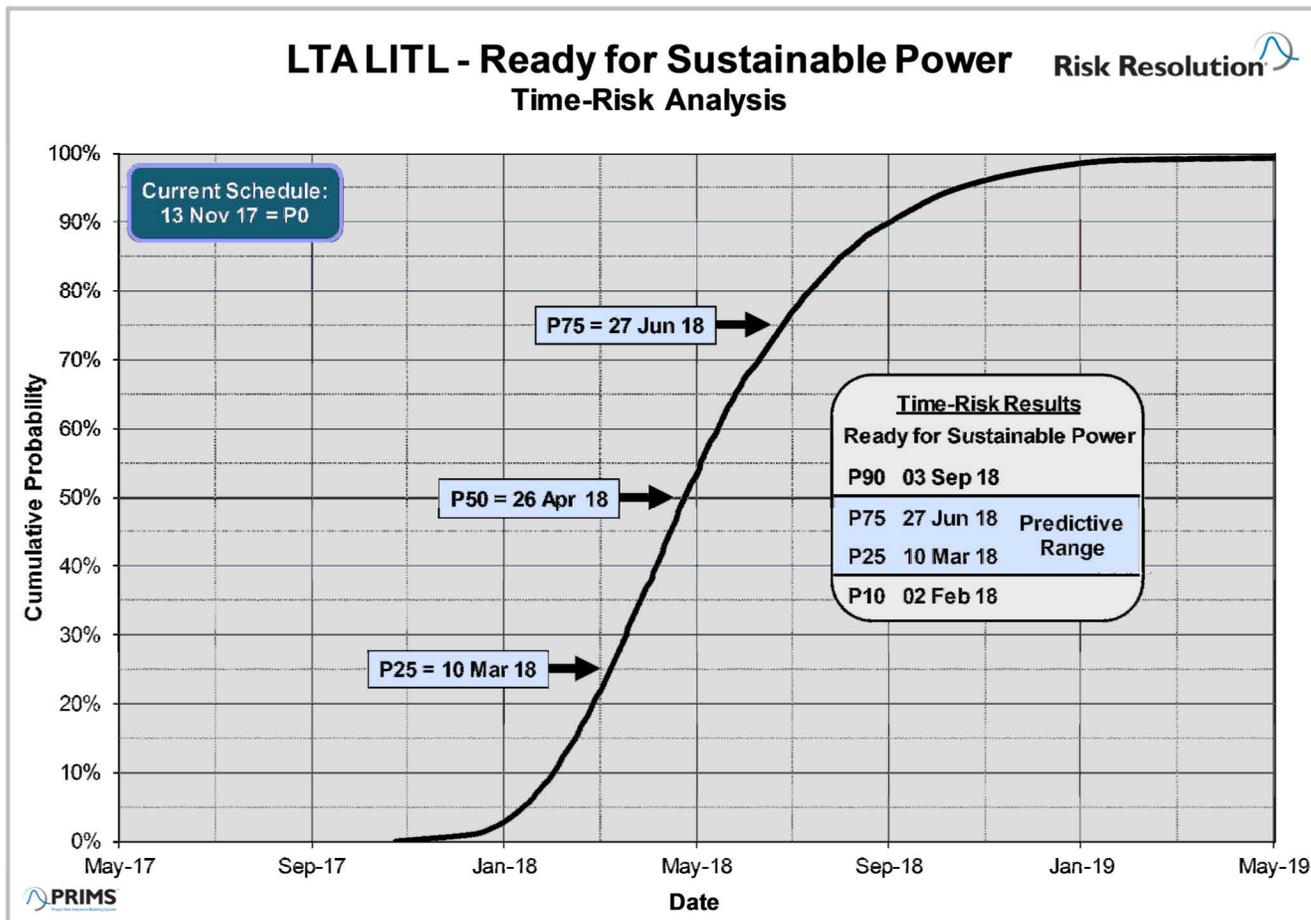
Draft results for the LTA LITL Time-Risk and Cost-Risk analyses are attached. Please let me know if you have any questions.

Thanks,

Jack

.....
Jack Evans
Westney Consulting Group
(281) 221-6488

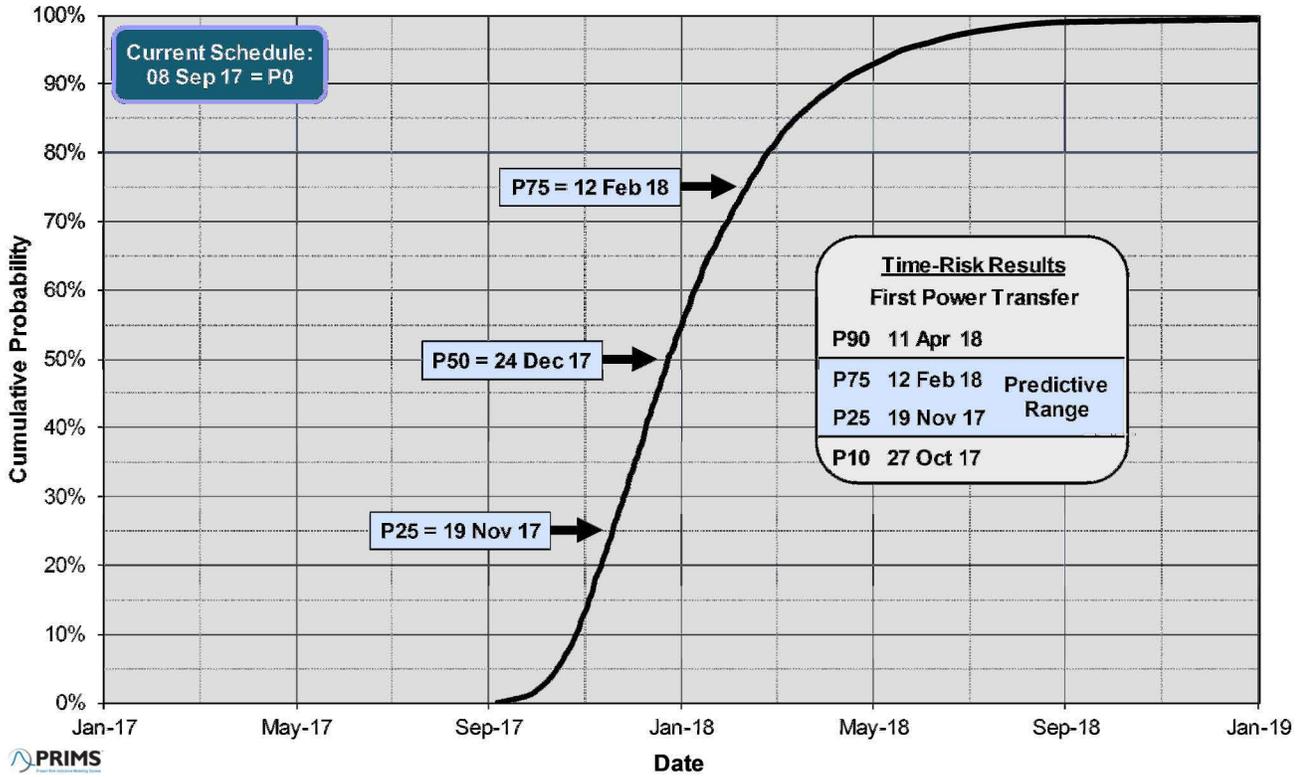
LTA LITL Draft Time-Risk Analysis_v4 04Feb2016



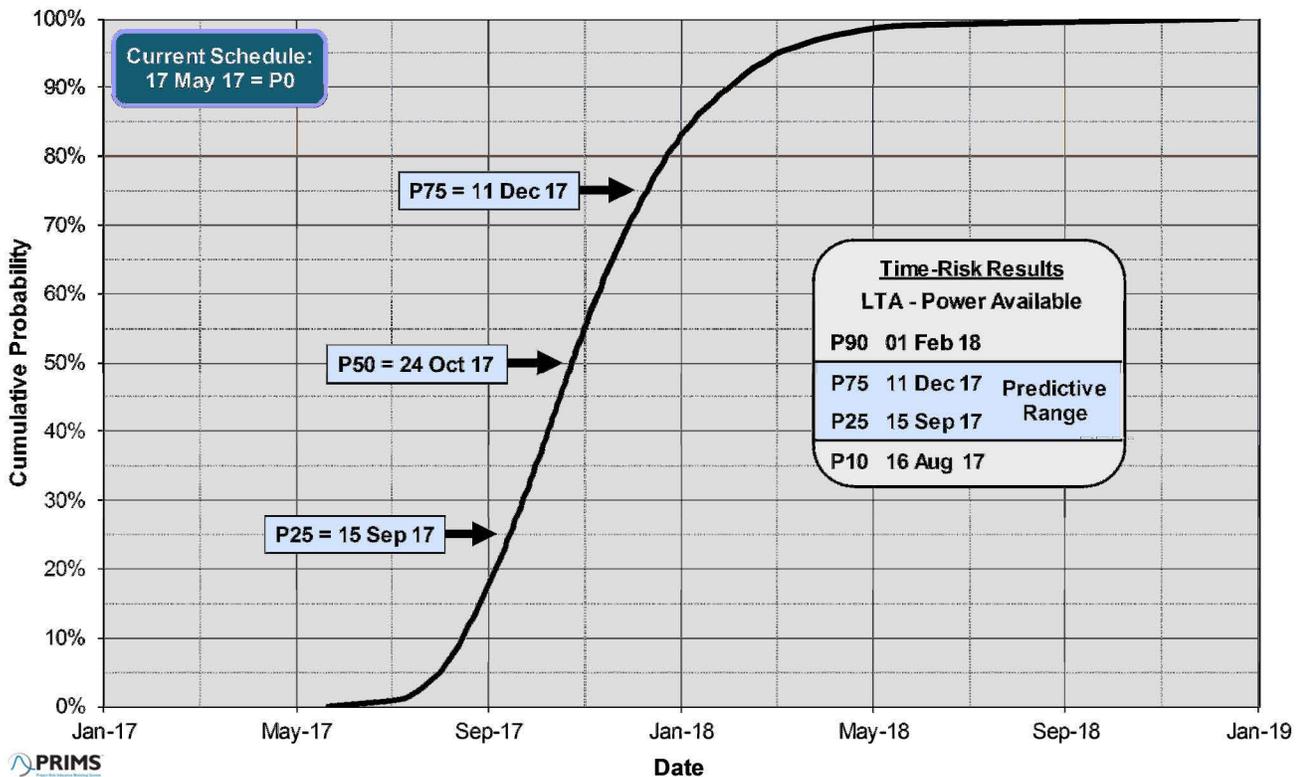
Approximate mean impact of task ranging (Ready for Sustainable Power):

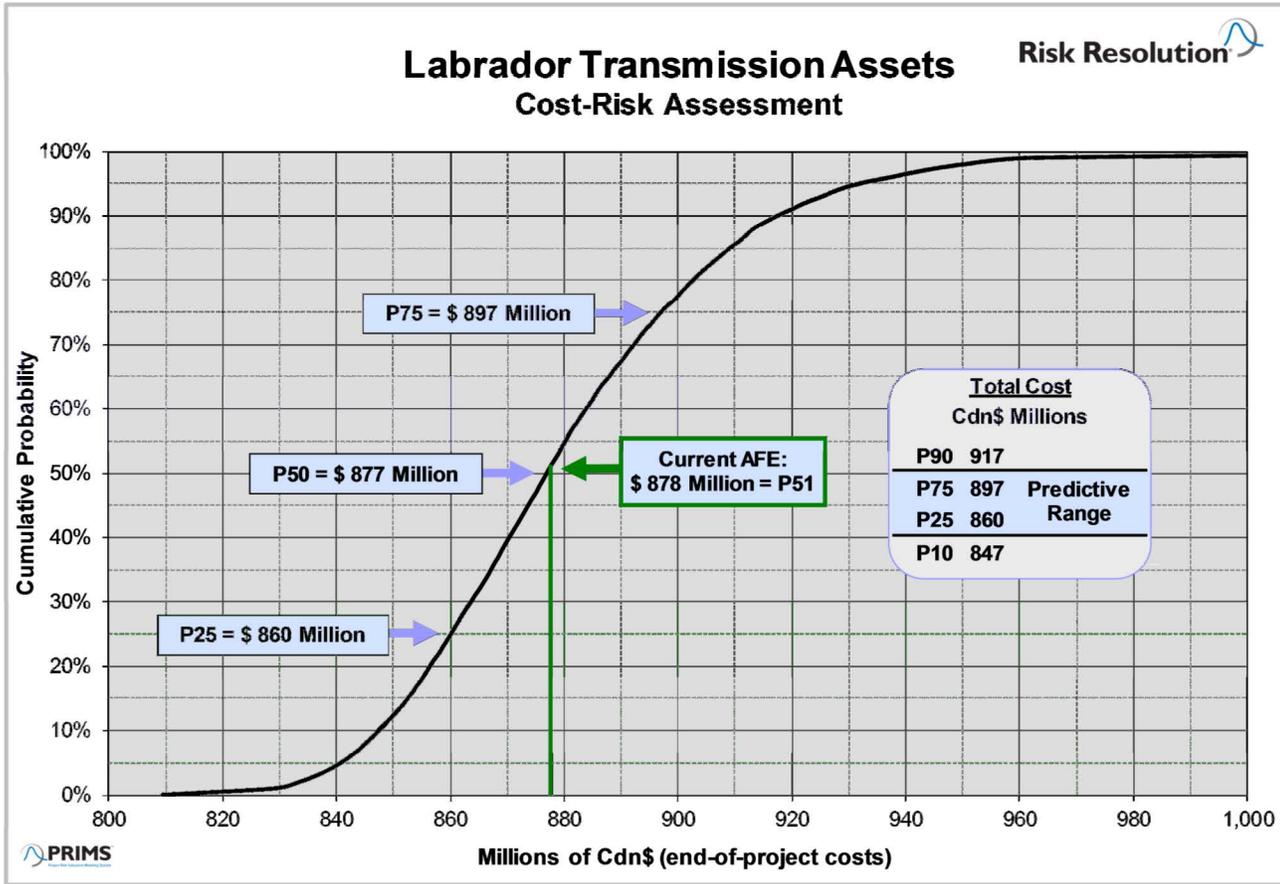
- 1) Task 19 – LITL MF Converter: HVdc Link Low Load Testing: 2.0 months
- 2) Task 47 – LITL Island 350 kV HVdc Transmission Line: Construction/Inspection: 1.5 months
- 3) Tasks 55/56/59 – LTA CF Switchyard Construction & Energization and MF Switchyard Energization: 1.0 month
- 4) Task 17 – LITL MF Converter: Construction/Static Commissioning: 0.5 month
- 5) Other Tasks – 1.0 month

LTA LITL - First Power Transfer Time-Risk Analysis

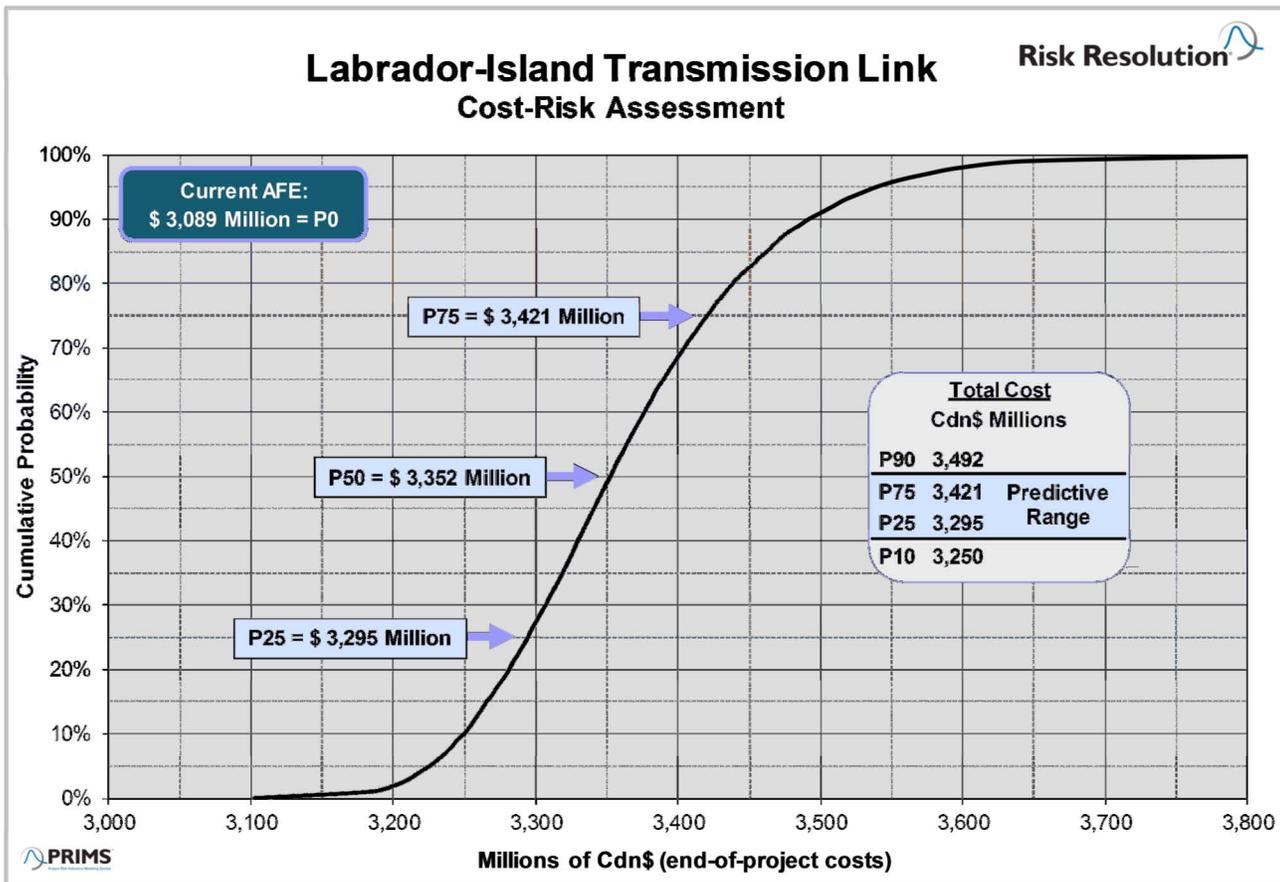


LTA LITL - Power Available (LTA) Time-Risk Analysis





LITL Draft Cost-Risk Analysis_v1 05Feb2016 (below)



LTA and LITL Integrated Project Schedule



Privileged and Confidential Information Prepared in Contemplation of Litigation

Time Risk Model

ID	Name	Duration	Start	Finish	Predecessors	@RISK: Critical Index	2016												2017												2018											
							Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar									
0	LTA and LITL IPS	683 d	1/1/16	11/13/17																																						
1	IPS Sub Proj: LCP General	180 d	5/17/17	11/13/17		100.00%																																				
2	IPS Sub B Site: Target Milestones	180 d	5/17/17	11/13/17		100.00%																																				
3	LTA-Ready for Power Transmission (Power Available) - Tracking Forecast	0 d	5/17/17	5/17/17	59FF	0.00%																																				
4	Overall-1st Power Transfer Labrador to Newfoundland - Tracking Forecast	0 d	9/8/17	9/8/17	8,9,18SS+14 d,31SS,3	0.00%																																				
5	Ready for Sustainable Power Transfer Labrador to Newfoundland-Tracking Forecast	0 d	11/13/17	11/13/17	12,19,22,31,4	100.00%																																				
6	IPS Sub Proj: LITL	683 d	1/1/16	11/13/17		100.00%																																				
7	IPS Sub B Site: LCP SysComp RFO	0 d	9/7/17	9/8/17		100.00%																																				
8	All HVdc TL COMPLETED AND CONNECTED	0 d	9/7/17	9/7/17	27,40,44,47,51	0.06%																																				
9	LITL HVdc LINK ENERGIZED	0 d	9/8/17	9/8/17	8,18SS+14 d,25SS,27,42,49	100.00%																																				
10	IPS Sub B Site: LITL Lab Grounding	221 d	3/1/17	10/7/17		0.36%																																				
11	LITL Labrador Grounding Station: Construction/Static Commissioning	107 d	3/1/17	6/15/17		0.00%																																				
12	LITL Labrador Grounding Station: Testing	30 d	9/8/17	10/7/17	9,11,15SS	0.36%																																				
13	IPS Sub B Site: LITL Lab TransComp	532 d	4/1/16	9/14/17		59.10%																																				
14	LITL Labrador Transition Compound: Construction/Static Commissioning	368 d	4/1/16	4/3/17		0.00%																																				
15	LITL Labrador Transition Compound: Testing	7 d	9/8/17	9/14/17	14,18SS+14 d,30	59.10%																																				
16	IPS Sub B Site: LITL MF Converter	683 d	1/1/16	11/13/17		99.35%																																				
17	LITL Muskrat Falls Converter: Construction/Static Commissioning	602 d	1/1/16	8/24/17		15.62%																																				
18	LITL Muskrat Falls Converter: STATION STAND ALONE TESTING and ENERGIZATION	0 d	8/24/17	8/24/17	17,30,59	59.32%																																				
19	LITL Muskrat Falls Converter: HVdc LINK SYSTEM LOW LOAD TESTING (2 months)	60 d	9/15/17	11/13/17	9,15,31FS+7 d	99.26%																																				
20	IPS Sub B Site: LITL Nfld Grounding	221 d	3/1/17	10/7/17		0.39%																																				
21	LITL Nfld Grounding Station: Construction/Static Commissioning	107 d	3/1/17	6/15/17		0.01%																																				
22	LITL Nfld Grounding Station: Testing	30 d	9/8/17	10/7/17	9,21	0.38%																																				
23	IPS Sub B Site: LITL Nfld TransComp	532 d	4/1/16	9/14/17		59.32%																																				
24	LITL Nfld Transition Compound: Construction/Commissioning	368 d	4/1/16	4/3/17		0.00%																																				
25	LITL Nfld Transition Compound: Testing	7 d	9/8/17	9/14/17	18SS+14 d,24,30	59.32%																																				
26	IPS Sub B Site: LITL SOBI Crossing	119 d	6/15/16	10/11/16		0.00%																																				

Printed: 2/4/16

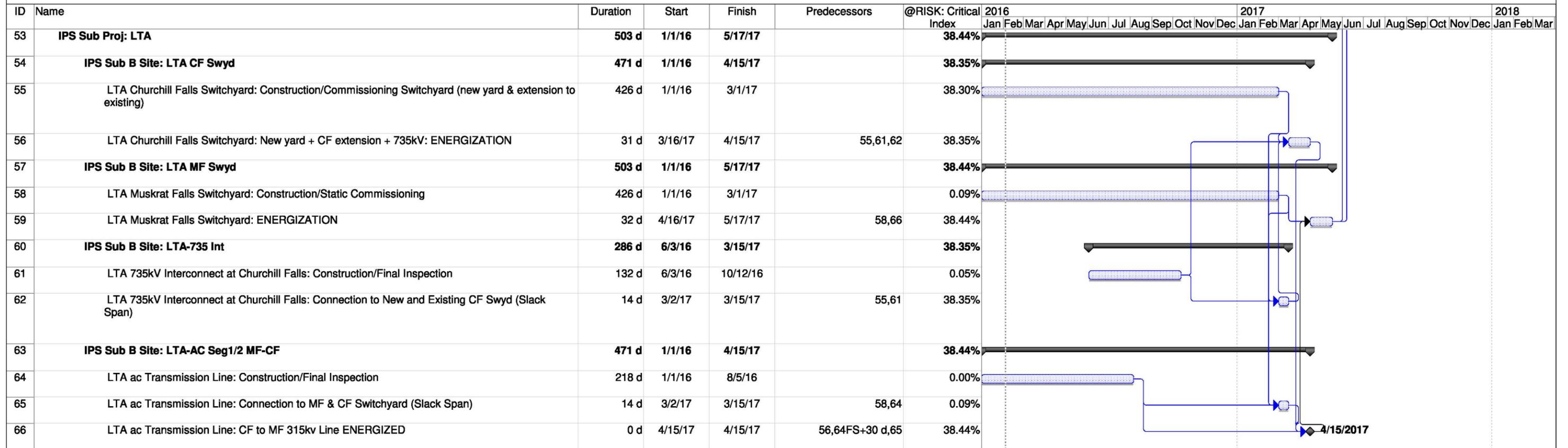
Task		Milestone		Rolled Up Critical Task		Split		Group By Summary	
Critical Task		Summary		Rolled Up Milestone		External Tasks		Deadline	
Progress		Rolled Up Task		Rolled Up Progress		Project Summary			

LTA and LITL Integrated Project Schedule



Privileged and Confidential Information Prepared in Contemplation of Litigation

Time Risk Model



Printed: 2/4/16

Task		Milestone		Rolled Up Critical Task		Split		Group By Summary	
Critical Task		Summary		Rolled Up Milestone		External Tasks		Deadline	
Progress		Rolled Up Task		Rolled Up Progress		Project Summary			

v3&v4 changes in yellow below (Tasks 15, 18, 19, 25, 30, and 31) LTA LITL Integrated Project Schedule									
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule									
Privileged and Confidential Information Prepared in Contemplation of Litigation									
Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish	Relevant Risks Significantly Influencing	Incremental Change in Duration (Days)			
						Best	Supporting Scenario	Worst	Supporting Scenario
01	IPS Sub Proj: LCP General	180 d	17-May-2017	13-Nov-2017					
02	IPS Sub B Site: Target Milestones	180 d	17-May-2017	13-Nov-2017					
03	LTA-Ready for Power Transmission (Power Available) - Tracking Forecast	0 d	17-May-2017	17-May-2017					
04	Overall-1st Power Transfer Labrador to Newfoundland - Tracking Forecast	0 d	08-Sep-2017	08-Sep-2017					
05	Ready for Sustainable Power Transfer Labrador to Newfoundland-Tracking Forecast	0 d	13-Nov-2017	13-Nov-2017					
06	IPS Sub Proj: LITL	683 d	01-Jan-2016	13-Nov-2017					
07	IPS Sub B Site: LCP Systems Completions RFO	0 d	07-Sep-2017	08-Sep-2017					
08	All HVdc TL COMPLETED AND CONNECTED	0 d	07-Sep-2017	07-Sep-2017					
09	LITL HVdc LINK ENERGIZED	0 d	08-Sep-2017	08-Sep-2017					
10	IPS Sub B Site: LITL Labrador Grounding Station	221 d	01-Mar-2017	07-Oct-2017					
11	LITL Labrador Grounding Station: Construction/Static Commissioning	107 d	01-Mar-2017	15-Jun-2017	DCSR007	0	Assumes all scope defined during Q2/Q3 2016 and Contract awarded by end of 2016.	30	Late award due to lack of sufficient LCP resources and later start due to late spring access to site.
12	LITL Labrador Grounding Station: Testing	30 d	08-Sep-2017	07-Oct-2017	DCSR114 DCSR116	0	Assumes no issues with LCP completions personnel	10	Delay in LCP resources testing the facility
13	IPS Sub B Site: LITL Labrador Transition Compound	532 d	01-Apr-2016	14-Sep-2017					
14	LITL Labrador Transition Compound: Construction/Static Commissioning	368 d	01-Apr-2016	03-Apr-2017	DCSR017 DCSR116	60	Assumes Alstom's current forecast completion date is correct	105	Potential delay to Alstom equipment installation start or impact on productivity due to LCP Civil Works Contractor (DCSR017). Assume 6 weeks impact.
15	LITL Labrador Transition Compound: Testing (risk modeled in Task 19 ranging)	7 d	08-Sep-2017	14-Sep-2017	DCSR116 DCSR114 DCSR118	0	Alignment with Converter station testing - all one system	0	Assumes 3 month duration for dynamic commissioning of converter station rather than current plan of 2 months due to lack of planning and sufficiently competent Completions personnel.
16	IPS Sub B Site: LITL Muskrat Falls Converter	683 d	01-Jan-2016	13-Nov-2017					
17	LITL Muskrat Falls Converter: Construction/Static Commissioning	602 d	01-Jan-2016	24-Aug-2017	DCSR010 DCSR113 DCSR116	0	Assumes that Alstom meets the current forecast date.	90	Assumes another 3 months delay due to current status of construction, late equipment delivery and lack of planning and sufficiently competent Completions personnel.
18	LITL Muskrat Falls Converter: STATION STAND ALONE TESTING and ENERGIZATION	0 d	24-Aug-2017	24-Aug-2017	DCSR114 DCSR003 DCSR110	0	Activity may not be required; not currently identified by Alstom.	0	Assumes that NLH will require Alstom to complete this stand alone testing.
19	LITL Muskrat Falls Converter: HVdc LINK SYSTEM LOW LOAD TESTING (2 months)	60 d	15-Sep-2017	13-Nov-2017	LCPR003 LCPR004 LCPR012 LCPR037 DCSR118 DCSR114 DCSR116	0	Assumes that 2 months duration provided by Alstom in their schedule is sufficient to complete dynamic commissioning at low power.	120	Assumes 6 months duration for dynamic commissioning of converter station rather than current plan of 2 months due to lack of planning and sufficiently competent Completions personnel and/or issues with connection to the Island Grid.

v3&v4 changes in yellow below (Tasks 15, 18, 19, 25, 30, and 31) LTA LITL Integrated Project Schedule									
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule									
Privileged and Confidential Information Prepared in Contemplation of Litigation									
Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish	Relevant Risks Significantly Influencing	Incremental Change in Duration (Days)			
						Best	Supporting Scenario	Worst	Supporting Scenario
20	IPS Sub B Site: LITL Island Grounding Station	221 d	01-Mar-2017	07-Oct-2017					
21	LITL Island Grounding Station: Construction/Static Commissioning	107 d	01-Mar-2017	15-Jun-2017	DCSR116	0	Assumes all scope defined during Q2/Q3 2016 and Contract awarded by end of 2016.	30	Late award due to lack of sufficient LCP resources and later start due to late spring access to site.
22	LITL Island Grounding Station: Testing	30 d	08-Sep-2017	07-Oct-2017	DCSR114 DCSR116	0	Assumes no issues with LCP completions personnel	10	Delay in LCP resources testing the facility
23	IPS Sub B Site: LITL Island Transition Compound	532 d	01-Apr-2016	14-Sep-2017					
24	LITL Island Transition Compound: Construction/Commissioning	368 d	01-Apr-2016	03-Apr-2017	DCSR017 DCSR116	60	Assumes Alstom's current forecast completion date is correct	105	Potential delay to Alstom equipment installation start or impact on productivity due to LCP Civil Works Contractor (DCSR017). Assume 6 weeks impact.
25	LITL Island Transition Compound: Testing (risk modeled in Task 31 ranging)	7 d	08-Sep-2017	14-Sep-2017	DCSR116 DCSR114 DCSR118	0	Alignment with Converter station testing - all one system	0	Assumes 3 month duration for dynamic commissioning of converter station rather than current plan of 2 months due to lack of planning and sufficiently competent Completions personnel.
26	IPS Sub B Site: LITL SOBI Crossing	119 d	15-Jun-2016	11-Oct-2016					
27	LITL SOBI Subsea Cable 1/2/3 Installation & Rock Placement & Testing	119 d	15-Jun-2016	11-Oct-2016		4	Additional exposure for weather.	64	Worst case is 15-Dec-2016 as driven by weather windows.
28	IPS Sub B Site: LITL Soldier's Pond Converter	683 d	01-Jan-2016	13-Nov-2017					
29	LITL Soldiers Pond Converter: Construction/Static Commissioning	580 d	01-Jan-2016	02-Aug-2017	DCSR116	0	Assumes that Alstom meets the current forecast date.	60	Assumes another 2 months delay due to late equipment delivery and lack of planning and sufficiently competent Completions personnel.
30	LITL Soldiers Pond Converter: STATION STANDALONE TESTING	0 d	02-Aug-2017	02-Aug-2017	DCSR003	0	Activity may not be required; not currently identified by Alstom.	0	Assumes that NLH will require Alstom to complete this stand alone testing.
31	LITL Soldiers Pond Converter: HVdc LINK Ready for Low Load Testing (modeled in Task 19)	0 d	08-Sep-2017	08-Sep-2017	LCPR003 LCPR004 LCPR012 LCPR037 DCSR118 DCSR114 DCSR116	0	Assumes that 2 months duration provided by Alstom in their schedule is sufficient	0	Assumes 6 months duration for dynamic commissioning of converter station rather than current plan of 2 months due to lack of planning and sufficiently competent Completions personnel and/or issues with connection to the Island Grid.
32	IPS Sub B Site: LITL Soldier's Pond Switchyard	393 d	01-Jan-2016	27-Jan-2017					
33	LITL Soldiers Pond Switchyard: Construction/Static Commissioning	335 d	01-Jan-2016	30-Nov-2016	DCSR116	60	Assumes 2 month minimum delay due to current status of construction.	120	Assumes a 4 month delay due to current construction status
34	LITL Soldiers Pond Switchyard: ENERGIZATION	44 d	15-Dec-2016	27-Jan-2017	DCSR118 DCSR114 DCSR003 DCSR117	0	Assumes current duration is sufficient	45	Assumes duration will be 3 months rather than 6 weeks currently planned due to connection to Island Grid
35	LITL Soldiers Pond Switchyard: ac POWER AVAILABLE AT SOP - from NF Power	0 d	27-Jan-2017	27-Jan-2017					
36	IPS Sub B Site: LITL SOP Synchronous Condenser	525 d	01-Jan-2016	08-Jun-2017					
37	LITL Soldiers Pond Synchronous Condensers: Construction/Static Commissioning Unit 1 & 2	482 d	01-Jan-2016	26-Apr-2017	DCSR116	30	Assumes mitigation measures implemented by Alstom to reduce payment of LDs	90	Assumes mitigation measures are not completely successful as well lack of sufficiently competent Completions personnel.

v3&v4 changes in yellow below (Tasks 15, 18, 19, 25, 30, and 31) LTA LITL Integrated Project Schedule									
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule									
Privileged and Confidential Information Prepared in Contemplation of Litigation									
Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish	Relevant Risks Significantly Influencing	Incremental Change in Duration (Days)			
						Best	Supporting Scenario	Worst	Supporting Scenario
38	LITL Soldiers Pond Synchronous Condensers: Dynamic Testing Units 1 & 2 (remaining)	43 d	27-Apr-2017	08-Jun-2017	DCSR114 DCSR117 DCSR118	0	Assumes current duration is sufficient	60	Assumes duration will be 3.5 months rather than 6 weeks currently planned primarily due to NLH personnel availability and connection to the Island Grid
39	IPS Sub B Site: LITL-Labrador 350kV HVdc TL	616 d	01-Jan-2016	07-Sep-2017					
40	LITL Labrador HVdc Transmission Line: HVdc TL Construction/Final Inspection	266 d	01-Jan-2016	22-Sep-2016	OTLR018 OTLR029 OTLR030 OTLR044 OTLR047	90	Best case scenario is that Valard are able to get out of Labrador by 2016. Assumes re-focus on winter zone and spring break-up is late, plus they get themselves re-organized.	180	Protest occurs by Quebec Innu causing 1 week loss of production (OTLR018) Geotechnical conditions hamper dead-end foundation assembly (OTLR029) Early and long spring break-up creates significant impact on SPRR (OTLR044)
41	LITL Labrador 350kV HVdc TL: HVdc TL Connection to MF Converter & Transit. Compound (Slack Span)	14 d	25-Aug-2017	07-Sep-2017		-3.5	Assume 50% of duration at best.	0	Same as plan.
42	LITL Labrador 350kV HVdc TL: HVdc TL and Electrode Line Labrador: Energized	0 d	07-Sep-2017	07-Sep-2017					
43	IPS Sub B Site: LITL-Labrador Electrode Line	500 d	19-Apr-2016	31-Aug-2017					
44	LITL Labrador Electrode Line: Construction/Inspection	158 d	19-Apr-2016	23-Sep-2016	Same as for Activity 40	30		60	
45	LITL Labrador Electrode Line: Connection to MF Converter & Grounding Station (Slack Span)	7 d	25-Aug-2017	31-Aug-2017	None identified	-3.5	Assume 50% of duration at best.	0	Same as plan.
46	IPS Sub B Site: LITL- Island 350kV HVdc TL	616 d	01-Jan-2016	07-Sep-2017					
47	LITL Island 350kV HVdc Transmission Line: Construction/Inspection	550 d	01-Jan-2016	03-Jul-2017	OTLR018 OTLR029 OTLR030 OTLR039 OTLR044 OTLR047 OTLR049	30	Valard will not conclude stringing in Labrador until end of November at best, while we are able to significantly advance access in the LRM by June 2016, with Valard coming behind. Assumes Valard are able to present a realistic recovery plan and there are no delays related to ROW access, while we have two favourable springs.	240	Valard continue to be "unorganized" and are not able to effectively implement a recovery plan to allow them to get out of Labrador by end of 2016, thereby de-focusing efforts on the Island. Foundation conditions continue to be unfavorable, while an early spring break-up hampers two winter zones on the Island.
48	LITL Island 350kV HVdc TL: Connection to Nfid Transit. Compound & Soldiers Pond Converter (Slack Span)	14 d	03-Aug-2017	16-Aug-2017	None identified	-3.5	Assume 25% of duration is required.	0	Same as plan.
49	LITL Island 350kV HVdc Transmission Line: HVdc TL and Electrode Line Nfid: Energized	0 d	07-Sep-2017	07-Sep-2017					
50	IPS Sub B Site: LITL- Island Electrode Line	496 d	01-Apr-2016	09-Aug-2017					
51	LITL Island Electrode Line: Construction/Inspection (static)	85 d	01-Apr-2016	24-Jun-2016	None identified	0	Proceeds per schedule	90	Assume extension in work schedule by Locke's by choice.
52	LITL Island Electrode Line: Connection to Grounding Site (slack span)	7 d	03-Aug-2017	09-Aug-2017	None identified	-3.5	Assume 50% of duration is required.	0	Same as plan
53	IPS Sub Proj: LTA	503 d	01-Jan-2016	17-May-2017	N/A				
54	IPS Sub B Site: LTA Churchill Falls Switchyard	471 d	01-Jan-2016	15-Apr-2017	N/A				

v3&v4 changes in yellow below (Tasks 15, 18, 19, 25, 30, and 31) LTA LITL Integrated Project Schedule									
Time-Risk Assessment - Ranging Sheet - Jan-2016 Schedule									
Privileged and Confidential Information Prepared in Contemplation of Litigation									
Project Schedule Critical Activities and Logic as Represented by Time-Risk Model					Risk-Adjusted Scenario				
ID	Task Description	Duration	Start	Finish	Relevant Risks Significantly Influencing	Incremental Change in Duration (Days)			
						Best	Supporting Scenario	Worst	Supporting Scenario
55	LTA Churchill Falls Switchyard : Construction/Commissioning Switchyard (new yard & extension t	426 d	01-Jan-2016	01-Mar-2017	DCSR002 DCSR003 DCSR116	30	Assumes that Alstom will only be 1 month behind schedule. Mitigation measures will be required to meet this date.	180	Assumes total of 6 months delay, ie another summer construction season required. This potential delay is due to complexity of connection to existing facility; potential issues with CF(L)Co interface and current construction status
56	LTA Churchill Falls Switchyard: New yard + CF Extension + 735kV: ENERGIZATION	31 d	16-Mar-2017	15-Apr-2017	DCSR114 DCSR003 DCSR117 DCSR002 DCSR118	30	Assumes current duration is insufficient due to connection to existing facility.	90	Assumes duration will be 4 months rather than 1 month currently planned due to interfaces and outages required with CF(L)Co
57	IPS Sub B Site: LTA MF Switchyard	503 d	01-Jan-2016	17-May-2017					
58	LTA Muskrat Falls Switchyard: Construction/Static Commissioning	426 d	01-Jan-2016	01-Mar-2017	DCSR010 DCSR113 DCSR116	30	Assumes mitigation measures implemented by Alstom to reduce payment of LDs	90	Assumes a more realistic end date according to current construction status
59	LTA Muskrat Falls Switchyard: ENERGIZATION	32 d	16-Apr-2017	17-May-2017	DCSR114 DCSR002 DCSR117 DCSR118	0	Assumes current duration is sufficient	30	Assumes duration will be 2 months rather than 1 month currently planned
60	IPS Sub B Site: LTA-735kV HVac Intertie	286 d	03-Jun-2016	15-Mar-2017					
61	LTA 735kV HVac Interconnect at Churchill Falls: Construction/Final Inspection	132 d	03-Jun-2016	12-Oct-2016	OTLR030 OTLR036 OTLR043	-60	Work is completed by Valard Quebec crews during spring break-up.	45	Work scope is delayed due to unavailability of crews - focused elsewhere addressing priority issues. Also some risk of interface with CF and C3 scope.
62	LTA 735kV HVac Interconnect at Churchill Falls: Connection to New and Existing CF Swyd (Slack S	14 d	02-Mar-2017	15-Mar-2017	DCSR114	-3.5	Assume 25% of duration is required.	0	Same as plan
63	IPS Sub B Site: LTA-315kV HVac Line 1 & 2 Muskrat Falls to Churchill Falls	471 d	01-Jan-2016	15-Apr-2017					
64	LTA 315kV HVac Transmission Line: Construction/Final Inspection	218 d	01-Jan-2016	05-Aug-2016	OTLR045	-30	Excludes time for site remediation and assumes that current quality rework goes better than planned.	60	Rework effort grows for those foundations where structures currently are erected and conductor strung.
65	LTA 315kV HVac Transmission Line: Connection to MF & CF Switchyard (Slack Span)	14 d	02-Mar-2017	15-Mar-2017	None Identified	-7.0	Assume 50% of duration is required.	0	Same as plan
66	LTA 315kV HVac Transmission Line: CF to MF 315kV Line ENERGIZED	0 d	15-Apr-2017	15-Apr-2017					
	Last Line								

ATTACHMENT A.16

**AFE Breakdown - LTA & LIL****Jason Kean** to: Jack Evans

Cc: "Meade, Aidan"

02/05/2016 01:17 PM

Privileged and Confidential Information Prepared in Contemplation of Litigation

Jack,

Attached is the AFE breakdown for each of LTA and LIL .

Please let me know if you have any questions .

Jason



LTA - LIL Cost Ranges with AFE Values.xlsx

Jason R. Kean, P.Eng., MBA, PMP**Deputy General Project Manager (Consultant to LCMC)****PROJECT DELIVERY TEAM****Lower Churchill Project**

t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787

e. jasonkean@lowerchurchillproject.caw. muskatfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

LTA Cost Model Input

Cost Category	AFE	Best Case	Worst Case
ROW Clearing 315 kV HVac Transmission Line (MF to CF)	31.6	32.4	50.9
Construction of 315 kV HVac Transmission Line (MF to CF)	277.0	270.5	282.5
Transmission Line Material (Hvac)	85.3	82.6	83.3
Churchill Falls Switchyard			
Muskrat Falls Switchyard			
Telecommunications (LTA)			
Owner's Project Team	146.6	138.9	144.9
General	9.2	10.7	11.9
Integrated Commissioning Support Services	10.5	13.5	15.5
Total	859.7	847.6	909.9
Contingency	17.8		

Current AFE	877.6	877.6
--------------------	--------------	--------------

LIL Cost Model Input

Cost Category	AFE	Best Case	Worst Case
Converters - MF and Soldier's Pond			
Transition Compounds			
Synchronous Condensers			
Soldier's Pond Switchyard			
Electrode Sites			
Island System Upgrades	37.8	37.6	38.6
ROW Clearing for HVdc Transmission Line	360.0	470.0	521.0
Construction of 350 kV HVdc Transmission Line	840.2	874.5	915.8
Transmission Line Material (HVdc)	261.2	276.7	286.3
SOBI Crossing	314.8	299.8	309.8
Telecommunications (LIL)			
Owner's Project Team	232.7	307.8	348.8
General	68.4	79.0	91.5
Integrated Commissioning Support Services	3.5	10.3	18.5
Total	2993.5	3243.6	3466.3
Contingency	95.9		

Current AFE	3089.4	3089.4
--------------------	---------------	---------------

Note: Privileged and Confidential Information Prepared in Contemplation of Litigation

**Inputs into Cost Model - LTA & LIL****Jason Kean** to: Jack Evans

Cc: "Aidan Meade"

02/04/2016 04:52 PM

Privileged and Confidential Information Prepared in Contemplation of Litigation

Jack,

Attached is the first cut at our input into the LTA - LITL cost model.

Please let me know if you have any questions .

