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Cc: [Bown, Charles](#); [Gilbert Bennett](#)
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Subject: Report feedback as requested
Date: Monday, June 22, 2015 11:34:32 AM
Attachments: [...png](#)
[Draft Report March 2015 r3 PH.docx](#)

Ed

Pls find attached my feedback to Craig on the draft- I have tried to help the Committee to avoid getting pulled into areas of commercial concern that I am sure they wish to prevent getting involved in - For instance It would not help our case with Astaldi if we flagged labour productivity as a major risk/issue in this report. That would just feed the Astaldi contention that is is all labour's fault.- which we know to be incorrect.

There is also a very pre mature statement on schedule that I have made some suggestions to modify.

As discussed this is a powerhouse and intake issue that we are dealing with actively and with all efforts- we know the risks and E & Y qre not adding value to that issue.

Regards Paul



Draft Report March 2015 r3 PH.docx

Paul Harrington

Project Director

PROJECT DELIVERY TEAM

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Introduction



Muskrat Falls Construction Site – Powerhouse and Spillway - August 2014

Commented [MC1]: Need Current picture of site from Nalcor



The Muskrat Falls Oversight Committee was established by the Government of Newfoundland and Labrador in March 2014 to strengthen the existing oversight of the Muskrat Falls Project (the Project). The Committee's mandate focuses on cost, schedule and risk management for the construction phase of the Project. Reports of the Committee can be located at <http://gov.nl.ca/mfoversight>.

The capital construction cost estimates for the Project are \$6.99 billion¹. At the end of March 2015 the incurred costs² to date were \$2.43 billion (exclusive of interest and other financing costs) and the committed costs³ totaled \$5.54 billion.

This report details the Committee's observations and summarizes the progress reported for the Project to the end of March 2015.

¹ Total Project costs include construction costs of \$6.99 billion plus interest and other financing costs of \$1.3 billion that will be incurred during construction, for an estimated total of \$8.29 billion.

² Incurred Costs: Represents the total estimated cumulative value of all goods and services provided to the Project up to the point in time regardless of whether it was paid during the current period or will be paid at some future point in time.

³ Committed Costs: The estimated value of an obligation made by the Project for the provision of goods or services; represented by a Financial Commitment. Committed costs are captured when a Financial Commitment is made and its value is based upon the original estimate for that Financial Commitment. A Financial Commitment is a legal agreement between Nalcor Energy – Lower Churchill Project (NE-LCP) and a third party which authorizes NE-LCP to proceed with the award/instruction to the third party to provide goods and/or services for an agreed price or in accordance with an agreed pricing structure. The value of the Financial Commitment is represented by the cumulative value of the original amount and any approved variation orders to the contracts or change orders to the purchase order (which may or may not be a Project scope change).

Project Performance

The Committee reports quarterly on the Muskrat Falls Project performance on both an overall Project basis and for each of the following three sub-projects:

- Muskrat Falls Generating Facility;
- Labrador-Island Transmission Link; and,
- Labrador Transmission Assets.

The Project cost and schedule performance is reported in two ways:

1. Long-term costs and schedule (to Project completion)
 - a. Project budget is compared to Project forecast cost
 - b. Project milestone schedule is monitored for change
2. Current costs and schedule (cumulative to date)
 - a. Incurred costs to date are compared to planned costs
 - b. Actual schedule progress is compared to planned schedule progress

These two time horizons provide the reader with both the projected long-term performance and the current performance for the overall Project and for each of the sub-projects based on the Project plans and schedule.

Long Committee Observations at March 2015

- Project capital budget of \$6.99 billion remains unchanged
- No significant variances between Project Budget and Project Forecast Cost
- Available Contingency budget at March 2015 is \$213.2 million
- Two major contracts have not been awarded. The impact of these contract awards on the Contingency budget will be determined once awarded remain uncertain
- Schedule pressures are being experienced
 - Critical path to first power remains for December 2017, however, risk levels for Critical Path have increased in some areas risen from Medium to High
 - No changes to the forecast Milestone Dates or planned Milestone Schedule in the current quarter, however significant schedule slippage has been experienced on the Powerhouse and Intake
 - Significant ppProduction improvements will be required and maintained at the Muskrat Falls Generating Facility in order to maintain the critical path and Milestone Schedule for the Powerhouse and Intakes
 - Mitigation actions continue to be implemented to address the schedule issues at the Generating Facility. Significant improvement in concrete placement volumes has been reported by Nalcor most recently has been reported for May 2015

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Long-term Costs

The total Project construction budget of \$6.99 billion is allocated among the three sub-projects as illustrated in Table 1 below. Total incurred costs to the end of March 2015 are \$2.427 billion or 34.7 per cent of the total budget.