Jason



LTA LIL Cost Model Input 4-Feb-2016.xlsx

Jason R. Kean, P.Eng., MBA, PMP**Deputy General Project Manager (Consultant to LCMC)****PROJECT DELIVERY TEAM****Lower Churchill Project**

t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787

e. jasonkean@lowerchurchillproject.caw. muskratfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

LTA Cost Model Input

Cost Category	Best Case	Worst Case
ROW Clearing 315 kV HVac Transmission Line (MF to CF)	32.4	50.9
Construction of 315 kV HVac Transmission Line (MF to CF)	270.5	282.5
Transmission Line Material (Hvac)	82.6	83.3
Churchill Falls Switchyard		
Muskrat Falls Switchyard		
Telecommunications (LTA)		
Owner's Project Team	138.9	144.9
General	10.7	11.9
Integrated Commissioning Support Services	13.5	15.5
Total	847.6	909.9

Current AFE	877.6
--------------------	--------------

Note: Privileged and Confidential Information Prepared in Contemplation of Litigation

LIL Cost Model Input

Cost Category	Best Case	Worst Case
Converters - MF and Soldier's Pond		
Transition Compounds		
Synchronous Condensers		
Soldier's Pond Switchyard		
Electrode Sites		
Island System Upgrades	37.6	38.6
ROW Clearing for HVdc Transmission Line	470.0	521.0
Construction of 350 kV HVdc Transmission Line	874.5	915.8
Transmission Line Material (HVdc)	276.7	286.3
SOBI Crossing	299.8	309.8
Telecommunications (LIL)		
Owner's Project Team	307.8	348.8
General	79.0	91.5
Integrated Commissioning Support Services	10.3	18.5
Total	3243.6	3466.3

Current AFE	3089.4
--------------------	---------------

Note: Privileged and Confidential Information Prepared in Contemplation of Litigation

Labrador Transmission Assets Cost Review

Cost Category	AFE Rev2 (C\$ MM)	Current Published Final Forecast Cost		Internal FFC Range				Risk Range				TOTAL				
		Value (C\$MM)	Basis	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID#	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes:	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
D.g - Owner's Project Team	146.6	146.7	latest budget at AFE rev2 (OK, possible saving of 10 M as per latest MFL)	138.4	10 M saving aligned with the latest MFL revision 1.7 M Currency impact		142.4	2 M addition on the saving in the best cost scenario to cover potential extension of personnel 2 M Currency Impact	LCPR033 OTLR045	0.5	\$0.25M associated with time and resources to support Valard quality rework oversight on AC foundations \$0.25M for Marshalling Yard operation	2.5	\$0.5M associated with time and resources to support Valard quality rework oversight on AC foundations \$0.5M for additional Marshalling Yard operation \$0.5M for CF(L)Co support \$1M for 2FTE for 18 months	LCPR033 (Poor contractor performance) OTLR045 (Systematic Construction quality problems) - could be covered by existing MFL FFC	138.9	144.9
D.h - Land Acquisition and Permits	1.1	1.1	Existing budget	1.1			1.1			0.0		0.0			1.1	1.1
D.i - Third Party Quality Surveillance & Inspection Services	1.7	1.7	Existing budget	1.7			1.7			0.0		0.0			1.7	1.7
D.j - Freight Forwarding Services	22.1	21.9	Existing budget	18.4			18.4			0.0		0.0			18.4	18.4
D.k - Environmental	0.8	0.8	Existing budget	0.7		Reconciliation with the JDE system of finance	0.7			0.0		0.0			0.7	0.7
D.l - Aboriginal	0.2	0.2	Existing budget	0.2			0.2			0.0		0.0			0.2	0.2
Total, C\$ MM	188.3	188.3		176.5			180.5			5.0		10.3			181.5	190.7
Contingency - LTA	17.8	17.6														
Total LTA, C\$ MM	877.6	877.6		836.2			878.4			11.4		31.5			847.6	909.9

Labrador Island Transmission Link Cost Review

Cost Category	AFE Rev2 (C\$ MM)	Current Published Final Forecast Cost		Internal FFC Range				Risk Range					TOTAL		
		Value (C\$ MM)	Basis	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID#	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes:	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
B.f - Island System Upgrades - Holyrood Conversion + Breakers + AC Rebuilds	37.8	37.6	19.1 M construction of the AC line on the Island 15 M ECC upgrades, and breakers at Bay D'espoirt	37.6		37.6			0.0		1.0	Scope growth		37.6	38.6
B.g - Clearing of Right of Way for HVdc Transmission Line	360.0	360.0	298 M of Clearing compared to 365 M in the real FFC The 365 M includes 30 M for Long range mountains & 34 M for blocks 17/18 62 M for Valard part B compared to 85.5 M in the real FFC	440.0	80 M for clearing and accesses (latest FFC of 90 M minus 10%)	470.0	110 M for clearing and accesses (latest FFC of 90 M plus 20%)	OTLR031 OTLR032 OTLR033 OTLR039 OTLR040 OTLR041 OTLR044 OTLR050	30.0	OTLR031: \$10M extra for LRM and \$10M extra for Blocks 17 & 18. OTLR033: No impact OTLR039: No impact - single season OTLR040: \$5M for removal and remediation of water crossings. OTLR041: Carried in FFC. OTLR044: \$7.5M extra for SPRR damage, plus work in other block Assume we backcharge \$2.5M from Valard for helicopter allowance contained in estimate	\$1.0	OTLR031: \$15M extra for LRM (second season) and \$15M extra for Blocks 17 & 18. OTLR033: \$1M of extra work for re-route in Blocks 17 & 18 OTLR040: \$10M for removal and remediation of water crossings. OTLR041: Carried in FFC. OTLR044: 15M extra for SPRR damage, plus work in other blocks. Assume we backcharge \$5M from Valard for helicopter allowance contained in estimate	OTLR031 (Access scope growth)- Value part of the Internal FFC OTLR032 (Construction permit delays)- Value part of the Internal FFC OTLR033 (ROW route changes) - Value part of the Internal FFC OTLR039 (LRM Construction Duration) OTLR040 (Temporary water crossing removal post construction) OTLR041 (Valard Part B management) - Value part of the Internal FFC OTLR050 (Construction access cost exposure due to poor on-site geotech for blocks 15 - 18) OTLR044 (Spring Break-up)	470.0	521.0
B.h - Construction of 350 KV HVdc Transmission Line	840.2	840.8	2 M labor trade escalation for 1 year 2.8 M for foundation cost increase due to design changes 5 M for increase in backfill quantities 8 M for Argentina NY	841.0		858.8	10 M for potential overall variance with Valard Contract 8 M for escalation	OTLR029 OTLR030 OTLR035 OTLR039 OTLR051 LCPR033	33.5	Allowance of \$8M in base case FFC for Argentina MY is not required OTLR029: \$20M for extra H-pile and micropile foundations OTLR030 and 51: In order to achieve the best case schedule (August 2016) we must offset any frivolous claims Valard may table with LD deferment, plus throw a \$20M incentive on the table. OTLR035: \$0.5M allowance for rescheduling slack spans in Labrador, plus \$1M for other interface related issues (e.g. Segment 5 OPGW availability)	57.0	OTLR029: \$50M for extra H-pile and micropile foundations OTLR030: 0 \$ OTLR035: 0.5 \$ OTLR039: 0 \$ OTLR030 and 51: Mitigated Worst case schedule scenario (Q4- 2017). LDs traded off against incentive plus closure of any frivolous claims. OTLR035: \$0.5M allowance for rescheduling slack spans in Labrador, plus \$1M for other interface related issues (e.g. Segment 5 OPGW availability) \$10M for other miscellaneous issues.	OTLR029 (Differing Geotechnical conditions and impact on Foundation Installation) OTLR030 (Valard's performance) - To be traded with LDs OTLR035 (Integration - Impact on C4 scope) OTLR039 (LRM Construction Duration) - Contractor's responsibility OTLR051 (Potential commercial claims from contractors) LCPR033 (Poor contractor performance) - Delays impact on MY	874.5	915.8
B.j - Material Supply - 350 KV HVdc	218.8	225.9	0.5M growth allowance for Towers 1.1 M growth for Hardware 0.5 M growth for pole supply 0.1 M growth for OPGW	225.9		230.4	4 M allowance for change in structure types and additional anchors	OTLR029	1.0	OTLR029: 1 \$	3.0	OTLR029: 3 \$	OTLR029 (Differing Geotechnical conditions and impact on Foundation Installation)	225.9	233.4

Labrador Island Transmission Link Cost Review

Cost Category	AFE Rev2 (C\$ MM)	Current Published Final Forecast Cost		Internal FFC Range				Risk Range				TOTAL			
		Value (C\$ MM)	Basis	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID#	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes:	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
B.m - SOBI Landfall / HDD Scope	72.5	72.5		68.5	Overall saving on final forecasted quantities	72.5		LCPR012 LCPR033 MCTRO01 MCTRO02 MCTRO03 MCTRO06 MCTRO07	0.0		0.0		LCPR012 (Effective interface management and coordination) LCPR033 (Poor contractor performance) MCTRO01 (MWS unknown requirements) MCTRO02 (C3 Construction interface) MCTRO03 (Overarching project schedule changes) MCTRO06 (Protests/Vessel interference) MCTRO07 (Sea Ice season in SOBI)	68.5	72.5
B.n - SOBI Cable Supply & Install	154.9	154.9		147.9	Overall saving on final forecasted quantities	154.9		MCTRO08 MCTRO09 MCTRO10 MCTRO12 MCTRO13 MCTRO14 MCTRO16 MCTRO17	0.0		0.0		MCTRO08 (Unexpected conduit conditions) MCTRO09 (Marine campaign readiness) MCTRO10 (Poor weather conditions) MCTRO12 (Pull-in arrangement) MCTRO13 (Nexans readiness) MCTRO14 (Insufficient site resources - contractor) MCTRO16 (Quay degradation prior or during installation) MCTRO17 (Excess rock requirements)	147.9	154.9
B.o - SOBI Seabed Protection	87.4	87.4		83.4	Overall saving on final forecasted quantities	87.4			0.0		0.0			83.4	87.4
B.x - Spares	0.0	0.0		0.0	spares were added to the TL procurement contracts	0.0			2.0	Additional critical spares required for start-up	3.0	Additional spares required for start-up		2.0	3.0
Total, C\$ MM	2,646.4	2,654.0		2,703.6		2,815.7			95.0		141.8			2,798.6	2,957.5
General - LIL															
D.b - Integrated Commissioning Support Services	3.5	3.5	DG3 values	3.5	No additional cost, commissioning cost is included in contracts and the Owner MFL; this budget will constitute a contingency for the overall commissioning cost	3.5			6.8	3 FTE permit holder support required from NLH for 1 year - \$1M Extended dynamic commissioning support - 3FTE for 18 months @ 400k per year = \$1.8M Allowance for various third party expertise to support RFO readiness \$2M \$2M allowance for additional commissioning staffing from either Alstom or LCMC.	15.0	5 FTE permit holder support required from NLH for 1 year - \$1.5M Extended dynamic commissioning support - 5FTE for 18 months @ 400k per year = \$2.4M Allowance for various third party expertise to support RFO readiness \$6M \$5M allowance for additional commissioning staffing from either Alstom or LCMC.	DCSR004 (Availability of Experienced completions personnel) : Contractor and Client	10.3	18.5
D.c - Project Vehicles	5.3	5.3	Revised budget at AFE rev2	5.3		5.3			1.0	\$1M for schedule related delay - 10 replacement vehicles required given age of fleet.	2.0	\$2M for schedule related delay - 20 replacement vehicles required given age of fleet.		6.3	7.3
D.d - Helicopter Services	5.6	5.6	Revised budget at AFE rev2	5.6		7.6	2 M increase to the LIL budget to cover constraints in the DC line construction, especially in the Long range mountains		0.0		0.0			5.6	7.6
D.e - Insurance	9.9	9.9	Revised budget at AFE rev2	10.6	Increase of insurance cost due to the increase in the overall project budget; values were calculated by the Nalcor insurance team	10.6			0.0		0.0			10.6	10.6
D.f - Financing and Commercial	6.6	6.6	Revised budget at AFE rev2	6.6		7.6	1 M Increase in Legal costs to cover potential litiges in the Valard and Alstom contracts		3.0	\$1M extra labor relations cost provision for management support. \$2M extra provisional allowance for legal support to resolve disputes and claims.	10.0	\$1M extra labor relations cost provision for management support. Provisional allowance of \$10 M to address extensive disputes with either of Valard or Alstom. In the case of the latter, it may be trigger by inability to hit operational performance targets.		9.6	17.6
D.g - Owner's Project Team	232.7	232.8	latest budget at AFE rev2 (short by more than 60 M compared to actual MFL)	287.8	40 M aligned with the latest MFL revision minus 5 M possible saving 20 M Currency Impact	300.8	40 M aligned with the latest MFL revision plus 5 M to cover potential extension of personnel 23 M Currency Impact	DCSR004 DCSR110 LCPR003 LCPR037 LCPR049 MCTRO04 OTLR045	18.0	\$15 M extra allowance to cost schedule related delay scenario for 150 persons required for 6 months.	45.0	\$45M extra allowance to cost schedule related delay scenario for 150 persons required for 18 months.	DCSR110 (C4 schedule slippage causing delays in C3 commissioning) - 4 to 8 Months LCPR003 (Final project integration) - Part of DCSR004 LCPR037 (System interfaces - Emera, NLH) - Part of DCSR004 LCPR049 (Managing contractor performance under T&M scheme) MCTRO04 (Delay to completion / commissioning handover) OTLR045 (Systematic construction quality problems)	305.8	345.8
D.h - Land Acquisition and Permits	19.6	19.6	Revised budget at AFE rev2	22.1	Increase in the land acquisition cost for the DC line portion	22.1			0.0		0.0			22.1	22.1
D.i - Third Party Quality Surveillance & Inspection Services	4.3	4.3	Revised budget at AFE rev2	4.3		4.3		OTLR045	0.5	OTLR045: 0.5 \$	1.0	OTLR045: 1 \$	OTLR045 (Systematic construction quality problems)	4.8	5.3
D.j - Freight Forwarding Services	42.4	42.4	Revised budget at AFE rev2	47.2	Increase in the land transport cost from the Marshaling yards to site on the DC line (based on latest requirement estimates)	48.1	Increase in the land transport cost from the Marshaling yards to site on the DC line		2.6	Delay by Valard requires maintain Labrador MY an additional 6 months at \$400k per month, plus Argentina MY for 2 months at @400k/month	4.8	Delay by Valard requires maintain Labrador MY an additional 6 months at \$400k per month, plus Argentina MY for 6 months at @400k/month		49.8	52.9
D.k - Environmental	14.4	14.4	Revised budget at AFE rev2	17.8	Reconciliation with the JDE system of finance	17.8			0.5	\$0.5M for avifauna support in 2016	0.5	\$0.5M for avifauna support in 2016		18.3	18.3
D.l - Aboriginal	2.7	2.7	Revised budget at AFE rev2	1.7	saving on the LIL section	1.7		OTLR018	0.0	OTLR018: 0 \$ - risk does not materialize	1.0	OTLR018: \$1M cost for Force Majeure event	OTLR018 (Opposition by First Nations Groups)	1.7	2.7
Total, C\$ MM	347.0	347.3		412.6		429.5			32.4		79.3			445.0	508.8
Contingency - LIL	95.9	87.9													
Total LIL, C\$ MM	3,089.4	3,089.2		3,116.2		3,245.2			127.4		221.1			3,243.6	3,466.3

ATTACHMENT A.17



LIL / LTA Risk Analysis Results

Mon 03/14/2016 2:15 PM - 3:15 PM

[Hide Details](#)

Attendance is **required** for Jason Kean

Chair: **Bev Tucker/NLHydro**

Location: EJM meeting room



This entry has an alarm. The alarm will go off 15 minutes before the entry starts.

Required:

Brian Crawley/NLHydro@NLHydro, Gilbert Bennett/NLHydro@NLHydro, Jason Kean/NLHydro@NLHydro, Karen O'Neill/NLHydro@NLHydro, Paul Harrington/NLHydro@NLHydro

Description

This meeting was requested by Paul Harrington to discuss data before the EY and OC reports are released and the media is involved.

Personal Notes

LTA-LITL Cost and Schedule Risk Assessment

14-Mar-2016

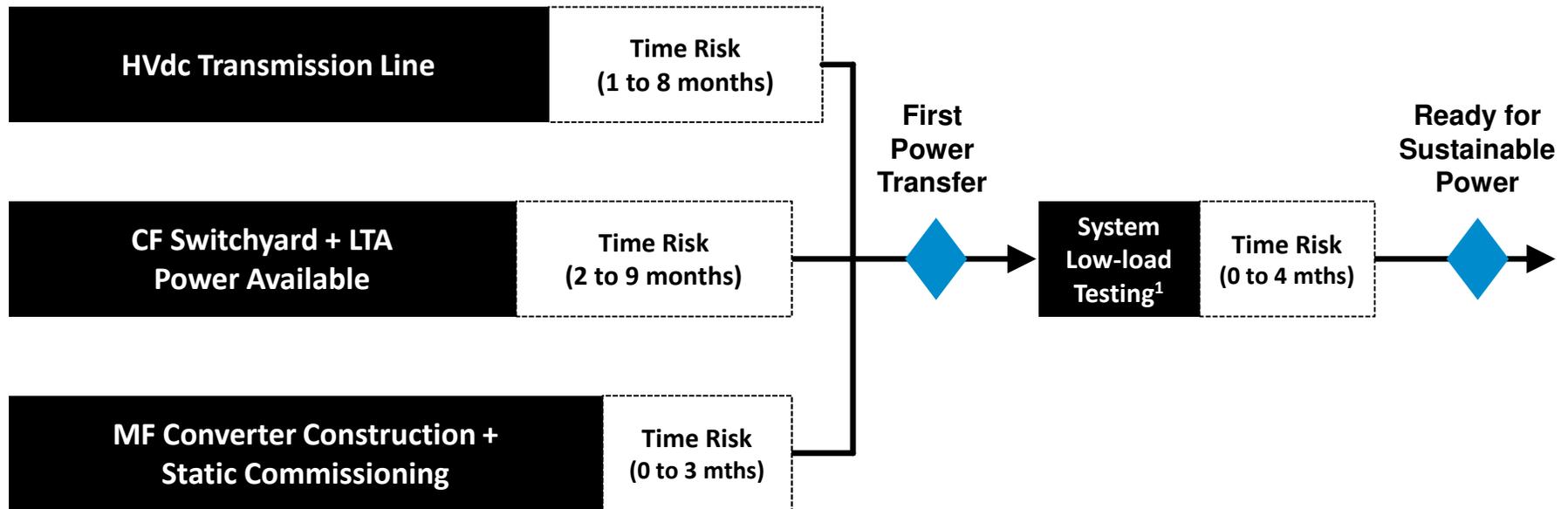
Boundless Energy



Background

- Westney engaged in December to support LCMC's planned cost and schedule risk assessment ("QRA") for LCP
- QRA broken into 2 separate reports: LTA /LITL and MF

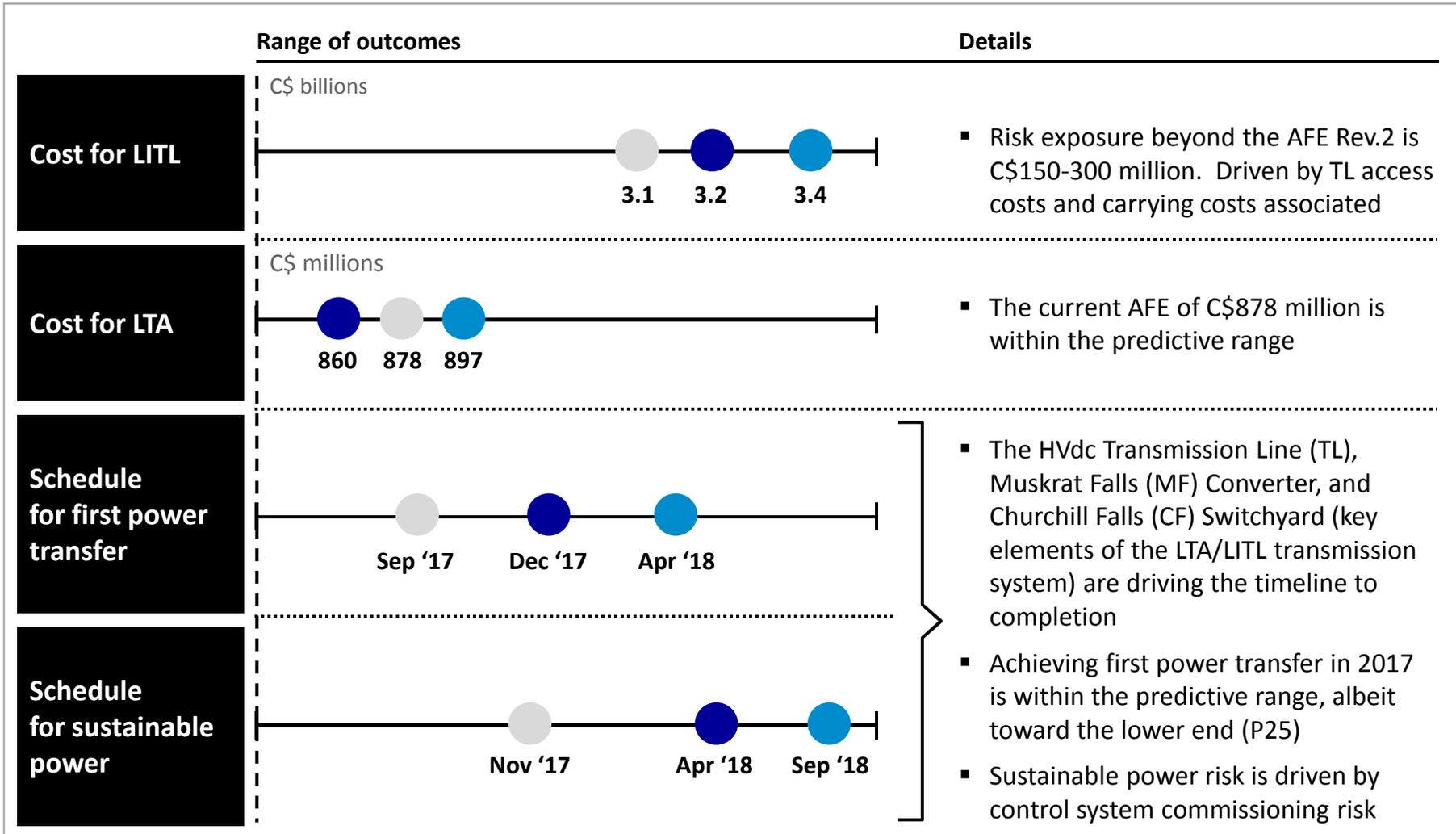
3 separate work streams drive the schedule for LTA/LITL energization and first power transfer from Labrador



¹System low-load testing with 70 MW block of recall power from Churchill Falls

Prediction Ranges for LITL/LTA Cost and Schedule

● Current AFE / sanction schedule ● Bottom of Predictive Range (P25) ● Top of Predictive Range (P75)



LITL Major Cost Drivers

Risk	Mean impact C\$ millions	Best-worst case C\$ millions	Details
Un-risked LITL cost	2,993		<ul style="list-style-type: none"> AFE Rev.2 less available contingency¹
A Access for HVdc transmission line	138	110 to 160	<ul style="list-style-type: none"> Unfunded scope - LRM and Avalon Peninsula Uncertainty re: winter access in Labrador & Eastern NL and remediation plans post-constr.
B Owner's project costs	97	75 to 116	<ul style="list-style-type: none"> Carrying costs to maintain team to lengthen schedule plus additional resources to manage underperforming contractors
C Construction of 350 kV HVdc transmission line	19	-6 to 40	<ul style="list-style-type: none"> Geotechnical conditions requiring more expensive H-piles Offset by anticipated recovery of partial LDs
D Converters - MF and Soldier's Pond	16	-5 to 35	<ul style="list-style-type: none"> Open change request (e.g. filters, etc.) and allowances for ECNs driving outlook Offset by anticipated recovery of partial LDs
E All other risks	59	37 to 80	<ul style="list-style-type: none"> Reference breakdown of tactical risks
Risk-adjusted LITL cost (P25 to P75)		3,248 - 3,384	

¹Total amount with contingency is C\$3,089 million



ATTACHMENT A.18



RE: Final version of LTA/LITL

Justin Dahl

to:

JasonKean@lowerchurchillproject.ca

05/30/2016 06:02 PM

Cc:

Kelly Clifton, "Meade, Aidan"

Hide Details

From: Justin Dahl <j_dahl@westney.com>

To: "JasonKean@lowerchurchillproject.ca" <JasonKean@lowerchurchillproject.ca>

Cc: Kelly Clifton <k_clifton@westney.com>, "Meade, Aidan"

<aidan.meade@mcinnescooper.com>

1 Attachment



Nalcor Cost and Schedule Risk Assessment LTA-LITL V_F 053016.pptx

PRIVILEGED AND CONFIDENTIAL IN CONTEMPLATION OF LITIGATION

Jason – doc attached.

Justin

From: JasonKean@lowerchurchillproject.ca [<mailto:JasonKean@lowerchurchillproject.ca>]

Sent: Monday, May 30, 2016 3:04 PM

To: Justin Dahl <j_dahl@westney.com>

Cc: Kelly Clifton <k_clifton@westney.com>

Subject: Fw: Final version of LTA/LITL

Justin,

Can you please confirm receipt of this email and status of my request.

Jason

Jason R. Kean, P.Eng., MBA, PMP

Deputy General Project Manager (Consultant to LCMC)

PROJECT DELIVERY TEAM

Lower Churchill Project

t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787

e. jasonkean@lowerchurchillproject.ca

w. muskratfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

----- Forwarded by Jason Kean/NLHydro on 05/30/2016 05:33 PM -----

From: Jason Kean/NLHydro

To: Justin Dahl <j_dahl@westney.com>

Date: 05/27/2016 11:47 AM

Subject: Re: Final version of LTA/LITL

Justin,

Can you please indicate on the cover that the report is based upon analysis completed in February 2016 as the cover indicates May 2016 which could be interpreted as analysis date.
To avoid confusion replace May 2016 with February - March 2016.

Jason

Jason R. Kean, P.Eng., MBA, PMP
Deputy General Project Manager (Consultant to LCMC)
PROJECT DELIVERY TEAM
Lower Churchill Project
t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787
e. jasonkean@lowerchurchillproject.ca
w. musktratfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

From: Justin Dahl <j_dahl@westney.com>
To: "JasonKean@lowerchurchillproject.ca" <JasonKean@lowerchurchillproject.ca>
Cc: "Meade, Aidan" <aidan.meade@mcinnescooper.com>, Keith Dodson <k_dodson@westney.com>
Date: 05/24/2016 08:22 PM
Subject: Final version of LTA/LITL

PRIVILEGED AND CONFIDENTIAL IN CONTEMPLATION OF LITIGATION

Jason,

Please see the final version of the LTA/LITL doc with the changes you requested.

Justin

Justin Dahl
Principal

Westney Consulting Group
P: 713.861.0800 | F: 713.861.6340
D: 713.960.4931 | M: 281.615.7054
E: j_dahl@westney.com
www.westney.com

[attachment "Nalcor Cost and Schedule Risk Assessment LTA-LITL V_F 052416.pptx" deleted by Jason Kean/NLHydro]



LCP Cost and Schedule Risk Assessment - LTA/LITL

Final report

February - March 2016

PRIVILEGED AND CONFIDENTIAL IN CONTEMPLATION OF LITIGATION



Contents

Details	Page
Summary	2
Key mitigations	3
Background and objectives	4
Overview of Westney support	5
Cost- and time-risk output overview	6
Observations regarding concurrent critical paths	7-8
Schedule-risk analysis for LITL/LTA	9
Cost-risk analysis for LITL	10-16
Cost-risk analysis for LTA	17-18
Appendix	19
HVac & HVdc TL progress	20
Contract overview	21
Risk frame #1	22
Detailed cost- and time-risk analysis	23-32
Risk Resolution® methodology	33-34
Disclaimer	35

Summary for LTA / LITL

Westney Consulting Group (WCG), in concert with LCMC, completed a risk-adjusted view of cost and schedule for both Labrador Transmission Assets (LTA) and Labrador-Island Transmission Link (LITL).

- Predictive range (P25 - P75) for cost is:
 - » LTA: C\$860 to C\$897 million compared to the current AFE of C\$878 million
 - » LITL: C\$3.2 to C\$3.4 billion compared to the current AFE of C\$3.1 billion
- Predictive range (P25 - P75) for schedule for LTA-LITL energization / first power transfer is 14 December 2017 to 20 April 2018, compared to the current schedule date of 08 September 2017
- Predictive range (P25 - P75) for schedule for LTA-LITL final commissioning (completion of low-load testing) is 09 April 2018 to 20 September 2018, compared to the current schedule date of 13 November 2017

The primary cause for the increase in cost to-date for LITL, and the biggest cost-risk to completion for LITL, is the difficulty in establishing construction access along the length of the transmission line versus that assumed in the estimates and bids.

The effort to establish “fit-for-purpose” access to what is the longest single transmission project completed in North America in recent times in remote and challenging terrain was underestimated by both Valard and LCMC. On-site conditions, challenging spring break-ups, unpredictable winters for iced roads, heavy snowfall, difficult logistics, lack of existing infrastructure, and permitting are amongst many of the contributing factors that have led to the significant increase in cost (spent to-date). Despite a large portion of the access has now been completed, the Project has yet to tackle the Long Range Mountains (LRM), while Valard’s lack of progress in the interior of Labrador winter zone leaves residual cost exposure.

LTA and LITL have a number of sub-critical path activities that each have time-risk, which when combined are threatening the likelihood of LTA/LITL Energization in 2017.

The HVdc Transmission Line (TL), Muskrat Falls (MF) Converter, and Churchill Falls (CF) Switchyard (each key elements of the LTA/LITL transmission system) are driving the timeline to completion, attributable largely to contractor performance issues. The risk characteristics of the TL (contracted to Valard) are vastly different than the scope under Alstom’s control (MF and CF). While a significant volume of work remains for the TL, Valard, with backing by Quanta Services, has the potential to deploy additional resources across the linear project in order to minimize schedule delay; however, activity is strongly influenced by weather (e.g. Long Range Mountains, winter zones, and spring break-up). Alstom Management’s timely response to the delays and improved subcontractor management will be critical in order to improve the likelihood of completion of the HVdc specialties scope (MF and CF) in a time required to energize the TL.

Note: Risk modeling does not consider any organizational risk related to readiness for operations/transition to operations elements of the project and its potential impact on first power transfer

There are a 4 key mitigations to consider for LTA-LITL first power that, if successful, could increase likelihood of power in 2017

- 1 Resolve Alstom's performance issues
- 2 Resolve Valard's performance issues
- 3 Consider seasonal access risk reduction measures for TL construction
- 4 Develop a detailed risk mitigation strategy to reduce time-risk for low-load testing

An updated, risk-adjusted view of cost and schedule was requested for the Lower Churchill Project

Background

- LCMC is in the construction phase of the Lower Churchill Project, which includes Muskrat Falls Generation (MFG), Labrador Transmission Assets (LTA), and Labrador Island Transmission Link (LITL)
- Westney Consulting Group (WCG) has completed cost and schedule risk analyses at several Lower Churchill Project milestones
- An updated cost and schedule analysis was requested to understand how the potential cost and schedule outcomes have evolved

Objectives

WCG, in concert with LCMC, was tasked to:

1. Develop a cost-risk analysis for the MF, LTA, and LITL sub-projects, including identification and quantification of risks most likely to affect the projects
2. Develop a time-risk analysis for the MF, LTA, and LITL sub-projects
3. Identify and recommend potential mitigations to identified risks, as appropriate

This report covers the LTA/LITL portion of the Lower Churchill Project only. The MFG portion is covered in a separate report.

Westney has supported the Lower Churchill Project at several critical points

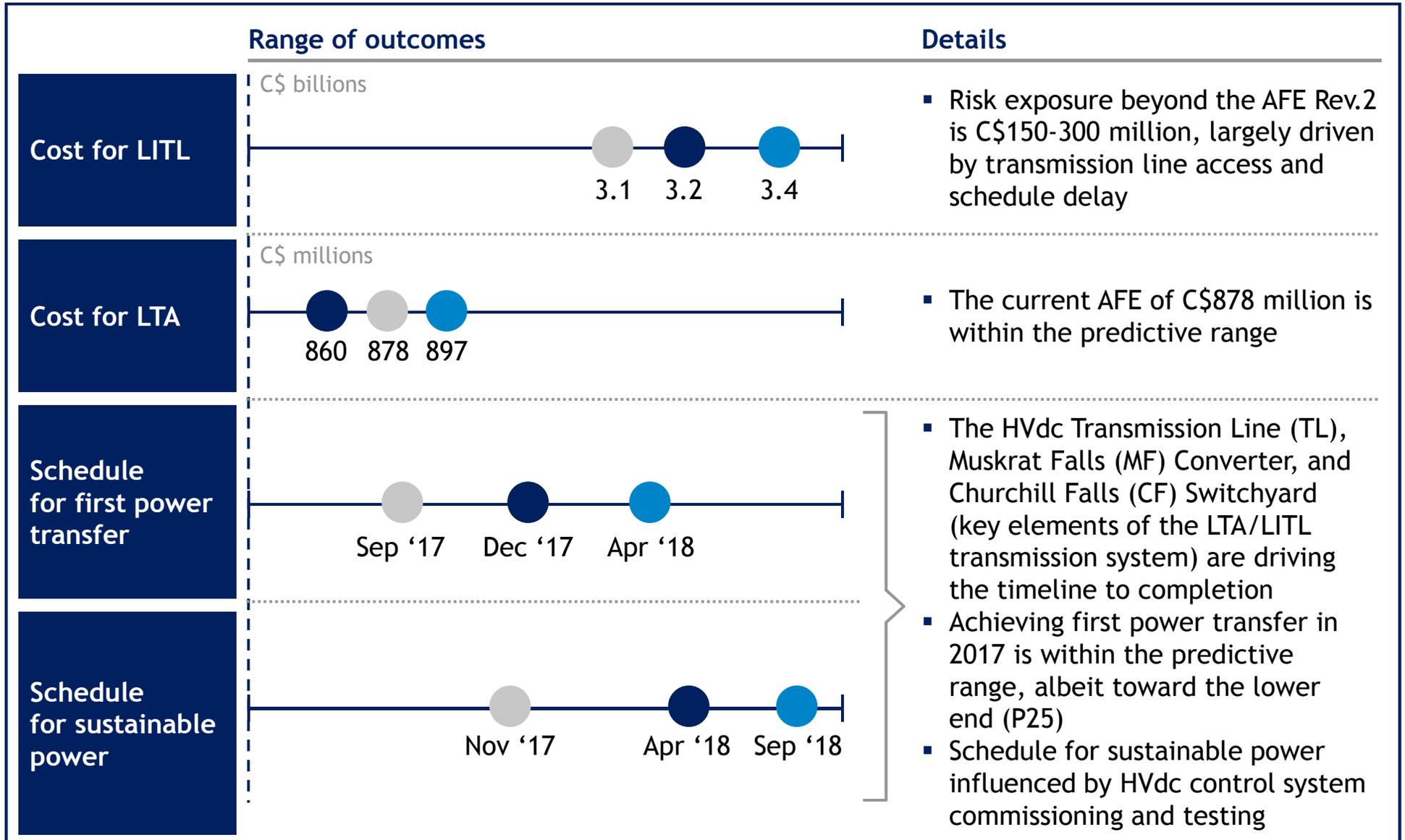
Scope of Westney support on risk analyses has varied slightly from year to year

✓ Analysis included in scope

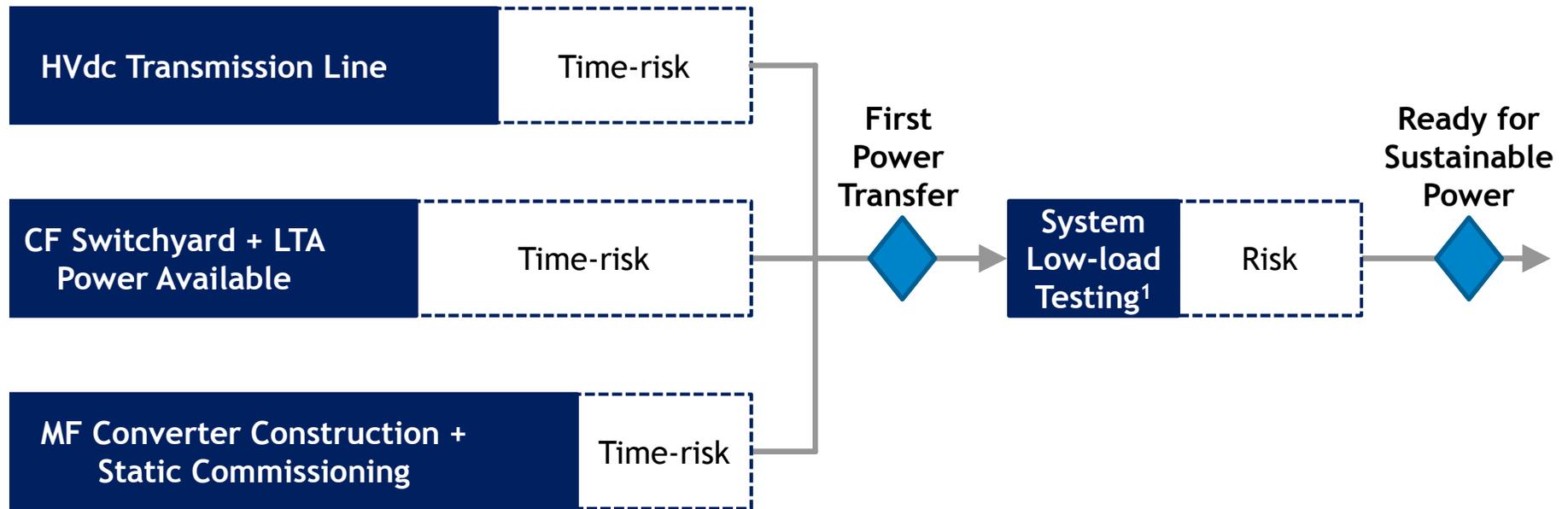
Scope of support	Projects included in analysis		Analysis completed		
	MF	LTA/LITL	Cost	Schedule	Other
2008-11 <ul style="list-style-type: none"> Front-end planning support providing a risk-adjusted view of cost and schedule (Westney’s Risk Resolution®) Scope included detailed risk frames, key risks, and mitigations 	✓	✓	✓	✓	
2010 <ul style="list-style-type: none"> EPCM mobilization readiness initiative to ensure owner’s responsibilities were understood 	✓	✓			✓
2012 <ul style="list-style-type: none"> Project sanction support to check estimate accuracy and assess appropriate level of contingency 	✓	✓	✓	✓	
2015-16 <ul style="list-style-type: none"> Updated view of risk-adjusted cost and schedule given current construction status Additional support evaluating Astaldi construction capability and cost to complete 	✓	✓	✓	✓	✓

Predictive ranges for LITL/LTA cost and schedule...

● Current AFE / sanction schedule ● Bottom of Predictive Range (P25) ● Top of Predictive Range (P75)



3 concurrent sub-critical paths drive the schedule for LTA/LITL energization and first power transfer from Labrador



¹ System low-load testing with 70 MW block of recall power from Churchill Falls

² Modeling assumes that 735kV portion of the new CF switchyard is energized before GWAC commencement on 1-Nov-2017

- The transmission system has been designed to facilitate low-load power transfer from Churchill Falls to the Island in the absence of Muskrat Falls Generation
- The system as designed is limited by:
 1. Reactive power support capacity at Muskrat Falls
 2. Available energy from Churchill Falls
- Integration and start-up of the HVDC link under low-load power testing is considered much simpler than full dynamic commissioning using Muskrat Falls

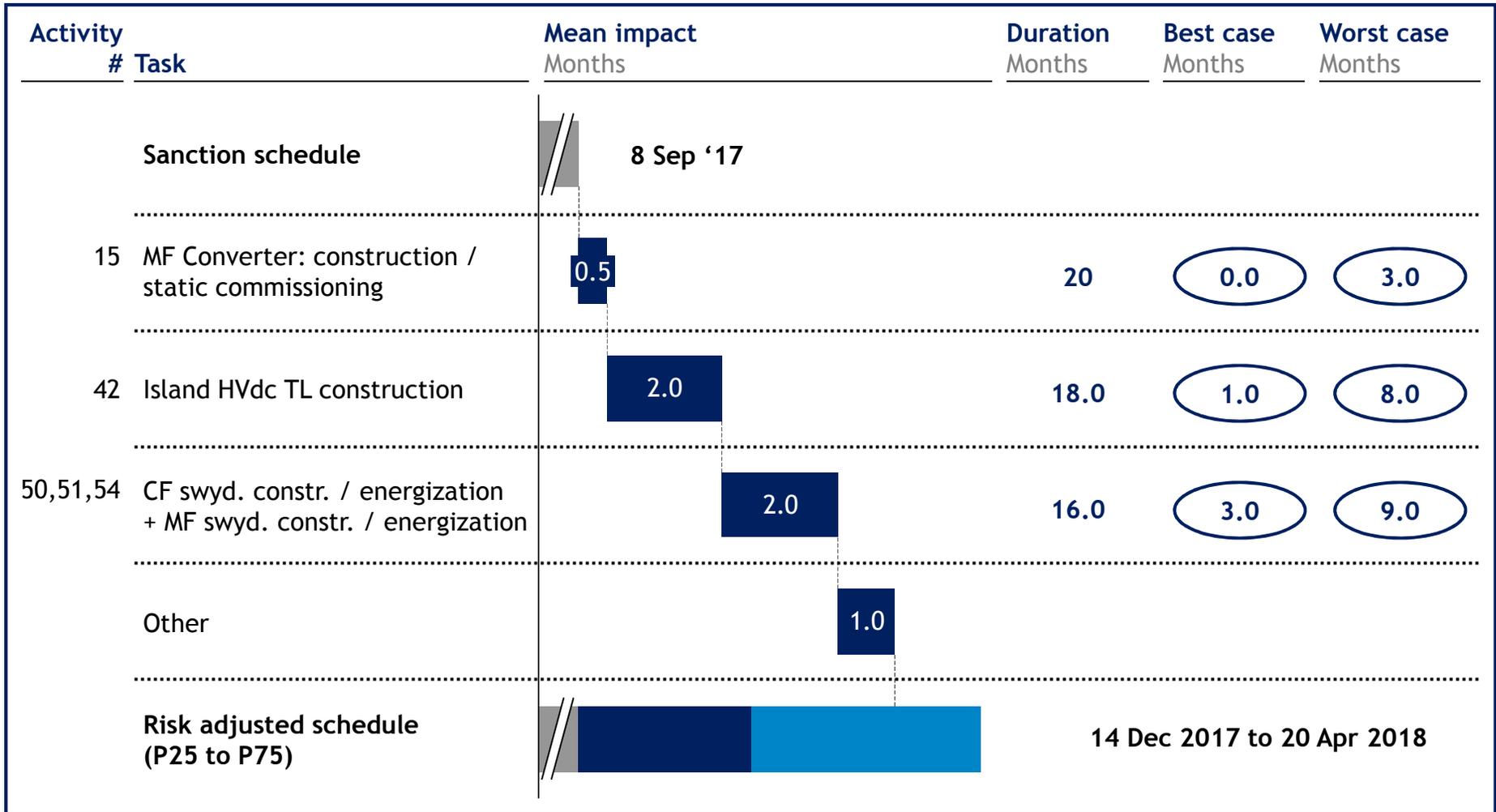
Risk mitigation measures must consider existence of concurrent critical paths

Observations on risk mitigation strategies

- LCMC should balance efforts to mitigate time risk in any/all of the concurrent schedule paths in order to mitigate overall time-risk exposure
- Risk characteristics of each of the Alstom and Valard scopes are dramatically different; mitigation measures must be designed and evaluated accordingly
- Mitigation strategies must consider the net financial benefit to be derived (i.e., early power will replace Island generation)
- Aggressive time-risk mitigation for commissioning and start-up provides the greatest opportunity for time-risk reduction per dollar spent on risk mitigation measures. Time-risk exposure for system low-load testing is inversely proportional to time made available for bench-testing Alstom's HVdc control system

Note: Risk modeling does not consider any organizational risk related to readiness for operations/transition to operations elements of the project and its potential impact on first power transfer

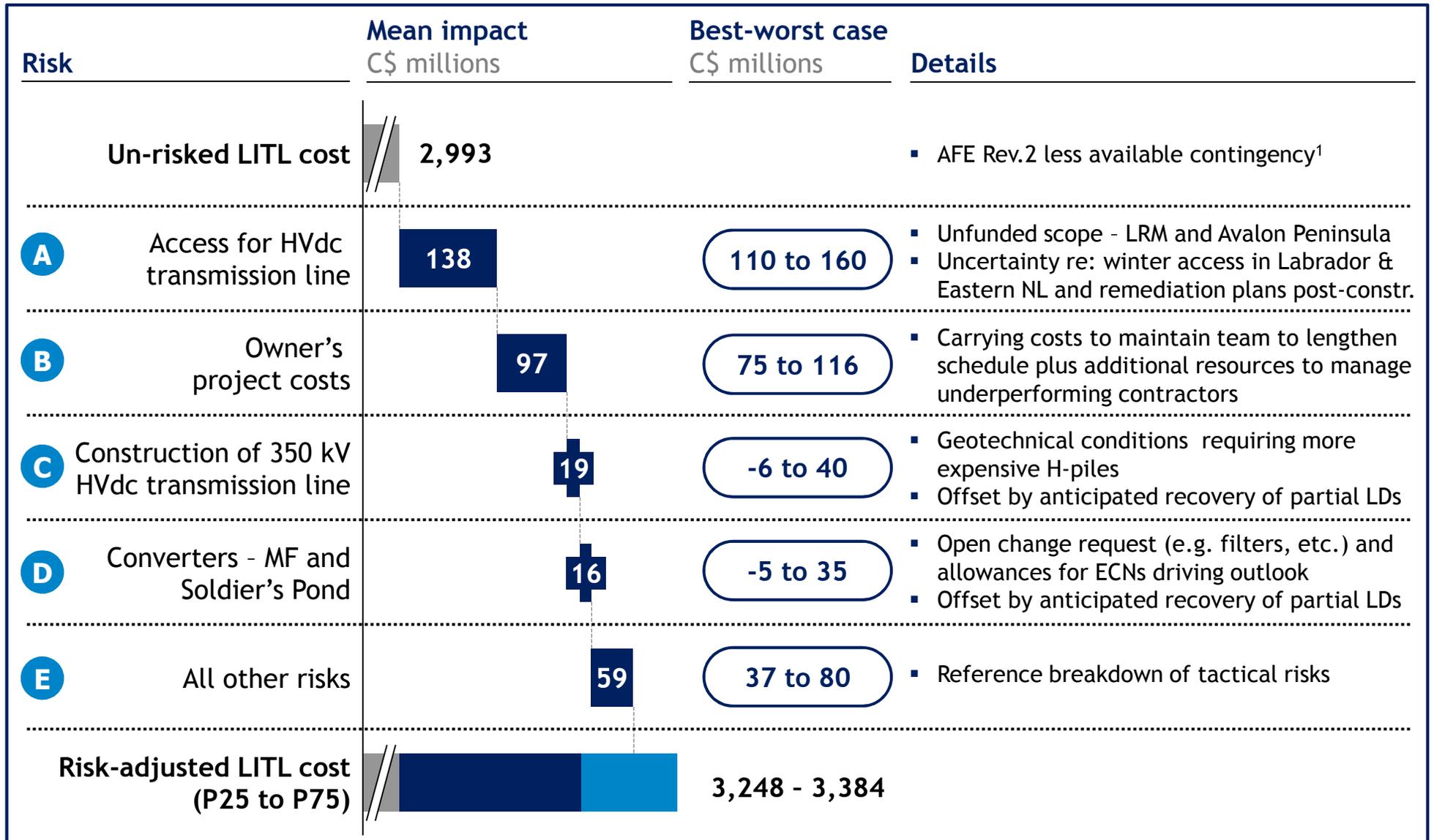
There are 3 key drivers of first power transfer for LITL/LTA



The system will undergo low-load testing (2 month duration) after first power transfer, and before sustainable power is achieved. The risk range for this activity (best case-worst case) is 0-4 months, with a mean impact of 2 months.

Note: Risk adjusted schedule does not consider any NLH imposed system constraints (e.g., injecting LITL power during winter peak period of 15-Nov to 1-Apr)

TL access and owner’s project team are driving increased cost-risk for LITL; recovery of LDs could help offset cost



¹Total amount with contingency is C\$3,089 million

A Despite extensive progress in 2015, ROW access remains the largest cost exposure for LITL

Details

Underestimation of the work and lack of management by Valard

- The effort required to construct access was underestimated - the project’s design philosophy did not contemplate establishment of a permanent access network for construction or operations; no consideration was made for reliability gains to LITL that permanent line access would provide
- Valard has not fulfilled its contractual obligation for access management
- On-site ground conditions and a delay in the quarry permitting timeline has created inefficiencies and added cost

Much effort has been made to mitigate the potential impact

- LCMC has added additional resources to increase field planning and work management, thereby reducing performance cost risk prevalent with T&M contracts
- Significant amount of Island access has been completed and will support O&M activities, thereby enhancing overall LITL reliability
- Access has progressed to a point that it cannot be considered a constraint to TL construction

Residual risk remains

- Valard’s demand for “all-season” access is threatening winter zone strategies (segment 2 structures 1-235 and Terra Nova); further compounded by “uncharacteristically” mild winters
- Uncertainty remains for Long Range Mountains and impact of spring break-up on access roads (in particular St. Paul’s River Road)
- Valard likely to request LD deferment for lack of “all-season” access

B Additional owner’s project costs are anticipated for LITL

Driver	Impacts	Best case - worst case C\$ millions
<p>Additional LCMC staff to manage underperforming contractors</p>	<ul style="list-style-type: none"> ▪ Additional field staff to support the management of underperforming contractors ▪ Extended duration for follow-on engineering team ▪ Extended staffing duration / additional staff to support ROW clearing and access management scope ▪ Additional commissioning and start-up resources 	<p>20 to 55</p>
<p>Carrying cost for time-risk delay</p>	<ul style="list-style-type: none"> ▪ Schedule extension cost - predictive range of 3 to 9 months ▪ Extension of core team to support dynamic commissioning with delay in MF Unit 1 	<p>18 to 30</p>
<p>Other costs</p>	<ul style="list-style-type: none"> ▪ Third party geotechnical support services for TL ▪ Foreign currency exposure ▪ Labor relations support 	<p>27 to 31</p>

Impact C\$MM

75 - 116

C Valard is underperforming expectations, largely driven by poor field coordination and management

Key risk: Valard's performance

Details

- Valard has struggled to get organized on the HVdc line, while production and rework rates are outside expectations. Competency gaps are evident
- Based upon slippage to-date, Valard will not be able to deliver to their contractual date of 1-Jul-2017, with a risk of slippage into 2018. LCMC will be exposed to incremental cost for maintaining access for extension
- Systematic quality problems are leading to extensive rework, thus distracting from the forward progression of the line
- It is possible that Valard will present a claim against LITP in a attempt to seek relief from LDs

Mitigation

- Valard, with its parent Quanta Services, must develop and resource a re-baseline plan that demonstrates their ability to deliver the Project without further delay
- Adequate experienced PM and CM leadership must be deployed by Valard in order to rejuvenate the site teams
- Additional foundation and stringing crews are needed
- LCMC and Valard must address open commercial issues and agree the basis upon the TL will be completed in as timely a fashion as possible
- LCMC to ensure strong QA oversight over critical works

Progress to-date

	Installed (Oct '14 - Dec '15)	To- Go
Foundations	710	2,520
Tower Assembly	808	2,422
Tower Erection	264	2,966
Stringing	144	3,086

Note: Total structure count for HVdc TL is 3,230

Note: The above installed quantities are reflective of the HVdc TL only and do consider the total of 1,263 towers completed by Valard on the HVac TL in the period of Jan 2014 to Dec 2015.



Uncertain soil conditions challenge cost predictability

Key risk: Uncertain soil conditions

Details

Uncertain soil conditions lead to variability in installation cost

- Contract with Valard is a combination of Unit Price and L/S, with foundations paid based upon as-installed quantities by type (grillage, rock, pile, etc.)
- All quantities except foundation type are fixed; predicted trends are not holding
- Lack of pan-TL geotechnical data creates uncertainty re actual quantities to be installed
- Foundation solution exists for all conditions; H-pile is very expensive

Increasing predictability by advanced geo-data collection

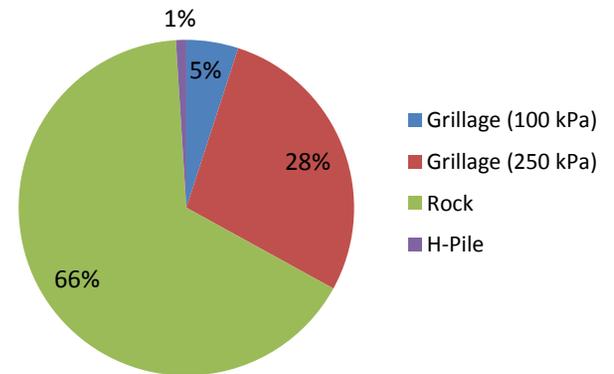
- LCMC have worked with Valard to implement further geotechnical data gathering in areas where uncertainty exists and schedule is constrained in order to reduce schedule risk due to surprises
- Alternate foundation solutions developed (micro-pile) to reduce reliance on costly H-pile

Residual risk remains

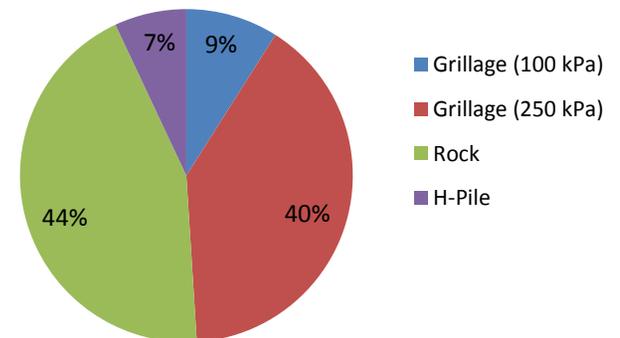
- Uncertainty remains until greater data is collected
- Labrador has tended to be less predictable than Island with expectations that more grillage and expensive H-pile will be required.

Plan versus actual/ forecast installation - segments 1 and 2

Tangent Structure - Planned Foundations (S1 & S2)



Tangent Structure - Actual / Forecast Foundations (S1 & S2)



Impact C\$MM

-6 - 40

D Alstom is not organized for successful delivery of a complex multi-site EPC program

Key Risk: Alstom's EPC Management Capability

Details

- Alstom has a significant scope spread across 3 large worksites and are leveraging subcontractors for execution
- Lack of leadership and accountability across all levels of the project team, likely compounded given distraction with recent acquisition by General Electric (GE)
- Minimal experience in delivery of large, complex projects resulting in a lack of integration of the various components (E, P, and C)
- Poor subcontractor management

Mitigation

- Alstom must assign the required support to its project director so as to ensure the depth of experience, leadership and organizational skills required for a project of this magnitude and complexity
- Supplement current team with highly qualified, experienced, and motivated personnel, to support project director with the mandate to deliver
- Assign additional competent resources to:
 - recover the schedule
 - ensure adherence to all contractual obligations
- LCMC to increase oversight resources over Alstom

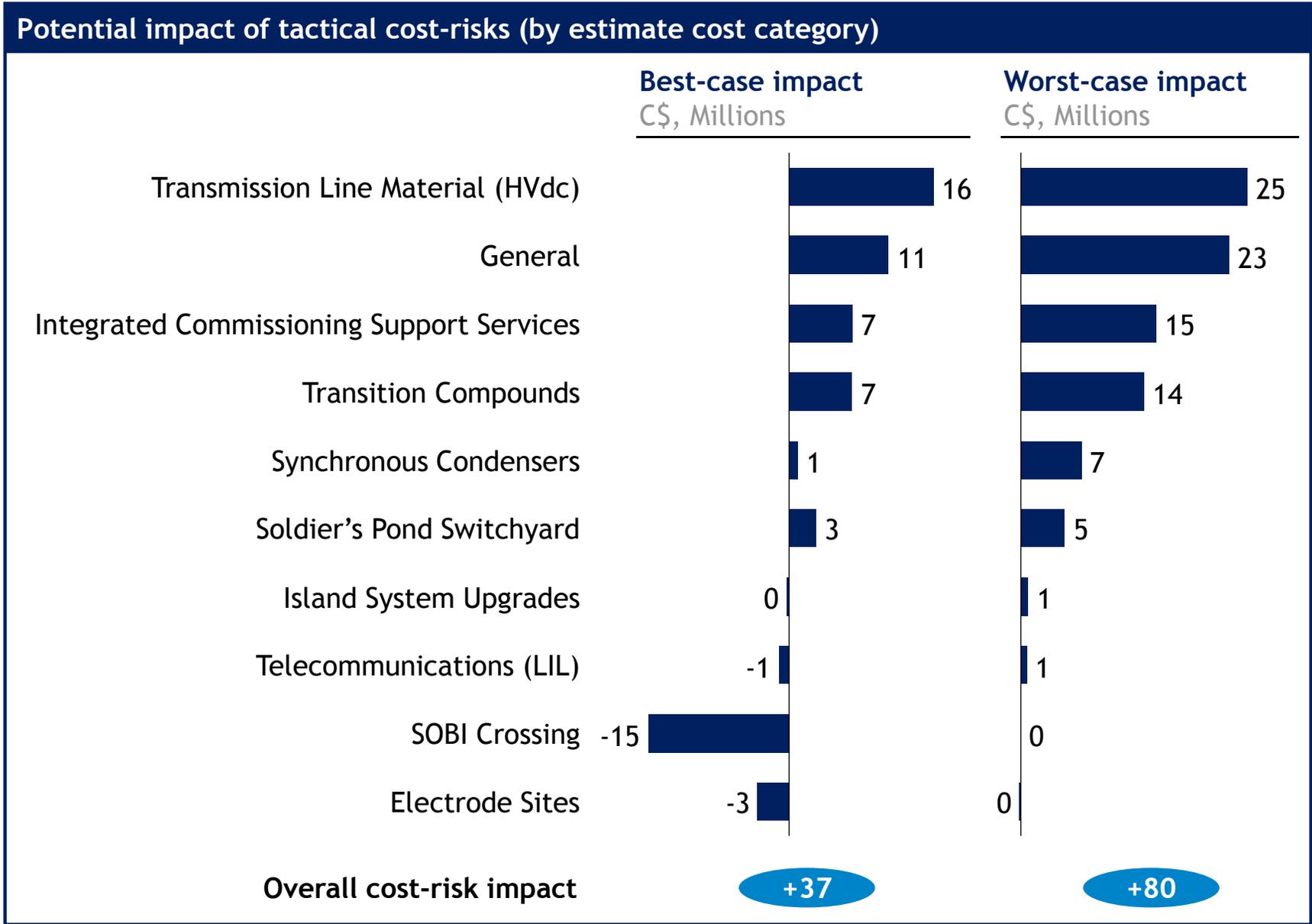
Alstom Progress (Dec 15)

CD0502	Dec-15	
	Baseline Planned (To Date)	Actual (To Date)
Phase		
Engineering	91.7%	60.6%
Procurement	75.4%	44.1%
Construction	52.7%	28.6%
Commissioning	0.0%	0.0%
Overall	63.1%	38.0%

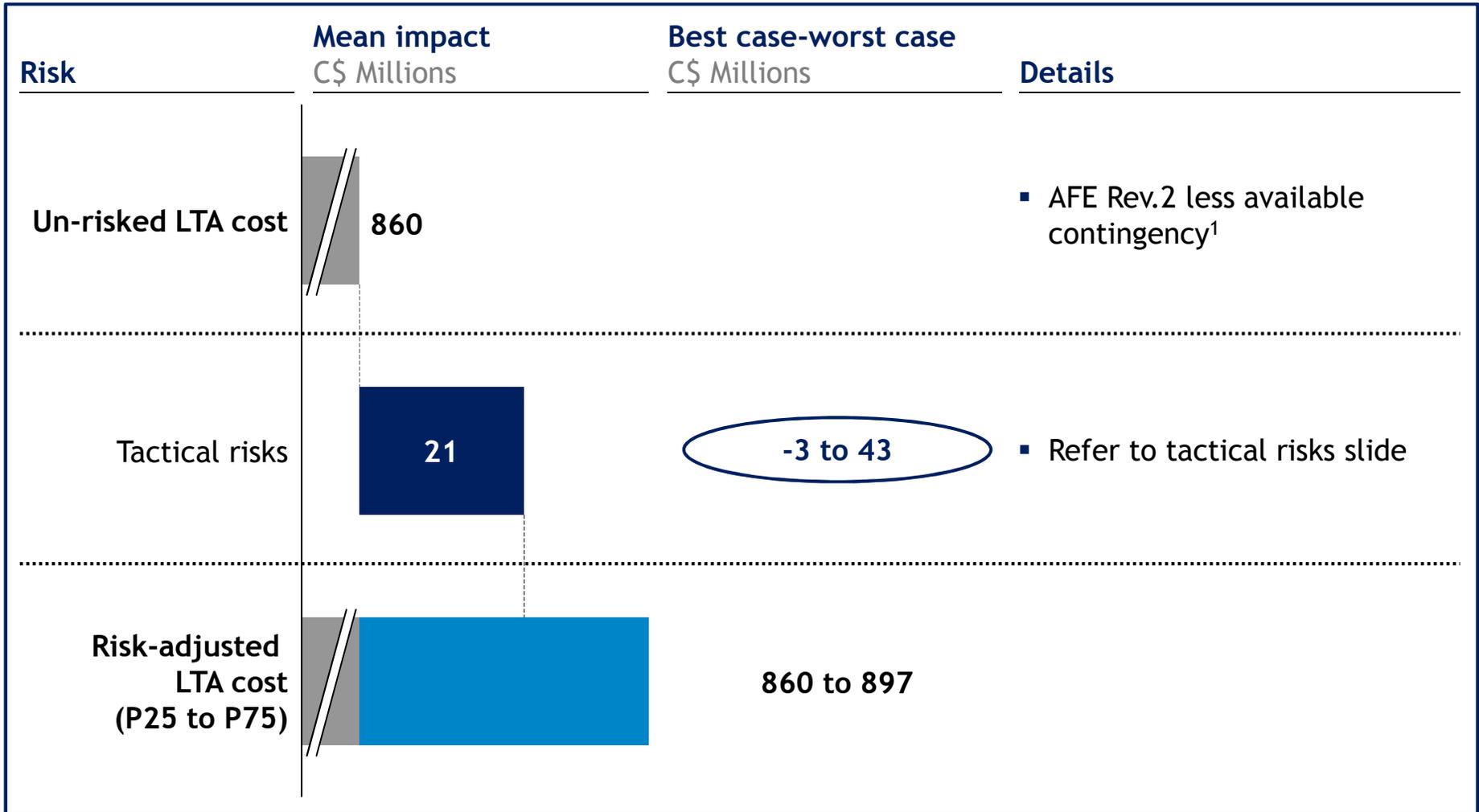
CD0501	Dec-15	
	Baseline Planned (To Date)	Actual (To Date)
Phase		
Engineering	91.2%	59.5%
Procurement	57.0%	28.0%
Construction	23.7%	7.8%
Commissioning	0.0%	0.0%
Overall	48.5%	23.6%

E

Several smaller risks could also impact LITL

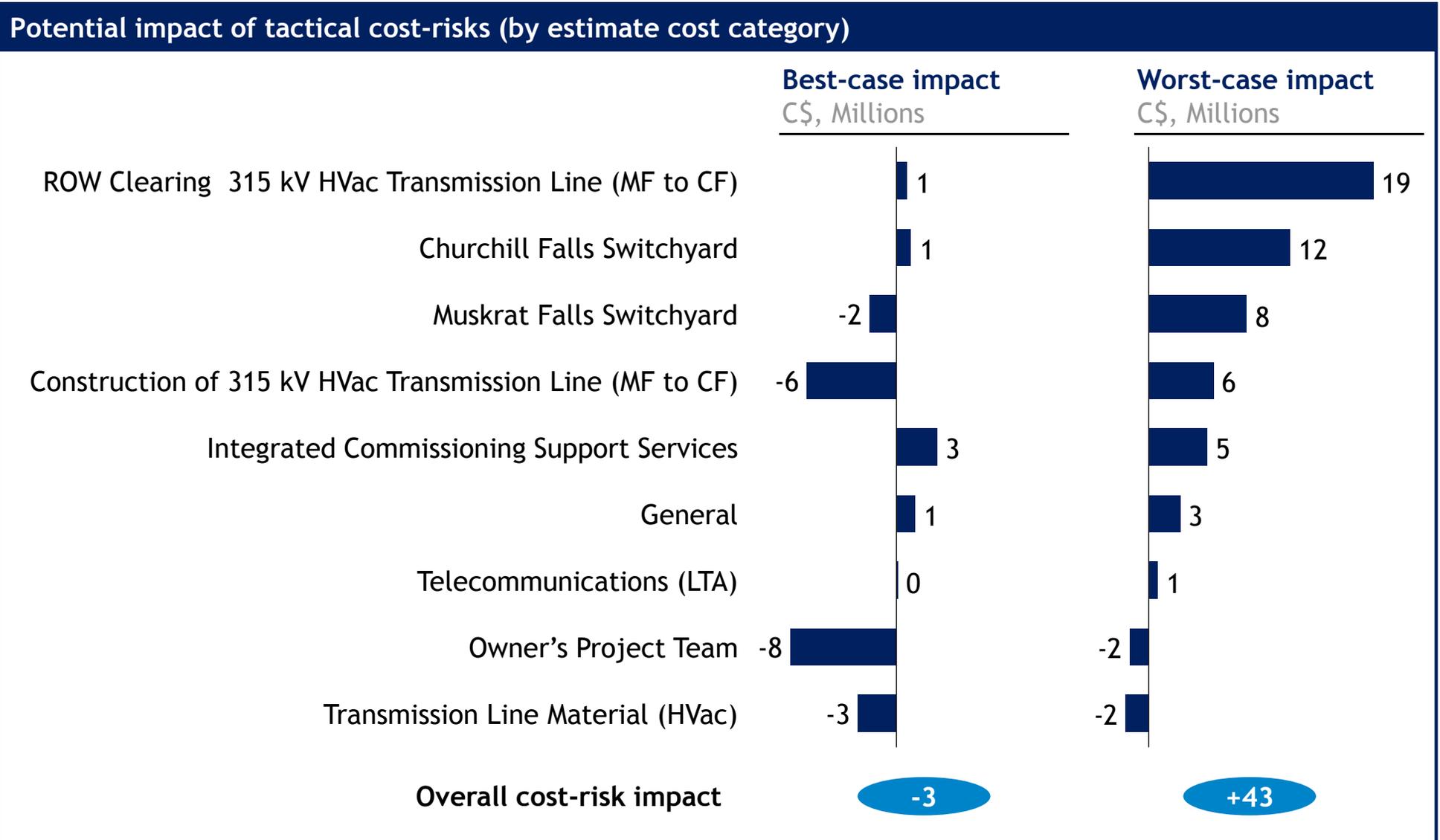


AFE Rev.2 falls within the predictive range for LTA



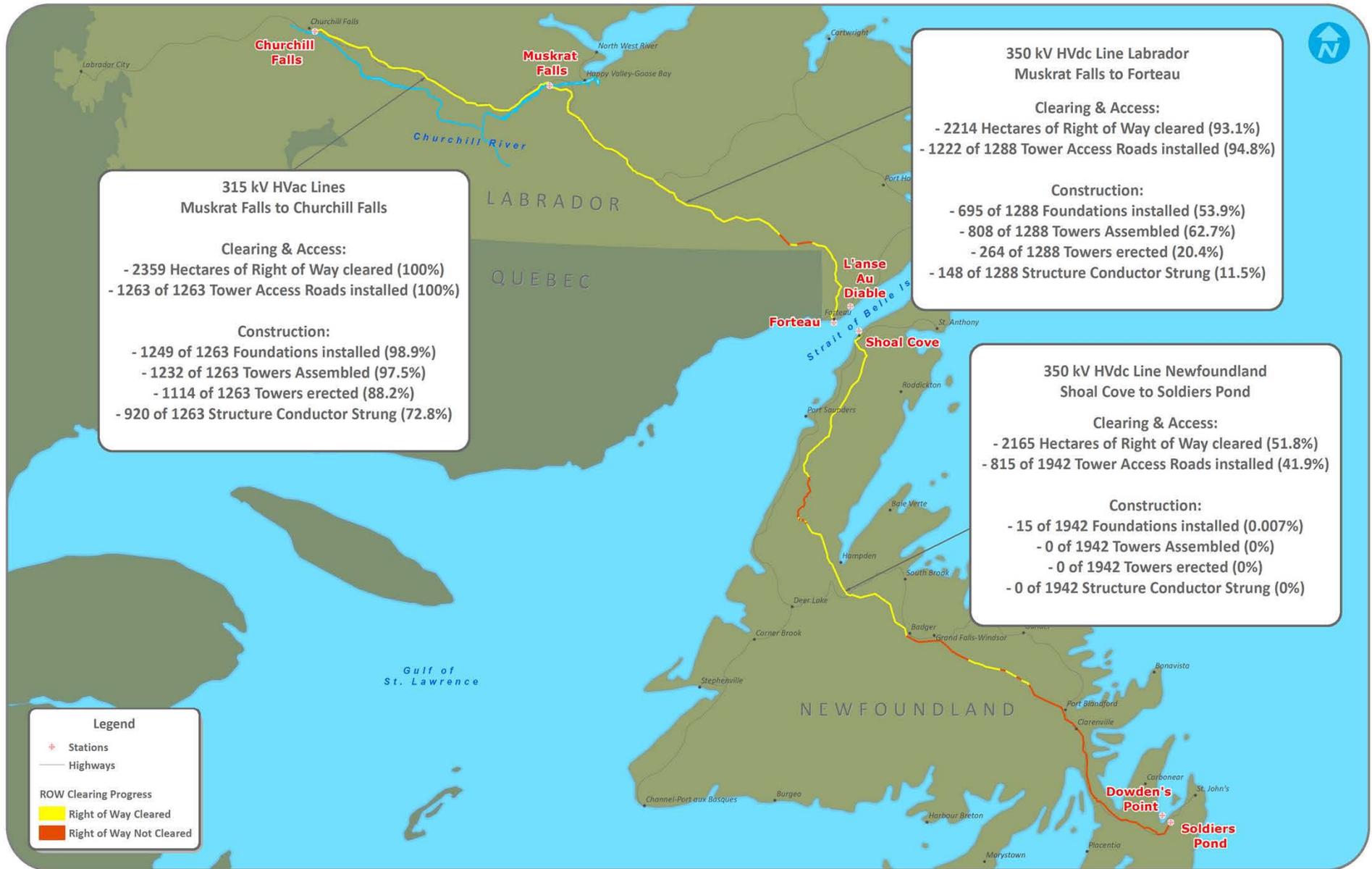
¹Total amount with contingency is C\$878 million

Detail on tactical risk impacts for LTA



Appendix

HVac & HVdc TL Progress



LCP - HVac and HVdc Transmission Line Construction Progress 20-JAN-2016

G:\526573\Comp4-Trans\40-ENG\40-GEN\ENG\Geomatics\Project\CI4 Overview\General Media Project Overview\SHP

Contract overview

Contract	Details	Key dates	Value and LDs
CDO501 - HVdc converter stations and transition compounds	<ul style="list-style-type: none"> EPC Contract with Alstom Grid for scope: <ul style="list-style-type: none"> ±350kV, 900MW HVdc Converter Stations at Muskrat Falls & Soldiers Pond Transition Compounds at Forteau Point & Shoal Cove 	<ul style="list-style-type: none"> RFP issue/close: Dec-12/ June-13 Contract award: Mar-14 Construction start: Jul-15 Commissioning static checks complete: Jun-17 	<ul style="list-style-type: none"> Overall contract value: \$370M + \$107M = \$477M CAD LDs cut in 15-Jun-2017 LDs Cap - 15% of Contract Price (\$56.4M)
CDO502 - AC substations	<ul style="list-style-type: none"> EPC Contract with Alstom Grid for: <ul style="list-style-type: none"> 735 kV / 315kV substation at Churchill Falls and extension of existing 735 kV substation 315 kV substation at Muskrat Falls 230 kV substation at Soldiers Pond 	<ul style="list-style-type: none"> RFP issue/close: Jul-13/ Nov-13 Contract award: Aug-14 Construction start: Jul-15 Commissioning static checks complete: SP - Dec-16, MF&CF Mar-17 	<ul style="list-style-type: none"> Overall contract value: \$186M + \$79M = 265M CAD LDs Cap - 15% of Contract Price (\$28.1M)
CT0327-001 - HVdc TL construction	<ul style="list-style-type: none"> Construction contract for HVdc TL with Valard 	<ul style="list-style-type: none"> Substantial completion: 30-Jun-17 	<ul style="list-style-type: none"> Overall contract value: \$880M = \$820M (Part A) + \$60M (Part B) CAD LDs Cap - 10% of Contract Price (\$88M); grace period of 15 days, \$350k/day 16-Jul- to 15-Aug-17, \$750k/day thereafter

Risk frame #1: ROW access cost impact

Description

- The key unknown/risk driving the cost outlook for LITL is the cost remaining to construct and maintain the access required for the HVdc transmission line
- Valard’s lack of progress in the Labrador winter zone is exposing the project to the cost of a second winter season
- Access plan and profile remain under development for LRM, which will confirm quantities; work zone is seasonally constrained
- Bids have not been received for Blocks 17 & 18 (Avalon Peninsula), however market conditions are favorable
- Severity of spring break-up is unknown
- Cost exposure to address viability of 25km winter zone in Eastern NL given the uncharacteristic mild winters in recent times
- Water crossings permitting to-date have been temporary in nature; unless approval for permanent installation can be granted, the project will have a much larger remediation cost
- Timely receipt of quarry permits is essential to optimize production

Potential mitigation

- Develop a detailed plan for LRM and seek competitive pricing
- Aggressively push conclusion of Labrador winter zone in 2016
- Plan for spring break-up and agree with Valard measures to halt unnecessary damage to roads
- Pursue aggressive quarry permitting strategy with the Province
- Fully understand risk and mitigations for Eastern NL winter zone

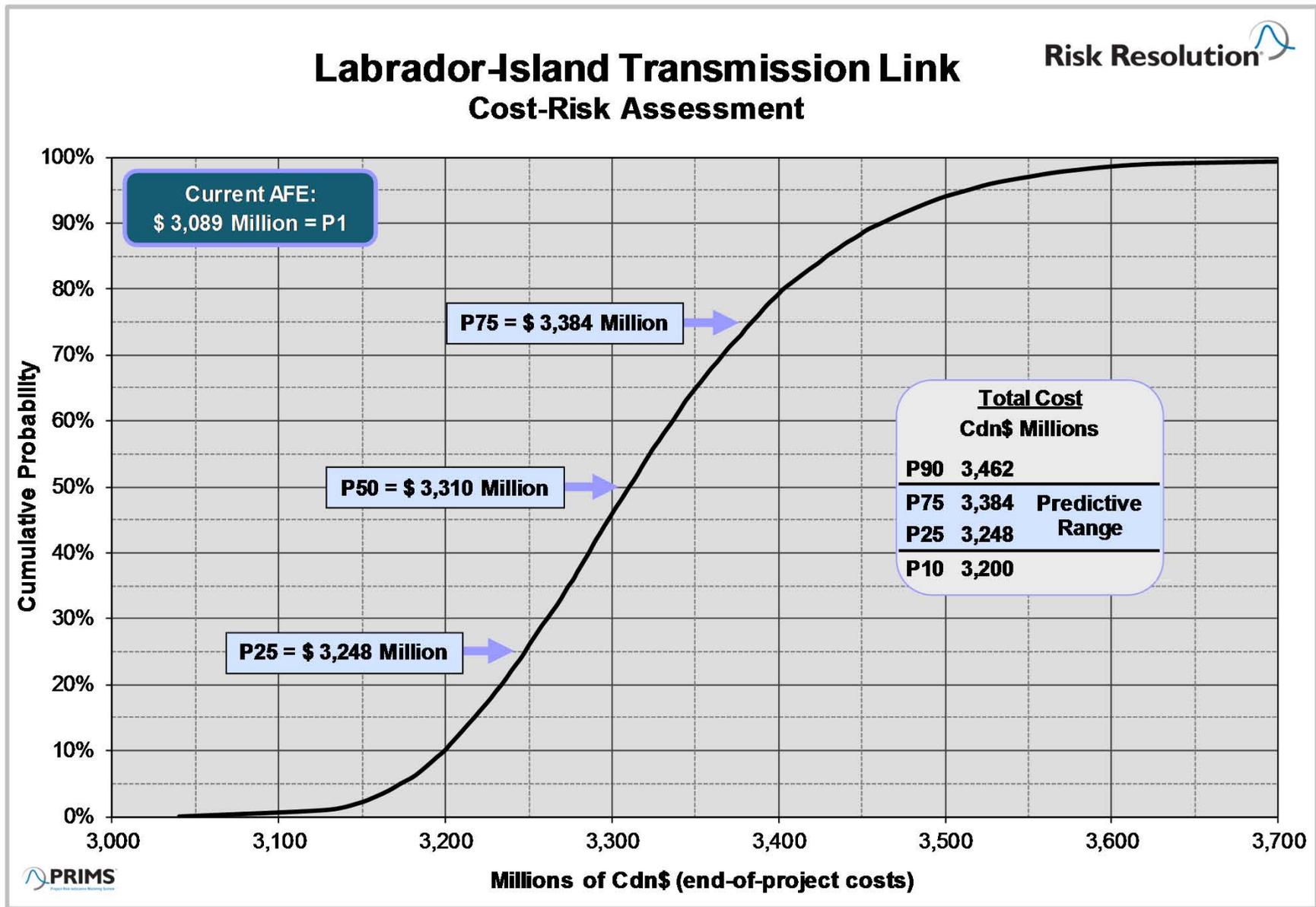
Impact

- Best case: C\$110 million
- Worst case: C\$160 million

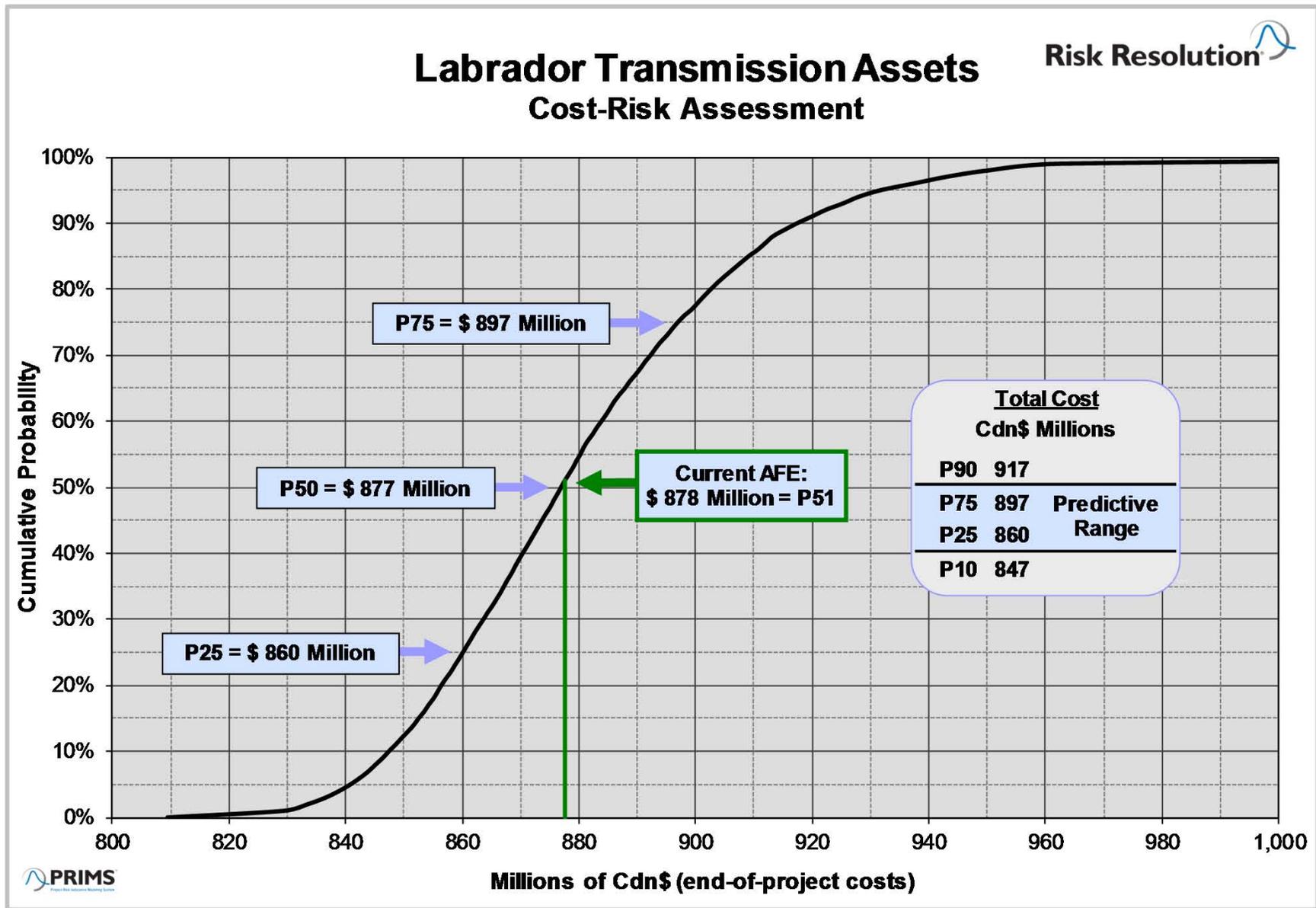
Calculation methodology

	Description	Best	Worst
	LRM	35	50
+	Blocks 17 / 18	45	50
+	Valard Part B	19	40
+	Spring Break-up	8	15
+	Water Crossing Remediation	5	10
-	Back charges to Valard	(3)	(5)
	Total		160

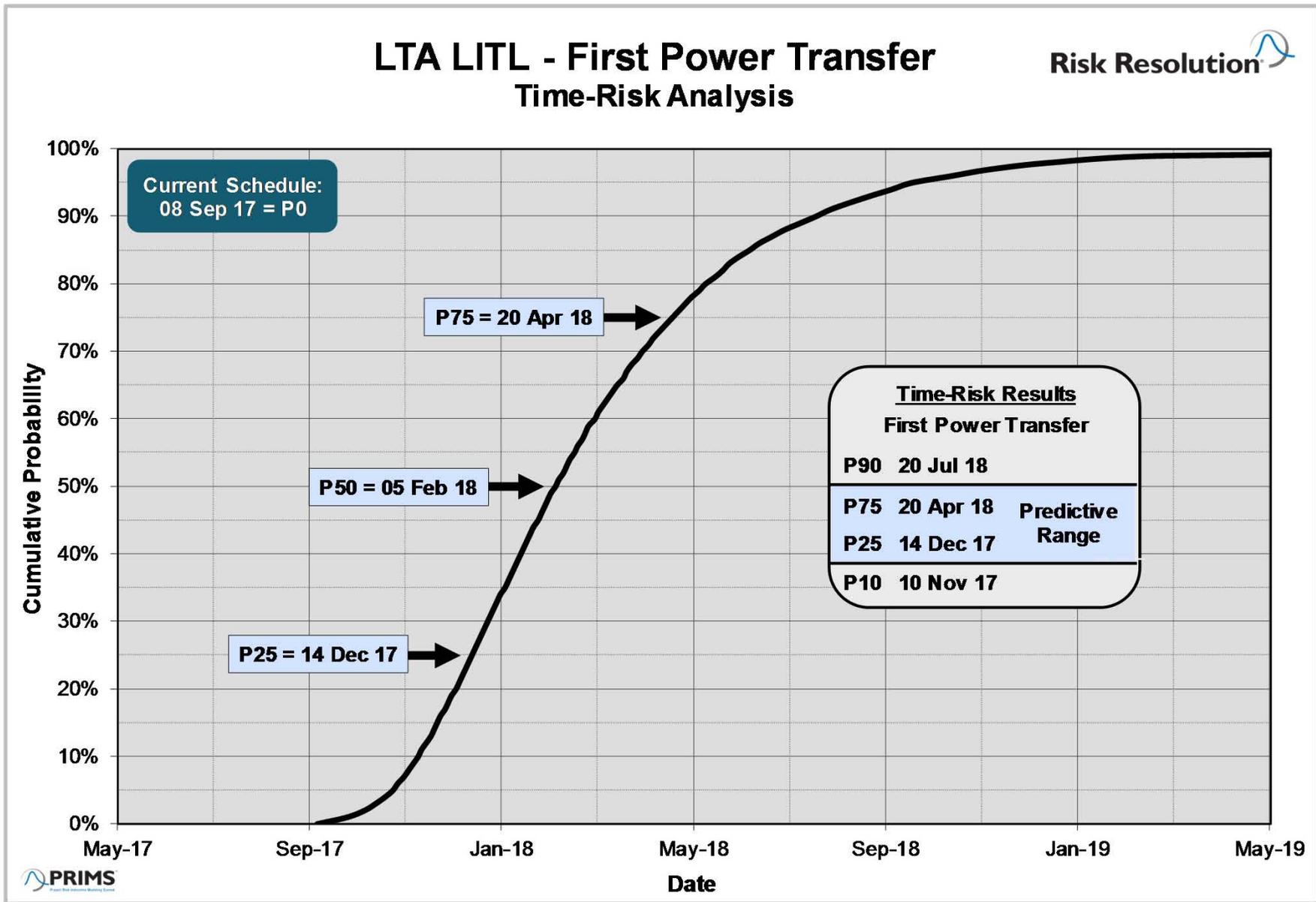
LITL cost-risk analysis



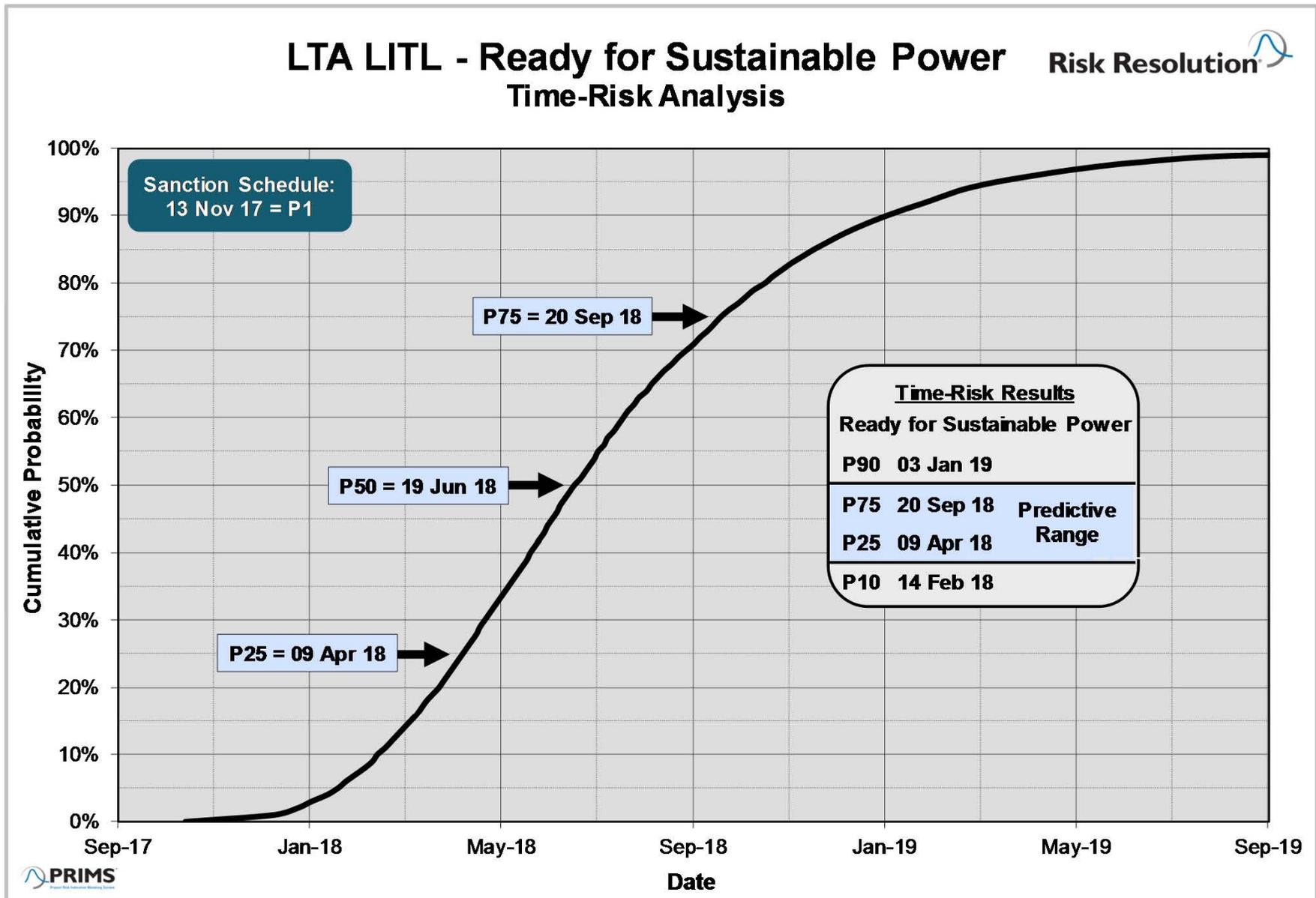
LTA cost-risk analysis



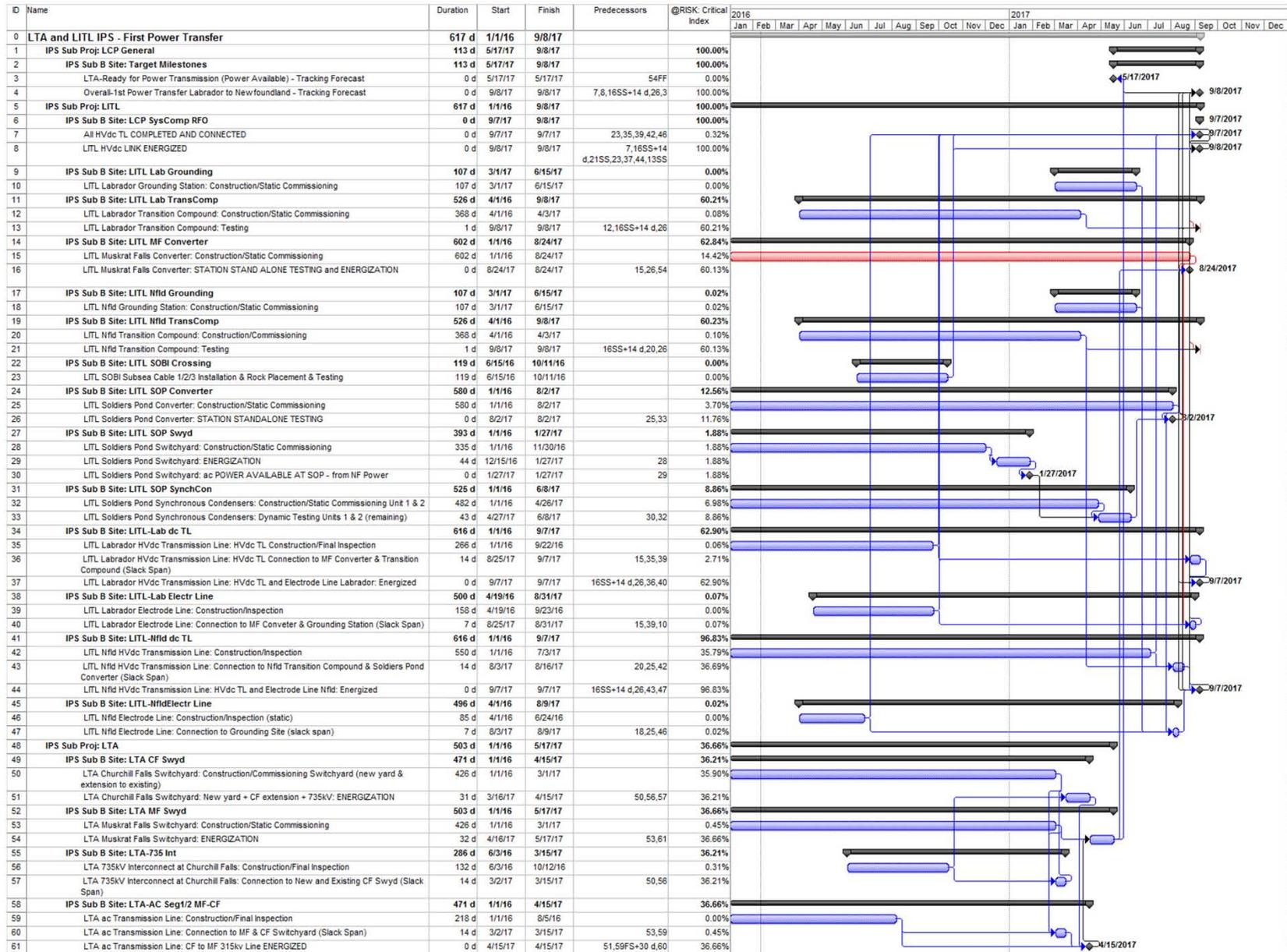
LTA/LITL time-risk analysis for first power transfer



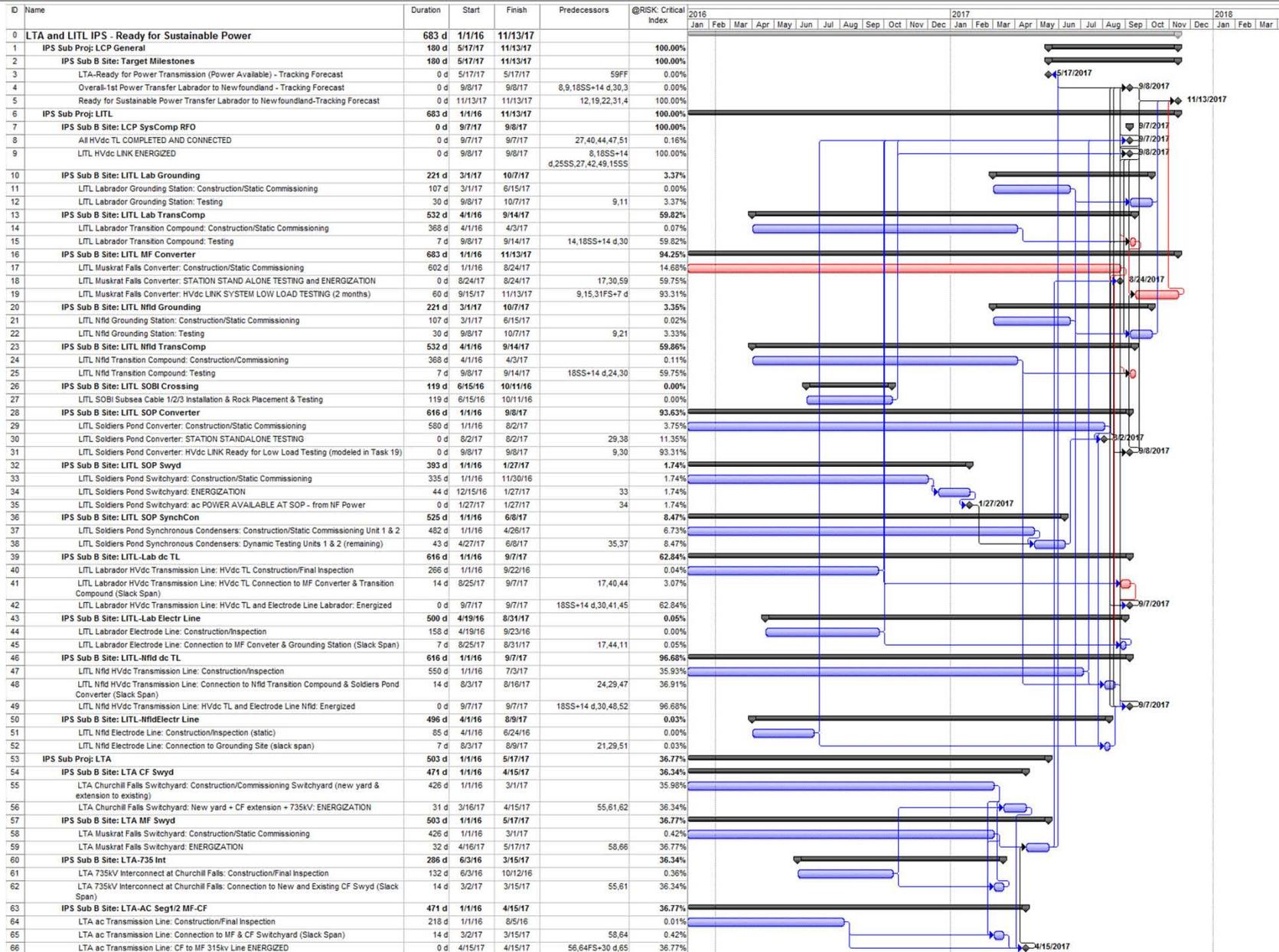
LTA/LITL time-risk analysis for sustainable power



LTA/LITL time-risk model for first power transfer



LTA/LITL time-risk model for sustainable power



LTA/LITL time-risk ranging for first power transfer (1 of 2)

LTA LITL IPS - First Power Transfer Time-Risk Assessment - Ranging Sheet						
Time-Risk Model					Change in Duration (Days)	
ID	Task Description	Duration	Start	Finish	Best	Worst
01	IPS Sub Proj: LCP General	113 d	17-May-17	8-Sep-17		
02	IPS Sub B Site: Target Milestones	113 d	17-May-17	8-Sep-17		
03	LTA-Ready for Power Transmission (Power Available) - Tracking Forecast	0 d	17-May-17	17-May-17		
04	Overall-1st Power Transfer Labrador to Newfoundland - Tracking Forecast	0 d	8-Sep-17	8-Sep-17		
05	IPS Sub Proj: LITL	617 d	1-Jan-16	8-Sep-17		
06	IPS Sub B Site: LCP SysComp RFO	0 d	7-Sep-17	8-Sep-17		
07	All HVdc TL COMPLETED AND CONNECTED	0 d	7-Sep-17	7-Sep-17		
08	LITL HVdc LINK ENERGIZED	0 d	8-Sep-17	8-Sep-17		
09	IPS Sub B Site: LITL Lab Grounding	107 d	1-Mar-17	15-Jun-17		
10	LITL Labrador Grounding Station: Construction/Static Commissioning	107 d	1-Mar-17	15-Jun-17	0	30
11	IPS Sub B Site: LITL Lab TransComp	526 d	1-Apr-16	8-Sep-17		
12	LITL Labrador Transition Compound: Construction/Static Commissioning	368 d	1-Apr-16	3-Apr-17	60	105
13	LITL Labrador Transition Compound: Testing	1 d	8-Sep-17	8-Sep-17		
14	IPS Sub B Site: LITL MF Converter	602 d	1-Jan-16	24-Aug-17		
15	LITL Muskrat Falls Converter: Construction/Static Commissioning	602 d	1-Jan-16	24-Aug-17	0	90
16	LITL MF Converter: STATION STAND ALONE TESTING and ENERGIZATION	0 d	24-Aug-17	24-Aug-17		
17	IPS Sub B Site: LITL Nfld Grounding	107 d	1-Mar-17	15-Jun-17		
18	LITL Nfld Grounding Station: Construction/Static Commissioning	107 d	1-Mar-17	15-Jun-17	0	30
19	IPS Sub B Site: LITL Nfld TransComp	526 d	1-Apr-16	8-Sep-17		
20	LITL Nfld Transition Compound: Construction/Commissioning	368 d	1-Apr-16	3-Apr-17	60	105
21	LITL Nfld Transition Compound: Testing	1 d	8-Sep-17	8-Sep-17		
22	IPS Sub B Site: LITL SOBI Crossing	119 d	15-Jun-16	11-Oct-16		
23	LITL SOBI Subsea Cable 1/2/3 Installation & Rock Placement & Testing	119 d	15-Jun-16	11-Oct-16	4	64
24	IPS Sub B Site: LITL SOP Converter	580 d	1-Jan-16	2-Aug-17		
25	LITL Soldiers Pond Converter: Construction/Static Commissioning	580 d	1-Jan-16	2-Aug-17	0	60
26	LITL Soldiers Pond Converter: STATION STANDALONE TESTING	0 d	2-Aug-17	2-Aug-17		
27	IPS Sub B Site: LITL SOP Swyd	393 d	1-Jan-16	27-Jan-17		
28	LITL Soldiers Pond Switchyard: Construction/Static Commissioning	335 d	1-Jan-16	30-Nov-16	60	120
29	LITL Soldiers Pond Switchyard: ENERGIZATION	44 d	15-Dec-16	27-Jan-17	0	45