Table 1
Budget and Incurred Costs by Sub-Project (in \$ thousands)

| Muskrat Falls Project: Sub-Project | Percentage of Total Project Budget | Project Capital Budget at June 2014 | Incurred Costs as of March 2015 | Percentage of Budget Incurred |
|------------------------------------|------------------------------------|-------------------------------------|---------------------------------|-------------------------------|
| Muskrat Falls Generating Facility | 48.2% | \$3,371,988 | \$1,376,989 | 40.8% |
| Labrador-Island Transmission Link | 39.9% | \$2,786,481 | \$692,360 | 24.8% |
| Labrador Transmission Assets | 11.9% | \$831,945 | \$358,026 | 43.0% |
| Total | 100.0% | \$6,990,414 | \$2,427,375 | 34.7% |

Table 2 shows the Project incurred costs to the end of March 2015 by expenditure category for each of the sub-projects. This table also includes the Project Capital Budget, as approved by the Nalcor Energy Board of Directors in June 2014, compared to the Project

Forecast Cost, which is the Project cost based on current incurred costs and schedule performance. The Overall Project Forecast Cost at March 2015 remains at \$6.99 billion, consistent with the Project Capital Budget approved in June 2014.

Table 2
Summary of Project Budget vs. Project Forecast Cost (in \$ thousands)

| Muskrat Falls Generating Facility | Project Budget at June 2014 | Incurred Costs at March 2015 | Project Forecast Cost March 2015 | Variance PFC from Budget |
|---|------------------------------------|-------------------------------------|---|---------------------------------|
| <i>Expenditure Category</i> | <i>A</i> | <i>B</i> | <i>C</i> | <i>D=A-C</i> |
| NE-LCP Owners Team, Admin and EPCM Services | \$382,811 | \$261,743 | \$387,723 | (\$4,912) |
| Feasibility Engineering | \$17,949 | \$17,949 | \$17,949 | \$0 |
| Environmental & Regulatory Compliance | \$24,312 | \$18,092 | \$24,742 | (\$430) |
| Aboriginal Affairs | \$13,314 | \$6,241 | \$13,314 | \$0 |
| Procurement & Construction | \$2,786,766 | \$1,058,288 | \$2,799,242 | (\$12,476) |
| Commercial & Legal | \$25,989 | \$14,696 | \$25,239 | \$750 |
| Contingency | \$120,847 | \$0 | \$103,780 | \$17,067 |
| Total for Sub-project | \$3,371,988 | \$1,376,989 | \$3,371,989 | \$0 |
| Labrador-Island Transmission Link | Project Budget at June 2014 | Incurred Costs at March 2015 | Project Forecast Cost March 2015 | Variance PFC from Budget |
| <i>Expenditure Category</i> | <i>A</i> | <i>B</i> | <i>C</i> | <i>D=A-C</i> |
| NE-LCP Owners Team, Admin and EPCM Services | \$225,814 | \$118,491 | \$221,239 | \$4,575 |
| Feasibility Engineering | \$21,252 | \$21,252 | \$21,252 | \$0 |
| Environmental & Regulatory Compliance | \$22,306 | \$8,925 | \$18,306 | \$4,000 |
| Aboriginal Affairs | \$2,244 | \$451 | \$2,244 | \$0 |
| Procurement & Construction | \$2,426,095 | \$530,477 | \$2,428,352 | (\$2,257) |
| Commercial & Legal | \$16,490 | \$12,764 | \$16,490 | \$0 |
| Contingency | \$72,280 | \$0 | \$78,597 | (\$6,317) |
| Total for Sub-project | \$2,786,481 | \$692,360 | \$2,786,480 | \$0 |
| Labrador Transmission Assets | Project Budget at June 2014 | Incurred Costs at March 2015 | Project Forecast