LTA/LITL time-risk ranging for first power transfer (2 of 2)

30	LITL SOP Switchyard: ac POWER AVAILABLE AT SOP - from NF Power	0 d	27-Jan-17	27-Jan-17		
31	IPS Sub B Site: LITL SOP SynchCon	525 d	1-Jan-16	8-Jun-17		
32	LITL SOP Synchronous Condensers: Construction/Static Commission. Units 1 & 2	482 d	1-Jan-16	26-Apr-17	30	90
33	LITL SOP Synchronous Condensers: Dynamic Testing Units 1 & 2 (remaining)	43 d	27-Apr-17	8-Jun-17	0	60
34	IPS Sub B Site: LITL-Lab dc TL	616 d	1-Jan-16	7-Sep-17		
35	LITL Labrador HVdc Transmission Line: HVdc TL Construction/Final Inspection	266 d	1-Jan-16	22-Sep-16	90	180
36	LITL Lab. HVdc TL: HVdc TL Connect. to MF Conv. & Trans. Comp. (Slack Span)	14 d	25-Aug-17	7-Sep-17	-3.5	0
37	LITL Labrador HVdc TL: HVdc TL and Electrode Line Labrador: Energized	0 d	7-Sep-17	7-Sep-17		
38	IPS Sub B Site: LITL-Lab Electr Line	500 d	19-Apr-16	31-Aug-17		
39	LITL Labrador Electrode Line: Construction/Inspection	158 d	19-Apr-16	23-Sep-16	30	60
40	LITL Lab. Electrode Line: Connect. to MF Convert. & Grounding Stat. (Slack Span)	7 d	25-Aug-17	31-Aug-17	-3.5	0
41	IPS Sub B Site: LITL-Nfld dc TL	616 d	1-Jan-16	7-Sep-17		
42	LITL Nfld HVdc Transmission Line: Construction/Inspection	550 d	1-Jan-16	3-Jul-17	30	240
43	LITL Nfld HVdc TL: Connect. to Nfld Trans. Comp. & SOP Converter (Slack Span)	14 d	3-Aug-17	16-Aug-17	-3.5	0
44	LITL Nfld HVdc TL: HVdc TL and Electrode Line Nfld: Energized	0 d	7-Sep-17	7-Sep-17		
45	IPS Sub B Site: LITL-NfldElectr Line	496 d	1-Apr-16	9-Aug-17		
46	LITL Nfld Electrode Line: Construction/Inspection (static)	85 d	1-Apr-16	24-Jun-16	0	90
47	LITL Nfld Electrode Line: Connection to Grounding Site (slack span)	7 d	3-Aug-17	9-Aug-17	-3.5	0
48	IPS Sub Proj: LTA	503 d	1-Jan-16	17-May-17		
49	IPS Sub B Site: LTA CF Swyd	471 d	1-Jan-16	15-Apr-17		
50	LTA CF Swyd: Constr./Commission. Switchyard (new yard & extension to existing)	426 d	1-Jan-16	1-Mar-17	30	180
51	LTA Churchill Falls Swyd: New yard + CF extension + 735kV: ENERGIZATION	31 d	16-Mar-17	15-Apr-17	30	90
52	IPS Sub B Site: LTA MF Swyd	503 d	1-Jan-16	17-May-17		
53	LTA Muskrat Falls Switchyard: Construction/Static Commissioning	426 d	1-Jan-16	1-Mar-17	30	90
54	LTA Muskrat Falls Switchyard: ENERGIZATION	32 d	16-Apr-17	17-May-17	0	30
55	IPS Sub B Site: LTA-735 Int	286 d	3-Jun-16	15-Mar-17		
56	LTA 735kV Interconnect at Churchill Falls: Construction/Final Inspection	132 d	3-Jun-16	12-Oct-16	-60	45
57	LTA 735kV Interconnect at CF: Connect. to New & Existing CF Swyd (Slack Span)	14 d	2-Mar-17	15-Mar-17	-3.5	0
58	IPS Sub B Site: LTA-AC Seg1/2 MF-CF	471 d	1-Jan-16	15-Apr-17		
59	LTA ac Transmission Line: Construction/Final Inspection	218 d	1-Jan-16	5-Aug-16	-30	60
60	LTA ac Transmission Line: Connection to MF & CF Switchyard (Slack Span)	14 d	2-Mar-17	15-Mar-17	-7	0
61	LTA ac Transmission Line: CF to MF 315kv Line ENERGIZED	0 d	15-Apr-17	15-Apr-17		
	Last Line					

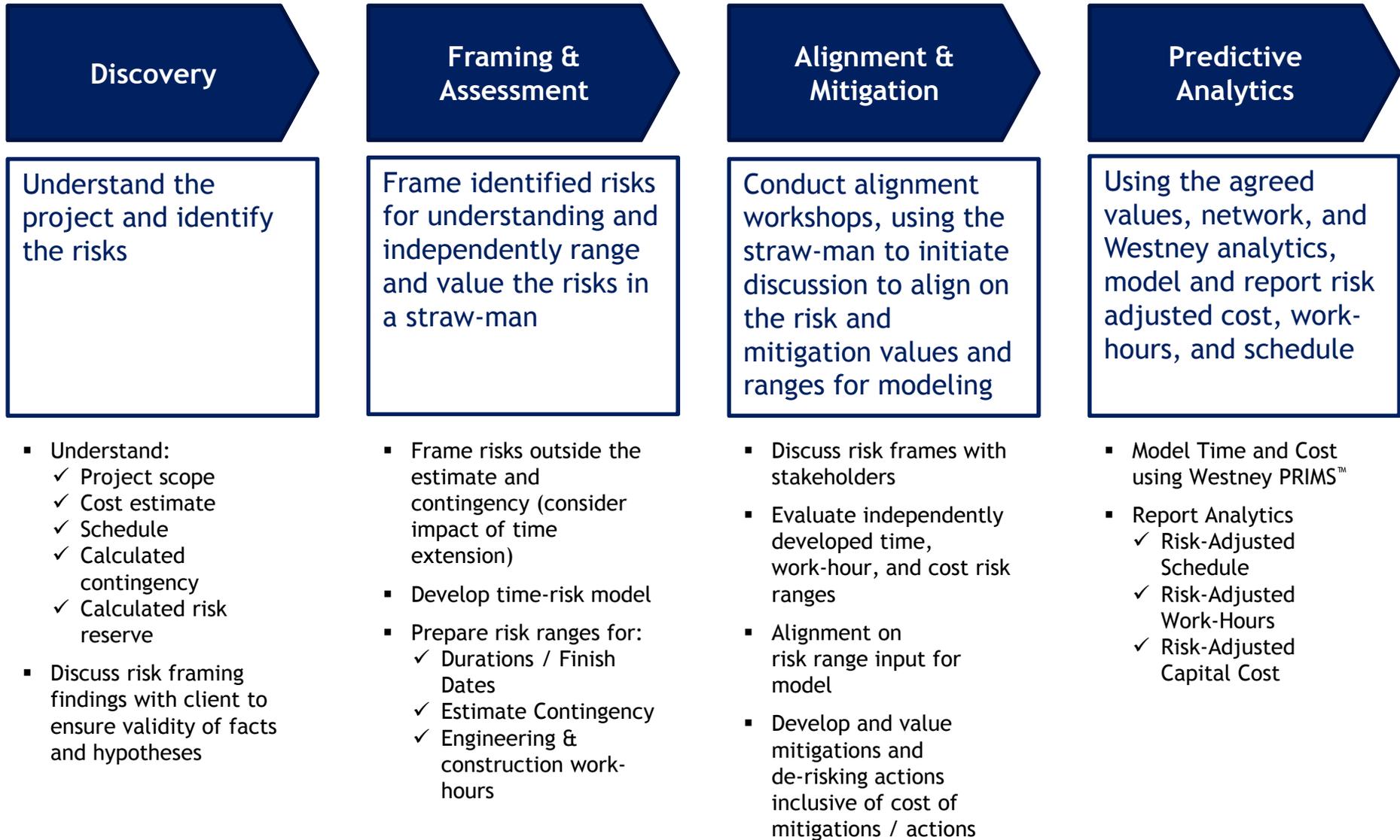
LTA/LITL time-risk ranging for sustainable power (1 of 2)

LTA LITL IPS - Ready for Sustainable Power Time-Risk Assessment - Ranging Sheet						
Time-Risk Model					Change in Duration (Days)	
ID	Task Description	Duration	Start	Finish	Best	Worst
01	IPS Sub Proj: LCP General	180 d	17-May-17	13-Nov-17		
02	IPS Sub B Site: Target Milestones	180 d	17-May-17	13-Nov-17		
03	LTA-Ready for Power Transmission (Power Available) - Tracking Forecast	0 d	17-May-17	17-May-17		
04	Overall-1st Power Transfer Labrador to Newfoundland - Tracking Forecast	0 d	8-Sep-17	8-Sep-17		
05	Ready for Sustainable Power Transfer Labrador to Nfld-Tracking Forecast	0 d	13-Nov-17	13-Nov-17		
06	IPS Sub Proj: LITL	683 d	1-Jan-16	13-Nov-17		
07	IPS Sub B Site: LCP SysComp RFO	0 d	7-Sep-17	8-Sep-17		
08	All HVdc TL COMPLETED AND CONNECTED	0 d	7-Sep-17	7-Sep-17		
09	LITL HVdc LINK ENERGIZED	0 d	8-Sep-17	8-Sep-17		
10	IPS Sub B Site: LITL Lab Grounding	221 d	1-Mar-17	7-Oct-17		
11	LITL Labrador Grounding Station: Construction/Static Commissioning	107 d	1-Mar-17	15-Jun-17	0	30
12	LITL Labrador Grounding Station: Testing	30 d	8-Sep-17	7-Oct-17	0	10
13	IPS Sub B Site: LITL Lab TransComp	532 d	1-Apr-16	14-Sep-17		
14	LITL Labrador Transition Compound: Construction/Static Commissioning	368 d	1-Apr-16	3-Apr-17	60	105
15	LITL Labrador Transition Compound: Testing (risk modeled in Task 19 ranging)	7 d	8-Sep-17	14-Sep-17		
16	IPS Sub B Site: LITL MF Converter	683 d	1-Jan-16	13-Nov-17		
17	LITL Muskrat Falls Converter: Construction/Static Commissioning	602 d	1-Jan-16	24-Aug-17	0	90
18	LITL MF Converter: STATION STAND ALONE TESTING and ENERGIZATION	0 d	24-Aug-17	24-Aug-17		
19	LITL MF Converter: HVdc LINK SYSTEM LOW LOAD TESTING (2 months)	60 d	15-Sep-17	13-Nov-17	0	120
20	IPS Sub B Site: LITL Nfld Grounding	221 d	1-Mar-17	7-Oct-17		
21	LITL Nfld Grounding Station: Construction/Static Commissioning	107 d	1-Mar-17	15-Jun-17	0	30
22	LITL Nfld Grounding Station: Testing	30 d	8-Sep-17	7-Oct-17	0	10
23	IPS Sub B Site: LITL Nfld TransComp	532 d	1-Apr-16	14-Sep-17		
24	LITL Nfld Transition Compound: Construction/Commissioning	368 d	1-Apr-16	3-Apr-17	60	105
25	LITL Nfld Transition Compound: Testing (risk modeled in Task 19 ranging)	7 d	8-Sep-17	14-Sep-17		
26	IPS Sub B Site: LITL SOBI Crossing	119 d	15-Jun-16	11-Oct-16		
27	LITL SOBI Subsea Cable 1/2/3 Installation & Rock Placement & Testing	119 d	15-Jun-16	11-Oct-16	4	64
28	IPS Sub B Site: LITL SOP Converter	616 d	1-Jan-16	8-Sep-17		
29	LITL Soldiers Pond Converter: Construction/Static Commissioning	580 d	1-Jan-16	2-Aug-17	0	60
30	LITL Soldiers Pond Converter: STATION STANDALONE TESTING	0 d	2-Aug-17	2-Aug-17		
31	LITL SOP Conv.: HVdc LINK Ready - Low Load Testing (modeled in Task 19)	0 d	8-Sep-17	8-Sep-17		
32	IPS Sub B Site: LITL SOP Swyd	393 d	1-Jan-16	27-Jan-17		

LTA/LITL time-risk ranging for sustainable power (2 of 2)

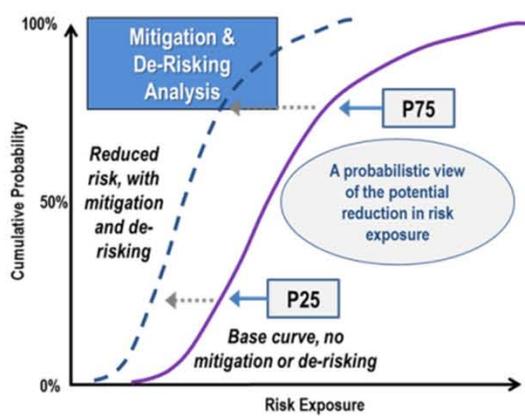
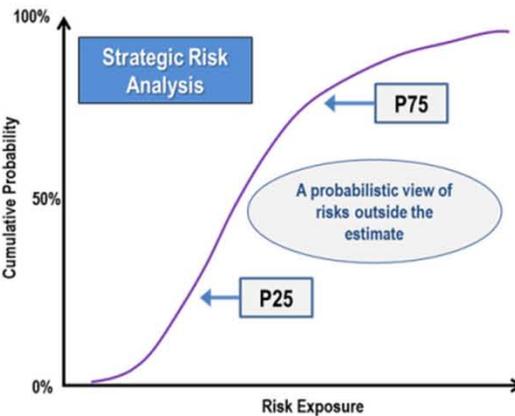
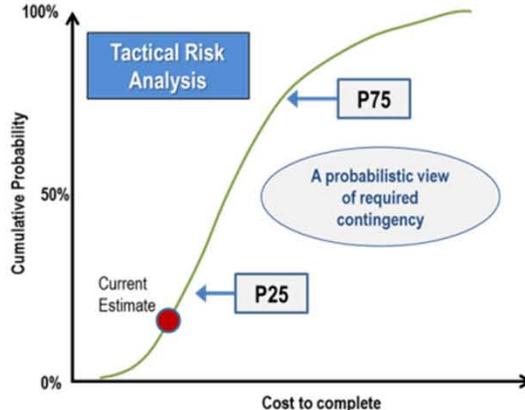
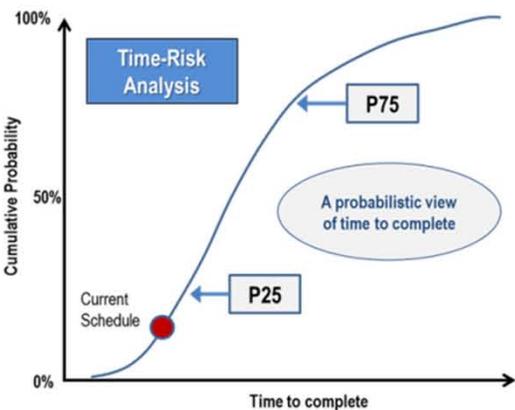
33	LITL Soldiers Pond Switchyard: Construction/Static Commissioning	335 d	1-Jan-16	30-Nov-16	60	120
34	LITL Soldiers Pond Switchyard: ENERGIZATION	44 d	15-Dec-16	27-Jan-17	0	45
35	LITL SOP Switchyard: ac POWER AVAILABLE AT SOP - from NF Power	0 d	27-Jan-17	27-Jan-17		
36	IPS Sub B Site: LITL SOP SynchCon	525 d	1-Jan-16	8-Jun-17		
37	LITL SOP Synchronous Condensers: Construction/Static Commission. Units 1 & 2	482 d	1-Jan-16	26-Apr-17	30	90
38	LITL SOP Synchronous Condensers: Dynamic Testing Units 1 & 2 (remaining)	43 d	27-Apr-17	8-Jun-17	0	60
39	IPS Sub B Site: LITL-Lab dc TL	616 d	1-Jan-16	7-Sep-17		
40	LITL Labrador HVdc Transmission Line: HVdc TL Construction/Final Inspection	266 d	1-Jan-16	22-Sep-16	90	180
41	LITL Lab. HVdc TL: HVdc TL Connect. to MF Conv. & Trans. Comp. (Slack Span)	14 d	25-Aug-17	7-Sep-17	-3.5	0
42	LITL Labrador HVdc TL: HVdc TL and Electrode Line Labrador: Energized	0 d	7-Sep-17	7-Sep-17		
43	IPS Sub B Site: LITL-Lab Electr Line	500 d	19-Apr-16	31-Aug-17		
44	LITL Labrador Electrode Line: Construction/Inspection	158 d	19-Apr-16	23-Sep-16	30	60
45	LITL Lab. Electrode Line: Connect. to MF Convert. & Grounding Stat. (Slack Span)	7 d	25-Aug-17	31-Aug-17	-3.5	0
46	IPS Sub B Site: LITL-Nfld dc TL	616 d	1-Jan-16	7-Sep-17		
47	LITL Nfld HVdc Transmission Line: Construction/Inspection	550 d	1-Jan-16	3-Jul-17	30	240
48	LITL Nfld HVdc TL: Connect. to Nfld Trans. Comp. & SOP Converter (Slack Span)	14 d	3-Aug-17	16-Aug-17	-3.5	0
49	LITL Nfld HVdc TL: HVdc TL and Electrode Line Nfld: Energized	0 d	7-Sep-17	7-Sep-17		
50	IPS Sub B Site: LITL-NfldElectr Line	496 d	1-Apr-16	9-Aug-17		
51	LITL Nfld Electrode Line: Construction/Inspection (static)	85 d	1-Apr-16	24-Jun-16	0	90
52	LITL Nfld Electrode Line: Connection to Grounding Site (slack span)	7 d	3-Aug-17	9-Aug-17	-3.5	0
53	IPS Sub Proj: LTA	503 d	1-Jan-16	17-May-17		
54	IPS Sub B Site: LTA CF Swyd	471 d	1-Jan-16	15-Apr-17		
55	LTA CF Swyd: Constr./Commission. Switchyard (new yard & extension to existing)	426 d	1-Jan-16	1-Mar-17	30	180
56	LTA Churchill Falls Swyd: New yard + CF extension + 735kV: ENERGIZATION	31 d	16-Mar-17	15-Apr-17	30	90
57	IPS Sub B Site: LTA MF Swyd	503 d	1-Jan-16	17-May-17		
58	LTA Muskrat Falls Switchyard: Construction/Static Commissioning	426 d	1-Jan-16	1-Mar-17	30	90
59	LTA Muskrat Falls Switchyard: ENERGIZATION	32 d	16-Apr-17	17-May-17	0	30
60	IPS Sub B Site: LTA-735 Int	286 d	3-Jun-16	15-Mar-17		
61	LTA 735kV Interconnect at Churchill Falls: Construction/Final Inspection	132 d	3-Jun-16	12-Oct-16	-60	45
62	LTA 735kV Interconnect at CF: Connect. to New & Existing CF Swyd (Slack Span)	14 d	2-Mar-17	15-Mar-17	-3.5	0
63	IPS Sub B Site: LTA-AC Seg1/2 MF-CF	471 d	1-Jan-16	15-Apr-17		
64	LTA ac Transmission Line: Construction/Final Inspection	218 d	1-Jan-16	5-Aug-16	-30	60
65	LTA ac Transmission Line: Connection to MF & CF Switchyard (Slack Span)	14 d	2-Mar-17	15-Mar-17	-7	0
66	LTA ac Transmission Line: CF to MF 315kv Line ENERGIZED	0 d	15-Apr-17	15-Apr-17		
	Last Line					

Risk Resolution[®] is a Four-Step Process



Risk Resolution® provides an independent view of risk-adjusted cost, schedule and work-hours

Probabilistic risk modeling



Sample outputs

Risk-Adjusted CAPEX

Tactical Cost (P50 Value): \$1,600 MM

Project Estimate: \$1,450 MM

Estimating Contingency: \$ 150 MM

Tactical Cost (P50 Value): \$1,600 MM

Major Strategic Risk Contributors

Major Strategic Risk Contributors	Mean Impact (Millions \$)
➤ Inexperienced Contractors / Default	\$200
➤ Contractor Risk Premiums	\$100
➤ Owner Deliverable Delays	\$100
➤ Favorable Steel Market	-\$80

Total Risk-Adjusted CAPEX* P25 to P75 = \$1,700 MM to \$2,200 MM

Risk-Adjusted Schedule

Current Schedule: January 2014

Major Time Risk Contributors	Mean Impact (Months)
➤ Right-of-way	3
➤ Qualified Bidders	1
➤ Owner Deliverable Delays	1
➤ Water and Power Supply	1

Total Risk-Adjusted Schedule P25 to P75 = April 2014 to November 2014
Equates to 3 – 10 month delay

Disclaimer

The analysis in this report was developed by Westney Consulting Group (Westney) in concert with the project team. Westney guided and facilitated the Risk Resolution® Process, using the consultants' experience to ask the right questions and, where appropriate, challenge the Nalcor Energy participant's thinking.

Westney has had varying levels of involvement on this project since 2008, providing us with good general knowledge of the project.

Any expressed opinions or recommendations expressed by Westney herein are the product of the experience of the Westney consultant(s) and are provided as input and information for decisions; any reliance upon or decisions made from the information is the sole judgment/ decision of the user of the information.

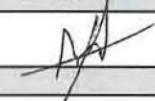
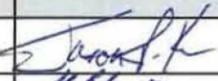
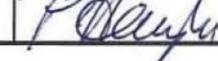
ATTACHMENT A.19

Period Ending: 25 April 2016
Currency : \$ CAD

		MF	LITL	LTA	LCP	LCP (Previous Month)
Base Estimate + Escalation	A	2,674,309,066	2,523,121,031	637,207,172	5,834,637,269	5,834,637,269
Contingency	B	226,849,222	86,627,861	54,375,314	367,852,397	367,852,397
Original Control Budget (OCB)	C = A+B	2,901,158,288	2,609,748,892	691,582,486	6,202,489,666	6,202,489,666
Approved Scope changes (PCNs)	D	932,956,714	509,855,110	225,476,579	1,668,288,403 ⁽²⁾	1,632,879,158
Current Control Budget (Excluding Contingency)	E = A+D	3,607,265,780	3,032,976,141	862,683,751	7,502,925,672	7,467,516,427
Deviations from CCB	F	-851,491	6,133,978	-10,878,298	-5,595,811 ⁽²⁾	30,329,240
Forecasted Available Contingency	G	79,551,240	50,268,040	25,751,924	155,571,204	155,055,398
Final Forecast Cost (FFC)	I = E+F+G	3,685,965,529	3,089,378,159	877,557,377	7,652,901,065 ⁽¹⁾	7,652,901,065
FFC - OCB	I - C	784,807,241	479,629,267	185,974,891	1,450,411,399	1,450,411,399

Notes:

1. The Final Forecasted Cost includes the cost impact of executed LNTP's, Contracts, PO costs and contingency
2. Refer to "Forecast Variation" documents for details

Prepared by:	Name	Signature	Date
Lead Cost Controller	George Chehab		11-May-2016
Reviewed by:			
Project Control Manager			
Approved by:			
Deputy General Project Manager	Jason Kean		16-MAY-2016
General Project Manager	Ron Power		16 May 2016
Project Director	Paul Harrington		17 May 2016



Incurred highlights – April 2016

1. Monthly incurred

Planned Incurred: 253 M

Incurred: 135.2 M

Variance: (117.8) M

Main Causes:

- MF: (25.5) M (Mainly due to delay in award of the BoP contract, lower than expected progress in the T&G and the reservoir clearing contracts, Catch up related to progress of the AC Collector lines)
- LTA: (11.9) M (Mainly due to lower than expected progress in the procurement, construction and civil works of the SY contract (MF and CF), lower than expected progress in the HVac TL construction, Delay in award of the OTN scope, lower than expected Owner's cost)
- LIL: (80.4) M (Mainly due to lower than expected progress in the HVdc TL construction. Delay in award of Blocks 17/18 and LRM in order to seek best price from market. Delay in settlement of pending CRs related to the Converters contract in an effort to reach an agreeable settlement, lower than expected progress by Alstom for major packages related to SP SY and the Converters contract. Delays in the award of the OTN, however we anticipate catching up on some of the delays before year end)

2. Yearly Incurred (2016)

Yearly budget approved by Nalcor Management for 2016: 2,295 M

Incurred yearly to date: 480 M

Forecast for 2016: 2,118 M

Variance (Forecast vs planned) : (177) M (7.7%)

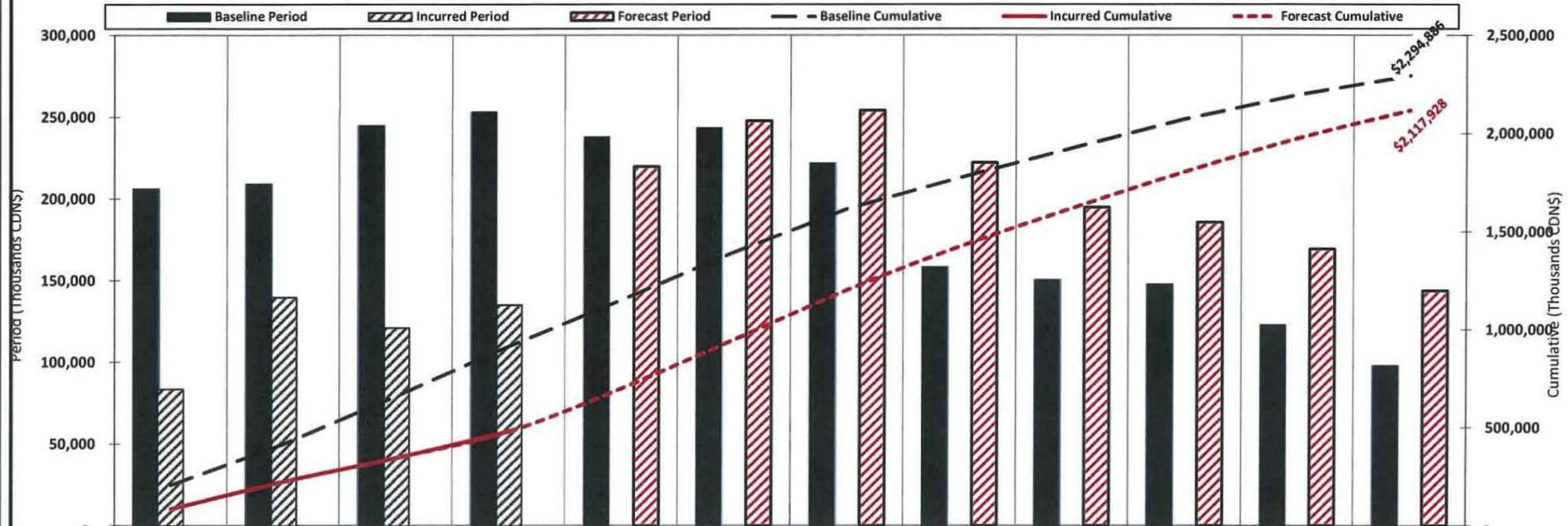
- MF: (27.4) M (Mainly due to lower than expected progress in the T&G contract, delay in award of the BoP contract)
- LTA: +2.5 M (Mainly due to catching up on delays highlighted in 2015)
- LIL: (152.1) M (Largely due to lower than expected progress on the HVdc TL along with to a lesser degree progress in the Converters, SP Switchyard and the Synchronous condensers contracts)

A schedule update is underway for the HVdc line, it is expected that it will reduce the yearly Forecast. Values will be updated in May once this exercise is complete.



LCP Phase I - Muskrat Falls Generation, Lab. Island Transmission Link, Lab Tx Asset
 Current Year Control Budget (Baseline), Incurred and Forecast Cost (Capital only)

For Period Ending: 25-April-2016



Period	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Baseline	206,167	209,228	244,818	253,029	237,764	243,385	221,964	158,556	150,509	148,076	123,144	98,246
Incurred	83,608	139,718	121,074	135,241								
Forecast					219,856	247,862	254,251	222,265	194,930	185,744	169,476	143,901
Cumulative												
Baseline ⁽¹⁾	206,167	415,395	660,212	913,241	1,151,005	1,394,390	1,616,355	1,774,911	1,925,420	2,073,496	2,196,640	2,294,886
Incurred	83,608	223,327	344,401	479,643								
Forecast					699,498	947,361	1,201,612	1,423,877	1,618,807	1,804,551	1,974,027	2,117,928

(1) This baseline represents the 2016 budget approved by Nalcor board on September 2015 as per the AFE rev2 values

Apr-16

Potential Deviations

C.P.	Package Description	Variation Description	Previous Cumulative	Monthly Variance	Total Potential	Comments	CM Ref.	Trend / CN / Sch. ref.
C1		Scope change						
SH0019	Security services	Adjustment to forecast (including the ERT and the recent ruling by arbitrator)	21,680,023		21,680,023	Estimate Security up to end of 2018.	DAN-1335	T-0864
SH0019	Security services	Memorandum of Settlement between Company and Contractor for meal allowances.	395,451		395,451	Retro to Dec 2014, Forecast till end of 2018	DAN-1553/PCN-0512	T-0864
SH0020	Medical services	North Spur Paramedic Support	1,602,598		1,602,598	Estimate Medical up to end of 2018.		T-0788-21 T-1312-01
SH0020	Medical services	Memorandum of Settlement between Company and Contractor for meal allowances.	677,710		677,710	Retro to Dec 2014, Forecast till end of 2018		T-1312-02
SH0022	Fuel Supply	Overall increase in Fuel cost caused by price adjustments and increase in quantities, addition of Diesel for MF Site (Security shack, Camp backups, equip, light plants)	2,940,310		2,940,310	Based on latest estimate; possible back charge to Astaldi for cost of transport included in his contract scope, MF Site Consumption for Nalcor owned / rented equipment not included in forecast update	DAN-1206	T-1313
SH0041	Personnel transport	Additional bus direct Sheshatshiu to MF Camp, excluding transport to North Spur	2,800,000		2,800,000	Reference protest event	DAN-1562	T-1301
SH0051	Building maintenance	Expected Increase of cost after site services review	1,300,000		1,300,000		DAN-1357	T-1302
CH0008	North Spur	Increase in Over burden quantities (Upstream and Downstream) Reduction in T&M Operations Shut Down in the Q6 Protestation Activities Direct Bussing of Innu Workers b/w NWR/S to NS Cut-Off Wall - Soils Conditions	Under Study		Under Study	The whole North Spur package will be reviewed in the winter break	DAN-1537/1562	T-1295/ 1296/ 1297/ 1244 CN 6/8/9/10 /11
CH0032	Hydro-Mechanical Equipment	Dunnage Under Crane on Permanent Upstream Bridge	150,000	-150,000	0	Forecasted	DAN-1785	CN-049
CH0009	Construction of North and South Dams	Overall increase over the budget related to fuel escalation, quantity increase	650,000		650,000		DAN-1867/PCN-0609	T-1424
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Deletion of Pay Item 279A - Installation of the lower portion of the circular passage	-390,000		-390,000		DAN-1732	T-1314/17
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Bussing from Accommodations Complex to Airport	591,856		591,856	Astaldi is transporting employees to / from airport and camp in addition to SH0041 Contractor Pencaf's regularly scheduled service and seeking compensation.		CHR2036
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Addition of Rock Bolts on Spillway Discharge Channel Base Slab	332,000		332,000	Annandale's study on Spillway Discharge Channel has determined that 864 rock bolts are required to anchor the concrete slab to bedrock.	DAN-1912	
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Geotechnical Instruments	118,112		118,112	Additional Piezometers / Inclinometers		ECN-045/CHR1061
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Maintenance of wash cars	2,500,000		2,500,000	Being re-negotiated again with Astaldi Estimate from Astaldi is ~\$300K/month in latest submission.		T-1314
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Powerhouse parking	Under Study		Under Study	Scope gap, currently being engineered	DAN-1646	
SH0018	Catering, housekeeping and janitorial	MF Accommodation complex expansion		4,000,000	4,000,000		PCN-643	
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Additional Grounding at Spillway	87,705		87,705			CHR2020
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Permanent Diversion Ditch to Direct Water away from South Dam Construction	113,000		113,000			CHR-1070
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Construction Management Consultants	1,745,000		1,745,000			T-1314
CH0007	Intake, Powerhouse, Spillway and Transition Dams	2016 / 2017 Field Work Orders	299,774	-299,774	0	Forecasted	DAN-1758 PCN-0589	T-1314
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Realign Upstream CTD Guide Rail	50,000		50,000	Realignment of Guide Rail on CTD to accommodate power cable for Trashrack Cleaning Machine	DAN-1759	
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Intake Rock Reconstruction	163,300		163,300			CHR2041
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Overbreak concrete	565,000		565,000	ECN 4 reduced the overbreak concrete quantity in the Intake and Powerhouse prematurely. It is a high probability to require this concrete		T-1062
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Delivery of secondary concrete	Under Study		Under Study			
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Spillway Damaged Bolt Holes	-248,206	248,206	0	Forecasted	DAN-1702 PCN-0578 DAN-1514	T-1371
CH0032	Hydro-Mechanical Equipment	Spillway Inspection Gallery Covers	-50,000		-50,000			
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Back charge to Astaldi for cost of transport included in his contract scope	-1,115,310	1,115,310	0	Backcharged \$139K for transport of workers from Accommodations to Work Front in BCH 05. The \$1.1M estimate was not backchargeable. We did the transportation from Goose Bay direct to the work front so the busses did not stop at camp. Astaldi's scope was to transport from camp to work face. LCP willingly transported the workers to the work front and did not notify Astaldi. We only backcharged from the period after notification		T-1014
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Storage and preservation of cranes (6 Months)	-150,000		-150,000	Delays to be recouped through Liquidated damages	DAN-1496	T-1153

Apr-16

Potential Deviations

C.P.	Package Description	Variation Description	Previous Cumulative	Monthly Variance	Total Potential	Comments	CM Ref.	Trend / CN / SCh. ref.
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Back charge to Astaldi for Embedded Guide & Associated Hardware Storage	-1,000,000		-1,000,000	Delays to be recouped through Liquidated damages	DAN-1494	T-1224
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Travel No-Shows	-874,537		-874,537	BC#0007 (Data being reviewed)		T-1181
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Andritz to manage primary anchor inventory off-site	-455,428	455,428	0	Forecasted	DAN-1101	T-1031
			34,478,358	5,369,170	39,847,528			
		Design Development						
CH0009	Construction of North and South Dams	Contractor to only use type GU cement	Under Study		Under Study	Once conditions on CON-CH0009001-0002 are satisfied, Contractor to submit CR for cost savings		T-1381
CH0009	Construction of North and South Dams	North & South Dam Value Engineering	Under Study		Under Study		DAN-1898	T-1454
CH0032	Hydro-Mechanical Equipment	Construction Power to Spillway Electrical Building	23,750		23,750	Item is being reviewed by the MFG Delivery Team to validate cost impacts, it's required to have this process completed in order to formalize this item and associated potential cost.		CN-046
CH0030	Turbine and generators	Modification to Communication Network Architecture (TS 9.6.2)	50,000		50,000		DAN-1783	T-1326
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Powerhouse Transmission Line Interconnection	Under Study		Under Study		DAN-1630	
			73,750	0	73,750			
		Errors & Omissions						
		Purchase orders and Construction contracts execution						
CH0030	Turbine and generators	Collective Agreement Apprentice Ratio	1,200,000		1,200,000	1.8 M was added to the Rebaseline, however the C1 team is estimating additional increase of 800 K	DAN-1215	T-1068
			1,200,000	0	1,200,000			
		SUBTOTAL C1	35,752,108	5,369,170	41,121,278			
		C3						
		Scope change						
CD0501/CD0502/CD0534		Soldiers Pond Water Requirements	500,000		500,000	Options are under evaluation	DAN-1535	T-1250
CD0501	Converters and cable transition compound	Additional grounding quantities - Muskrat Falls and Soldiers Pond	-5,000,000	4,000,000	-1,000,000	Potential savings on specified growth included in AFE 2015.	DAN-0928	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Soldiers Pond	-750,000	500,000	-250,000	Potential savings on specified growth included in AFE 2015.	DAN-0929	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Churchill Falls	-1,671,922		-1,671,922	Potential savings on specified growth included in AFE 2015.	DAN-0929	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Muskrat Falls	-1,258,210		-1,258,210	Potential savings on specified growth included in AFE 2015.	DAN-0929	T-1285
CD0501	Converters and cable transition compound	Temporary Utilities at MF to Support Energisation of AC and DC to Support Export of Power to Island (Water and Sewer)	500,000		500,000	Options are under evaluation	DAN-1806	T-1426
CD0502	Construction of AC Substations	Interface between the Power Plant and the MF Substation for Fibre Optic Cables	80,000		80,000	An additional trench sloped concrete ductbank and associated civil works is required. Options are under evaluation.	DAN-1779	T-1427
CD0510	Permanent Telecommunications	Unavailability of DC TL OPGW Fiber for TL Redirects into Soldiers Pond TS	1,000,000	-1,000,000	0	No cost impact	DAN-1805	T-1429
CD0501/CD0502/CD0534		Sewage Systems in Permanent Buildings for all applicable C3 sites		Under Study	Under Study	Options are under evaluation to mitigate risk, potential no cost impact.	DAN-1942	T-1487
PD0537	Power Transformers, AC Substations at CF, MF and SP	MF & CF Reactor Heat Run Test Results	-65,000		-65,000	Change request received from ABB for saving of \$16,000, company believes to be additional savings.	DAN-1888	T-1463
			-6,665,132	3,500,000	-3,165,132			
		Growth Allowance / Errors / Omissions						
CD0502-001	Construction of AC Substations	Non-Specified Growth (LIL)	-410,326	368,500	-41,826	Rejection of change order #12 - Removal of Key Personnel		
CD0502-001	Construction of AC Substations	Non-Specified Growth (LTA)	-519,037	131,500	-387,537	Rejection of change order #12 - Removal of Key Personnel		
CD0534	Soldiers Pond Synchronous Condensers	Non-Specified Growth	-110,855		-110,855			
XD0001	LIL	Non-Specified Growth	-3,503,536	3,136,664	-366,872	Updated pricing for structured wiring and disconnect switches.		
XD0001	LTA	Non-Specified Growth	-640,439	-258,717	-899,156	Updated pricing for structured wiring and disconnect switches.		
SD0564	CF camp services	Non-Specified Growth	-175,555		-175,555	Fire Protection		
			-5,359,747	3,377,947	-1,981,801			
		SUBTOTAL C3	-12,024,879	6,877,947	-5,146,933			
		C4						
		Scope change						
CT0327	Construction of HVdc Transmission line	Additional HVdc Foundation on HVdc Line due to Design Weight Changes (WF1,2&3)	under study		under study	2.8M included in rebaseline, under study potential remains	DAN-1403	T-1202
CT0327	Construction of HVdc Transmission line	Additional HVdc Backfill on HVdc Line due to Design Changes (WF1, 2 & 3)	under study		under study	5.6M included in rebaseline, under study potential remains	DAN-1126	T-1202
CT0327	Construction of HVdc Transmission line	Foundation cost decrease WF1 (Segment 1 & 2)	under study		under study	Saving expected to be offset by increase in micro pile foundations covered under DAN 1446/PCN529	DAN-1446/PCN-0529	T-1378/1235

Apr-16

Potential Deviations

C.P.	Package Description	Variation Description	Previous Cumulative	Monthly Variance	Total Potential	Comments	CM Ref.	Trend / CN / Sch. ref.
CT0327	Construction of HVdc Transmission line	Foundation increase in installation cost due to ECNs (WF1, 2 & 3)	10,000,000		10,000,000		TBD	T-1381
CT0327	Construction of HVdc Transmission line	HVdc Clearing and Access - Block 12 (Long Range Mountains)	24,000,000		24,000,000	28 M overall, 4 M in Forecast	TBD	T-1374
CT0327	Construction of HVdc Transmission line	Valard Part B forecast increase	8,500,000	-8,500,000	0	no forecast increase for Part B, current outlook 62.4M	TBD	T-1375
CT0327	Construction of HVdc Transmission line	Bridge Materials	2,000,000		2,000,000		DAN-1586	T-1465
CT0327	Construction of HVdc Transmission line	Road Upkeep, Snow Clearing		11,500,000	11,500,000		DAN-1876	T-1493
CT0327	Construction of HVdc Transmission line	Completion of Blocks 15 & 16, including road topping		-2,000,000	-2,000,000		TBD	T-1494
CT0327	Construction of HVdc Transmission line	Completion of Clearing and Access Terra Nova Winter Zone (all season road)		10,000,000	10,000,000		TBD	T-1495
CT0327	Construction of HVdc Transmission line	Upgrade Winter Road to All Season Access Road (interior Labrador).	20,000,000		20,000,000	10M for JCL, 10M for C&T	DAB-1876	T-1466
CT0327	Construction of HVdc Transmission line	Additional costs (mob,demob,storage) due to delays in the HVdc TL Gantry Connection	under study		under study	cost to be transferred from C3	DAN-1444	T-1237
CT0327	Construction of HVdc Transmission line	Potential Delay of LIL Energization Milestone	under study		under study		DAN-1676	T-1353
CT0327	Construction of HVdc Transmission line	Use of Local Accommodations in lieu of Valard Contractor's Camp	-1,000,000		-1,000,000	preliminary analysis, ongoing assessment	DAN-1635	T-1338
CT0327	Construction of HVdc Transmission line	Pre- Foundation Selection for Island (HVdc) / Additional geotech (island)		under study	under study	\$250K for pre selection and additional geotech understudy est b/w \$1-2M	DAN-1954/PCN-0626	T-1386
CT0327	Construction of HVdc Transmission line	Trade labour escalation, due to Valard delays		under study	under study		DAN-1957	T-1477
CT0327/CT031	Construction HVdc / HVdc Transmission lines	HVdc and HVdc Concrete Quality Issues	under study		under study	low cost impact	DAN-1675	T-1354
CT0355	Marshaling Yards for Hvac Line	Inland trucking services for C4 deliveries	5,000,000		5,000,000		TBD	T-1372
CT0342	ROW Clearing Hvac line	Directive from Hydro regarding construction schedule and line design for TL 266 (230 KV line re-build at Soldiers Pond)	under study		under study	to be reimbursed by NL Hydro	DAN-1529	T-1269
CT0327	Construction of HVdc Transmission line	Potential Savings on 350 kV HVdc Line for Using Modified Guy Anchor Top Bar	-1,282,500		-1,282,500	materials in pending	DAN-1849/PCN-0607	T-1433
CT0327	Construction of HVdc Transmission line	Additional geotech	under study	0	0	combined with T-1386	TBD	T-1442
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Installation of second Stockbridge dampers at some towers	under study		under study		DAN-1786	T-1434
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	TL240 options post impoundment	450,000		450,000		DAN-1862	T-1435
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Rock jack hammering/busting costs	644,711		644,711		DAN-1863	T-1436
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Structure 142 Line 1 on the HVdc line required rework due to settlement	1,200,000		1,200,000		DAN-1652	T-1437
PT0352	Supply of Anchor Materials - Hvac	Purchase of Tie-Down Anchors for Valard for 350 kV HVdc Line		1,000,000	1,000,000	includes supply only, 90K in pending	DAN-1807	T-1489
CT0327	Construction of HVdc Transmission line	Fuel (Impacts of 2016 Budget on LCP)		under study	under study		DAN-1963	T-1497
CT0327	Construction of HVdc Transmission line	Review of HVdc Anti-Cascade Criteria and Optimization		-2,500,000	-2,500,000	potential savings	DAN-1959	T-1498
CT0327	Construction of HVdc Transmission line	HVdc Re-route at Goose Pond on the Avalon		under study	under study		DAN-1975	T-1499
CT0327	Construction of HVdc Transmission line	Potential HVdc route adjustment from Witless Bay Line to Soldiers Pond		under study	under study		DAN-1676	T-1500
CH0024	Reservoir Clearing	Clearing of Muskrat Falls spillway and intake (Additional quantities)	699,324	-699,324	0	Forecasted	DAN-1031	T-1467
PT0331	Supply of Hardware - HVdc	Optimization of Design of Electrode Line Conductor and Guy Anchor Hardware	under study	500,000	500,000	savings captured in PCN-0604	DAN-1870	T-1441
Bids received and lessons learned			70,211,535	9,300,676	79,512,211			
SUBTOTAL C4			70,211,535	9,300,676	79,512,211			
Services								
CT0355/SM0700	Marshaling yard - Argentinia	Inland transport for DC line materials	-3,493,630		-3,493,630	Cancelling the LTA section, should be LIL.		
SUBTOTAL Services			-3,493,630	0	-3,493,630			
Other scope								
Scope change								
XX0100	Owner's cost	Increase in Owner's team cost	Under Study		Under Study		TBD	

Apr-16

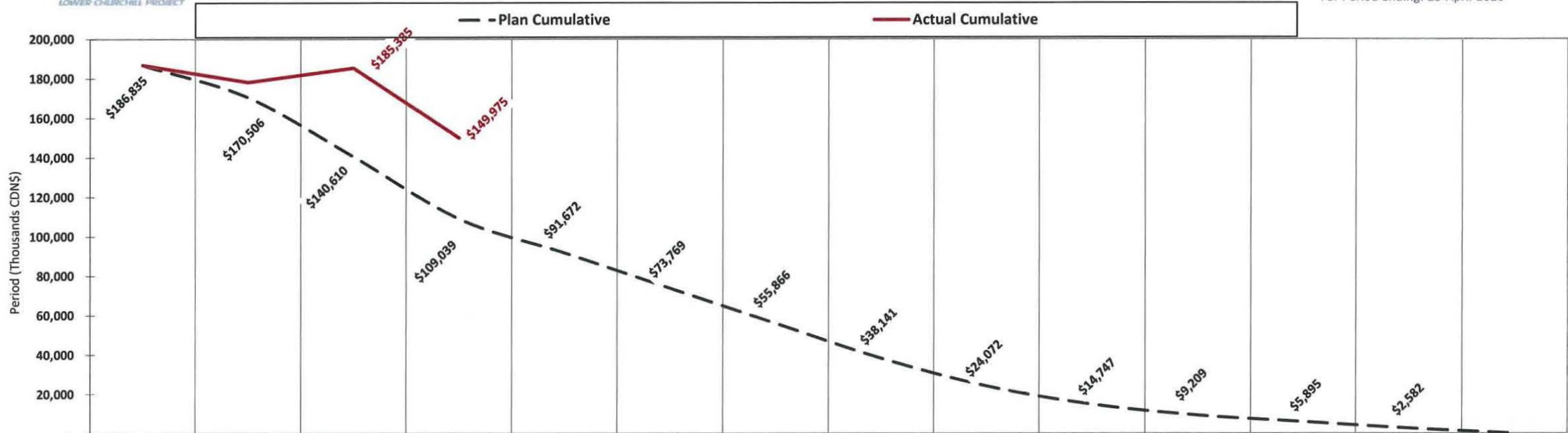
Potential Deviations

C.P.	Package Description	Variation Description	Previous Cumulative	Monthly Variance	Total Potential	Comments	CM Ref.	Trend / CN / Sch. ref.
		<u>SUBTOTAL other scope</u>	0	0	0			
		TOTAL AMOUNT	90,445,134	21,547,793	111,992,926			



Lower Churchill Project Phase I Project Contingency Drawdown (CDN \$000)

For Period Ending: 25-April-2016



Period	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	-	16,329	29,896	31,570	17,368	17,903	17,903	17,725	14,069	9,325	5,538	3,313	3,313	2,582
Consumed	-	8,627	(7,177)	35,409	-	-	-	-	-	-	-	-	-	-
Cumulative														
Plan (AFE rev2)	186,835	170,506	140,610	109,039	91,672	73,769	55,866	38,141	24,072	14,747	9,209	5,895	2,582	(0)
Actual Budget	186,835	178,207	185,385	149,975	-	-	-	-	-	-	-	-	-	-

Note 1: AFE rev2 = Authorization for Expenditure approved by Nalcor Energy Board of Directors on September 2015

Grouped by:C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)									
CD0503 - EarthWorks at Various Power Distribution	67,511,852	-15,423,037	52,088,815	52,088,813	0	0	0	0	52,086,877	52,088,813	0	2
CD0508 - Electrodes Sites	30,324,143	-11,954,780	18,369,363	14,134,989	0	225,000	4,209,375	0	14,128,856	18,569,364	0	-200,000
CD0512 - Construction Power Facilities	9,222,116	3,478,259	12,700,375	12,700,375	0	0	0	0	12,700,375	12,700,375	0	-0
CD0535 - Construction of Const. Tele. Services -	7,035,756	-7,035,756	0	0	0	0	0	0	0	0	0	0
CD0538 - Accommodations Camp (CF)	17,839,372	-12,433,765	5,405,607	5,405,606	0	0	0	0	5,405,607	5,405,606	0	0
CD0566 - Supply of Construction Power	0	3,753,864	3,753,864	3,059,516	0	220,544	473,804	7,702	1,377,582	3,753,864	0	0
CD0568 - Offsite Infrastructure Upgrades	0	3,113,200	3,113,200	1,035,200	0	0	2,078,000	0	1,026,253	3,113,200	0	0
CFLCO - CFLCO Work Orders	0	-0	-0	0	0	0	0	0	0	0	0	-0
CH0002 - Accommodations Complex Buildings	66,895,398	79,732,566	146,627,964	146,554,952	-565	148,379	-74,795	0	146,445,518	146,627,970	-74,795	-6
CH0003 - Administrative Buildings	8,652,347	12,247,448	20,899,795	20,899,795	0	0	0	0	20,837,512	20,899,795	0	-0
CH0004 - Southside Access Road	40,359,578	15,985,199	56,344,777	56,344,777	0	0	0	0	56,344,777	56,344,777	0	0
CH0005 - Accommodation Complex Site Utilities	18,577,209	-18,577,209	0	0	0	0	0	0	0	0	0	0
CH0006 - Bulk Excavation Works	139,882,886	11,464,082	151,346,967	151,346,956	0	0	0	0	151,346,956	151,346,956	0	11
CH0008 - North Spur Stabilization Works	66,427,162	76,948,846	143,376,008	140,813,744	5,000	2,412,020	399,739	0	70,313,342	143,630,503	0	-254,494
CH0023 - Reservoir Clearing South Bank	90,551,215	-90,551,215	0	0	0	0	0	0	0	0	0	0
CH0024 - Reservoir Clearing North Bank	57,310,625	72,413,143	129,723,768	129,177,962	0	0	545,806	4,492,585	98,071,127	129,723,768	533,368	0
CH0029 - Site Restoration	0	920,185	920,185	0	0	0	920,185	0	0	920,185	420,185	0
CH0030 - Turbines and Generators	205,387,347	-12,430,515	192,956,832	179,840,665	3,476,835	15,336,630	0	2,524,907	112,712,623	198,654,130	0	-5,697,298
CH0031 - Mechanical and Electrical Auxiliaries (M	101,096,139	-14,388,672	86,707,467	0	0	69,963,512	86,707,467	0	0	156,670,979	0	-69,963,512
CH0032 - Hydro-Mechanical Equipment	104,242,075	134,168,828	238,410,902	230,233,793	2,026,900	1,623,774	5,923,433	11,079,833	117,248,908	239,807,900	98,382	-1,396,997
CH0033 - Powerhouse Cranes	9,564,462	48,425	9,612,887	9,084,260	60,000	520,740	0	10,000	7,477,516	9,665,000	0	-52,113
CH0034 - Powerhouse Elevator	808,729	-309,733	498,996	498,996	0	0	0	0	49,886	498,996	0	0
CH0039 - McKenzie River Bridge	2,654,965	3,334,579	5,989,544	6,002,143	0	407,586	-420,185	0	5,989,544	5,989,544	-420,185	-0
CH0046 - Spillway Hydro-Mechanical Equipment	52,899,185	-52,899,185	0	0	0	0	0	0	0	0	0	0
CH0048 - Site Clearing Access Road and Ancillary	3,635,203	4,317,615	7,952,818	8,010,028	0	0	-57,210	0	7,952,818	7,952,818	0	0
CH0062 - Offside Roads and Bridges	0	48,000	48,000	48,000	0	0	0	0	48,000	48,000	0	0
CT0319 - Construction of HVac TL	204,427,902	72,342,660	276,770,562	268,667,468	0	4,745,606	2,006,104	7,499,278	252,023,114	275,419,178	-367,402	1,351,384
CT0327 - Construction of HVdc TL - 1	392,729,526	784,505,034	1,177,234,560	1,136,690,522	0	45,839,575	42,018,927	4,104,768	533,595,598	1,224,549,024	-4,756,417	-47,314,464
CT0341 - Clearing of ROW HVac TL	30,703,771	14,726,656	45,430,427	42,786,329	0	2,000,000	0	0	42,786,329	44,786,329	0	644,098
CT0342 - Construction of AC TL - Island	14,134,585	5,099,163	19,233,749	18,329,858	0	0	903,891	992,269	10,416,444	19,233,749	0	0
CT0343 - Clearing of ROW HVdc TL - 1	96,975,584	-96,975,584	0	0	0	0	0	0	0	0	0	0
CT0345 - Clearing of ROW HVdc TL - 2	57,585,444	-57,585,444	0	0	0	0	0	0	0	0	0	0

Grouped by:C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
CT0346 - Construction of HVdc TL – 2	187,414,391	-187,414,391	-0	0	0	0	-0	0	0	-0	0	0
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	5,341,415	5,341,415	5,181,039	0	160,376	0	0	5,180,290	5,341,415	0	0
CT0355 - Marshaling Yards for HVdc Line	0	8,000,000	8,000,000	7,153,162	0	0	846,838	234,532	2,798,092	8,000,000	0	0
NLH - NLH Work Orders	0	0	0	0	0	0	0	0	0	0	0	0
PD0505 - Switchyard Equipment-AC Substations at C	98,321,259	-98,321,259	0	0	0	0	0	0	0	0	0	0
PD0513 - 138/25 kV Transformers	2,176,538	470,899	2,647,437	2,647,437	0	0	0	0	2,647,437	2,647,437	0	0
PD0514 - 138 kV and 25 kV Circuit Breakers	204,749	36,487	241,236	241,236	0	0	0	0	241,236	241,236	0	0
PD0515 - 230kV,138kV and 25kV Disconnect Switches	215,228	41,434	256,662	256,662	0	0	0	0	256,662	256,662	0	0
PD0518 - 138kV Capacitor Voltage Transformers	25,876	-1,336	24,540	24,540	0	0	0	0	24,540	24,540	0	0
PD0519 - 25 kV Vacuum Interrupters	142,352	23,409	165,761	165,761	0	0	0	0	165,761	165,761	0	0
PD0520 - 25 kV 6 x 3.6 MVAR Capacitor Banks	206,881	38,865	245,746	245,746	0	0	0	0	245,746	245,746	0	0
PD0522 - Pre-fabricated Control Room Building	822,811	284,511	1,107,322	1,107,322	0	0	0	0	1,107,322	1,107,322	0	0
PD0523 - Substation Service Transformer	18,204	32	18,236	18,236	0	0	0	0	18,236	18,236	0	0
PD0529 - 25kV Reclosers	62,751	73,611	136,362	136,362	0	0	0	0	136,362	136,362	0	0
PD0530 - 138 kV and 25 kV Surge Arresters	41,254	71	41,325	41,325	0	0	0	0	41,325	41,325	0	0
PD0531 - MV Instrument Transformer	55,410	102	55,512	55,512	0	0	0	0	55,512	55,512	0	0
PD0533 - Early Works Telecom Devices	319,443	-71,305	248,138	248,138	0	0	0	0	248,138	248,138	0	-0
PD0537 - Power Transformers, AC Substations at CF	31,093,446	6,613,626	37,707,072	37,391,864	0	315,208	0	723,935	37,391,864	37,707,072	0	0
PD0561 - D20 RTU & Cabinet (CF)-Construction Powe	50,103	-13,397	36,706	36,706	0	0	0	0	36,706	36,706	0	0
PD0562 - Protection Front Panels (CF)	99,828	58,903	158,731	158,731	0	0	0	0	158,731	158,731	0	0
PD0563 - 138 kV Circuit Switcher (CF), MV Switche	116,767	-7,686	109,081	109,081	0	0	0	0	109,081	109,081	0	0
PH0014 - GSU Transformer	20,549,016	-5,336,346	15,212,670	15,012,670	0	200,000	0	12,378	3,771,588	15,212,670	0	0
PH0015 - Isolated Phase Bus	1,902,522	125,000	2,027,522	950,823	0	0	1,076,699	0	66,803	2,027,522	0	0
PH0016 - Generator Circuit Breakers	5,170,372	-3,455,176	1,715,196	1,715,196	0	0	0	0	358,333	1,715,196	0	0
PH0035 - Station Service Transformers	0	0	0	0	0	0	0	0	0	0	0	0
PH0036 - Auxiliary Transformers	474,712	100,066	574,778	555,808	0	18,970	0	0	555,808	574,778	0	0
PH0037 - 25 kV Switchgear	1,381,328	-1,381,328	0	0	0	0	0	0	0	0	0	0
PH0038 - Emergency Diesel Generators	1,754,986	264,677	2,019,663	2,019,663	0	0	0	0	2,019,368	2,019,663	0	1
PH0053 - LCP Used Camp	0	18,177,409	18,177,409	18,548,573	-11,399	0	-359,765	0	18,173,167	18,177,409	0	-0
PT0300 - Supply of Conductors – HVac	20,880,983	-7,337,371	13,543,612	13,543,612	0	0	0	0	13,543,612	13,543,612	0	0
PT0301 - Supply of Insulators - HVac	4,939,704	-2,116,621	2,823,083	2,823,082	0	0	0	0	2,823,082	2,823,082	0	1
PT0302 - Supply of Towers– HVac	24,434,086	-3,614,374	20,819,712	20,713,660	0	0	106,052	0	20,713,660	20,819,712	0	-0
PT0303 - Supply of Hardware – HVac	12,835,064	-4,021,468	8,813,596	8,774,245	38,800	0	551	20,010	8,654,017	8,813,596	0	0
PT0304 - Supply of OPGW - HVac	2,472,133	-592,632	1,879,501	1,761,536	0	55,282	62,683	0	1,761,536	1,879,501	0	0
PT0307 - Supply of Steel Tower Foundations – HVac	5,522,873	2,000,333	7,523,206	7,523,018	0	0	188	0	7,523,018	7,523,206	0	0
PT0308 - Supply of Steel Tower Foundations– HVdc	24,071,995	12,496,149	36,568,144	37,006,793	0	222,155	4,800	2,233,597	31,500,000	37,233,748	-67,735	-665,604
PT0326 - Supply of Steel Wires – HVac	2,885,849	760,628	3,646,477	3,642,592	0	3,886	0	0	3,642,592	3,646,477	0	-0
PT0328 - Supply of Conductors - HVdc	89,474,058	-37,974,011	51,500,047	51,500,047	0	0	0	0	51,429,553	51,500,047	0	-0
PT0329 - Supply of Insulators - HVdc	52,513,276	-30,797,088	21,716,188	21,647,376	0	46,740	22,072	0	21,608,410	21,716,188	0	-0
PT0330 - Supply of Towers – HVdc	63,048,979	-4,434,025	58,614,954	58,172,239	0	401,240	442,717	838,431	56,077,043	59,016,196	10,492	-401,242
PT0331 - Supply of Hardware – HVdc	6,867,096	16,723,022	23,590,118	23,070,140	153,655	75,658	290,665	564,513	18,899,218	23,590,118	267,901	-1
PT0334 - Supply of Wires - HVdc	1,914,335	5,674,470	7,588,805	7,574,480	0	14,324	0	0	7,574,480	7,588,804	0	1

Grouped by:C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
PT0335 - Supply of Anchors - HVac	1,988,073	1,528,391	3,516,464	3,514,245	0	0	2,220	0	3,514,245	3,516,464	0	-0
PT0336 - Supply of 25 kV Hardware	497,042	75,970	573,012	573,013	0	0	0	0	573,013	573,013	0	-1
PT0337 - Supply of 25 kV ADSS	467,173	-82,735	384,438	384,438	0	0	0	0	384,438	384,438	0	0
PT0338 - Supply of 25 kV Conductors	344,111	-28,733	315,378	315,378	0	0	0	0	315,378	315,378	0	0
PT0339 - Supply of 25 kV Insulators	65,096	-7,403	57,693	57,693	0	0	0	0	57,693	57,693	0	0
PT0340 - Supply of Poles for 138/25 KV	391,185	12,514	403,699	403,699	0	0	0	0	403,699	403,699	0	-0
PT0351 - Supply of Poles	477,982	1,221,237	1,699,219	1,261,289	0	0	437,930	0	1,261,289	1,699,219	0	0
PT0352 - Supply of Anchors - HVdc	22,878,411	-6,004,873	16,873,538	17,078,513	0	500,000	103,786	0	16,862,883	17,682,299	0	-808,761
PT0353 - Supply of OPGW - HVdc	4,285,092	4,560,403	8,845,495	8,757,168	0	5,379	82,948	80,110	8,628,271	8,845,495	0	-1
PT0356 - Supply of Dampers HVdc	0	1,379,928	1,379,928	1,379,627	0	1,060	0	0	1,379,627	1,380,687	0	-759
SD0536 - Integrated Commissioning Support Service	16,141,864	-16,141,864	0	0	0	0	0	0	0	0	0	0
SD0564 - CF Camp Services	103,824	15,238,073	15,341,897	13,353,673	0	3,067,305	1,068,900	679,871	9,084,955	17,489,878	0	-2,147,981
SD0565 - Marine Geo-tech Electrodes	0	333,260	333,260	333,260	0	0	0	0	333,260	333,260	0	0
SD0567 - Installation of Geodetic Control Survey	0	39,179	39,179	39,179	0	0	0	0	39,179	39,179	0	0
SD0568 - C3 Site Office Supplies	0	36,400	36,400	36,400	0	0	0	0	1,127	36,400	0	0
SH0001 - Physical Hydraulic Model	723,100	0	723,100	723,100	0	0	0	0	723,100	723,100	0	0
SH0021 - Road Maintenance and Snow Clearing Servi	9,152,021	-9,152,021	0	0	0	0	0	0	0	0	0	0
SH0054 - Temporary Site Services	0	25,424,739	25,424,739	24,525,774	55,607	843,358	0	0	25,424,740	25,424,739	0	0
SH0063 - Provision of Site Services	0	0	0	0	0	0	0	0	0	0	0	0
SH0066 - Hydraulic Model - North Dam	0	358,670	358,670	358,670	0	0	0	0	358,670	358,670	0	0
SM0703 - Happy Valley-Goose Bay Project Office Sp	532,356	-532,356	0	0	0	0	0	0	0	0	0	0
SM0704 - Surveying Services	14,671,329	-6,854,456	7,816,873	22,924,414	105,090	-123,712	-15,088,920	0	7,652,886	7,816,873	0	0
SM0710 - IT Equipment	2,155,286	-2,155,286	0	0	0	0	0	0	0	0	0	0
SM0713 - 2012 Field Geotechnical Investigations	2,108,854	1,619,818	3,728,672	3,963,132	0	-234,461	0	0	3,714,456	3,728,671	0	1
ST0309 - Provision of Geotech - HVac	956,750	-956,750	0	0	0	0	0	0	0	0	0	0
ST0310 - Provision of Geotech - HVdc	4,018,074	-4,018,074	0	0	0	0	0	0	0	0	0	0
ST0311 - Provision of Survey - HVac	0	135,074	135,074	135,075	0	0	0	0	135,075	135,075	0	-1

Grouped by:C.P.

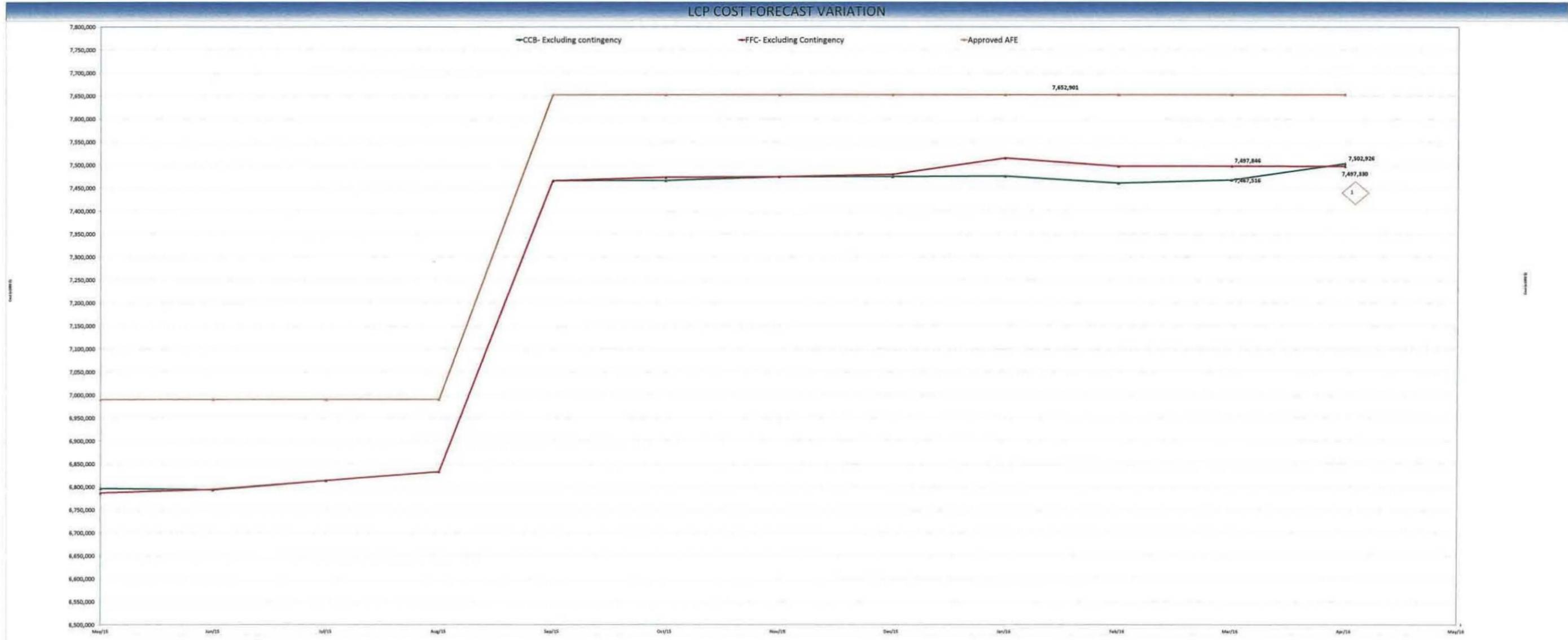
Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
ST0312 - Provision of Survey - HVdc	0	0	0	0	0	0	0	0	0	0	0	0
XD0001 - AFE Estimated Growth - C3	0	22,429,590	22,429,590	0	0	-14,552,312	10,360,447	0	0	-4,191,865	-2,877,947	26,621,455
XH0001 - AFE Estimated Growth - C1	0	92,834,417	92,834,417	0	0	-92,834,417	92,834,417	0	0	0	0	92,834,417
XM0001 - AFE Estimated Growth - General	0	5,639,830	5,639,830	0	0	0	5,639,830	0	0	5,639,830	-800,000	0
XT0001 - AFE Estimated Growth - C4	0	30,775,120	30,775,120	0	0	-52,843,404	30,775,120	0	0	-22,068,284	0	52,843,404
XX0001 - SOBI	352,014,204	-7,783,072	344,231,132	307,201,193	0	7,545,045	29,484,895	7,768,006	221,129,179	344,231,132	0	-1
XX0002 - Additional Scope of Work	72,490,420	-34,497,748	37,992,672	29,966,756	0	412,648	7,613,268	267,343	24,431,658	37,992,672	-0	0
XX0003 - Environmental Approval	0	0	0	0	0	0	0	0	0	0	0	0
XX0004 - Historical cost	186,083,322	-186,083,322	0	0	0	0	0	0	0	0	0	0
XX0005 - Owner Cost	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total:	6,202,489,666	1,450,411,399	7,652,901,065	6,764,414,877	-868,581	48,214,085	841,140,684	135,241,377	4,483,146,540	7,652,901,065	1	-0



Note 1: April vs. March Forecast Variance

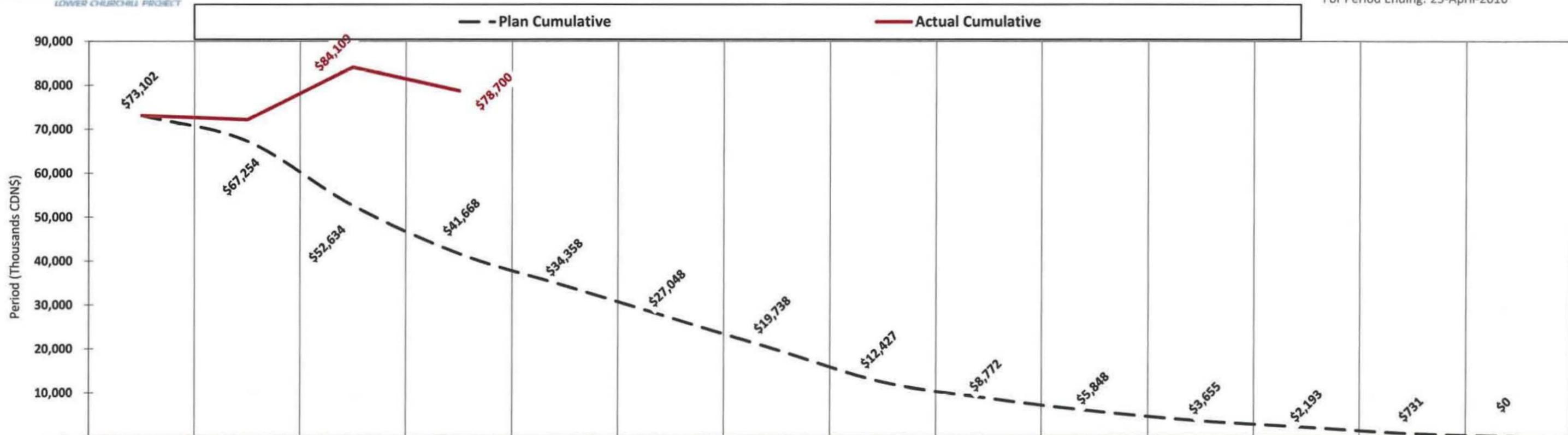
- 0.4 M Misc. ECH's and FWO's in Astaldi's contract including the Spillway discharge channel length reduction
- 0.1 M Dunnage Under Crane on Permanent Upstream Bridge
- (6 M) Overall saving on the growth of C3
- 5 M Dispute resolution costs at MF

Remarks:
 The FFC value of \$ 7,497,330 does not include any contingency
 The CCB value of \$ 7,502,926 does not include any contingency



LCP Phase I - Muskrat Falls Generation Project Contingency Drawdown (CDN \$000)

For Period Ending: 25-April-2016



Period	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	-	5,848	14,620	10,965	7,310	7,310	7,310	7,310	3,655	2,924	2,193	1,462	1,462	731
Consumed	-	930	(11,937)	5,409	-	-	-	-	-	-	-	-	-	-
Cumulative	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	73,102	67,254	52,634	41,668	34,358	27,048	19,738	12,427	8,772	5,848	3,655	2,193	731	0
Actual Budget	73,102	72,172	84,109	78,700	-	-	-	-	-	-	-	-	-	-

Note 1: AFE rev2 = Authorization for Expenditure approved by Nalcor Energy Board of Directors on September 2015

Grouped by: cost category; C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)		(6=3-5)
CD0503 - EarthWorks at Various Power Distribution	0	0	0	0	0	0	0	0	0	0	0	0
CD0508 - Electrodes Sites	0	0	0	0	0	0	0	0	0	0	0	0
CD0512 - Construction Power Facilities	9,222,116	3,478,259	12,700,375	12,700,375	0	0	0	0	12,700,375	12,700,375	0	-0
CD0535 - Construction of Const. Tele. Services -	1,105,811	-1,105,811	0	0	0	0	0	0	0	0	0	0
CD0568 - Offsite Infrastructure Upgrades	0	3,113,200	3,113,200	1,035,200	0	0	2,078,000	0	1,026,253	3,113,200	0	0
CFLCO - CFLCO Work Orders	0	0	0	0	0	0	0	0	0	0	0	0
CH0002 - Accommodations Complex Buildings	66,895,398	79,732,566	146,627,964	146,554,952	-565	148,379	-74,795	0	146,445,518	146,627,970	-74,795	-6
CH0003 - Administrative Buildings	8,652,347	12,247,448	20,899,795	20,899,795	0	0	0	0	20,837,512	20,899,795	0	-0
CH0004 - Southside Access Road	40,359,578	15,985,199	56,344,777	56,344,777	0	0	0	0	56,344,777	56,344,777	0	0
CH0005 - Accommodation Complex Site Utilities	18,577,209	-18,577,209	0	0	0	0	0	0	0	0	0	0
CH0006 - Bulk Excavation Works	137,362,113	4,557,966	141,920,079	141,963,074	0	0	0	0	141,963,074	141,963,074	0	-42,995
CH0008 - North Spur Stabilization Works	66,427,162	76,945,846	143,373,008	140,810,744	5,000	2,412,020	399,739	0	70,310,342	143,627,503	0	-254,494
CH0023 - Reservoir Clearing South Bank	90,551,215	-90,551,215	0	0	0	0	0	0	0	0	0	0
CH0024 - Reservoir Clearing North Bank	57,310,625	72,413,143	129,723,768	129,177,962	0	0	545,806	4,492,585	98,071,127	129,723,768	533,368	0
CH0034 - Powerhouse Elevator	808,729	-309,733	498,996	498,996	0	0	0	0	49,886	498,996	0	0
CH0039 - McKenzie River Bridge	2,654,965	3,334,579	5,989,544	6,002,143	0	407,586	-420,185	0	5,989,544	5,989,544	-420,185	-0
CH0046 - Spillway Hydro-Mechanical Equipment	52,899,185	-52,899,185	0	0	0	0	0	0	0	0	0	0
CH0048 - Site Clearing Access Road and Ancillary	3,635,203	3,923,570	7,558,773	7,615,983	0	0	-57,210	0	7,558,773	7,558,773	0	0
CH0062 - Offside Roads and Bridges	0	48,000	48,000	48,000	0	0	0	0	48,000	48,000	0	0
CT0319 - Construction of HVac TL	4,165,814	1,272,934	5,438,748	5,430,801	0	600,000	7,947	5,430,801	5,430,801	6,038,748	0	-600,000
CT0327 - Construction of HVdc TL - 1	0	0	0	0	0	0	0	0	0	0	0	0
CT0346 - Construction of HVdc TL - 2	0	-0	-0	0	0	0	-0	0	0	-0	0	0
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	0	0	0	0	0	0	0	0	0	0	0
PD0513 - 138/25 kV Transformers	2,176,538	470,899	2,647,437	2,647,437	0	0	0	0	2,647,437	2,647,437	0	0
PD0514 - 138 kV and 25 kV Circuit Breakers	204,749	36,487	241,236	241,236	0	0	0	0	241,236	241,236	0	0
PD0515 - 230kV,138kV and 25kV Disconnect Switches	215,228	41,434	256,662	256,662	0	0	0	0	256,662	256,662	0	0
PD0518 - 138kV Capacitor Voltage Transformers	25,876	-1,336	24,540	24,540	0	0	0	0	24,540	24,540	0	0

Grouped by: cost category; C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	
3' - Muskrat Falls												
PD0519 - 25 kV Vacuum Interrupters	142,352	23,409	165,761	165,761	0	0	0	0	165,761	165,761	0	0
PD0520 - 25 kV 6 x 3.6 MVAR Capacitor Banks	206,881	38,865	245,746	245,746	0	0	0	0	245,746	245,746	0	0
PD0522 - Pre-fabricated Control Room Building	822,811	284,511	1,107,322	1,107,322	0	0	0	0	1,107,322	1,107,322	0	0
PD0523 - Substation Service Transformer	18,204	32	18,236	18,236	0	0	0	0	18,236	18,236	0	0
PD0529 - 25kV Reclosers	62,751	73,611	136,362	136,362	0	0	0	0	136,362	136,362	0	0
PD0530 - 138 kV and 25 kV Surge Arresters	41,254	71	41,325	41,325	0	0	0	0	41,325	41,325	0	0
PD0531 - MV Instrument Transformer	55,410	102	55,512	55,512	0	0	0	0	55,512	55,512	0	0
PD0533 - Early Works Telecom Devices	319,443	-71,305	248,138	248,138	0	0	0	0	248,138	248,138	0	-0
PD0561 - D20 RTU & Cabinet (CF)-Construction Powe	50,103	-13,397	36,706	36,706	0	0	0	0	36,706	36,706	0	0
PD0562 - Protection Front Panels (CF)	99,828	58,903	158,731	158,731	0	0	0	0	158,731	158,731	0	0
PD0563 - 138 kV Circuit Switcher (CF), MV Switche	116,767	-7,686	109,081	109,081	0	0	0	0	109,081	109,081	0	0
PH0014 - GSU Transformer	20,549,016	-5,336,346	15,212,670	15,012,670	0	200,000	0	12,378	3,771,588	15,212,670	0	0
PH0015 - Isolated Phase Bus	1,902,522	125,000	2,027,522	950,823	0	0	1,076,699	0	66,803	2,027,522	0	0
PH0016 - Generator Circuit Breakers	5,170,372	-3,455,176	1,715,196	1,715,196	0	0	0	0	358,333	1,715,196	0	0
PH0035 - Station Service Transformers	0	0	0	0	0	0	0	0	0	0	0	0
PH0036 - Auxiliary Transformers	474,712	100,066	574,778	555,808	0	18,970	0	0	555,808	574,778	0	0
PH0037 - 25 kV Switchgear	1,381,328	-1,381,328	0	0	0	0	0	0	0	0	0	0
PH0038 - Emergency Diesel Generators	1,754,986	264,677	2,019,663	2,019,663	0	0	0	0	2,019,368	2,019,663	0	1
PH0053 - LCP Used Camp	0	18,177,409	18,177,409	18,548,573	-11,399	0	-359,765	0	18,173,167	18,177,409	0	-0
PT0336 - Supply of 25 kV Hardware												
PT0336 - Supply of 25 kV Hardware	497,042	75,970	573,012	573,013	0	0	0	0	573,013	573,013	0	-1
PT0337 - Supply of 25 kV ADSS												
PT0337 - Supply of 25 kV ADSS	467,173	-82,735	384,438	384,438	0	0	0	0	384,438	384,438	0	0
PT0338 - Supply of 25 kV Conductors												
PT0338 - Supply of 25 kV Conductors	344,111	-28,733	315,378	315,378	0	0	0	0	315,378	315,378	0	0
PT0339 - Supply of 25 kV Insulators												
PT0339 - Supply of 25 kV Insulators	65,096	-7,403	57,693	57,693	0	0	0	0	57,693	57,693	0	0
PT0340 - Supply of Poles for 138/25 KV												
PT0340 - Supply of Poles for 138/25 KV	391,185	12,514	403,699	403,699	0	0	0	0	403,699	403,699	0	-0
SD0536 - Integrated Commissioning Support Service												
SD0536 - Integrated Commissioning Support Service	2,172,433	-2,172,433	0	0	0	0	0	0	0	0	0	0
SD0560 - Provision of Early Works & Starter Camp												
SD0560 - Provision of Early Works & Starter Camp	312,456	2,299,792	2,612,248	1,366,945	0	17,035	1,228,268	2,931	1,081,524	2,612,248	0	0
SH0001 - Physical Hydraulic Model												
SH0001 - Physical Hydraulic Model	723,100	0	723,100	723,100	0	0	0	0	723,100	723,100	0	0
SH0021 - Road Maintenance and Snow Clearing Servi												
SH0021 - Road Maintenance and Snow Clearing Servi	9,152,021	-9,152,021	0	0	0	0	0	0	0	0	0	0
SH0022 - Fuel Supply and Dispensing Services (MF)												
SH0022 - Fuel Supply and Dispensing Services (MF)	841,507	5,184,059	6,025,566	6,005,566	0	20,000	0	103,961	3,738,488	6,025,566	0	-0
SH0054 - Temporary Site Services												
SH0054 - Temporary Site Services	0	25,424,739	25,424,739	24,525,774	55,607	843,358	0	0	25,424,740	25,424,739	0	0
SH0063 - Provision of Site Services												
SH0063 - Provision of Site Services	0	0	0	0	0	0	0	0	0	0	0	0
SH0066 - Hydraulic Model - North Dam												
SH0066 - Hydraulic Model - North Dam	0	358,670	358,670	358,670	0	0	0	0	358,670	358,670	0	0



Grouped by: cost category; C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

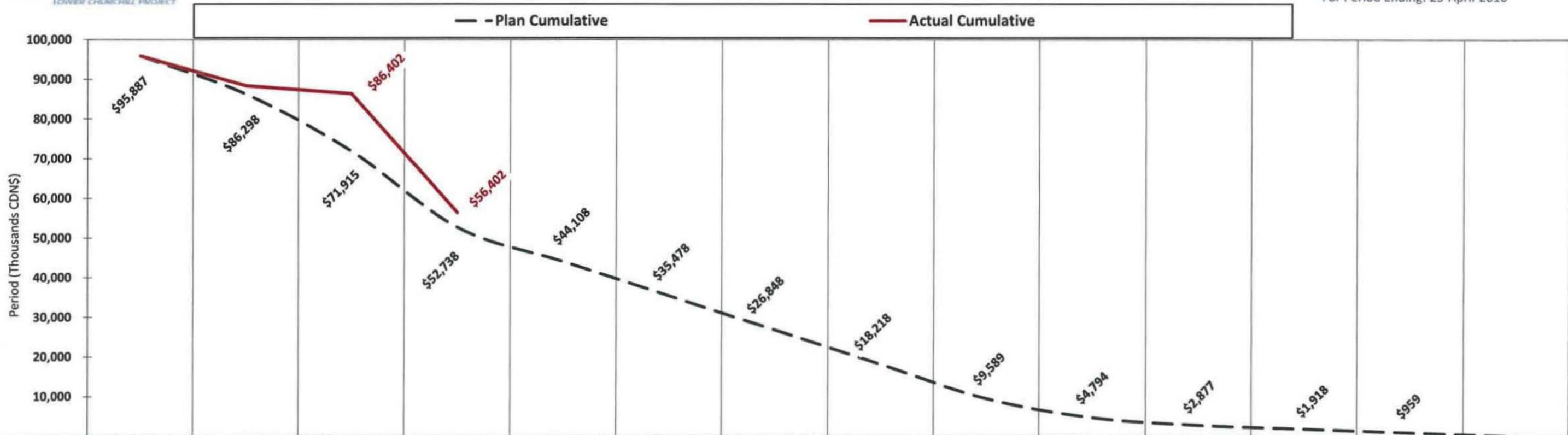
	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	
3' - Muskrat Falls												
SM0703 - Happy Valley-Goose Bay Project Office Sp	532,356	-532,356	0	0	0	0	0	0	0	0	0	0
SM0704 - Surveying Services	14,671,329	-6,854,456	7,816,873	22,924,414	105,090	-123,712	-15,088,920	0	7,652,886	7,816,873	0	0
SM0710 - IT Equipment												
SM0710 - IT Equipment	2,155,286	-2,155,286	0	0	0	0	0	0	0	0	0	0
SM0713 - 2012 Field Geotechnical Investigations												
SM0713 - 2012 Field Geotechnical Investigations	2,108,854	1,608,574	3,717,428	3,951,889	0	-234,461	0	0	3,703,212	3,717,428	0	0
SM0714 - EPCM Services												
SM0714 - EPCM Services	176,044,269	-48,510,345	127,533,924	127,533,924	0	0	0	0	127,533,924	127,533,924	0	0
XH0001 - AFE Estimated Growth - C1												
XH0001 - AFE Estimated Growth - C1	0	84,941,801	84,941,801	0	0	-84,941,801	84,941,801	0	0	0	0	84,941,801
XM0001 - AFE Estimated Growth - General												
XM0001 - AFE Estimated Growth - General	0	0	0	0	0	0	0	0	0	0	-800,000	0
XT0001 - AFE Estimated Growth - C4												
XT0001 - AFE Estimated Growth - C4	0	600,000	600,000	0	0	-600,000	600,000	0	0	0	0	600,000
XX0002 - Additional Scope of Work												
XX0002 - Additional Scope of Work	2,697,350	6,306,773	9,004,123	6,338,027	0	401,829	2,264,267	1,699	6,064,702	9,004,123	0	0
XX0003 - Environmental Approval												
XX0003 - Environmental Approval	0	0	0	0	0	0	0	0	0	0	0	0
XX0004 - Historical cost												
XX0004 - Historical cost	96,580,064	-96,580,064	0	0	0	0	0	0	0	0	0	0
XX0005 - Owner Cost												
XX0005 - Owner Cost	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total for : 3' - Muskrat Falls												
Sub Total for : 3' - Muskrat Falls	2,901,158,288	784,807,241	3,685,965,529	3,232,251,112	-1,625,532	20,294,204	435,045,745	75,428,765	2,233,620,927	3,685,965,529	-9	-0
Grand Total:												
Grand Total:	2,901,158,288	784,807,241	3,685,965,529	3,232,251,112	-1,625,532	20,294,204	435,045,745	75,428,765	2,233,620,927	3,685,965,529	-9	-0





LCP Phase I - Labrador Island Transmission Link Project Contingency Drawdown (CDN \$000)

For Period Ending: 25-April-2016



Period	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	-	9,589	14,383	19,177	8,630	8,630	8,630	8,630	8,630	4,794	1,918	959	959	959
Consumed	-	7,482	2,002	30,000	-	-	-	-	-	-	-	-	-	-
Cumulative	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	95,887	86,298	71,915	52,738	44,108	35,478	26,848	18,218	9,589	4,794	2,877	1,918	959	(0)
Actual Budget	95,887	88,404	86,402	56,402	-	-	-	-	-	-	-	-	-	-

Note 1: AFE rev2 = Authorization for Expenditure approved by Nalcor Energy Board of Directors on September 2015

Grouped by: cost category; C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	
CD0503 - EarthWorks at Various Power Distribution	49,496,880	-20,811,436	28,685,444	28,685,443	0	0	0	0	28,683,508	28,685,443	0	0
CD0508 - Electrodes Sites	30,324,143	-11,954,780	18,369,363	14,134,989	0	225,000	4,209,375	0	14,128,856	18,569,364	0	-200,000
CD0535 - Construction of Const. Tele. Services -	3,863,886	-3,863,886	0	0	0	0	0	0	0	0	0	0
CD0566 - Supply of Construction Power	0	3,555,419	3,555,419	2,872,307	0	215,394	467,719	7,702	1,270,373	3,555,419	0	-0
CH0006 - Bulk Excavation Works	1,320,023	3,597,661	4,917,684	4,896,300	0	0	0	0	4,896,300	4,896,300	0	21,384
CH0008 - North Spur Stabilization Works	0	3,000	3,000	3,000	0	0	0	0	3,000	3,000	0	0
CH0048 - Site Clearing Access Road and Ancillary	0	195,000	195,000	195,000	0	0	0	0	195,000	195,000	0	0
CT0327 - Construction of HVdc TL - 1	392,729,526	784,121,741	1,176,851,267	1,136,307,829	0	45,839,575	42,018,927	4,104,768	533,212,905	1,224,166,331	-4,756,417	-47,315,064
CT0342 - Construction of AC TL - Island	14,134,585	5,099,163	19,233,749	18,329,858	0	0	903,891	992,269	10,416,444	19,233,749	0	0
CT0343 - Clearing of ROW HVdc TL - 1	96,975,584	-96,975,584	0	0	0	0	0	0	0	0	0	0
CT0345 - Clearing of ROW HVdc TL - 2	57,585,444	-57,585,444	0	0	0	0	0	0	0	0	0	0
CT0346 - Construction of HVdc TL - 2	187,414,391	-187,414,391	-0	0	0	0	-0	0	0	-0	0	0
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	2,759,898	2,759,898	2,694,140	0	83,396	0	0	2,693,392	2,777,536	0	-17,638
CT0355 - Marshaling Yards for HVdc Line	0	8,000,000	8,000,000	7,153,162	0	0	846,838	234,532	2,798,092	8,000,000	0	0
NLH - NLH Work Orders	0	0	0	0	0	0	0	0	0	0	0	0
PD0505 - Switchyard Equipment-AC Substations at C	23,922,612	-23,922,612	0	0	0	0	0	0	0	0	0	0
PD0537 - Power Transformers, AC Substations at CF	7,043,291	4,268,940	11,312,231	11,203,680	0	108,551	0	0	11,203,680	11,312,231	0	0
PT0308 - Supply of Steel Tower Foundations- HVdc	24,071,995	11,472,399	35,544,394	35,983,043	0	222,155	4,800	2,549,829	31,500,000	36,209,998	-67,735	-665,604
PT0328 - Supply of Conductors - HVdc	89,474,058	-37,974,011	51,500,047	51,500,047	0	0	0	0	51,429,553	51,500,047	0	-0
PT0329 - Supply of Insulators - HVdc	52,513,276	-30,797,088	21,716,188	21,647,376	0	46,740	22,072	0	21,608,410	21,716,188	0	-0
PT0330 - Supply of Towers - HVdc	63,048,979	-4,434,025	58,614,954	58,172,239	0	390,749	442,717	838,431	56,077,043	59,005,705	1	-390,751
PT0331 - Supply of Hardware - HVdc	6,867,096	16,723,022	23,590,118	23,061,130	153,655	75,658	290,665	564,513	18,899,218	23,581,108	258,891	9,009
PT0334 - Supply of Wires - HVdc	1,914,335	5,674,470	7,588,805	7,574,480	0	14,324	0	0	7,574,480	7,588,804	0	1
PT0335 - Supply of Anchors - HVac	0	0	0	71,712	0	0	0	0	0	71,712	0	-71,712
PT0351 - Supply of Poles	477,982	1,221,237	1,699,219	1,261,289	0	0	437,930	0	1,261,289	1,699,219	0	0
PT0352 - Supply of Anchors - HVdc	22,878,411	-6,004,873	16,873,538	17,078,513	0	500,000	103,786	0	16,862,883	17,682,299	0	-808,761
PT0353 - Supply of OPGW - HVdc	4,285,092	4,560,403	8,845,495	8,757,168	0	5,379	82,948	80,110	8,628,271	8,845,495	0	-1
PT0356 - Supply of Dampers HVdc	0	1,379,928	1,379,928	1,379,627	0	1,060	0	0	1,379,627	1,380,687	0	-759
SD0536 - Integrated Commissioning Support Service	3,517,934	-3,517,934	0	0	0	0	0	0	0	0	0	0
SD0565 - Marine Geo-tech Electrodes	0	333,260	333,260	333,260	0	0	0	0	333,260	333,260	0	0
SD0567 - Installation of Geodetic Control Survey	0	39,179	39,179	39,179	0	0	0	0	39,179	39,179	0	0
SD0568 - C3 Site Office Supplies	0	22,400	22,400	22,400	0	0	0	0	0	22,400	0	0

Grouped by: cost category; C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

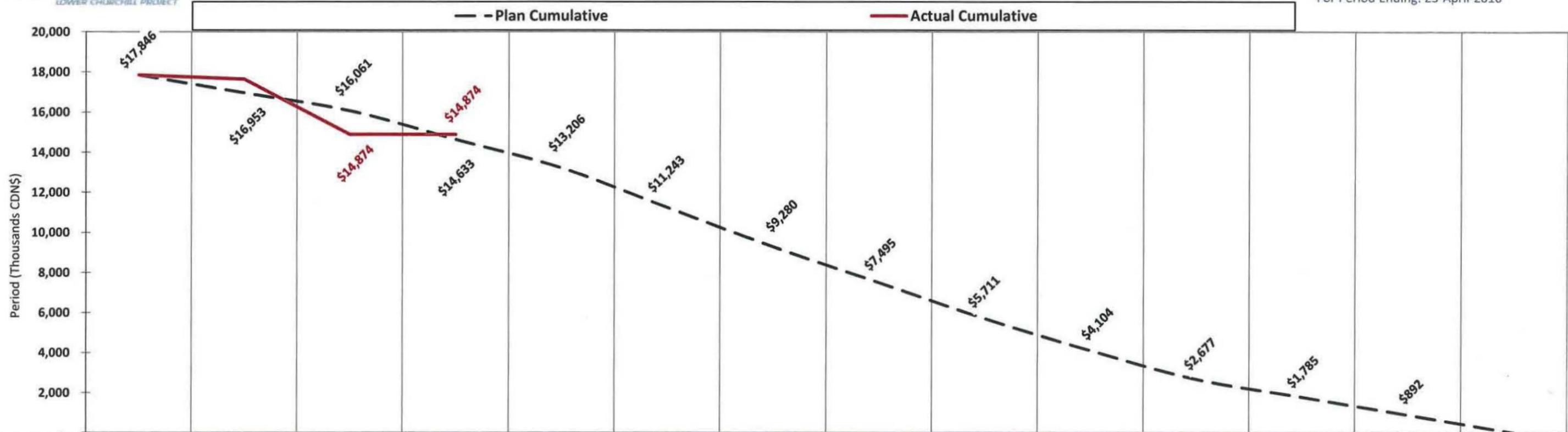
Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)				(7)	(5)	(Curr-Prev)	(6=3-5)	
ST0310 - Provision of Geotech – HVdc	4,018,074	-4,018,074	0	0	0	0	0	0	0	0	0	0
ST0312 - Provision of Survey - HVdc	0	0	0	0	0	0	0	0	0	0	0	0
XD0001 - AFE Estimated Growth - C3	0	22,110,953	22,110,953	0	0	-10,267,128	10,634,000	0	0	366,872	-3,136,664	21,744,081
XH0001 - AFE Estimated Growth - C1	0	4,915,488	4,915,488	0	0	-4,915,488	4,915,488	0	0	0	0	4,915,488
XM0001 - AFE Estimated Growth - General	0	1,396,200	1,396,200	0	0	0	1,396,200	0	0	1,396,200	0	0
XT0001 - AFE Estimated Growth - C4	0	41,972,696	41,972,696	0	0	-41,972,696	41,972,696	0	0	0	0	41,972,696
XX0001 - SOBI	352,014,204	-7,783,072	344,231,132	307,201,193	0	7,545,045	29,484,895	7,768,006	221,129,179	344,231,132	0	-1
XX0002 - Additional Scope of Work	58,376,785	-41,160,146	17,216,639	13,499,062	0	10,819	3,706,758	265,644	10,297,333	17,216,639	-0	0
XX0003 - Environmental Approval	0	0	0	0	0	0	0	0	0	0	0	0
XX0004 - Historical cost	85,307,165	-85,307,165	0	0	0	0	0	0	0	0	0	0
XX0005 - Owner Cost	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total for : 4' - Labrador Island Link	2,609,748,892	479,629,267	3,089,378,160	2,747,059,012	983,895	16,195,377	325,139,875	47,379,619	1,598,411,692	3,089,378,159	-0	1
Grand Total:	2,609,748,892	479,629,267	3,089,378,160	2,747,059,012	983,895	16,195,377	325,139,875	47,379,619	1,598,411,692	3,089,378,159	-0	1





Period	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	-	892	892	1,428	1,428	1,963	1,963	1,785	1,785	1,606	1,428	892	892	892
Consumed	-	215	2,757	-	-	-	-	-	-	-	-	-	-	-
Cumulative	Q3-2015	Q4-2015	Q1-2016	Q2-2016	Q3-2016	Q4-2016	Q1-2017	Q2-2017	Q3-2017	Q4-2017	Q1-2018	Q2-2018	Q3-2018	Q4-2018
Plan (AFE rev2)	17,846	16,953	16,061	14,633	13,206	11,243	9,280	7,495	5,711	4,104	2,677	1,785	892	(0)
Actual Budget	17,846	17,631	14,874	14,874	-	-	-	-	-	-	-	-	-	-

Note 1: AFE rev2 = Authorization for Expenditure approved by Nalcor Energy Board of Directors on September 2015

Grouped by: cost category; C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

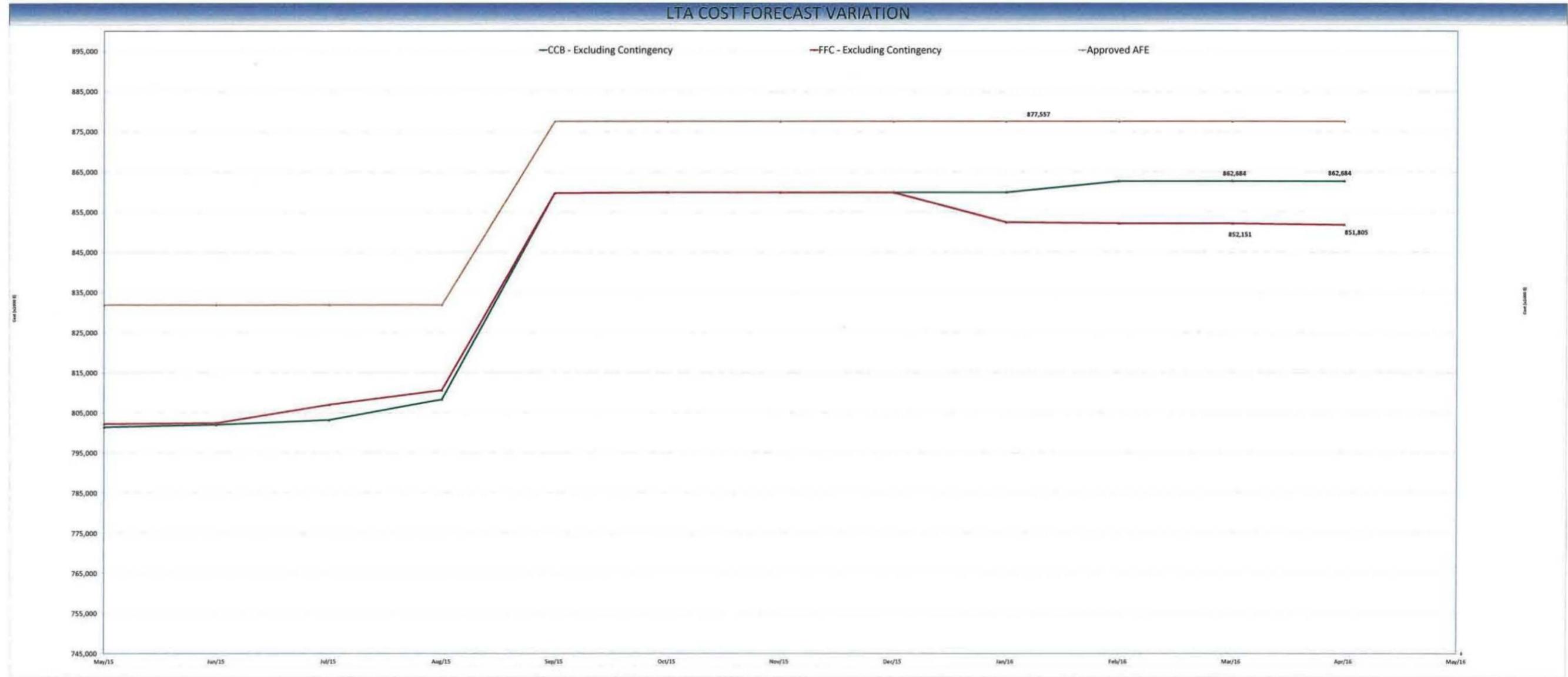
Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(6=3-5)	
6' - Labrador Transmission Asset												
CD0503 - EarthWorks at Various Power Distribution	18,014,972	5,388,399	23,403,371	23,403,369	0	0	0	0	23,403,369	23,403,369	0	1
CD0535 - Construction of Const. Tele. Services -	2,066,059	-2,066,059	0	0	0	0	0	0	0	0	0	0
CD0538 - Accommodations Camp (CF)	17,839,372	-12,433,765	5,405,607	5,405,606	0	0	0	0	5,405,607	5,405,606	0	0
CD0566 - Supply of Construction Power	0	198,445	198,445	187,210	0	5,150	6,085	0	107,210	198,445	0	0
CFLCO - CFLCO Work Orders	0	-0	-0	0	0	0	0	0	0	0	0	-0
CH0006 - Bulk Excavation Works	1,200,749	3,308,455	4,509,204	4,487,582	0	0	0	0	4,487,582	4,487,582	0	21,622
CH0048 - Site Clearing Access Road and Ancillary	0	199,045	199,045	199,045	0	0	0	0	199,045	199,045	0	0
CT0319 - Construction of HVac TL	200,262,088	71,069,726	271,331,814	263,236,666	0	4,145,606	1,998,157	2,068,476	246,592,312	269,380,430	-367,402	1,951,384
CT0327 - Construction of HVdc TL - 1	0	383,293	383,293	382,693	0	0	0	0	382,693	382,693	0	600
CT0341 - Clearing of ROW HVac TL	30,703,771	14,726,656	45,430,427	42,786,329	0	2,000,000	0	0	42,786,329	44,786,329	0	644,098
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	2,581,518	2,581,518	2,486,899	0	76,980	0	0	2,486,898	2,563,879	0	17,638
NLH - NLH Work Orders	0	0	0	0	0	0	0	0	0	0	0	0
PD0505 - Switchyard Equipment-AC Substations at C	74,398,647	-74,398,647	0	0	0	0	0	0	0	0	0	0
PD0537 - Power Transformers, AC Substations at CF	24,050,155	2,344,686	26,394,841	26,188,184	0	206,657	0	723,935	26,188,184	26,394,841	0	0
PT0300 - Supply of Conductors - HVac	20,880,983	-7,337,371	13,543,612	13,543,612	0	0	0	0	13,543,612	13,543,612	0	0
PT0301 - Supply of Insulators - HVac	4,939,704	-2,116,621	2,823,083	2,823,082	0	0	0	0	2,823,082	2,823,082	0	1
PT0302 - Supply of Towers- HVac	24,434,086	-3,614,374	20,819,712	20,713,660	0	0	106,052	0	20,713,660	20,819,712	0	-0
PT0303 - Supply of Hardware - HVac	12,835,064	-4,021,468	8,813,596	8,774,245	38,800	0	551	20,010	8,654,017	8,813,596	0	0
PT0304 - Supply of OPGW - HVac	2,472,133	-592,632	1,879,501	1,761,536	0	55,282	62,683	0	1,761,536	1,879,501	0	0
PT0307 - Supply of Steel Tower Foundations - HVac	5,522,873	2,000,333	7,523,206	7,523,018	0	0	188	0	7,523,018	7,523,206	0	0
PT0308 - Supply of Steel Tower Foundations- HVdc	0	1,023,750	1,023,750	1,023,750	0	0	0	-316,232	0	1,023,750	0	0
PT0326 - Supply of Steel Wires - HVac	2,885,849	760,628	3,646,477	3,642,592	0	3,886	0	0	3,642,592	3,646,477	0	-0
PT0330 - Supply of Towers - HVdc	0	0	0	0	0	10,491	0	0	0	10,491	10,491	-10,491
PT0331 - Supply of Hardware - HVdc	0	0	0	9,010	0	0	0	0	0	9,010	9,010	-9,010
PT0335 - Supply of Anchors - HVac	1,988,073	1,528,391	3,516,464	3,442,533	0	0	2,220	0	3,514,245	3,444,752	0	71,712
SD0536 - Integrated Commissioning Support Service	10,451,497	-10,451,497	0	0	0	0	0	0	0	0	0	0
SD0560 - Provision of Early Works & Starter Camp	0	1,141,549	1,141,549	708,604	0	0	433,235	-4,907	576,204	1,141,838	288	-290
SD0564 - CF Camp Services	103,824	15,238,073	15,341,897	13,353,673	0	3,067,305	1,068,900	679,871	9,084,955	17,489,878	0	-2,147,981
SD0568 - C3 Site Office Supplies	0	14,000	14,000	14,000	0	0	0	0	1,127	14,000	0	0
SH0054 - Temporary Site Services	0	0	0	0	0	0	0	0	0	0	0	0

Grouped by: cost category; C.P.
 Period 058 From: 2016-03-31 To: 2016-04-27
 Report Setting: cost report custom rev1

Project Currency: CAD
 Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
6' - Labrador Transmission Asset												
SM0713 - 2012 Field Geotechnical Investigations	0	11,244	11,244	11,244	0	0	0	0	11,244	11,244	0	0
ST0309 - Provision of Geotech - HVac	956,750	-956,750	0	0	0	0	0	0	0	0	0	0
ST0311 - Provision of Survey - HVac	0	135,074	135,074	135,075	0	0	0	0	135,075	135,075	0	-1
XD0001 - AFE Estimated Growth - C3	0	318,637	318,637	0	0	-4,285,184	-273,553	0	0	-4,558,738	258,717	4,877,374
XH0001 - AFE Estimated Growth - C1	0	2,977,128	2,977,128	0	0	-2,977,128	2,977,128	0	0	0	0	2,977,128
XM0001 - AFE Estimated Growth - General	0	4,243,630	4,243,630	0	0	0	4,243,630	0	0	4,243,630	0	0
XT0001 - AFE Estimated Growth - C4	0	-11,797,576	-11,797,576	0	0	-10,270,708	-11,797,576	0	0	-22,068,284	0	10,270,708
XX0002 - Additional Scope of Work	11,416,285	355,625	11,771,910	10,129,667	0	0	1,642,243	0	8,069,624	11,771,910	0	0
XX0003 - Environmental Approval	0	0	0	0	0	0	0	0	0	0	0	0
XX0004 - Historical cost	4,196,093	-4,196,093	0	0	0	0	0	0	0	0	0	0
XX0005 - Owner Cost	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total for : 6' - Labrador Transmission Asset	691,582,486	185,974,891	877,557,376	785,104,752	-226,945	11,724,505	80,955,064	12,432,993	651,113,922	877,557,377	10	-0
Grand Total:	691,582,486	185,974,891	877,557,376	785,104,752	-226,945	11,724,505	80,955,064	12,432,993	651,113,922	877,557,377	10	-0



Grouped by:C.P.

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

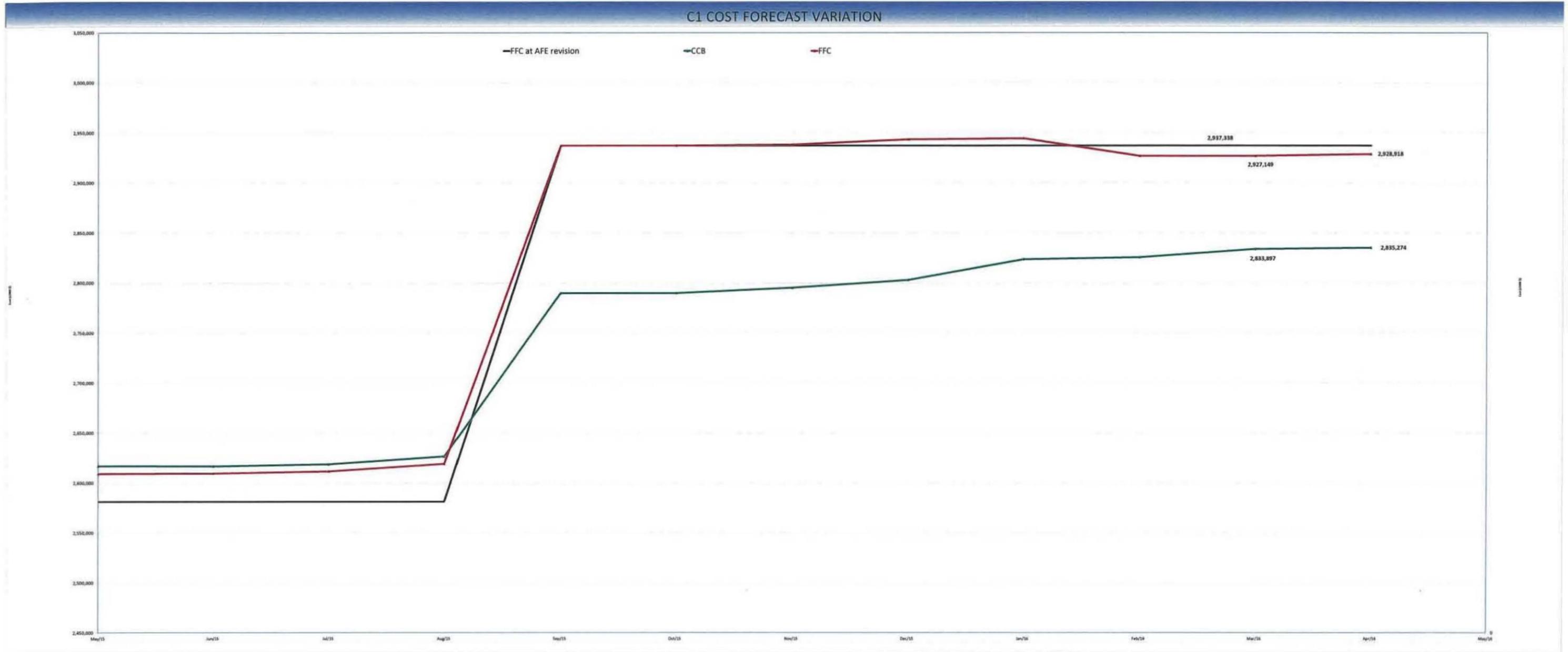
Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)	(4)					(7)	(5)	(Curr-Prev)	(6=3-5)
CH0002 - Accommodations Complex Buildings	66,895,398	79,732,566	146,627,964	146,554,952	-565	148,379	-74,795	0	146,445,518	146,627,970	-74,795	-6
CH0003 - Administrative Buildings	8,652,347	12,247,448	20,899,795	20,899,795	0	0	0	0	20,837,512	20,899,795	0	-0
CH0004 - Southside Access Road	40,359,578	15,985,199	56,344,777	56,344,777	0	0	0	0	56,344,777	56,344,777	0	0
CH0005 - Accommodation Complex Site Utilities	18,577,209	-18,577,209	0	0	0	0	0	0	0	0	0	0
CH0006 - Bulk Excavation Works	139,882,886	11,464,082	151,346,967	151,346,956	0	0	0	0	151,346,956	151,346,956	0	11
CH0008 - North Spur Stabilization Works	66,427,162	76,948,846	143,376,008	140,813,744	5,000	2,412,020	399,739	0	70,313,342	143,630,503	0	-254,494
CH0034 - Powerhouse Elevator	808,729	-309,733	498,996	498,996	0	0	0	0	49,886	498,996	0	0
CH0039 - McKenzie River Bridge	2,654,965	3,334,579	5,989,544	6,002,143	0	407,586	-420,185	0	5,989,544	5,989,544	-420,185	-0
CH0046 - Spillway Hydro-Mechanical Equipment	52,899,185	-52,899,185	0	0	0	0	0	0	0	0	0	0
CH0048 - Site Clearing Access Road and Ancillary	3,635,203	4,317,615	7,952,818	8,010,028	0	0	-57,210	0	7,952,818	7,952,818	0	0
CH0062 - Offside Roads and Bridges	0	48,000	48,000	48,000	0	0	0	0	48,000	48,000	0	0
PH0014 - GSU Transformer	20,549,016	-5,336,346	15,212,670	15,012,670	0	200,000	0	12,378	3,771,588	15,212,670	0	0
PH0015 - Isolated Phase Bus	1,902,522	125,000	2,027,522	950,823	0	0	1,076,699	0	66,803	2,027,522	0	0
PH0016 - Generator Circuit Breakers	5,170,372	-3,455,176	1,715,196	1,715,196	0	0	0	0	358,333	1,715,196	0	0
PH0035 - Station Service Transformers	0	0	0	0	0	0	0	0	0	0	0	0
PH0036 - Auxiliary Transformers	474,712	100,066	574,778	555,808	0	18,970	0	0	555,808	574,778	0	0
PH0037 - 25 kV Switchgear	1,381,328	-1,381,328	0	0	0	0	0	0	0	0	0	0
PH0038 - Emergency Diesel Generators	1,754,986	264,677	2,019,663	2,019,663	0	0	0	0	2,019,368	2,019,663	0	1
PH0053 - LCP Used Camp	0	18,177,409	18,177,409	18,548,573	-11,399	0	-359,765	0	18,173,167	18,177,409	0	-0
SH0001 - Physical Hydraulic Model	723,100	0	723,100	723,100	0	0	0	0	723,100	723,100	0	0
SH0054 - Temporary Site Services	0	25,424,739	25,424,739	24,525,774	55,607	843,358	0	0	25,424,740	25,424,739	0	0
SH0063 - Provision of Site Services	0	0	0	0	0	0	0	0	0	0	0	0
SH0066 - Hydraulic Model - North Dam	0	358,670	358,670	358,670	0	0	0	0	358,670	358,670	0	0

Grouped by: C.P.
 Period 058 From: 2016-03-31 To: 2016-04-27
 Report Setting: cost report custom rev1
 Project Currency: CAD
 Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
SM0704 - Surveying Services	14,671,329	-6,854,456	7,816,873	22,924,414	105,090	-123,712	-15,088,920	0	7,652,886	7,816,873	0	0
SM0713 - 2012 Field Geotechnical Investigations	2,108,854	1,619,818	3,728,672	3,963,132	0	-234,461	0	0	3,714,456	3,728,671	0	1
XH0001 - AFE Estimated Growth - C1	0	92,834,417	92,834,417	0	0	-92,834,417	92,834,417	0	0	0	0	92,834,417
Grand Total:	2,024,167,660	903,940,609	2,928,108,269	2,641,270,243	-1,625,532	18,799,454	270,473,365	61,416,511	1,718,734,433	2,928,917,530	1,768,987	-809,261



Grouped by:C.P.

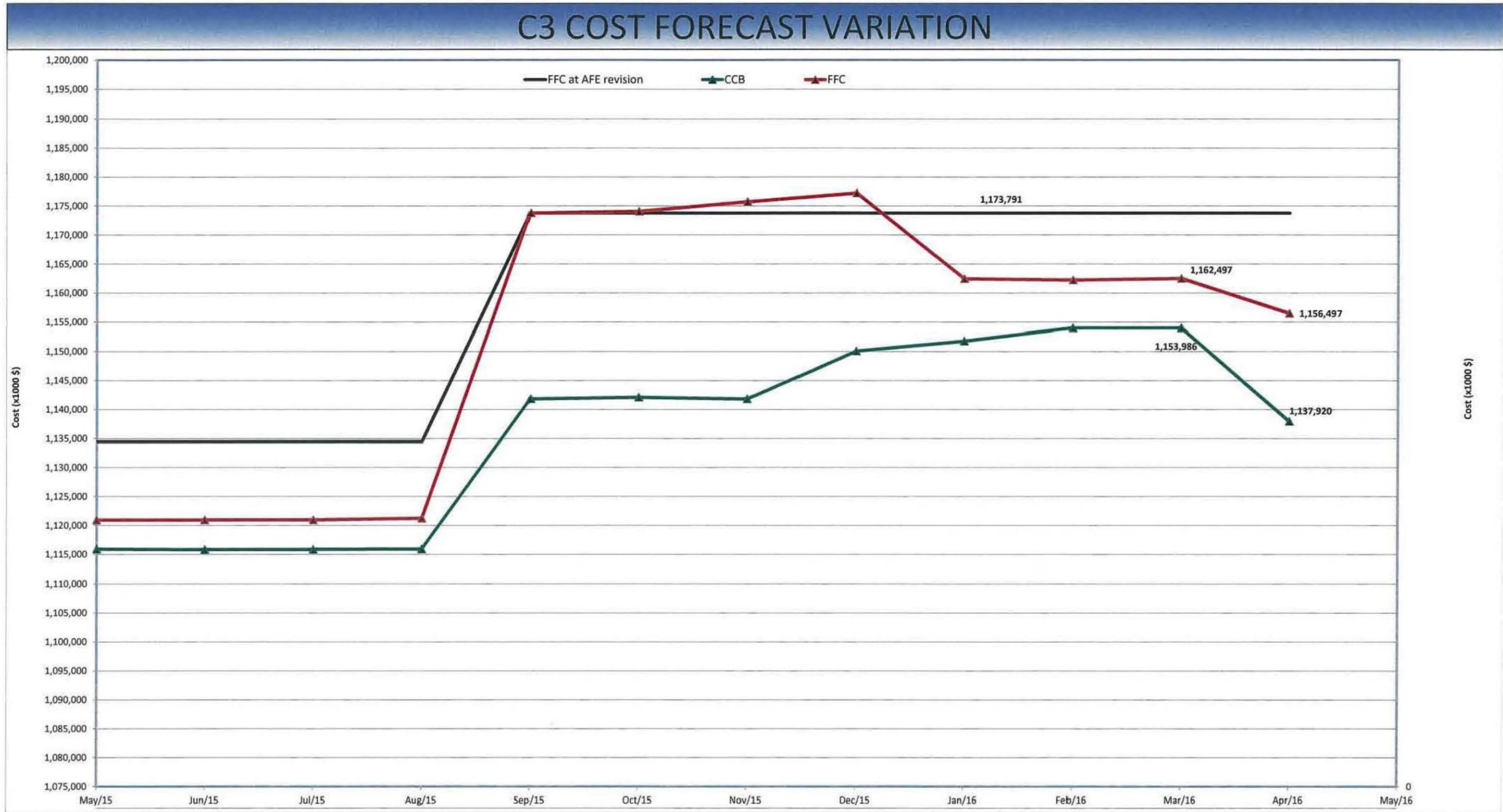
Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
CD0503 - EarthWorks at Various Power Distribution	67,511,852	-15,423,037	52,088,815	52,088,813	0	0	0	0	52,086,877	52,088,813	0	2
CD0508 - Electrodes Sites	30,324,143	-11,954,780	18,369,363	14,134,989	0	225,000	4,209,375	0	14,128,856	18,569,364	0	-200,000
CD0512 - Construction Power Facilities	9,222,116	3,478,259	12,700,375	12,700,375	0	0	0	0	12,700,375	12,700,375	0	-0
CD0535 - Construction of Const. Tele. Services -	7,035,756	-7,035,756	0	0	0	0	0	0	0	0	0	0
CD0538 - Accommodations Camp (CF)	17,839,372	-12,433,765	5,405,607	5,405,606	0	0	0	0	5,405,607	5,405,606	0	0
CD0566 - Supply of Construction Power	0	3,753,864	3,753,864	3,059,516	0	220,544	473,804	7,702	1,377,582	3,753,864	0	0
CD0568 - Offsite Infrastructure Upgrades	0	3,113,200	3,113,200	1,035,200	0	0	2,078,000	0	1,026,253	3,113,200	0	0
PD0505 - Switchyard Equipment-AC Substations at C	98,321,259	-98,321,259	0	0	0	0	0	0	0	0	0	0
PD0513 - 138/25 kV Transformers	2,176,538	470,899	2,647,437	2,647,437	0	0	0	0	2,647,437	2,647,437	0	0
PD0514 - 138 kV and 25 kV Circuit Breakers	204,749	36,487	241,236	241,236	0	0	0	0	241,236	241,236	0	0
PD0515 - 230kV,138kV and 25kV Disconnect Switches	215,228	41,434	256,662	256,662	0	0	0	0	256,662	256,662	0	0
PD0518 - 138kV Capacitor Voltage Transformers	25,876	-1,336	24,540	24,540	0	0	0	0	24,540	24,540	0	0
PD0519 - 25 kV Vacuum Interrupters	142,352	23,409	165,761	165,761	0	0	0	0	165,761	165,761	0	0
PD0520 - 25 kV 6 x 3.6 MVAR Capacitor Banks	206,881	38,865	245,746	245,746	0	0	0	0	245,746	245,746	0	0
PD0522 - Pre-fabricated Control Room Building	822,811	284,511	1,107,322	1,107,322	0	0	0	0	1,107,322	1,107,322	0	0
PD0523 - Substation Service Transformer	18,204	32	18,236	18,236	0	0	0	0	18,236	18,236	0	0
PD0529 - 25kV Reclosers	62,751	73,611	136,362	136,362	0	0	0	0	136,362	136,362	0	0
PD0530 - 138 kV and 25 kV Surge Arresters	41,254	71	41,325	41,325	0	0	0	0	41,325	41,325	0	0
PD0531 - MV Instrument Transformer	55,410	102	55,512	55,512	0	0	0	0	55,512	55,512	0	0
PD0533 - Early Works Telecom Devices	319,443	-71,305	248,138	248,138	0	0	0	0	248,138	248,138	0	-0
PD0537 - Power Transformers, AC Substations at CF	31,093,446	6,613,626	37,707,072	37,391,864	0	315,208	0	723,935	37,391,864	37,707,072	0	0
PD0561 - D20 RTU & Cabinet (CF)-Construction Powe	50,103	-13,397	36,706	36,706	0	0	0	0	36,706	36,706	0	0
PD0562 - Protection Front Panels (CF)	99,828	58,903	158,731	158,731	0	0	0	0	158,731	158,731	0	0
PD0563 - 138 kV Circuit Switcher (CF), MV Switch	116,767	-7,686	109,081	109,081	0	0	0	0	109,081	109,081	0	0
SD0536 - Integrated Commissioning Support Service	16,141,864	-16,141,864	0	0	0	0	0	0	0	0	0	0
SD0564 - CF Camp Services	103,824	15,238,073	15,341,897	13,353,673	0	3,067,305	1,068,900	679,871	9,084,955	17,489,878	0	-2,147,981
SD0565 - Marine Geo-tech Electrodes	0	333,260	333,260	333,260	0	0	0	0	333,260	333,260	0	0
SD0567 - Installation of Geodetic Control Survey	0	39,179	39,179	39,179	0	0	0	0	39,179	39,179	0	0
SD0568 - C3 Site Office Supplies	0	36,400	36,400	36,400	0	0	0	0	1,127	36,400	0	0
XD0001 - AFE Estimated Growth - C3	0	22,429,590	22,429,590	0	0	-14,552,312	10,360,447	0	0	-4,191,865	-2,877,947	26,621,455
Grand Total:	990,008,577	170,340,577	1,160,349,154	997,586,978	564,495	10,499,884	147,845,779	32,874,165	507,199,760	1,156,497,136	-6,000,000	3,852,018





Grouped by:C.P.

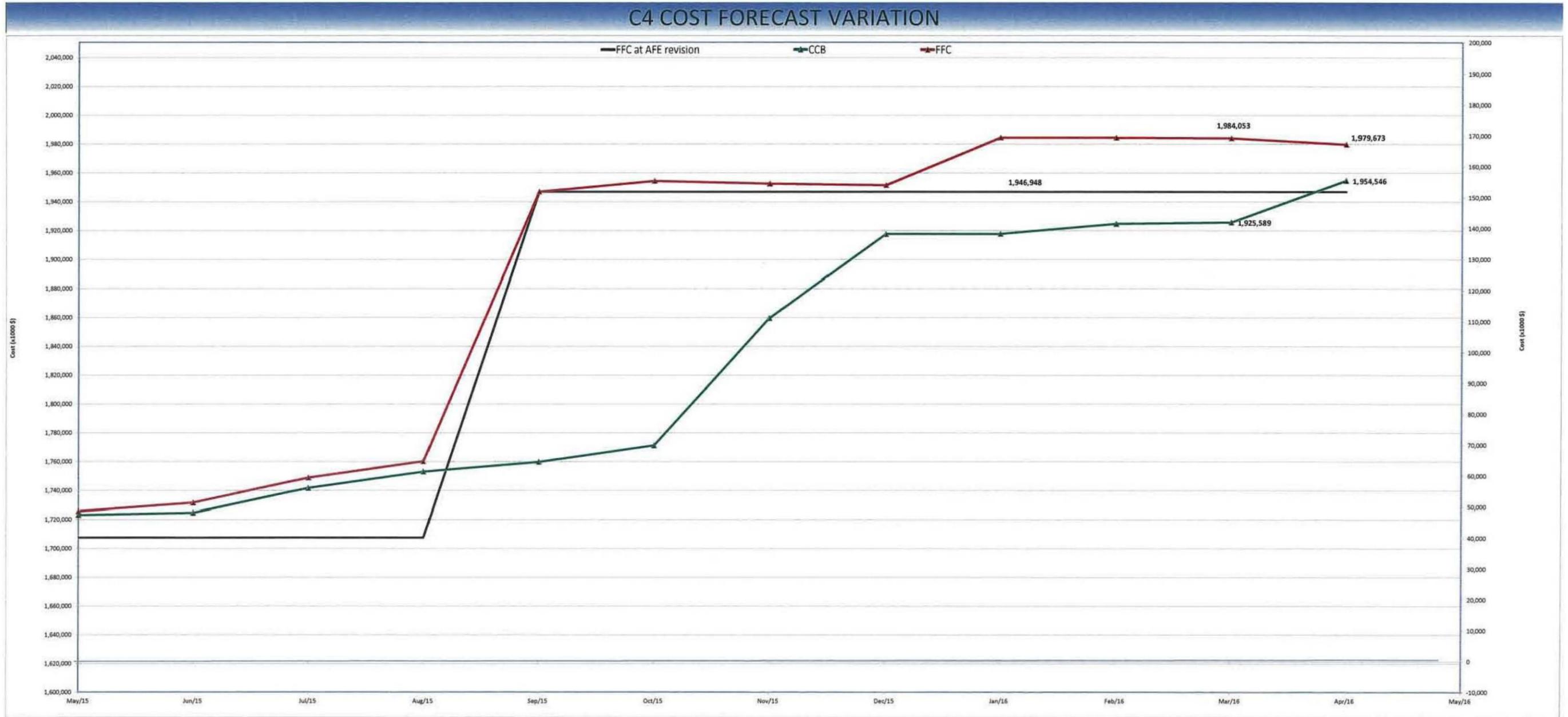
Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance	Variance (Bud. - Fcst)
	Original	Sc.Ch.&Trans	Revised									
	(1)	(2)	(3=1+2)									
CH0024 - Reservoir Clearing North Bank	57,310,625	72,413,143	129,723,768	129,177,962	0	0	545,806	4,492,585	98,071,127	129,723,768	533,368	0
CT0319 - Construction of HVac TL	204,427,902	72,342,660	276,770,562	268,667,468	0	4,745,606	2,006,104	7,499,278	252,023,114	275,419,178	-367,402	1,351,384
CT0327 - Construction of HVdc TL - 1	392,729,526	784,505,034	1,177,234,560	1,136,690,522	0	45,839,575	42,018,927	4,104,768	533,595,598	1,224,549,024	-4,756,417	-47,314,464
CT0341 - Clearing of ROW HVac TL	30,703,771	14,726,656	45,430,427	42,786,329	0	2,000,000	0	0	42,786,329	44,786,329	0	644,098
CT0342 - Construction of AC TL - Island	14,134,585	5,099,163	19,233,749	18,329,858	0	0	903,891	992,269	10,416,444	19,233,749	0	0
CT0343 - Clearing of ROW HVdc TL - 1	96,975,584	-96,975,584	0	0	0	0	0	0	0	0	0	0
CT0345 - Clearing of ROW HVdc TL - 2	57,585,444	-57,585,444	0	0	0	0	0	0	0	0	0	0
CT0346 - Construction of HVdc TL - 2	187,414,391	-187,414,391	-0	0	0	0	-0	0	0	-0	0	0
CT0354 - Marshaling Yards for HVac Line (HVGB)	0	5,341,415	5,341,415	5,181,039	0	160,376	0	0	5,180,290	5,341,415	0	0
CT0355 - Marshaling Yards for HVdc Line	0	8,000,000	8,000,000	7,153,162	0	0	846,838	234,532	2,798,092	8,000,000	0	0
PT0300 - Supply of Conductors - HVac	20,880,983	-7,337,371	13,543,612	13,543,612	0	0	0	0	13,543,612	13,543,612	0	0
PT0301 - Supply of Insulators - HVac	4,939,704	-2,116,621	2,823,083	2,823,082	0	0	0	0	2,823,082	2,823,082	0	1
PT0302 - Supply of Towers- HVac	24,434,086	-3,614,374	20,819,712	20,713,660	0	0	106,052	0	20,713,660	20,819,712	0	-0
PT0303 - Supply of Hardware - HVac	12,835,064	-4,021,468	8,813,596	8,774,245	38,800	0	551	20,010	8,654,017	8,813,596	0	0
PT0304 - Supply of OPGW - HVac	2,472,133	-592,632	1,879,501	1,761,536	0	55,282	62,683	0	1,761,536	1,879,501	0	0
PT0307 - Supply of Steel Tower Foundations - HVac	5,522,873	2,000,333	7,523,206	7,523,018	0	0	188	0	7,523,018	7,523,206	0	0
PT0308 - Supply of Steel Tower Foundations- HVdc	24,071,995	12,496,149	36,568,144	37,006,793	0	222,155	4,800	2,233,597	31,500,000	37,233,748	-67,735	-665,604
PT0326 - Supply of Steel Wires - HVac	2,885,849	760,628	3,646,477	3,642,592	0	3,886	0	0	3,642,592	3,646,477	0	-0
PT0328 - Supply of Conductors - HVdc	89,474,058	-37,974,011	51,500,047	51,500,047	0	0	0	0	51,429,553	51,500,047	0	-0
PT0329 - Supply of Insulators - HVdc	52,513,276	-30,797,088	21,716,188	21,647,376	0	46,740	22,072	0	21,608,410	21,716,188	0	-0
PT0330 - Supply of Towers - HVdc	63,048,979	-4,434,025	58,614,954	58,172,239	0	401,240	442,717	838,431	56,077,043	59,016,196	10,492	-401,242
PT0331 - Supply of Hardware - HVdc	6,867,096	16,723,022	23,590,118	23,070,140	153,655	75,658	290,665	564,513	18,899,218	23,590,118	267,901	-1
PT0334 - Supply of Wires - HVdc	1,914,335	5,674,470	7,588,805	7,574,480	0	14,324	0	0	7,574,480	7,588,804	0	1
PT0335 - Supply of Anchors - HVac	1,988,073	1,528,391	3,516,464	3,514,245	0	0	2,220	0	3,514,245	3,516,464	0	-0
PT0336 - Supply of 25 kV Hardware	497,042	75,970	573,012	573,013	0	0	0	0	573,013	573,013	0	-1
PT0337 - Supply of 25 kV ADSS	467,173	-82,735	384,438	384,438	0	0	0	0	384,438	384,438	0	0
PT0338 - Supply of 25 kV Conductors	344,111	-28,733	315,378	315,378	0	0	0	0	315,378	315,378	0	0
PT0339 - Supply of 25 kV Insulators	65,096	-7,403	57,693	57,693	0	0	0	0	57,693	57,693	0	0
PT0340 - Supply of Poles for 138/25 KV	391,185	12,514	403,699	403,699	0	0	0	0	403,699	403,699	0	-0
PT0351 - Supply of Poles	477,982	1,221,237	1,699,219	1,261,289	0	0	437,930	0	1,261,289	1,699,219	0	0
PT0352 - Supply of Anchors - HVdc	22,878,411	-6,004,873	16,873,538	17,078,513	0	500,000	103,786	0	16,862,883	17,682,299	0	-808,761
PT0353 - Supply of OPGW - HVdc	4,285,092	4,560,403	8,845,495	8,757,168	0	5,379	82,948	80,110	8,628,271	8,845,495	0	-1
PT0356 - Supply of Dampers HVdc	0	1,379,928	1,379,928	1,379,627	0	1,060	0	0	1,379,627	1,380,687	0	-759
ST0309 - Provision of Geotech - HVac	956,750	-956,750	0	0	0	0	0	0	0	0	0	0
ST0310 - Provision of Geotech - HVdc	4,018,074	-4,018,074	0	0	0	0	0	0	0	0	0	0
ST0311 - Provision of Survey - HVac	0	135,074	135,074	135,075	0	0	0	0	135,075	135,075	0	-1
ST0312 - Provision of Survey - HVdc	0	0	0	0	0	0	0	0	0	0	0	0
XT0001 - AFE Estimated Growth - C4	0	30,775,120	30,775,120	0	0	-52,843,404	30,775,120	0	0	-22,068,284	0	52,843,404
Grand Total:	1,389,511,249	595,809,733	1,985,320,981	1,899,599,297	192,455	1,227,877	78,653,298	21,060,092	1,224,136,824	1,979,672,927	-4,379,792	5,648,054



Grouped by:C.P.; Nalcor Code; Physical component

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
XX0001 - SOBI												
4 - Labrador Island Transmision Link (LITL)												
0000 - No Physical Component	352,014,204	-352,014,204	-0	0	0	0	0	0	0	0	0	-0
Sub Total for : 4 - Labrador Island Transmision Link (LITL)	352,014,204	-352,014,204	-0	0	0	0	0	0	0	0	0	-0
4230200000 - Geotechnical Investigations - LITL												
8520 - Transition Compound - Northern Peninsula	0	0	0	83,965	0	0	0	0	83,315	83,965	0	-83,965
8510 - Transition Compound - Labrador	0	44,031	44,031	49,758	0	0	0	0	49,109	49,758	0	-5,727
8520 - Transition Compound - Northern Peninsula	0	83,965	83,965	0	0	0	0	0	0	0	0	83,965
Sub Total for : 4230200000 - Geotechnical Investigations - LITL	0	127,996	127,996	133,723	0	0	0	0	132,424	133,723	0	-5,727
4290000001 - SOBI subsea cable and installation												
8100 - dc Specialties - Marine Crossings	0	154,730,365	154,730,365	147,413,060	0	5,261,364	4,067,152	5,707,310	88,467,074	156,741,576	-19,606	-2,011,211
Sub Total for : 4290000001 - SOBI subsea cable and installation	0	154,730,365	154,730,365	147,413,060	0	5,261,364	4,067,152	5,707,310	88,467,074	156,741,576	-19,606	-2,011,211
4290000002 - SOBI subsea protection												
8100 - dc Specialties - Marine Crossings	0	72,511,006	72,511,006	54,724,190	0	0	15,769,878	2,047,500	35,476,481	70,494,068	0	2,016,938
Sub Total for : 4290000002 - SOBI subsea protection	0	72,511,006	72,511,006	54,724,190	0	0	15,769,878	2,047,500	35,476,481	70,494,068	0	2,016,938
4290000003 - SOBI Landfall												
8100 - dc Specialties - Marine Crossings	0	87,103,084	87,103,084	82,672,813	0	0	4,430,272	1,358	76,639,657	87,103,085	0	-1
Sub Total for : 4290000003 - SOBI Landfall	0	87,103,084	87,103,084	82,672,813	0	0	4,430,272	1,358	76,639,657	87,103,085	0	-1
4290000008 - Project Engineering and Misc works												
8100 - dc Specialties - Marine Crossings	0	11,835,974	11,835,974	9,623,425	0	0	2,212,549	1,816	8,643,933	11,835,974	0	0
Sub Total for : 4290000008 - Project Engineering and Misc works	0	11,835,974	11,835,974	9,623,425	0	0	2,212,549	1,816	8,643,933	11,835,974	0	0
4290114000 - Third party inspections												
8100 - dc Specialties - Marine Crossings	0	3,211,567	3,211,567	2,511,024	0	0	700,543	10,022	1,664,418	3,211,567	0	0
Sub Total for : 4290114000 - Third party inspections	0	3,211,567	3,211,567	2,511,024	0	0	700,543	10,022	1,664,418	3,211,567	0	0
4500030102 - Labrador Electrode Line Construction												
8610 - Electrode Labrador	0	0	0	0	0	0	0	0	0	0	0	0
Sub Total for : 4500030102 - Labrador Electrode Line Construction	0	0	0	0	0	0	0	0	0	0	0	0
4500030103 - Transition Compound Construction												
8520 - Transition Compound - Northern Peninsula	0	0	0	0	0	0	0	0	0	0	0	0
8510 - Transition Compound - Labrador	0	0	0	0	0	0	0	0	0	0	0	0
8520 - Transition Compound - Northern Peninsula	0	0	0	0	0	2,252,361	0	0	2,252,361	0	0	-2,252,361
8510 - Transition Compound - Labrador	0	2,294,091	2,294,091	0	0	31,320	2,262,771	0	0	2,294,091	0	0
8520 - Transition Compound - Northern Peninsula	0	2,294,091	2,294,091	0	0	0	41,730	0	0	41,730	0	2,252,361
Sub Total for : 4500030103 - Transition Compound Construction	0	4,588,182	4,588,182	0	0	2,283,681	2,304,501	0	0	4,588,182	0	0
4521030100 - LITL DC Specialties & Switchyard Civil Works												
8520 - Transition Compound - Northern Peninsula	0	0	0	2,137,887	0	0	0	0	2,137,887	2,137,887	-1,671	-2,137,887
8510 - Transition Compound - Labrador	0	3,476,716	3,476,716	7,985,071	0	0	0	0	7,967,306	7,985,071	17,765	-4,508,355
8520 - Transition Compound - Northern Peninsula	0	-800,000	-800,000	0	0	0	0	0	0	0	800,000	-800,000
8510 - Transition Compound - Labrador	0	4,508,355	4,508,355	0	0	0	0	0	0	0	0	4,508,355

Grouped by: C.P.; Nalcor Code; Physical component

Period 058 From: 2016-03-31 To: 2016-04-27

Report Setting: cost report custom rev1

Project Currency: CAD

Report Currency: CAD at the rate of: 1.00000000

	Budget			Total Commitment	Outstanding Changes	Trends	Unawarded Scope (Unalloc. Budget)	Incurred this Period	Incurred to Date	Current Forecast	Forecast Variance (Curr-Prev)	Variance (Bud. - Fcst) (6=3-5)
	Original (1)	Sc.Ch.&Trans (2)	Revised (3=1+2)									
XX0001 - SOBI												
4521030100 - LITL DC Specialties & Switchyard Civil Works												
8520 - Transition Compound - Northern Peninsula	0	2,937,887	2,937,887	0	0	0	0	0	0	0	-796,488	2,937,887
Sub Total for : 4521030100 - LITL DC Specialties & Switchyard Civil Works	0	10,122,958	10,122,958	10,122,958	0	0	0	0	10,105,193	10,122,958	19,606	0
Sub Total for : XX0001 - SOBI	352,014,204	-7,783,072	344,231,132	307,201,193	0	7,545,045	29,484,895	7,768,006	221,129,179	344,231,132	0	-1
Grand Total:	352,014,204	-7,783,072	344,231,132	307,201,193	0	7,545,045	29,484,895	7,768,006	221,129,179	344,231,132	0	-1

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
C1		Approved Scope change:						
CH0003	Administrative Buildings	Addition of a sports complex	5,000,000		5,000,000		PCN-0066	SC0005
CH0003	Administrative Buildings	Purchase of washcars	581,111		581,111		PCN-0229	SC0215
SH0051	Building maintenance	Impact of extension of CH0007 by 6 months	2,400,000		2,400,000		PCN-0137	SC0118
SH0040	Garbage removal and disposal	Impact of extension of CH0007 by 6 months	250,000		250,000		PCN-0137	SC0118
SH0019	Security services	Impact of the collective agreement	9,000,000		9,000,000		PCN-0153	SC0101
SH0020	Medical services	Impact of the collective agreement	1,000,000		1,000,000		PCN-0153	SC0101
SH0019	Security services	Impact of extension of CH0007 by 6 months	1,500,000		1,500,000		PCN-0137	SC0118
CH0003	Administrative Buildings	Relocation of concrete lab and tech offices	99,250		99,250		PCN-0195	SC0151
CH0006	Bulk Excavations works	Relocation of concrete lab and tech offices	205,369		205,369		PCN-0195	SC0151
CH0006	Bulk Excavations works	Additional quantities at the switchyard and converter stations	4,300,955		4,300,955		PCN-0194	SC0230
SH0020	Medical services	Impact of extension of CH0007 by 6 months	1,500,000		1,500,000		PCN-0137	SC0118
SH0041	Personnel Transport	Impact of extension of CH0007 by 6 months	1,270,000		1,270,000		PCN-0137	SC0118
CH0002	Accommodations complex Buildings	Adjustment to cover a low estimate	40,994,428		40,994,428		PCN-0119	SC0068/254
CH0002	Accommodations complex Buildings	Crawspace remediation at the camp	1,500,000		1,500,000		PCN-0486	SC0501/528/ 542
CH0003	Administrative buildings	Claim for relocation of Admin. Bldg	500,000		500,000			SC0528
CH0003	Accommodations complex Buildings	Budget adjustments to align with AFE	700,332		700,332			SC0542
CH0006	Bulk Excavations works	Quantity adjustment to final contract values	-4,735,764		-4,735,764			SC0542
CH0006	Bulk Excavations works	Increase in claim value	7,900,000		7,900,000		PCN-0624	SC0664
CH0003	Administrative Buildings	additional cost to relocate the admin buildings	3,915,566		3,915,566			SC0005/254
CH0004	Southside Access Road	Claim for SSAR and budget reduction on the road upgrade	3,925,699		3,925,699			SC0254
CH0006	Bulk Excavations works	Scope adjustment, claim	912,521		912,521			SC0254
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Remove LMAX from Budget, cancel credit on the NS and Dams, adjust growth	-20,900,000		-20,900,000			SC0254
CH0008	North Spur Stabilization Works	Additional cost due to changes in quantities and shcedule extension	18,400,000		18,400,000			SC0256
CH0008	North Spur Stabilization Works	North Spur dam break analysis work	15,000		15,000		PCN-0288	SC0285
CH0008	North Spur Stabilization Works	Revision to Power Supply for Group Gilbert and Internet Philosophy	200,000		200,000		PCN-0474	SC0496
CH0009	North and South Dams	Additional cost due to changes in quantities and shcedule extension	61,110,985		61,110,985			SC0256
CH0030	Turbine and generators	Forecast adjustment due to favorable bid prices	-26,781,181		-26,781,181			SC0256
CH0030	Turbine and generators	Increase in cost of the storage	1,021,243		1,021,243		PCN-0386	SC0386
CH0032	Hydro mechanical equipment	multiple Design changes	1,600,125		1,600,125			SC0256
CH0033	Powerhouse Cranes	Reduction of the rated capacity of cranes from 700 to 650 TM	-1,467		-1,467			SC0256
CH0034	Powerhouse elevator	Forecast adjustment to bid prices and latest RFA	-293,313		-293,313			SC0256
CH0052	Habitat compensation	Increase of quantities for the construction works of the fish habitat compensation and provision for wet lands	6,125,000		6,125,000			SC0256
PH0014	GSU Transformer	Forecast adjustment to bid prices	-5,297,366		-5,297,366			SC0256
PH0016	Generator Circuit Breakers	Saving due to favaarable bid values	-2,730,176		-2,730,176			SC0256

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PH0036	Auxiliary Transformers	Additional transfos required	100,065		100,065			SC0256
PH0053	LCP Used Camp	Alignment to final contract price	-165,156		-165,156			SC0256
SH0019	Security Services	Alignment to bids received	-1,653,412		-1,653,412			SC0254
SH0022	Fuel Dispensing services	Alignment to bids received	1,722,435		1,722,435			SC0254
SH0040	Garbage removal and disposal services	Operational impact caused by the relocation of the Admin. Bldg. cost increase to align with bid received	6,251,575		6,251,575			SC0254
SH0054	Temporary site services	Extension of some services till end of April	1,217,016		1,217,016			SC0254
CH0048	Site Clearing Access Road and Ancillary Areas	Clearing for additional laydown areas and spoil disposal areas, widening the ROW of the construction power, several FWI	3,984,272		3,984,272			SC0254
PH0038	Emergency Diesel Generators	Increase in the capacity of Generators from 3MW to 4 MW	214,047		214,047			SC0256
SH0018/XH0001	Catering, housekeeping and janitorial	services for C3 team	12,450,000		12,450,000		PCN-0480	SC0518/528
SH0018/XH0001	Catering, housekeeping and janitorial	Additional cost for labor maintenance	4,945,750		4,945,750			SC0528
SH0019/XH0001	Security services	Additional cost required due to increase in number of hours in the security contract	2,000,000		2,000,000			SC0528
SH0022	Fuel Dispensing services	services for C3 team	175,000		175,000		PCN-0468	SC0527/528
SH0040/XH0001	Garbage removal and disposal services	services for C3 team	2,762,989		2,762,989		PCN-0468	SC0528
SH0041	Personnel Transport	Travel allowance for unionised employees (change request #1)	94,568		94,568			SC0542
SH0051	Building maintenance	Site entrance flag poles	8,475		8,475			SC0537
SH0051/XH0001	Building maintenance	Renovate the old camp to make it re-usable	491,525		491,525			SC0528
SH0051/XH0001	Building maintenance	Increase in maintenance cost	1,000,000		1,000,000			SC0528
SH0054	Temporary site services	Budget adjustments to align with AFE	889,691		889,691			SC0542
SH0018	Catering, housekeeping and janitorial	Overall saving between bids and revised budget	-7,455,183		-7,455,183			SC0254
SH0020	Medical services	re evaluation of CA impact, drug tests and vehicules strategy	-4,498,010		-4,498,010			SC0254
CH0002	Accommodations complex Buildings	Additional funds required to execute the camp utilities under the CH0002 contract; Liannu's bid was higher than the estimated budget	22,900,000		22,900,000		PCN-0158	SC0099
SH0054	Temporary site services	Additional TV's for the temporary camp	126,750		126,750		PCN-0136	SC0072
CH0062	Offsite Roads and Bridges	Demonstration Pad	48,000		48,000		PCN-0106	SC0018
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Additional funds to cover the shortfall between the award value and the budget	387,574,315		387,574,315		PCN-0209	SC0208/528
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Growth reduction	-5,000,000		-5,000,000			SC0528
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Estimate on highlighted engineering changes to date	1,050,000		1,050,000			SC0528
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Miscellaneous ECN's and Change Requests		242,245	242,245		PCN-0597	SC0668
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Concrete supply for C3	-2,112,500		-2,112,500			SC0528
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Budget adjustments to align with AFE	-2,860,877		-2,860,877			SC0542
CH0007/XH0001	Intake, Powerhouse, Spillway and Transition Dams	Estimate on highlighted engineering changes to date	2,112,500		2,112,500			SC0528
CH0007/XH0001	Intake, Powerhouse, Spillway and Transition Dams	Cancelling the cleaning and maintenance of wash cars	7,500,000		7,500,000			SC0528/CR#4
SH0022	Fuel Dispensing services	Budget adjustments to align with AFE	20,000		20,000			SC0542
SH0041	Personnel Transport	Additional funds required due to change in shift and extra bussing and unionizing the workers	8,219,713		8,219,713		PCN-0240	SC0213
PH0053	LCP Used Camp	Supply and install temporary camp from Manitoba Hydro	15,921,000		15,921,000		PCN-0087	SC0041/SC0132
CH0004	Southside Access Road	Caroline brook resource road upgrade	12,000,000		12,000,000		PCN-0196	SC0131
CH0004	Southside Access Road	Closing of SSAR contract	-900,685		-900,685		PCN-0460	SC0482

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
SH0066	Hydraulic Model - North Dam	North RCC dam physical hydraulic model study	400,000		400,000		PCN-0109	SC0084
CH0009	North and South Dams	Elimination of concrete and replacing it by vertical steps in RCC dam	-9,000,000		-9,000,000		PCN-0109	SC0061
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Extending the schedule by 6 months - indirects cost	20,845,286		20,845,286		PCN-0137	SC0118
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Discharge Channel	7,600,000		7,600,000		PCN-0058	SC0017
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Spillway Low Level Gates - civil	1,850,000		1,850,000		PCN-0055	SC0004
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Reducing the length of the spillway discharge channel	-6,167,000	167,000	-6,000,000		PCN-0377	SC0413/ 528/636 /681
SH0022	Fuel Supply	Forecast increase due to Conversion error in O&M cost from bid to contract in addition to price adjustment	3,922,809		3,922,809		PCN-0426	SC0453
CH0008	North Spur Stabilization Works	Confirmation of Quantities at North Spur	2,503,042		2,503,042		PCN-0200	SC0177
SH0066	Hydraulic model - North Dam	Adjustment to final contract value	-39,470		-39,470			SC0538
CH0008	North Spur Stabilization Works	Re-routing of construction power at the North Spur	250,000		250,000		PCN-0084	SC0019
CH0008	North Spur Stabilization Works	Dynamic and Hydrogeological studies	600,000		600,000		PCN-0206	SC0186
CH0039	Mckenzie river bridge	Alignment of forecast with contract value	198,776		198,776		PCN-0291	SC0306
CH0068	MF Construction power- remaining works	Additional funds required to finalize construction power at MF	1,370,000		1,370,000		PCN-0331	SC0310
PH0016	Generator Circuit Breakers	Funds transferred to CH0008 to cover Dynamic and Hydrogeological studies	-600,000		-600,000		PCN-0206	SC0186
CH0008	North Spur Stabilization Works	Additional Stabilization works because of risk of slope instability and breaching in the area	1,400,000		1,400,000		PCN-0141	SC0089
CH0030	S/I Turbine and Generators	Milestone revision due to extending the schedule of CH0007 by 6 months	2,000,000		2,000,000		PCN-0137	SC0118
CH0008	North Spur Stabilization Works	Additional geotechnical works at the NS	625,000		625,000		PCN-0405	SC0426/539
CH0008/XH0001	North Spur Stabilization Works	LT-124 - Non-Working OE Apprentices	200,000		200,000			SC0491
CH0009	North and South Dams	Budget increase to align with contract value	108,000,000		108,000,000			SC0528
CH0009/XH0001	North and South Dams	Budget increase to align with contract value	4,000,000		4,000,000			SC0528
CH0030	Turbine and generators	Transfer of traveling cost to SM0709	-1,940,209		-1,940,209			SC0491
CH0030/XH0001	Turbine and generators	Additional Storage Requirements	13,500,000		13,500,000			SC0491
CH0030/XH0001	Turbine and generators	Miscellaneous engineering changes	2,792,418		2,792,418			SC0491
CH0030/XH0001	Turbine and generators	Compensation for apprentices ratio	1,800,000		1,800,000		DAN-1215	SC0491
CH0031/XH0001	Mechanical and Electrical Auxiliaries (MF)	Alignment with the projected contract price of 160 M	73,300,000		73,300,000			SC0491
CH0031/XH0001	Mechanical and Electrical Auxiliaries (MF)	Projected Value engineering saving	-4,000,000		-4,000,000		DAN-1151	SC0491
CH0031/XH0001	Mechanical and Electrical Auxiliaries (MF)	Multiple engineering changes	663,512		663,512			SC0491
CH0032	Hydro mechanical equipment	Adjustment to existing budget	100,000		100,000			SC0491
CH0032	Hydro mechanical equipment	Schedule Acceleration	5,370,314		5,370,314		PCN-0545	SC0587
CH0032/XH0001	Hydro mechanical equipment	Additional Anchorage storage (beyond June) due to schedule delays	500,000		500,000			SC0491
CH0032/XH0001	Hydro mechanical equipment	Remedial works for as built anchor position, Spillway Maintenance Gallery Lighting	200,000		200,000		DAN 1100	CN012/18 SC0491
CH0032/XH0001	Hydro mechanical equipment	Embedded Guide & Associated Hardware Storage	1,000,000		1,000,000		DAN-1494	SC0491
CH0033	Powerhouse cranes	Storage and preservation of cranes	180,000		180,000			SC0491
CH0039	Mackenzie river	Alignment with final contract cost	371,024		371,024			SC0542
CH0048	Site Clearing Access Road and Ancillary Areas	Contract closeout reconciliation	-57,210		-57,210			SC0528
CH0068	MF Construction power- remaining works	Budget adjustments to align with AFE	-808		-808			SC0542

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PH0014	GSU Transformer	Adjustment to existing budget	-37,800		-37,800			SC0491
CH0032	Hydro-Mechanical Equipment	Alternative Power Supply for Spillway Gate MCC (CR-1015)	343,087		343,087		PCN-0598	SC0658
SH0018	Catering, housekeeping and janitorial	MF Main Gate - Sign and Flag Poles	41,770		41,770		PCN-0513	SC0537
SH0018	Catering, housekeeping and janitorial	Budget adjustments to align with AFE	-904,389		-904,389			SC0542
CH0030	Turbine and generators	Adjustment to collective Agreement (CHR-0245)	347,215		347,215		PCN-0336	SC0437
CH0030	T&G Contract	Storage of circular passage liners	\$79,999		\$79,999		PCN-0412	SC0438
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Ad-hoc professional concrete services	\$60,000		\$60,000		PCN-0518	SC0553
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Overbreak in separation wall / Spillway south Pier	\$296,957		\$296,957		PCN-0567	SC0614
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Increased embedments and rebars for Spillway Piers	\$812,125		\$812,125		PCN-0561	SC0622
CH0007	Intake, Powerhouse, Spillway and Transition Dams	Intake vent pipes	400,000		400,000		PCN-0422	SC0444
SH0019	Security services	Security at the North Spur	600,000		600,000		PCN-0415	SC0432
SH0020	Medical services	Medical services at the North Spur	1,450,000		1,450,000		PCN-0415	SC0432
CH0008	North Spur Stabilization Works	Forecast alignment with value of bids received	53,600,000		53,600,000		PCN-0399	SC0431
CH0032	Hydro mechanical equipment	Adjustment to bid price	52,663,427		52,663,427		PCN-0218	SC0197
PH0058	Supply of 600 V switchgear	S/I of 600 V switchgear	924,196		924,196		PCN-0185	SC0142
CH0039	Mackenzie river	Additional cost for the mackenzie river due to engineering constraints	2,000,000		2,000,000		PCN-0291	SC0352
CH0007	Intake, Powerhouse, Spillway and Transition Dams	MF additional site orders	378,000		378,000		PCN-0589	SC0635
CH0032	Powerhouse and Spillway hydro mechanical Equipment	Spillway Low Level Gates - Hydromechanical	8,500,000		8,500,000		PCN-0055	SC0004
			941,614,251	409,245	942,023,496			
		Pending Scope change:						
CH0032	Hydro-Mechanical Equipment	Supply of Concrete to Contractor 1-Oct-2015 to 20-Dec-2015 (BCH-002) and other misc. savings on existing CR	-71,345		-71,345			CN-050
CH0032	Hydro-Mechanical Equipment	Dunnage Under Crane on Permanent Upstream Bridge (CR-3002)		74,950	74,950	PCN in process	PCN-0629/DAN-1785	CN-049
CH0030	Turbine and generators	Switchyard Single Line	397,000		397,000		PCN-623	CN-076
CH0030	Turbine and generators	Turbine Servomotor Long-term Protection (CR-287)	50,297		50,297		DAN-1495	CN-062
			375,952	74,950	450,902			
		Design Development						
		Errors & Omissions						
		Bids Received						
		Purchase orders and Construction contracts execution						
Misc.			1,448		1,448			
		SUBTOTAL C1	941,991,651	484,195	942,475,846			
C3		Approved Scope change:						
CD0503	Earth works at various power distribution	Removal of FP transition compound from CD0503	-3,458,952		-3,458,952		PCN-0062	SC0009
CD0501	Converters and cable transition compound	MF converter and AC switchyard geotechnical investigation	300,000		300,000		PCN-0112	SC0098
CD0501	Converters and cable transition compound	washcars for sites	85,176		85,176		PCN-0468	SC0527
CD0504	Civil Works for the Converter Stations and Switchyards	Site Services for Component 3 Contractors - maintenance, cleaning and consumables of the wash car at MF and SP	309,011		309,011		PCN-0468	SC0527

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
CD0502	Construction of AC Substations	A separate control and protection shelter at CF SY to accommodate the protection panels	372,000		372,000		PCN-0145	SC0090
PD0533	S/I Early works telecom devices	Additional cell and SAT phones to increase safety for workers, deployment of a stand alone LMRS	177,876		177,876		PCN-0126	SC0073
SD0560	Early works construction communications services (MF)	Additional cell and SAT phones to increase safety for workers, deployment of a stand alone LMRS	169,932		169,932		PCN-0136	SC0074
PD0537	Power Transformers, AC Substations at CF, MF and SP	Additional spare transformers and grounding reactors at CF and SP SY	5,740,997		5,740,997		PCN-0113	SC0063
SD0565	Marine Geotech Investigation	Investigation to ensure soil conditions for breakwater at both electrode sites	380,000		380,000		PCN-0068	SC0053
CD0512	Construction Power Facilities	MF change of scope, medical services and CF Accommodations	969,000		969,000		PCN-0095	SC0031/55
CD0534	Soldiers Pond Synchronous Condensers	EPC Contract Strategy Change for Synchronous Condensers	8,424,109		8,424,109		PCN-0148	SC0107
CD0512	Construction Power Facilities	Construction Power Extra Claims	3,200,000		3,200,000		PCN-0165	SC0113
CD0566	Supply of Construction Power	Issue Constuction power to various sites (FP, SC, CF, SP, LDE, DPE)	4,000,000		4,000,000		PCN-0138	SC0126
SD0567	Installation of Geodetic Control Survey	Installation of geodetic control survey for FP, LAD,SC,DP and SP	49,326		49,326		PCN-0168	SC0116/155
CD0504	Civil Works for the Converter Stations and Switchyards	CD0502/CD0504 - Transfer of Supply / Install of Substation Control Buildings from CW Baseline budget (CD0504) to EPC Contractor (CD0502)	-5,862,248		-5,862,248		PCN-0519	SC0555
CD0502	Construction of AC Substations	CD0502/CD0504 - Transfer of Supply / Install of Substation Control Buildings from CW Baseline budget (CD0504) to EPC Contractor (CD0502) and 5% mark up	6,155,361		6,155,361		PCN-0519	SC0555
CD0502	Construction of AC Substations	Estimate premium for the change in contract strategy from EPCM to EPC for CD0502	47,448,738		47,448,738		PCN-0163	SC0135
PD0537	Power Transformers	Forecast Over Run as per RFA	3,079,909		3,079,909		PCN-0067	SC0205
CD0534	Soldiers Pond Synchronous Condensers	Increase in Synchronous condenser capacity from 150 to 175 MVAR	4,300,000		4,300,000		PCN-0067	SC0205
PD0537	Power Transformers	Forecast Over Run as per RFA	240,751		240,751		PCN-0226	SC0206
CD0502	Construction of AC Substations	Reduction of the SP switchyard by 2 feeders for a total of 13 instead of 15 feeders	-12,359,240		-12,359,240		PCN-0174	SC0159
CD0503	Earthworks at Various Power Distribution Site	Reduction of the SP switchyard by 2 feeders for a total of 13 instead of 15 feeders	156,975		156,975		PCN-0174	SC0159
CD0502	Construction of AC Substations	Reduction in the size and amount of equipment required at CF switchyard	-9,010,806		-9,010,806		PCN-0175	SC0158
CD0503	Earthworks at Various Power Distribution Site	Optimization for Churchill Falls and Solider Ponds site	-22,690,931		-22,690,931		PCN-0175	SC0158/257
CD0503	Earthworks at Various Power Distribution Site	Re-routing of the 13.8 kV distribution line at CF to travel parallel to the existing 138 kV transmission line	617,000		617,000		PCN-0173	SC0163
CD0535	Construction of Const. Tele. Services	Transfer of Telecoms Scope from CD0535 to SD0560	-7,035,756		-7,035,756		PCN-0162	SC0123
CD0501	Converters and cable transition compound	Optimization and Contract strategy changes for the converter station and the transition compounds.	25,204,634		25,204,634		PCN-258	SC0259
CD0501	Converters and cable transition compound	Budget alignment to final contract value for Geotech work	-30,543		-30,543		Rebaseline	SC0257/265
CD0502	Construction of AC Substations	Funds to cover the shortfall between the award value and the budget (Includes additional equipment for revenue & statistical metering and civil scope)	61,756,260		61,756,260		Rebaseline	SC0257
CD0502	Construction of AC Substations	Cost of the HVGB line to Gull Island	-10,203,988		-10,203,988		Rebaseline	SC0257
CD0512	Construction Power Facilities	Budget alignment to final contract value	-676,331		-676,331		Rebaseline	SC0257
CD0534	Soldiers Pond Synchronous Condensers	Alignment to contract forecast - Includes additional budget for equipment, civil work and increased market condition costs.	45,000,000		45,000,000		Rebaseline	SC0257
CD0538	Accommodation Camp (CF)	Budget alignment to final contract value	-5,227		-5,227		Rebaseline	SC0257
CD0566	Supply of Construction Power	Budget alignment to contract forecast -Saving on installation of infrasturture at Soldiers Pond and Forteau Point	-659,608		-659,608		Rebaseline	SC0257
PD0513	138/25 kV Transformers	Budget alignment to final contract value	471,329		471,329		Rebaseline	SC0257
PD0514	138 kV and 25 kV Circuit Breakers	Budget alignment to final contract value	40,351		40,351		Rebaseline	SC0257
PD0515	230 kV, 138 kV and 25 kV Disconnect Switches	Budget alignment to final contract value	41,558		41,558		Rebaseline	SC0257
PD0518	138 kV Capacitor Voltage Transformers	Budget alignment to final contract value	-1,336		-1,336		Rebaseline	SC0257
PD0519	25 kV Vacuum Interrupters	Budget alignment to final contract value	50,110		50,110		Rebaseline	SC0257
PD0520	25 KV 6 x 3.6 MVAR Capacitor Banks	Budget alignment to final contract value	38,865		38,865		Rebaseline	SC0257

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PD0522	Pre-fabricated Control Room Building	Budget alignment to final contract value	330,897		330,897		Rebaseline	SC0257
PD0523	Substation Service Transformers	Budget alignment to final contract value	32		32		Rebaseline	SC0257
PD0529	25 kV Reclosers	Budget alignment to final contract value	74,893		74,893		Rebaseline	SC0257
PD0530	138 kV and 25 Kv Surge Arresters	Budget alignment to final contract value	71		71		Rebaseline	SC0257
PD0531	MV Instrument Transformers	Budget alignment to final contract value	102		102		Rebaseline	SC0257
PD0537	Power Transformers, AC Substations at CF, MF and SP	Budget alignment to final contract value	-2,721,868		-2,721,868		Rebaseline	SC0257
PD0537	Power Transformers, AC Substations at CF, MF and SP	Cost of the HVGB line to Gull Island	-3,047,600		-3,047,600		Rebaseline	SC0257
PD0561	D20 RTU & Cabinet (CF) - Construction Power	Budget alignment to Final contract value	1,246		1,246		Rebaseline	SC0257
CD0503-002	Earth Works at Soldiers Pond	Increase in Quantities Due to Site Conditions. (Terrafix Erosion Control Blanket, Slope protection , Rock fill)	288,150		288,150		PCN-0312	SC0298
CD0502	Construction of AC Substations	Reduction in CVTs at CF	-118,642		-118,642		PCN-0304	SC0311
CD0502	Construction of AC Substations	Change to GIS - savings on base price for package	-5,071,642		-5,071,642		PCN-0305	SC0312
CD0501-001	Converters and cable transition compound	Creepage Distance for Equipment in ac Terminal Stations	288,000		288,000		PCN-0311	SC0313
CD0502	Construction of AC Substations	Creepage Distance for Equipment	258,567		258,567		PCN-0311	SC0313
CD0502	Construction of AC Substations	Growth allowance for Additional O&M Assistance, optimization of controls buildings, underun on supply of granular at CF, etc.	2,099,409		2,099,409		PCN-0314	SC0314
CD0502	Construction of AC Substations	Change in Civil Contracting Strategy	-11,600,000		-11,600,000		PCN-0307	SC0315
CD0501-001	Converters and cable transition compound	Removal of MF substation breakers due to GIS	-2,789,507		-2,789,507		PCN-0305	SC0312
PD0562	Protection Front Panels (CF)	Budget alignment to Final contract value	58,903		58,903		Rebaseline	SC0257
PD0563	138 kV Circuit Switcher (CF), MV Switcher	Budget alignment to Final contract value	2,064		2,064		Rebaseline	SC0257
SD0564	CF camp services	FWO issued during Mobilization of Camp	52,059		52,059		Rebaseline	SC0257
CD0503-002	Earth Works at Soldiers Pond	Increased bog quantities and other additional costs.	2,007,391		2,007,391		PCN-0298	SC0284
CD0503-002	Earthworks at SP	Soldiers Pond Earthworks - Increase in Contract Quantities	3,222,500		3,222,500		PCN-0330	SC0329
CD0503-002	Earthworks at SP	Soldiers Pond - Siltation Control plus 10% growth.	44,305		44,305		PCN-0341	SC0333
SD0564	CF camp services	CF Camp Trailers	169,686		169,686		PCN-0338	SC0332
CD0568	Offsite Infrastructure Upgrades	Offsite Infrastructure Upgrades - Cartwright to MF and Bay Bulls to SOP. Required scope of work reduced as a result of the route study.	-7,677,149		-7,677,149		PCN-0319	SC0335
CD0501-001	Converters and cable transition compound	Arc Flash Design to Cat 2	226,000		226,000		PCN-0315	SC0336
CD0501-001	Converters and cable transition compound	Addition of PA/GA, Internet/telephones and SACS to Contract	300,000		300,000		PCN-0339	SC0337
CD0502	Construction of AC Substations	Transfer of common site services budget from CD0502 to CD0503-002 for paving and CD0534 for snow maintenance	-750,000		-750,000		PCN-0356/0359	SC0348 / SC0356
CD0534	Soldiers Pond Synchronous Condensers	Transfer of common site services budget for snow maintenance from CD0502 to CD0534	419,500		419,500		PCN-0359	SC0356
CD0504	Civil Works for the Converter Stations and Switchyards	Transfer of Scope from CW Baseline Budget - Site offices and Temporary Trailers	-872,073		-872,073		PCN-0506	SC0540
CD0501	Converters and cable transition compound	Transfer of Scope from CW Baseline Budget - Site offices and Temporary Trailers - MF and SP	531,955		531,955		PCN-0506	SC0540
CD0502	Construction of AC Substations	Transfer of Scope from CW Baseline Budget - Site offices and Temporary Trailers - CF	340,118		340,118		PCN-0506	SC0540
XD00001	AFE Estimated Growth - C3	Estimated growth as per approved AFE 2015 - Includes Credit from NL Hydro for HVBG	22,429,590		22,429,590		Rebaseline	SC0524
CD0510	Permanent Telecommunications	Budget for Potential over run Repeaters - Permanent Phase Optical Transport Network	1,700,000		1,700,000		PCN-0355 Rev 01	SC0613
CD0501	Converters and cable transition compound	Foreign exchange budget added to commitment package for conversion of unpaid portion of the contract to Canadian dollars at contract signing.	18,788,865		18,788,865		PCN-0297 / Rebaseline 2015	SC0524
CD0501	Converters and cable transition compound	Removal of non specified growth and specified growth for RDTS	-7,050,437		-7,050,437		Rebaseline	SC0524
CD0502	Construction of AC Substations	Budget alignment to match contract value - Removal of credit from commitment package for NL Hydro for HVBG	10,203,988		10,203,988		Rebaseline	SC0524

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
CD0502	Construction of AC Substations	Removal of non specified growth and specified growth for creepage distance (included in contract price)	-7,732,922		-7,732,922		Rebaseline	SC0524
CD0502	Construction of AC Substations	Additional LCP Trailer requirements for Muskrat Falls and Churchill Falls	153,996		153,996		PCN-0511	SC0551
CD0504	Civil Works for the Converter Stations and Switchyards	Additional budget to align with Converter Civil Target Price (Muskrat Falls and Soldiers Pond)	10,123,799		10,123,799		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Additional budget to align with Soldiers Pond Switchyard Target Price	-1,509,748		-1,509,748		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Additional budget to align with Churchill Falls Switchyard Target Price	2,726,177		2,726,177		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Additional budget to align with Muskrat Falls Switchyard Target Price	25,091		25,091		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Removal of non specified growth as per approved AFE 2015	-3,180,106		-3,180,106		Rebaseline	SC0524
CD0504	Civil Works for the Converter Stations and Switchyards	Additional LCP Trailer requirements for Muskrat Falls and Churchill Falls	164,388		164,388		PCN-0511	SC0551
CD0508	Electrode Sites	Removal of non specified growth as per approved AFE 2015	-1,288,585		-1,288,585		Rebaseline	SC0524
CD0534	Soldiers Pond Synchronous Condensers	Foreign exchange budget added to commitment package for conversion of unpaid portion of the contract to Canadian dollars at contract signing.	1,092,428		1,092,428		Rebaseline	SC0524
CD0534	Soldiers Pond Synchronous Condensers	Removal of non specified growth as per approved AFE 2015	-3,910,379		-3,910,379		Rebaseline	SC0524
PD0537	Power Transformers, AC Substations at CF, MF and SP	Budget to align with contract value - Removal of credit from commitment package for NL Hydro for HVBG	2,824,557		2,824,557		Rebaseline	SC0524
CD0508	Electrode Sites	Access Road Maintenance and Environmental Requirements at Soldiers Pond	30,000		30,000		PCN-0449	SC0494
CD0508	Electrode Sites	Contract Under run as per approved RFA	-7,960,863		-7,960,863		PCN-0414	SC0455
CD0503	Converters and cable transition compound	Final Contract value - Close out	-1,553,050		-1,553,050		PCN-0366	SC0409
CD0503-002	Earthworks at SP	Transfer of common site services budget for paving from CD0502 to CD0503-002	330,500		330,500		PCN-0356	SC0348
CD0502	Construction of AC Substations	Transfer from CD0502 to CD0503-001 for common fill and supply of granular at CF (currently in CD0503-001 scope)	-355,000		-355,000		PCN-0300	SC0351
CD0503-003	Earth Work remediation at SY and converter at MF	MF Switchyard/Converter Outstanding Work Prior to Handover to HVdc Specialties	1,019,576		1,019,576		PCN-0309	SC0297
CD0566	Supply of Construction Power	Construction Power hook up at Churchill Falls	104,410		104,410		PCN-0370	SC0379
SD0564	CF camp services	SD0564 - Maintenance Labor - CF Camp - Remaining Duration of Camp	786,720		786,720		PCN-0392	SC0421
CD0510	Permanent Telecommunications	Requirement for Repeaters - Permanent Phase Optical Transport Network	3,657,000		3,657,000		PCN-0355	SC0381
PD0513 -PD0563	MF Construction Power Procurement Packages	MF Construction Power Procurement Packages under run. Budget transferred to MF Contingency.	-103,179		-103,179		PCN-0349	SC384
SD0565	Marine Geotech Investigation	Budget alignment to Final contract value	-46,740		-46,740		Rebaseline	SC0257
SD0567	Installation of Geodetic Control Survey	Budget alignment to Final contract value	-10,147		-10,147		Rebaseline	SC0257
CD0501	Converters and cable transition compound	Alstom Grid Harmonic Impedance Study Results - Impacts on Converter Filter Design	5,000,000		5,000,000		PCN-0538	SC0598
CD0502	Construction of AC Substations	Triple Circuit Tower Redesign - Soldiers Pond	1,980,000		1,980,000		PCN-0543	SC0599
CD0502	Construction of AC Substations	Addition of mimic panels to local control cubicles - Churchill Falls and Muskrat Falls	288,573		288,573		PCN-0571	SC0603
CD0502	Construction of AC Substations	Bedrock and Boulders Encountered at Soldiers Pond	11,000		11,000		PCN-0566	SC0605
CD0501	Converters and cable transition compound	Bedrock and Boulders Encountered at Soldiers Pond	30,000		30,000		PCN-0566	SC0605
CD0504	Civil Works for the Converter Stations and Switchyards	Bedrock and Boulders Encountered at Soldiers Pond	769,000		769,000		PCN-0566	SC0605
CD0534	Soldiers Pond Synchronous Condensers	Additional Costs and Schedule Delay Associated with Piling for Synchronous Condenser Foundations	340,000		340,000		PCN-0574	SC0604
CD0501	Converters and cable transition compound	Change to MF and SP Converter Layouts as a result of Soil Conditions and design development	2,696,835		2,696,835		PCN-0577	SC0630
CD0504	Civil Works for the Converter Stations and Switchyards	Change to MF and SP Converter Layouts as a result of Soil Conditions and design development	-193,127		-193,127		PCN-0577	SC0630
CD0502	Construction of AC Substations	Change to MF and SP Switchyard due to changes to the converter Layouts as a result of Soil Conditions and design development	-1,275,990		-1,275,990		PCN-0577	SC0630
CD0502	Construction of AC Substations	Tap Changer Controller - Muskrat Falls	22,378		22,378		PCN-0583	SC0627
CD0508	Electrode Sites	Final Quantities - Completion of CD0508-001 / Completion of CD0508-001: Savings on Specified Growth Allowance	-3,282,347		-3,282,347		PCN-0588	SC0628

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
CD0501	Converters and cable transition compound	Over run on Transition Compounds Civil Scope	4,007,359		4,007,359		PCN-0574	SC0641
SD0560	Early works construction communications services (MF)	Transfer of Telecoms Scope from CD0535 to SD0560	5,535,756		5,535,756		PCN-0162	SC0123
		Pending Scope change:	180,241,035	0	180,241,035			
			0	0	0			
		Errors & Omissions						
		Purchase orders and Construction contracts execution						
CD0501	Converters and cable transition compound	Additional grounding quantities - Muskrat Falls and Soldiers Pond	7,000,000	-4,000,000	3,000,000	Preliminary estimate - Contract price based on a 20x20 grid, estimated based on a 5x5 grid.	DAN-0928 / Rebaseline	T-1285
CD0501	Converters and cable transition compound	Alstom Grid Harmonic Impedance Study Results - Impacts on Converter Filter Design	8,000,000		8,000,000		DAN-1065 / Rebaseline	T-1458
CD0501	Converters and cable transition compound	HVdc Line Fundamental Frequency Resonance Issue	1,000,000	1,700,000	2,700,000	It has been identified by the CD0501 Contractor, Alstom Grid, that preliminary engineering studies are indicating a resonance point at or around fundamental frequency (60hz) on the HVdc line. Estimate	DAN-1220 / Rebaseline	T-1285
CD0501	Converters and cable transition compound	Transition Compounds - Washrooms	800,000		800,000		DAN-1477 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Add & Upgrade Disconnect Switches - Churchill Falls, Muskrat Falls and Soldiers Pond	325,137	-308,558	16,579	Final price agreed with Alstom	DAN-0863 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Soldiers Pond	1,500,000	-500,000	1,000,000	Bid based upon 20x20 grid; potential additional costs based upon 7x7. Actual impact to be confirmed once resistivity testing received.	DAN-0929 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Churchill Falls	2,421,922		2,421,922		DAN-0929 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Additional Grounding - Muskrat Falls	1,758,210		1,758,210		DAN-0929 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Structured Cabling - Churchill Falls, Muskrat Falls and Soldiers Pond	143,495	-13,495	130,000	Final price agreed with Alstom	DAN-1167 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Bedrock / Boulders Encountered at Churchill Falls	494,109		494,109		DAN-1548 / Rebaseline	T-1285
CD0502	Construction of AC Substations	Grounding reactors and Resistors at CF and MF	100,000		100,000		DAN-1348 / Rebaseline	T-1285
CD0508	Electrode Sites	Foundations for passive filters at Dowden's Point	200,000		200,000		DAN-1219 / Rebaseline	T-1285
CD0504	Civil Works for the Converter Stations and Switchyards	Removal of Boulder - Muskrat Falls Switchyard	2,000		2,000		DAN-1442 / Rebaseline	FWO-001
CD0502	Civil Works for the Converter Stations and Switchyards	Removal of Boulder - Muskrat Falls Switchyard (5% Mark Up)	100		100		DAN-1442 / Rebaseline	FWO-001
XD0001	AFE Estimated Growth - C3	C3 Estimated growth - Pending budget transfers to commitment packages	-23,744,971	-2,877,947	-26,622,918		Rebaseline	T-1286
			2	-6,000,000	-5,999,998			
			0	0	0			
		Misc.						
		SubTOTAL C3	180,241,038	-6,000,000	174,241,037			
		Approved Scope change:						
	Various Packages in HVac	Increase in the length of the 735 kV line to the final location of the CF switchyard	2,600,000		2,600,000		PCN-0093	SC0066
	PT0328/PT0330/CT0327	Reoptimization of the HVdc conductor	144,324		144,324		PCN-0093	SC0078
	PT0307	Supply of Steel Tower Foundations- Hvac	60,000		60,000		PCN-0130	SC0076
	CT0342	Construction of Hvac Transmission line - Island	480,000		480,000		PCN-0091	SC0007
	CT0319	Construction of 315 Hvac Transmission line (MF-CF)	-150,000		-150,000		PCN-0070	SC0054
	PT0307	Supply of Steel Tower Foundations- Hvac	39,626		39,626		PCN-0476	SC0503
	CT0319	Construction of 315 Hvac Transmission line (MF-CF)	100,000		100,000		PCN-0455	SC0509
	PT0330	Supply of Towers - HVdc	-148,061		-148,061		PCN-0099	SC0015
	CT0342	Construction of AC Transmission Lines - Island	374,638		374,638		PCN-0207	SC0240
	CT0319	Construction of 315 Hvac Transmission line (MF-CF)	2,107,399		2,107,399		PCN-0271	SC0512

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
Various Packages in HVdc		Re-routing HVdc line next to MF access road and TLH phase 2 at MF	10,000,000		10,000,000		PCN-0096	SC0016
PT0353	Supply of OPGW HVdc	alignment with the bid price of 10.5 M	2,993,921		2,993,921		PCN-0256	SC0235
PT0335	Supply of Anchors - HVac	Rock anchors unit cost more than originally estimated due to change in technical requirements / Additional Rock Anchors for 315 kV HVac Lines	1,402,577		1,402,577		PCN-0142 /419	SC0096 / 443
PT0330	Supply of Towers - HVdc	Change in Step Bolt Size	270,000		270,000		PCN-0156	SC0104
ST0311	Survey - Hvac	Not included in original estimate	1,200,000		1,200,000		PCN-0171	SC0115
ST0312	Survey - HVdc	Not included in original estimate	2,900,000		2,900,000		PCN-0171	SC0115
ST0311	Survey - Hvac	Installation of Geodetic Survey Control Network	31,674		31,674		PCN-0168	SC0116
PT0334	Supply of Steel Wires- HVdc	Forecast overrun at time of the Recommendation for Award	4,729,527		4,729,527		PCN-0250	SC0218
Various	Various packages	Remove all variances on completed packages	-30,387		-30,387		PCN-0252	T-0649
PT0330	Supply of towers - HVdc	Design criteria change - reduction from 0-6° to 0-3°	335,000		335,000		PCN-0147	SC0121
CT0327	Construction of HVcd line section 1	HVdc Access Road Ballasting S1- to S1-400	4,098,717		4,098,717		PCN-0456	SC0504
CT0327	Construction of HVcd line section 1	Geotech field investigation and foundation pre-selection program	1,025,000		1,025,000		PCN-0531 rev1/580	SC0649/659
CT0327	Construction of HVcd line section 1	HVdc Clearing and Access - Block 7 and Partial 6 (C&T Enterprises) Contract Value Increase. Relocation of access road at CF switchyard	10,025,000		10,025,000		PCN-0481/494	SC0507/523
CT0342	Construction of Hvac Transmission line - Island	Removal of the ADSS fibre optic cable from the Wood Pole Electrode Line between Soldiers Pond and Holyrood Plant (BCC)	-432,154		-432,154		PCN-0448	SC0514
CT0342	Construction of Hvac Transmission line - Island	Budget increase to align with contract value	8,945,975		8,945,975		PCN-0497	SC0515
CT0327	Construction of HVcd line section 1	Additional Guy Anchor Bottom Bars, Couplers and Centralizers for HVdc Line	2,981,338		2,981,338		PCN-0452	SC0508
PT0352	Supply of anchors - HVdc	Additional Guy Anchor Bottom Bars, Couplers and Centralizers for HVdc Line	1,000,406		1,000,406		PCN-0452	SC0508
CT0327	Construction of HVcd line section 1	Creation of Marshalling yard packages	-1,560,000		-1,560,000			SC0024
CT0354	Marshaling Yards for Hvac Line (HVGB)	Creation of Marshalling yard packages	1,560,000		1,560,000			SC0024
CT0354	Marshaling Yards for Hvac Line (HVGB)	Increase in budget to accommodate most recent estimate and bid price for construction	1,409,829		1,409,829		PCN-0184	SC0122
PT0330	Supply of Towers - HVdc	Include Low Temperature Rated Steel for HVdc Towers	872,560		872,560		PCN-0198	SC0153
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Reassignment of the Provision of Geotech Investigation Services for 315 kV Hvac	956,750		956,750		PCN-0187	SC0165
ST0309	Provision of Geotech - Hvac	Reassignment of the Provision of Geotech Investigation Services for 315 kV Hvac	-956,750		-956,750		PCN-0187	SC0165
PT0329	Supply of insulators - HVdc	Increase in Insulators quantity for electrode conductors as a result of new study of "Electrode Insulation & Clearance" report	108,039		108,039		DAN-0411 / PCN-0191	SC0134
ST0311	Survey - Hvac	Verification survey requirements for CF	53,525		53,525		PCN-0212	SC0183
PT0356	Supply of Damper - HVdc	Increase in quantities	1,646,194		1,646,194		PCN-0219	SC0184
PT0302	Supply of Steel Towers - Hvac	Tower weight increase	1,024,191		1,024,191		PCN-0155	SC0185/268
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Tower weight increase	24,500,000		24,500,000		PCN-0155	SC0185
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	clearing for 2 towers/Rework of structure 3101-142 & 3101-143	149,091		149,091		PCN-0472/458	SC0529/534
ST0312	Provision of Survey - HVdc	Cancelling of Package - Survey requirements to be completed by lands group.	-1,377,300		-1,377,300		PCN-0230	SC0200
PT0300	Supply of Conductors - Hvac	Estimate unit price was higher than the bid price	-4,048,702		-4,048,702			SC0268
PT0301	Supply of Insulator - Hvac	Underrun on the budget compared to contract value	-359,067		-359,067		PCN-0402	SC0268/422
PT0303	Supply of Hardware - Hvac	Underrun on the budget compared to contract value	-3,742,358		-3,742,358			SC0268
PT0304	Supply of OPGW - Hvac	Underrun on the budget compared to contract value	-460,842		-460,842			SC0268
PT0307	Supply of Steel Foundation- Hvac	Additional quantities	178,218		178,218			SC0268

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PT0307	Supply of Steel Foundation- Hvac	Corrosion protection/quantity adjustment/increase in deep rock foundations	454,848		454,848		PCN-0130/323/396	SC0076/268/387
PT0308	Supply of Steel Foundation - HVdc	Underrun on the budget compared to contract value	-2,746,175		-2,746,175			SC0268
PT0308	Supply of Steel Foundation - HVdc	Additional foundations required to avoid construction delays, Brace Extensions for HVdc Rock Foundations	3,366,548		3,366,548		PCN-0429 /432	SC0268 / 465 / 470
PT0326	Supply of Steel Wires- HVdc	Bid unit rates higher than budgeted	419,348		419,348		PCN-0395	SC0268/405
PT0328	Supply of Conductor - HVdc	Underrun on the budget compared to contract value	-6,622,857		-6,622,857			SC0268
PT0328	Supply of Conductor - HVdc	Insurance claim for damaged reels	-40,205		-40,205		PCN-0515	SC0640
PT0329	Supply of Insulator - HVdc	Underrun on the budget compared to contract value	-18,801,303		-18,801,303			SC0268
PT0330	Supply of Steel Tower - HVdc	Underrun on the budget compared to contract value	-492,362		-492,362			SC0268
PT0330	Supply of Steel Tower - HVdc	Addition of tower accessories (ECN14)	98,558		98,558		PCN-0489	SC0639
PT0330	Supply of Steel Tower - HVdc	Geometry changes/dessicants(white rust mitigation)/Redesign of 2 zones (max wind load requirements)	1,198,946		1,198,946		PCN-0498 /500 / 394	SC0533/536/552
PT0331	Supply of Hardware - HVdc	Underrun on the budget compared to contract value	-9,359,408		-9,359,408			SC0268/497
PT0334	Supply of Steel Wires- HVdc	Under run on package and Change from steel to wooden reels	-1,129,373		-1,129,373			SC0268
PT0353	Supply of OPGW - HVdc	Underrun on the budget compared to contract value	-424,616		-424,616			SC0268
PT0329	Supply of Insulator - HVdc	Funds required for additional insulator testing	45,000		45,000		PCN-0302	SC0295
PT0356	Supply of Damper - HVdc	Underrun on the budget compared to contract value	-711,974		-711,974			SC0268
CT0327	HVdc	Extension of the TL due to new location of Forteau transition station	352,000		352,000		PCN-0308	SC0368
CT0327	HVdc	Install additional anchors&bars	850,000		850,000		PCN-0394	SC0552
CT0327	HVdc	Move rockpile/backfill requirements	358,293		358,293		PCN-0472/510	SC0529/535
PT0352	Supply of Anchor Materials - Hvac	Decrease in # of anchors	-532,883		-532,883			SC0270
ST0311	Provision of Survey - Hvac	Change in package strategy	-247,665		-247,665			SC0267
CH0024	Reservoir Clearing	Cost saving due to the change in execution strategy	-16,009,090		-16,009,090			SC0266
CT0319	Construction of Hvac Transmission line	Cost of the HVGB line to Gull Island	-7,757,956		-7,757,956			SC0266
XT0001 (for CT0319)	Construction of Hvac Transmission line	Micropiles, foundations, mudslabs, stringingdelays of tie-ins and interconnection, stringing, downlead clamps/cotter keys	9,934,037		9,934,037			SC0497
PT0302	Supply of Steel Tower - Hvac	Tower weight increase/Metallurgical testing on tower washers/extra fasteners/735kV/ Tower quantity change	616,000		616,000		PCN-326 / 420	SC0339 / 467
PT0302	Supply of Steel Tower - Hvac	Extra fasteners are required so they are readily available to avoid any shortages or delays in tower installation	54,272		54,272		PCN-0326	SC0339
PT0307	Supply of Steel Foundation- Hvac	HVac Grillage Foundation Quantity Adjustment (Additional foundations and conversion kits)	808,326		808,326		PCN-0323/573	SC0325/619
PT0307	Supply of Steel Foundation- Hvac	Extra Self Support Foundation	444,100		444,100		PCN-0501	SC0530
PT0335	Supply of Anchor Materials - HVdc	Additional bottom bars and centralizers	103,200		103,200		PCN-0347	SC0345
PT0335	Supply of Anchor Materials - HVdc	Anchor materials for driven pile foundations	33,119		33,119		PCN-0436	SC0531
PT0356	Supply of Damper - HVdc	Price increase to perform radiographic examination on 20 pieces of each clamp and keeper	217		217		PCN-0329	SC0340
PT0356	Supply of Damper - HVdc	Additional dampers	49,240		49,240		PCN-0503	SC0564
CT0327	Construction of HVdc Transmission line	Geotechnical Field Investigation for HVdc Line	275,000		275,000		PCN-0531	SC0572
CT0327	Construction of HVdc Transmission line	Micro Pile Foundation Application for HVdc Line	210,500		210,500		PCN-0529	SC0575
CT0327	Construction of HVdc Transmission line	Additional cost of Clearing Blocks 15&16, bridging materials, clearing blocks 4,5,6,7,8,9,10,11,13,14	135,981,632		135,981,632		PCN-0530/536 / 552/ 558/559 /562	SC0577/583 / 588/591 / 592 /597
CT0327	Construction of HVdc Transmission line	Blocks 9,10,11,12/ Second OHSW required on HVdc Slack Span to Gantries/ Technical Support LRM Access Plan/ Backcharge guy anchors	6,541,249		6,541,249		PCN-0530 rev1/547 / 590/ 539	SC0624/625 /626/644

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
PT0308	Supply of Steel Tower Foundations - 350 kV HVdc	Extra Foundations and Segment 5 Foundations for HVdc Line.	9,071,466		9,071,466		PCN-0541	SC0584
PT0308	Supply of Steel Tower Foundations - 350 kV HVdc	Foundation tower shoes and conversion kit for A2 grillage and tower shoes for pile	226,086		226,086		PCN-0586	SC0643
CT0327	Construction of HVdc Transmission line	Additional funds to cover clearing and accesses costs - blocks 17/18, Re-route saving, Backcharge for turnbuckle and anchor shackles		28,591,289	28,591,289		PCN-0625 /604/ 619	SC0676 672/673/675
PT0330	Supply of Steel Tower - HVdc	Re-route saving - Tower procurement		1,037,100	1,037,100		PCN-0604	SC0673
PT0331	Supply of Hardware - HVdc	Turnbuckles		264,733	264,733		PCN-0619	SC0675
PT0334	Supply of Hardware - HVdc	Anchor shackles		3,168	3,168		PCN-0619	SC0682
PT0352	Supply of Anchor Materials - HvdC	Re-route saving - Anchor procurement		103,710	103,710		PCN-0604	SC0673
XT0001 (for PT0356)	Supply of Damper - HVdc	Additional quantities	760		760			SC0497
PT0352	Supply of Anchor Materials - HvdC	Bearing Plates and Nuts for Anchor Installation (HVdc Deep Rock Self-surported Towers)	136,922		136,922		PCN-0325	SC0344
PT0352	Supply of Anchor Materials - HvdC	Additional rock anchor	686,393		686,393		PCN-0499	SC0532
PT0335	Supply of Anchor Materials - HVac	Rock anchors unit cost more (technical req)/Bottom bars & centralizers/Increase in deep rock foundations	56,413		56,413		PCN-0142/347/396 /	SC0096/345/387 / 471/477
PT0352	Supply of Anchor Materials - HvdC	Quantity change for HVdc Anchors due to Line Optimization, Williams Site Visit for Technical Assistance for Installation of HVdc Anchors, backcharge guy anchors	158,838		158,838		PCN-0345 /430 / 433/ 539	SC0341 /460/469/ 644
PT0330	Supply of Steel Tower - HVdc	Funds transferred to quality surveillance for location change	-400,500		-400,500		PCN-0294	SC0350
PT0330	Supply of Steel Tower - HVdc	Increase in transportation cost	401,976		401,976		PCN-0560	SC0593
XT0001 (for PT0330)	Supply of Steel Tower - HVdc	Additional quantities	390,747		390,747			SC0497
PT0330	Supply of Steel Tower - HVdc	supply of fasteners/Strengthening of Guy Cross arm A2 and A4/OPGQ bracket change/construction spares	598,738		598,738		PCN-425/496/493/453	SC0520/521/522 /519
PT0352	Supply of Anchor Materials - HvdC	Foundations/Anchors and Segment 5 Foundations for HVdc Line (OOM)	159,709		159,709		PCN-0541rev1	T-1366
PT0352	Supply of Anchor Materials - HvdC	Additional funds for the change in quantities and anchors	138,072		138,072		PCN-0322	SC0324
CT0327	Construction of HVdc Transmission line	Additional funds required for package to align with the negotiated price /Extension of TL Forteau transition station/Weight increase in foundations	236,277,149		236,277,149		PCN-0308/400/422	SC0266/368/448 / 466
XT0001 (for CT0327)	Construction of HVdc Transmission line	Foundations, backfill, steel tower punching, clipping, re-galvanizing, labor trade escalation, Valard Part B	41,581,189		41,581,189			SC0497
CT0327	Construction of HVdc Transmission line	Forecasted Cost Increase (Blocks #4, 5 and partial #6)	11,190,160		11,190,160		PCN-0502	SC0563
PT0307	Supply of Steel Foundation- Hvac	Additional 220 kN Insulators required for 735 kV Tower Hardware Type Tests	258,433		258,433		PCN-0411	SC0445
PT0308	Supply of Steel Foundations - HVdc	HVdc Pile foundation Tower Shoe to be added to the supplier 's scope / Extra guy tower foundations / extra grillage foundations for HVdc	2,288,628		2,288,628		PCN-0407/418/450	SC0449/450/489
PT0308	Supply of Steel Foundations - HVdc	Connection between foundation and tower for out of tolerance foundations	100,000		100,000		PCN-0522	SC0565
PT0328	Supply of Conductor - HVdc	Replacement of damaged and stolen reels / insurance refund	4,273		4,273		PCN-0409	SC0451/478
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	More guy anchors due to poor soil conditions at the 735 KV line	625,000		625,000		PCN-0131/305/363/27	SC0266/312/371/39 1/397
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Additional cost of Import backfill & type A-2 & B-2 foundations	2,742,791		2,742,791		PCN-0379/451	SC0398/476
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Increase in guy anchors due to soil conditions	6,000,000		6,000,000		PCN-0363	SC0371
CT0341	Clearing of Right-of-Way for HVac Transmission Line	Funds added to cover overrun due to contract being cancelled and awarded to new contractor	15,051,411		15,051,411			SC0266
XT0001 (for CT0341)	Clearing of Right-of-Way for HVac Transmission Line	second pass mulching	1,000,000		1,000,000			SC0497
XT0001 (for CT0341)	Clearing of Right-of-Way for HVac Transmission Line	GWF Bond recuperation	-15,000,000		-15,000,000			SC0497
CT0354	Marshaling Yards for Hvac Line (HVGB)	Additional funds required to align with commitments values	246,587		246,587			SC0266
CT0319	Construction of Hvac Transmission line - Island	Additional cost for relocating tower(s) due to C-3 change to GIS	200,000		200,000		PCN-0306	SC0312
PT0302	Supply of Steel Towers - Hvac	Tower weight increase	847		847		PCN-0313	SC0301
PT0329	Supply of Insulator - HVdc	Funds for air freight for samples due to time constraints	2,700		2,700		PCN-0310	SC0302
CT0355	Marshaling Yards for HvdC Line	Additional funds required to align with latest forecast	4,000,000		4,000,000			SC0266

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Market conditions and poor productivity than estimated, additional medical services, boarding and lodging, growth	36,460,005		36,460,005		PCN-0199	SC0191
		Pending Scope change:	529,011,258	30,000,000	559,011,258			
CT0327	Construction of HVdc Transmission line	Additional funds to cover clearing and accesses costs (for LRM, blocks 17/18 and CT0327-015 in Labrador)	40,000,000	-40,000,000	0		DAN-1692	T-1418
CT0327	Construction of HVdc Transmission line	HVdc ROW Clearing and Access - Block 4,5,6 (CT0327-013)		5,966,770	5,966,770		DAN-1473	T-1418
CT0327	Construction of HVdc Transmission line	HVdc ROW Clearing and Access - Block 12 (Long Range Mountains)		4,033,230	4,033,230		DAN-1473	T-1418
PT0352	Supply of Anchor Materials - Hvdc	Purchase of tie-down anchors for Valard for ac line	93,132		93,132		DAN-1807/PCN-0600	T-1420
PT0352	Supply of Anchor Materials - Hvdc	Reduction of guy anchor length for surface rock locations	215,629		215,629		DAN-1849/PCN-0607	T-1430
CT0341	Clearing of Right-of-Way for HVac Transmission Line	Contract close-out	-1,644,098		-1,644,098			
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Saving on additional foundation costs and pile usage	-8,695,708		-8,695,708		TBD	T-1412
CT0319	Construction of 315 Hvac Transmission line (MF-CF)	Backcharge: To repair break on fibre optic cable	-17,122		-17,122		TBD	T-1260
CH0024	Reservoir clearing	Edwards Brook Camp - Cost for Contractor Provided Fuel	20,000		20,000		DAN-1023	T-0926
		Design Development	29,971,833	-30,000,000	-28,167			
		Errors & Omissions						
		Purchase orders and Construction contracts execution						
			0	0	0			
Misc.			0	0	0			
		SUBTOTAL C4	558,983,091	0	558,983,091			
		Approved Scope change:						
SM0704	Survey services	Impact of the collective agreement	5,600,000		5,600,000		PCN-0153	SC0101
SM0710	IT Equipment	Reduction of IT budget	-1,155,286		-1,155,286		PCN-0105	SC0010
SM0701	Provision of 3rd party quality inspection	Additional funds required for quality surveillance	6,060,066		6,060,066		PCN-0294	SC0350
SM0704	Survey services	Saving on final contract value	-500,000		-500,000			SC0528
SM0706	Vehicule services	Additional funds required for vehicules	6,038,442		6,038,442		PCN-0343	SC0353
SM0707	Helicopter services	Saving on the helicopter services	-3,760,215		-3,760,215		PCN-0343	SC0353
SM0704	Survey services	Additional OT cost per Collective agreement	2,523,512		2,523,512		PCN-0178	SC0105
SM0713	Field Geotechnical Investigations	Alignment with final contract values	-355,879		-355,879			SC0254
SM0704	Surveying services	Several changes (Mob/Demob, training, additional IT and GPS equipment)	90,952		90,952			SC0254
SM0705	Laboratory services	Forecast adjustment due to favorable bid prices	-4,620,869		-4,620,869			SC0254
SM0705	laboratory services	CR#1 Addition of engineering services to CH0007/CH0009	75,000		75,000		DAN-0833	CR#1
SM0700	Freight Forwarding Services	Additional funds to cover freight forwarding services, duties, operation at marshalling yard	3,886,698		3,886,698		DAN-0728 / PCN-0266	SC0253
SM0707	Helicopter services	Additional services due to increase in historical resources	200,000		200,000			SC0576
XM0001(for SM0707) Helicopter services		Additional services due to increase in historical resources	800,000		800,000			SC0538/ 576
XM0001(for SM0700) Freight Forwarding Services		Hauling material from the marshalling yard to contractor camp for the Hvac line	3,493,810		3,493,810			SC0538
SM0709	Air transportation	Additional funds for LIL and LTA for Nalcor team	600,000		600,000			SC0538
SM0709	Air transportation	Reduction due to canceling the Astaldi section	-5,000,000		-5,000,000		PCN-0388	SC0406
SM0709	Air transportation	Travel for the CF camp services	115,400		115,400		PCN-0346	SC0407

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
SM0701	Provision of 3rd party quality inspection	Additional funds for expediting and cost increases in quality inspection	2,400,000		2,400,000		re-baseline	SC0264
SM0701	Provision of 3rd party quality inspection	Additional funds for Segments 1 thru 5 Foundations	75,000		75,000		PCN-0541	SC0511
SM0714	EPCM	Engineering and Project management cost of the HVGB line to Gull Island	-2,513,710		-2,513,710			T-0595
SM0714	EPCM services	Reduction in EPCM services due to change from EPCM to EPC strategy CD0502	-19,675,571		-19,675,571		PCN-0163	SC0135
SM0714	EPCM services	Reduction in EPCM services due to change from EPCM to EPC strategy CD0534	-3,550,915		-3,550,915		PCN-0148	SC0107
SM0704	Surveying services	Execution module modification of the surveying services in MF	-14,588,920		-14,588,920		PCN-0375	SC0419
SM0714	EPCM services	Change to diversion timeline at MF	10,000,000		10,000,000		PCN-0137	SC0118
SM0705	Laboratory services	Impact of the collective agreement	400,000		400,000		PCN-0153	SC0101
SM0713	Field Geotechnical Investigations	Change from Helicopter to trail access	97,446		97,446		PCN-0159	SC0092
SM0713	Field Geotechnical Investigations	Cost growth for archeological monitoring and recovery costs	300,000		300,000		PCN-0181	SC0111
SM0713	Field Geotechnical Investigations	Scope reduction	-835,000		-835,000		PCN-0073	SC0058
			-13,800,039	0	-13,800,039			
		Pending Scope change:						
SM0700	Freight Forwarding Services	Saving on final contract value of SM0700-009	0	0	0			
		Errors & Omissions						
		Bids Received						
		Purchase orders and Construction contracts execution						
			0	0	0			
		Misc.						
		Other scope						
		Approved Scope change:						
XX0300	EA (Environmental)	Cost growth for archeological monitoring and recovery costs	175,000		175,000		PCN-0181	SC0111
XX0300	EA (Environmental)	Financing of environmental monitors for the gov of NL	488,000		488,000		PCN-0238	SC0228
XX0300	EA (Environmental)	Saving on the LIL Regulatory Compliance cost	-4,000,000		-4,000,000		PCN-0398	SC0485
XX0002	Additional scope of work	River management	575,000		575,000		PCN-0293	SC0291
XX0100	Owner cost	Additional funds required to finalize construction power at MF	324,800		324,800		PCN-0331	SC0310
XX0300	EA (Environmental)	Saving on the LIL environmental cost	-2,983,342		-2,983,342			SC0538
XX0100	Owner cost	Foundation Pre-selection Program - HVdc Line	700,000		700,000		PCN-0580	SC0651
XX0100	Owner cost	Additional funds required for Owner's team	65,275,112		65,275,112			SC0538
XX0400	Aboriginal affairs	Transfer from XX0300	439,372		439,372			SC0538
ZZ0999	Unallocated scope	Budget adjustment for non required scope in LIL	-106,856		-106,856			SC0538
XXSMFG	MF site purchase orders	MF site cameras	155,000		155,000		PCN-0364	SC0361
XH0001(for XXSMFC MF site purchase orders		Additional funds for site purchase orders	250,000		250,000			SC0528
XM0001(for XX0900) Commercial and Legal		Legal costs fro GWF	750,000		750,000			SC0538
XX0002	Additional scope of work	Additional funds fro ECC upgrades and circuit breakers	1,104,330		1,104,330		PCN-0483	SC0569
XM0001(for XX0002) Additional scope of work		Additional funds fro ECC upgrades and circuit breakers	1,396,200		1,396,200			SC0538
XX0002	Additional scope of work	Reconciliation with financial data	4,861,132		4,861,132			SC0538

Apr-16

Forecast Variation

C.P.	Package Description	Variation Description	Previous Cumulative variance	Monthly variance	Total Variance	Comments	CM Ref.	Trend / CN / Sch. ref.
XXSMFG	MF site purchase orders	Additional funds for site purchase orders	250,000		250,000		PCN-0272	SC0427
XX0100	Owner cost	Follow on Engineering studies	250,000		250,000		PCN-0316	SC0316
XX0001	SOBI	Budget adjustment after forecast reevaluation	-800,815		-800,815			SC0538
XX0001	SOBI	Adustment of old scope changes approved for SOBI	11,379,201		11,379,201			SC0169
XX0001	SOBI	Addition of FP transition compound from CD0503	3,458,952		3,458,952		PCN-0062	SC0009
XX0001	SOBI	Saving from the drag free fishing agreement which results in less rock cover over the cables	-7,000,000		-7,000,000		PCN-0085	SC0236
XX0100	Owner cost	Alignment with rebaseline values and reduction of helicopter costs	-34,938,158		-34,938,158			SC0260
XX0200	Feasibility Engineering	Alignment with Final costs	-2,978,945		-2,978,945			SC0260
ZZ0999	Unallocated scope	Alignment of power consumption with forecast	-4,356,788		-4,356,788			SC0260
XX0900	Commercial and Legal	Additional funds required to cover insurance costs	643,816		643,816			SC0260
XX0001	SOBI	Saving from the route reduction (subsea rock protection and submarine cable design), additional funds for FP civil works	-5,210,170		-5,210,170			SC0260
XX0900	Commercial and Legal	Dispute resolution costs		5,000,000	5,000,000		PCN-0605	SC0672
XX0002	ASOW	cancel Soldier's pond access road	-3,793,573		-3,793,573			SC0260
XX0100	Owner cost	Additional funds required for the dc line QC survey resources	227,300		227,300		PCN-0230	SC0200
XX0001	SOBI	Saving in the drilling scope	-10,000,000		-10,000,000		PCN-0416	SC0429
XX0001	SOBI	Saving in the S/I of fiber optics	-17,100,000		-17,100,000		PCN-0210	SC0209
XX0002	Additional scope of work	Upgrade Line protection	252,914		252,914		PCN-0223	SC0221
XX0002	Additional scope of work	Adustment of old approved scope changes	276,397		276,397		PCN-0118/135	SC0174
XX0100	Owner cost	Change to diversion timeline at MF	10,000,000		10,000,000		PCN-0137	SC0118
XX0100	Owner cost	Adustment of old approved scope changes	17,330,142		17,330,142		various	SC0170
XX0200	Feasibility Engineering	Adustment of old approved scope changes	863,500		863,500		various	SC0171
XX0300	EA (Environmental)	Adustment of old approved scope changes	2,210,000		2,210,000		various	SC0172
XX0900	Commercial and Legal	Adustment of old approved scope changes	1,877,139		1,877,139		various	SC0173
XX0002	Additional scope of work	Cost reduction at Holyrood due to increase of Syn. condenser by 25 MVAR	-36,451,994		-36,451,994		PCN-0067	SC0119
		Pending Scope change:	-4,207,334	5,000,000	792,666			
Misc.			0	0	0			
		SUBTOTAL Other Scope	-4,207,334	5,000,000	792,666			
		TOTAL AMOUNT	1,663,208,407	-515,805	1,662,692,602			

ATTACHMENT A.20

Expected Contingency Draw down (LIL)

28-Apr-2015

PCN #	Description	Value (\$)	Status	Target Commitment Date	Comments	Timeline of Impact
Approved Contingency (initial Oct 2013)		10,386,845				
515	Damaged reals and storage quantities delivered	-42,205	Approved			
516	Transfer of SF of Substation Control Buildings from CW to EPC Contractor	76,000	Approved			
529	Misc File Foundation Application for HVdc Line	310,500	Approved			
530	Additional clearing costs for CT0327-01E	128,443	Approved			
531	Geotechnical Field Investigation for HVdc Line	1,000,000	Approved			
541	Segment 5 Foundations for HVdc Line-contingency Foundations	7,078,182	Approved		Assess/Adv impact of installation in CT0327-001	
547	Second OHSW Required on dc Stack Span to Gantries	40,000	Approved			
577	Change in Layouts of MF and SF converters and SY	-217,852	Approved			
580	Pre-Founder Selection for Winter Section of Segment 2 of HVdc Line	1,000,000	Approved			
588	HVdc File Foundation Tower Shoes	226,086	Approved			
604	HVdc Transmission line Re-routes and Design change (Accounts for the extra material cost in DAN 1773 and change in types of foundations and additional Piles)		Approved		Total Saving of 11,361,763 M remains in CT0327 Tower purchase: 1,037,100 (PT0300) Extra material: 109,710 (PT0302)	
625	HVdc ROW Clearing and Access - (Stacks 17 & 18)	30,000,000	Approved		40 M additional (30 from contingency and 10 from saving in PCN 604)	
Available Contingency		10,386,845				
PCN #	Description	Value (\$)	Status	Target Commitment Date	Comments	Timeline of Impact
562	HVdc ROW and Access Works Cost for CT0327-01E	5,000,000		May	Includes 5 M Flood Maintenance and Snow clearing	Short Term
607	Potential saving on 350 KV HVdc line for using modified guy anchor top bar	215,630	Under Review	May	Saving expected on the construction side	Short Term
610	Re-location of systems linkage services	250,000	Created	May		Short Term
623	Removal of one re-termination line from LCP scope	-620,000	Created	May		Short Term
628	Overall growth saving on CS	-6,200,000		May		Short Term
DAN #	Description	Value (\$)	Status	Target Commitment Date	Comments	Timeline of Impact
1774	Exploit river bridge load rating reduction	30,000	Under Review	June		Short Term
1809	Performed repair sleeves for 350 Kv HVdc line pole and electrode conductor	30,000	Under Review	July		Short Term
1878	Permanent road instead of winter road in Tana Nasa winter zone	3,000,000		2.5 M in May, 2.5 M in June	5 M of the total forecasted cost of 8 M, is already accounted for in the Forecast of CT0327-017	Short Term
1904	Rental of Generators at the HVDC Marshalling Yard	50,000	Created	May		Short Term
1916	HVdc line 84-690 pile/bolt remove		Under Review		Need follow up by Cost Controller	Short Term
1920	Execution Strategy - Labrador (Electrode Line)		Created		Need follow up by Cost Controller	Short Term
1956	Purchase of tension meter - HVdc	40,000	Created	May		Short Term
N/A	HVdc ROW and Access Works for LRM	28,000,000		LNTF by 15-May for \$1M; balance by 1-Jun (1M in May, 27 M in June)		Short Term
N/A	Supply of Covers for HVdc - CT0327-012 & CT0327-007	900,000		June		Short Term
N/A	Labrador clearing and access bridge - CT0327-006	900,000		May		Short Term
N/A	Permanent road instead of winter road in Labrador	20,000,000		Work to be completed on T&M basis by mid-August. Opportunity to manage commitment. Plan \$12M by 1-Jun (12M in June, 6 M in July, 2M in August)		Short Term
N/A	Carroll burial of TL on the island	-1,700,000		May		Short Term
Non-Reserved Contingency (L)		2,244,815				
PCN #	Description	Value (\$)	Status	Comments	Timeline of Impact	
565	Inland trucking services (transportation) for CA deliveries	4,534,200	On Hold		Long Term	
564	Addition of Turnbuckles on 350 Kv HVdc line conductor hardware assemblies	127,037	On Hold		Long Term	
634	Transfer of Valard camp sites to Owner's		Created		Long Term	
640	Impacts of 2016 Budget on LCP (FUEL)	500,000	Created		Long Term	
DAN #	Description	Value (\$)	Status	Comments	Timeline of Impact	
935	Spares Parts Storage Strategy for Component 3		Under Review	Need follow up by Cost Controller	Long Term	
1042	Project Insurance Coverage - Budget Shortfall	1,110,800	Under Review	Need follow up by Cost Controller	Long Term	
1444	Deferral of HVdc TL Gantry Connection		Under Review	Need follow up by Cost Controller	Long Term	
1448	Labour Relations Cost - Claim Mgmt		Under Review	Need follow up by Cost Controller	Long Term	
1535	Soldiers Pond Water Requirements	1,000,000	Under Review	Need follow up by Cost Controller	Long Term	
1585	Change in Deflection Criteria for Driven Pile Design		Under Review	Need follow up by Cost Controller	Long Term	
1633	Alignment of Soldiers Pond 350 HVdc Tower Structure and Converter Station Gantry		Under Review	Need follow up by Cost Controller	Long Term	
1669	315V & 735 kV Post Insulators Technical Characteristics (Substations)	-108,500	Under Review		Long Term	
1788	Additional SOBI PMT post 2016	2,000,000	Under Review		Long Term	
1763 / 1765	CS Transition compound construction moved from 2015 to 2016; Additional SOBI Scope	50,000	On Hold	Need follow up by Cost Controller (Vessel delays not included in the SO K)	Long Term	
1764	CS Transition compound construction moved from 2015 to 2016; Deferred Execution of SOBI Scope		On Hold	Need follow up by Cost Controller (Impact on Nexens)	Long Term	
1766	Re-baselined S&K Completion; Dynamic commissioning Support post 2016		On Hold	Need follow up by Cost Controller	Long Term	
1767	Re-baselined S&K Completion; Additional duration and works prior to Turnover to Operations		On Hold	Need follow up by Cost Controller (DTS monitoring; annual land asset and risk protection team inspection)	Long Term	
1806	Temporary utilities at MF to support energisation of AC and DC to support Export of Power to Island	350,000	Under Review		Long Term	
1869	Temporary shunt reactor - LIL operation prior to MFA G1		Under Review	Need follow up by Cost Controller	Long Term	
1870	Optimization of design of electrode line conductor and guy anchor hardware		Under Review	Need follow up by Cost Controller	Long Term	
1942	Sewage Systems in Permanent Buildings for CS sites		Created		Long Term	
1953	HVdc Foundation Installation Cost based on Trend of Foundation Type Installed	10,000,000		includes piles	Long Term	
1957	CT0327-001 - Trade labour escalation	20,000,000		initial estimate (due to delays)	Long Term	
1956	Review of HVdc Anti-Cascade Criteria and Optimization			Saving expected	Long Term	
N/A	Additional cost for maintenance (was in Valard part B)	8,500,000	Created		Long Term	
N/A	Foundation increase in installation cost due to ECNs (WF1,2,3)	10,000,000		Can this be offset by Macro-Plan?	Long Term	
N/A	Owner's cost	80,000,000			Long Term	
N/A	Currency impact	25,000,000			Long Term	
N/A	Additional funds for air transportation	50,000			Long Term	
N/A	Reconciliation to Finance JCE for cat 200/500	1,392,412			Long Term	
N/A	Saving on overall value of aboriginal affairs	-1,000,000			Long Term	
N/A	underrun forecast for RLIH Network Services Support for telecom services - phase 2	-950,000			Long Term	
N/A	underrun forecast for early works on starting camp	-850,000			Long Term	
Total Contingency		10,386,845				

Small (L) - 2015 10,386,845

Up to PCN 642 and DAN 1964 Short term = up to and of September Long Term = After September 2014

Expected Contingency Draw down (LTA)

26-Apr-2016

PCN #	Description	Value (\$)	Target Commitment Date	Status	Comments	Timeline of Impact
AFE Rev2 Contingency (end of Sep 2015)		17,945,500				
519	Transfer of S/I of Substation Control Buildings from CW to EPC Contractor	215,000		Approved		
577	Change in Layouts of the MF and SP converter and SY	2,757,286		Approved		
Available Contingency:		14,873,214				
PCN #	Description	Value (\$)	Target Commitment Date	Status	Comments	Timeline of Impact
600	Tie-down anchors for Valard for 350 Kv Hvac line	93,132		Under Review		Short Term
610	Reallocation of custom brokerage services	-273,824		Created		Short Term
618	Additional Quantity of Counterpole Ground Rod Assemblies	235,600		Under Review	PT303 (38,300) CT0319 (196,600)	Short Term
DAN #	Description	Value (\$)	Target Commitment Date	Status	Comments	Timeline of Impact
1852	Structure 142 Line 1 on the HVac line required rework due to settlement	1,200,000	July	Under Review	Need follow up by Cost Controllers	Short Term
1786	Installation of second stockbridge dampers at some towers		July	Under Review	Valard should be responsible of any extra costs	Short Term
1862	TL240 options post impoundment	750,000	August	PCN required	Should be backcharged to HVGB line	Short Term
1884	Hvac TL stream diversions	54,741	June	Under Review		Short Term
1888	MF & CF Reactor Heat Run Test Results	-65,000	July	Under Review		Short Term
1904	Rental of Generators at the HVGB Marshalling Yard	50,000	May	Created		Short Term
1940	Generation Rejection Schemes (CD0502)			For CCB input		Short Term
Non Reserved Contingency (1)		12,828,588				
PCN #	Description	Value (\$)	Status	Comments	Timeline of Impact	
565	Inland trucking services (transport) for C4 deliveries	-3,493,630	On Hold		Long Term	
640	Impacts of 2016 Budget on LCP (FUEL)	300,000	Created		Long Term	
DAN #	Description	Value (\$)	Status	Comments	Timeline of Impact	
355	Spare Parts Storage Strategy for Component 3		Under Review	Need follow up by Cost Controllers	Long Term	
766	AC clearing - second pass matching quantities	1,000,000	Under Review	1 M, Inc. in Rev2	Long Term	
1042	Project Insurance Coverage - Budget Shortfall	277,700	Under Review		Long Term	
1448	Labour Relations Cost - Claim Mgmt		Under Review		Long Term	
1806	Temporary utilities at MF to support energisation of AC and DC to support export of power to Island	500,000	Under Review		Long Term	
1850 / 1873	Requirements of AC & DC load studies at CFL00 SY		Under Review	Could be high impact	Long Term	
1863	Rock jack hammering/busting costs	645,000	PCN required	DAN was rejected	Long Term	
1942	Sewage Systems in Permanent Buildings for C3 sites		Created		Long Term	
N/A	Owner's cost	-15,000,000			Long Term	
N/A	Saving on final contract value for the AC line clearing	-2,644,098			Long Term	
N/A	Saving on final contract value for the AC line construction	-8,800,000			Long Term	
N/A	Reconciliation to Finance JDE for cal 200/300	21,154			Long Term	
N/A	Saving on CF camp services	-1,500,000			Long Term	
Total Long Term Items (2)		-28,693,974				

Shortfall (2 - 1) -41,522,439 No Shortfall saving

Up to PCN 642 and DAN 1964

Short term = up to end of September
Long Term = After September 2016

ATTACHMENT A.21

**LTA - LITL Revised Cost Model Input**

Jason Kean to: Justin Dahl
Cc: "Meade, Aidan", "Jack Evans"
Bcc: George Chehab

05/03/2016 10:34 AM

PRIVILEGED AND CONFIDENTIAL IN CONTEMPLATION OF LITIGATION

Justin,

As discussed, the attached file provides revised cost model input ranges for each of LTA and LITL. We would like to have the risk model re-run with these new inputs asap.

Please confirm receipt and advise when we can expect results.

Thanks,

Jason



LTA - LITL Cost Ranges for Westney - 3-May-2016.xlsx

Jason R. Kean, P.Eng., MBA, PMP

Deputy General Project Manager (Consultant to LCMC)

PROJECT DELIVERY TEAM

Lower Churchill Project

t. (709) 737-1321 c. (709) 727-9129 f. (709) 754-0787

e. jasonkean@lowerchurchillproject.caw. muskratfalls.nalcorenergy.com

You owe it to yourself, and your family, to make it home safely every day. What have you done today so that nobody gets hurt?

LTA Cost Model Input

Rev: 2-May-2016

Cost Category	AFE	Best Case	Worst Case
ROW Clearing 315 kV HVac Transmission Line (MF to CF)	31.6	30.8	49.3
Construction of 315 kV HVac Transmission Line (MF to CF)	277.0	268.3	283.0
TL Material Procurement and Management (HVac)	85.3	83.9	84.7
Churchill Falls Switchyard			
Muskrat Falls Switchyard			
Telecommunications (LTA)			
LCMC Project Delivery Team	146.6	132.9	135.1
General Costs	9.2	10.9	12.1
Integrated Commissioning Support Services	10.5	13.5	15.5
Total	859.7	840.8	898.5
Contingency	17.8		

Current AFE	877.6	877.6
--------------------	--------------	--------------

LIL Cost Model Input

Rev: 2-May-2016

Cost Category	AFE	Best Case	Worst Case
Converters - MF and Soldier's Pond			
Transition Compounds			
Synchronous Condensers			
Soldier's Pond Switchyard			
Electrode Sites			
Island System Upgrades	37.8	35.5	36.6
ROW Clearing for HVdc Transmission Line	360.0	490.4	530.4
Construction of 350 kV HVdc Transmission Line	840.2	861.1	899.9
TL Material Procurement and Management (HVdc)	261.2	319.9	327.9
SOBI Crossing	314.8	304.4	319.4
Telecommunications (LIL)			
LCMC Project Delivery Team	232.7	325.3	334.3
General Costs	68.4	74.6	83.3
Integrated Commissioning Support Services	3.5	10.3	18.5
Total	2993.5	3317.3	3468.0
Contingency	95.9		
Current AFE	3089.4	3089.4	

Note: Privileged and Confidential Information Prepared in Contemplation of Litigation

Labrador Transmission Assets Cost Review

Cost Category	APE Rev2 (C\$ MM)	A: Current Published Final Forecast Cost		B: Potential FFC Range based upon Identified Trends				C: Incremental Exposure beyond FFC due to identified Risks					TOTAL (APE+FC)		
		Value (C\$MM)	Basis	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID#	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
C.b - Construction of 315 kV HVac Transmission Line (MF to CF)	277.0	266.3	2 M transferred to C3 for CF camp services 2.2 M: Unspecified Growth Includes (7.1) M recoupment for the HVGB line	266.8	Includes (7.5) M recoupment for the HVGB line from Hydro 2.2 M saving on Growth not required 0.1 M Installation of second Stockbridge dampers at some towers 0.5 M TL240 options post impoundment 0.65 M Rock jack hammering/busting costs 1.2 M Structure 142 Line 1 required rework due to settlement 0.2 M Additional Quantity of Counterpoise Ground Rod Assemblies	277.0	No recoupment for the HVGB line from Hydro No growth saving 0.5 M Installation of second Stockbridge dampers at some towers 1 M TL240 options post impoundment 0.65 M Rock jack hammering/busting costs 1.2 M Structure 142 Line 1 required rework due to settlement 0.2 M Additional Quantity of Counterpoise Ground Rod Assemblies	OTLR036 OTLR051 DCSR005	1.5	\$0.75M deframent of stringing powerhouse interconnect (last tower to P1), plus slack spans on each of MF and CF switchyard. \$0.5M for TL240 and 25kV construction power rework	6.0	\$1.5M deframent of stringing of powerhouse interconnect, plus slack spans on each of MF and CF switchyard. \$1M for TL240 and 25kV construction power rework \$1M for unexpected claims \$2M for access establish post construction	OTLR036 (Interface management between C4 and other components) DCSR005 (Interfaces with C5)	268.3	283.0
C.e - Supply of Foundations and Steel Towers - 315 kV HVac	32.6	32.3	0.1 M general growth	33.7	0.1 M Tie-down anchors for Valard for 350 kv Hvac line 1.3 M Currency impact	33.7	0.1 M Tie-down anchors for Valard for 350 kv Hvac line 1.5 M Currency impact		0.5	Additional Spares and storage	1.0	Additional Spares and storage		34.2	34.7
C.d - Conductor, OPGW, Insulators and Other Hardware - 315 kV HVac	30.6	30.7	0.1 M general growth	30.8	0.1 M Additional hardware, second dampers at some towers	30.9	0.7 M Additional hardware, second dampers at some towers		0.1	Additional Spares and storage	0.5	Additional Spares and storage		31.1	31.4
D.i - Third Party Quality Surveillance & Inspection Services for TL Material	1.7	1.7	Existing budget	1.7		1.7			0.0		0.0			1.7	1.7
D.j - TL Materials Shipment and Marshalling Yard Operations	22.1	21.7	Existing budget	18.6	3.5 M saving on the inland transport 0.5 M Currency impact	18.6	3.5 M saving on the inland transport 0.5 M Currency impact		0.0		0.0			18.6	18.6
C.x - Spares	0.0	0.0	they were added in TL procurement	0.0		0.0			0.0		0.0			0.0	0.0
Total, C\$ MM	695.2	686.0		678.9		716.2			6.4		21.3			685.3	737.5
General - LTA															
D.b - Integrated Commissioning Support Services	10.5	10.5	DC3 values	10.5	No additional cost, commissioning cost is included in contracts	10.5	No additional cost, commissioning cost is included in contracts		0.0	\$3 M extra allowance	1.0	\$5M extra allowance		13.5	15.5
D.c - Project Vehicles	0.9	0.9	Revised budget at APE rev2	0.9		0.9			0.8	\$0.5M for schedule related delay - replacement vehicles required given age of fleet.	0.8	\$0.75M for schedule related delay - replacement vehicles required given age of fleet.		1.4	1.6
D.d - Helicopter Services	0.6	0.6		0.6		0.6			0.0		0.0			0.6	0.6
D.e - Insurance	1.4	1.4	Revised budget at APE rev2	1.7	0.3 M Increase of insurance cost due to the increase in the overall project budget; values were calculated by the Nalcor insurance team	1.7	0.3 M Increase of insurance cost due to the increase in the overall project budget; values were calculated by the Nalcor insurance team		0.0		0.0			1.7	1.7

Labrador Transmission Assets Cost Review

Cost Category	AFE Rev2 (C\$ MM)	A: Current Published Final Forecast Cost		B: Potential FFC Range based upon Identified Trends				C: Incremental Exposure beyond FFC due to Identified Risks					TOTAL (C\$-MM)		
		Value (C\$MM)	Basis	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event (ID#)	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes:	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
D.f - Financing and Commercial	2.5	2.5	0.75 M for GW legal - estimate	2.5		2.5			1.0	\$1M for legal fees to address potential claims	2.0	\$2M for legal fees to address potential claims		3.5	4.5
D.g - Owner's Project Team	146.6	146.8	latest budget w/ AFE rev2 (OK, possible saving as per latest MFL)	132.4	0.2 M Saving on the final cost of the air transport service 14.3 M saving aligned with the latest MFL revision 0.16 M Alignment with Finance reconciliation	132.8	14.3 M saving aligned with the latest MFL revision 0.16 M Alignment with Finance reconciliation	LCPR033 DTLR045	0.5	\$0.25M associated with time and resources to support Valard quality rework oversight on AC foundations \$0.25M for Marshalling Yard operation	2.5	\$0.5M associated with time and resources to support Valard quality rework oversight on AC foundations \$0.5M for additional Marshalling Yard operation \$0.5M for CIL/Co support \$3M for ZFTL for 18 months	LCPR033 (Poor contractor performance) DTLR045 (Systematic Construction quality problems) - could be covered by existing MFL FFC	132.9	155.1
D.h - Land Acquisition and Permits	1.1	1.1	Existing budget	1.1		1.1			0.0		0.0			1.1	1.1
D.k - Environmental	0.8	0.8	Existing budget	0.7	0.14 M Alignment with Finance reconciliation	0.7	0.14 M Alignment with Finance reconciliation		0.0		0.0			0.7	0.7
D.l - Aboriginal	0.2	0.2	Existing budget	0.2		0.2			0.0		0.0			0.2	0.2
Total (C\$ MM)	164.6	164.8		150.6		150.8		5.0		10.3				155.6	161.0
Contingency - LTA	17.8	26.8													
Total LTA (C\$ MM)	182.4	191.6		150.6		150.8		11.4		31.5				167.0	192.5

Labrador Island Transmission Link Cost Review

Cost Category	A: Current Published Final Forecast Cost			B: Potential FFC Range based upon Identified Trends			C: Incremental Exposure beyond FFC due to Identified Risks					TOTAL RISK			
	AFE Best (C\$ MM)	Value (C\$ MM)	Base	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
B.f - Island System Upgrades - Holyrood Conversion + Breakers + AC Rebuilds	37.8	37.8	33.2 M construction of the AC Bus on the Island - as per contract value and follow FFC after discussions with MR 16.7 M ECC upgrades, and services at Day Dispatch, Start of distribution lines - as per contract.	35.5	0.8 M Saving for Removal of one re-termination line from ICP scope 1.7 M Saving for Consolidating the burial of distribution lines	35.5	0.3 M Saving for Removal of one re-termination line from ICP scope 1.7 M Saving for Consolidating the burial of distribution lines		8.0		1.8	Scope growth		35.5	39.6
B.g - Clearing of Right of Way for HVdc Transmission Line	368.0	388.8	IFC includes 62 M for Valad Part B secured 244 M as per end of March 2016 (Notes 1615) high	408.4	2.2 M IPRR Total IPR for IPR's 20 M 40 M Block 17/18 10M reduction for Valad Part B due to cover-incurial 12 M Water road to all season road in Labrador (S1-2 to 232) 1.3 M Block 4,5,6 15.4 M Allowance for clearing and road maintenance	479.4	6.2 M IPRR Total FFC for IPR's 30 M 62 M Block 17/18 18 M Water road to all season road in Labrador (S1-2 to 232) 1.3 M Block 4,5,6 18 M Snow clearing and road maintenance	OTL001 OTL002 OTL003 OTL004 OTL005 OTL006 OTL007 OTL008 OTL009	32.0	OTL001: 5M extra for IPR. OTL002: 5M of extra work for re-route in Blocks 17 & 18 OTL003: Multi-pass - single season OTL004: 5M for removal and construction of water encroachment, 15 M for re-termination to S1-1 to 400. OTL005: Covered in FFC OTL006: 5M extra for spring break-up damage on existing roads OTL007: 5M extra for Valad for helicopter allowance confirmed in estimate 8 M allowance for Terra Nova Winter Zone	52.0	OTL002: 5M extra for IPR (second season) OTL003: 5M of extra work for re-route in Blocks 17 & 18 OTL004: 5M for removal and remediation of water encroachment, 5M for re-termination to S1-1 to 400. OTL005: Covered in FFC OTL006: 12 M extra for spring break-up damage on existing roads OTL007: 5M extra for Valad for helicopter allowance confirmed in estimate 8 M allowance for Terra Nova Winter Zone	OTL001 (Scope change) - Value part of the Internal FFC OTL002 (Construction permit delays) - Value part of the Internal FFC OTL003 (ROW multi-passes) - Value part of the Internal FFC OTL004 (IM Construction Duration) OTL005 (Temporary water crossing removal post construction) OTL006 (Water Part E management) - Value part of the Internal FFC OTL007 (Construction access cost exposure due to poor on-site geotech for blocks 15 - 18) OTL008 (Spring Break-up)	368.0	390.4
B.h - Construction of 350 KV HVdc Transmission Line	840.2	896.1	2 M labor cost escalation for 5 year 2.4 M for foundation cost increase due to design changes 1 M increase in backfill quantities	857.4	5 M Additional geotech - PCR 406 13.8 M Saving on Re-routing - PCR 404 1 M Backfill 15 M increase in Foundation Installation cost due to ECR on MW1,2,3 8.2 M Reduction of accommodation cost 3 M Allowance for fuel and labor escalation 3 M Change in transition type - other than the pilot 1 M Additional guy anchors	880.0	8 M Additional geotech - PCR 406 3 M Saving on Re-routing - PCR 404 1 M Backfill 15 M increase in Foundation Installation cost due to ECR on MW1,2,3 8.2 M Reduction of accommodation cost 3 M Allowance for fuel and labor escalation 5 M Additional guy anchors	OTL001 OTL002 OTL003 OTL004 OTL005 OTL006 OTL007 OTL008 OTL009	23.5	OTL001: 5M for extra pile and micropile foundations, but saving savings of 5M cost due to success with re-routing by affecting cost exposure from foundation ECR on MW1, 2 & 3 OTL002 and 3: the net savings any IDL, either use to increase Valad - Barcoo summer delivery by end of October 2017 OTL004: 50M allowance for re-anchoring work upon re-anchoring, plus 1M for other interface related items (e.g. Segment 5 CPGW availability) 5M for other miscellaneous items 5M additional concrete saving 5M additional re-locate savings We offset changes orders to equal 50% of IPR budgetary allowance of 5M.	49.0	OTL002: 5M for extra pile and micropile foundations, but saving savings of 5M cost due to success with re-routing by affecting cost exposure from foundation ECR on MW1, 2 & 3. OTL003: 5M OTL004: 5M OTL005: 5M OTL006 and 7: Mitigated Worst case of ECR scenario (S1-2020) - we recover 5M in IDL to offset off against seasonal fluctuations of any pilehead status. OTL008: 50M allowance for re-anchoring work upon re-anchoring, plus 1M for other interface related items (e.g. Segment 5 CPGW availability) 5M for other miscellaneous items 5M additional concrete saving 5M additional re-locate savings We offset changes orders to equal 50% of IPR budgetary allowance of 5M.	OTL001 (Shifting Geotechnical conditions and impact on Foundation installation) OTL002 (New's performance) - To be traded with IDL OTL003 (Integration - Impact on CA scope) OTL004 (IM Construction Duration) - Contractor's Responsibility OTL005 (Potential commercial issues from contractors) OTL006 (Poor contractor performance) - Delay impact on MW	840.2	894.0
B.j - Material Supply - 350 KV HVdc	224.8	224.8	0.0 of identified growth for additional materials	224.8	0.5 M Additional guy anchors 17.7 M Fuel impact	224.8	0.5 M Additional guy anchors 17.7 M Fuel impact	OTL009	8.8		5.0			224.8	233.6

Labrador Island Transmission Link Cost Review

Cost Category	AFE Rev2 (C\$ MM)	A: Current Published Final Forecast Cost		B: Potential FFC Range based upon identified trends				C: Incremental Exposure Beyond FFC due to identified Risks				TOTAL FFC			
		Value (C\$ MM)	Basis	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Risk Event ID	Best Cost (C\$ MM)	Scenario Supporting Best Cost	Worst Cost (C\$ MM)	Scenario Supporting Worst Cost	Notes	Best Cost (C\$ MM)	Worst Cost (C\$ MM)
D.l - Third Party Quality Surveillance & Inspection Services for TL Material	4.3	4.3	Revised budget at AFE rev2	4.3		4.3		DT0045	6.5	DT0045: 0.5 S	1.0	DT0045: 1.1	DT0045 (Systemic construction quality problems)	4.4	4.4
D.j - TL Materials Shipment and Marshalling Yard Operations	40.2	34.8	Revised budget at AFE rev2	32.2	0.25 M Reduction of custom brokerage 1 M Currency impact 5 M Island transportation 0.5 M Operation of Argenta Marshalling yard 0.4 M Fuel consumption at Labrador Marshalling yard	47.8	1.5 M Additional transport for increase quantities of material 0.5 M Island transportation 1 M Currency impact 1 M Operation of Argenta Marshalling yard 1 M Fuel consumption at Labrador Marshalling yard		3.8	Delay by Valard requires maintain Labrador MF an additional 6 months at \$400k per month, plus Argenta MF for 2 months at \$400k/month	4.8	Delay by Valard requires maintain Labrador MF an additional 6 months at \$400k per month, plus Argenta MF for 2 months at \$400k/month		47.8	47.8
B.m - SOBI Landfill / HDD Scope	72.5	67.1		65.1		67.1		LCPR02 LCPR03 MC1001 MC1002 MC1003 MC1004 MC1005 MC1006 MC1007 MC1008 MC1009 MC1010 MC1011 MC1012 MC1013 MC1014 MC1015 MC1016 MC1017	8.4		0.0		LCPR02 (3) Effective site face management and coordination LCPR03 (3) Poor contractor performance MC1001 (3) MMS unknown requirements MC1002 (3) Contractor (see interface) MC1003 (3) Overseeing project schedule changes MC1004 (3) Safety/Access interface MC1005 (3) Site access in winter MC1006 (3) Unpermitted conduct (conditions) MC1007 (3) Safety compliance (conditions) MC1008 (3) Poor weather conditions MC1009 (3) Safety management MC1010 (3) Safety compliance MC1011 (3) Safety compliance MC1012 (3) Safety compliance MC1013 (3) Safety compliance MC1014 (3) Safety compliance MC1015 (3) Safety compliance MC1016 (3) Safety compliance MC1017 (3) Safety compliance	65.1	87.2
B.n - SOBI Cable Supply & Install	154.9	154.7		150.7		154.7			0.0		0.0			150.7	154.7
B.o - SOBI Seabed Protection	67.4	72.5		68.2		72.5			0.0		0.0			68.2	72.5
B.k - Spares	0.8	0.0		0.0	0.0M spare added by the TL government contract	0.0			2.0	Additional critical spares required for start-up	3.0	Additional spares required for start-up		3.0	3.0
Total, C\$ MM	2,261.1	2,277.7		2,241.7		2,267.3			11.4		144.8			2,051.9	2,412.1
General - ILL															
D.b - Integrated Commissioning Support Services	4.1	3.3	Best value	3.5	No additional cost, commissioning cost is included in contracts	3.2	No additional cost, commissioning cost is included in contracts		4.8	3 FTE permit holder support required from NR for 1 year - \$1.5M Extended dynamic commissioning support - MTE for 18 months @ 400k per year - \$1.8M Allowance for various third party expertise to support RFO readiness \$2M \$2M allowance for additional commissioning staffing from other stations at LQVC	1.8	3 FTE permit holder support required from NR for 1 year - \$1.5M Extended dynamic commissioning support - MTE for 18 months @ 400k per year - \$1.8M Allowance for various third party expertise to support RFO readiness \$2M \$2M allowance for additional commissioning staffing from other stations at LQVC	DCR004 (Probability of Experienced construction personnel / Contractors at start)	3.3	3.3
D.c - Project Vehicles	5.9	5.1	Revised budget at AFE rev2	4.8	0.5 M saving on owned cost of vehicles based upon current journal cost	5.3			6.5	\$0.5M for schedule related delay - 20 replacement vehicles required given age of fleet	1.8	\$1M for schedule related delay - 20 replacement vehicles required given age of fleet		6.3	6.3
D.d - Helicopter Services	5.8	5.4	Revised budget at AFE rev2	5.5		4.5	3M allowance in the DC line construction, especially in the long range operations		9.0		4.0			5.4	5.4
D.e - Insurance	8.8	8.0	Revised budget at AFE rev2	10.1	0.22 M increase of insurance cost due to the increase in the overall project budget	10.8	1 M increase of insurance cost due to the increase in the overall project budget		8.0		0.0			10.1	10.8
D.f - Financing and Commercial	9.8	8.8	Revised budget at AFE rev2	6.8		7.0	1 M increase in legal costs to cover potential litigs in the island and Alaska contracts		3.0	\$1M extra labor relations cost provision for management support \$2M extra provisional allowance for legal support to resolve disputes and claims	4.8	\$1M extra labor relations cost provision for management support Provisional allowance of \$5M to address sensitive disputes with either of Valard or Alstom. In the case of the latter, it may be triggered by inability to hit operational performance targets		8.8	8.8
D.g - Owner's Project Team	432.7	388.3	Best budget at AFE rev2 (short by more than 60 M compared to actual MF)	312.8	0.1 M increase of the air transport service 10 M increase aligned with the latest MF revision 1.5 M saving Alignment with Finance reconciliation	312.8	0.1 M increase of the air transport service 50 M increase aligned with the latest MF revision 2 Missing Alignment with Finance reconciliation	DCR004 DCR020 LCPR003 LCPR007 LCPR046 MC10004 DTL0545	12.0	\$12 M extra allowance to cost schedule related delay scenario for 150 persons required for 8 months	38.0	\$20M extra allowance to cost schedule related delay scenario for 150 persons required for 8 months with an average reduced to \$1.5M per month	DCR010 (4) Schedule change causing delay in CQ commissioning - 4 to 6 Months LCPR003 (2nd project) Integrated - Part of DCR004 LCPR007 (2nd project) Integrated - Extra, NLN - Part of DCR004 LCPR046 (Managing contractor performance under T&M scheme) MC10004 (Delay to completion / commissioning hardware) DTL0545 (Systemic construction quality problems)	312.8	331.3
D.h - Land Acquisition and Permits	15.8	18.8	Revised budget at AFE rev2	15.6		15.6			0.0		0.0			15.6	18.8
D.k - Environmental	14.4	14.2	Revised budget at AFE rev2	17.8	1.3 M Alignment with Finance reconciliation	17.8	0.5 M Alignment with Finance reconciliation		3.1	\$0.5M for pollution support in 2016	0.0	\$5.5M for pollution support in 2016		18.3	18.3
D.l - Aboriginal	2.7	2.7	Revised budget at AFE rev2	1.1	0.5 saving on the LL section	1.7	1 saving on the LL section	DTL0014	0.4	DTL0014: 0.1 - risk done and waterfalls	1.0	DTL0014: \$1M cost for Force Majeure event	DTL0014 (Speculation by First Nations Groups)	1.0	2.7
Contingency - ILL	25.9	48.3		1.711		1.721			2.1		41.4			0	0
Total (C\$ MM)	2,316.8	2,366.0		2,243.4		2,289.0			13.5		186.2			2,056.9	2,475.2

ATTACHMENT A.22

LTA – LITL QUANTITATIVE COST AND SCHEDULE RISK ANALYSIS (Q1-2016)		
Nalcor Doc. No.	Revision	Page
LCP-PT-MD-0000-RI-RP-0001-01	B1	

Attachment A.22: LTA – LITL Cost Sensistivity Check

The attached Cost Model Input was conducted as a Sensistivity Check of the January – March Westney QRA



Results for the Updated LTA LITL Cost-Risk Analysis

Jack Evans

to:

JasonKean@lowerchurchillproject.ca

05/03/2016 04:58 PM

Cc:

"aidan.meade@mcinnescooper.com", "Keith Dodson", Justin Dahl

Hide Details

From: Jack Evans <j_evans@westney.com>

To: "JasonKean@lowerchurchillproject.ca" <JasonKean@lowerchurchillproject.ca>

Cc: "aidan.meade@mcinnescooper.com" <aidan.meade@mcinnescooper.com>, "Keith Dodson" <k_dodson@westney.com>, Justin Dahl <j_dahl@westney.com>

1 Attachment



LTA(v3) LITL(v5) Cost-Risk_03May2016.docx

Privileged and Confidential Information Prepared in Contemplation of Litigation

Jason,

Results for the updated LTA LITL Cost-Risk analysis are attached. Please let me know if you have any questions.

Thanks,

Jack

.....
Jack Evans
Westney Consulting Group
(281) 221-6488

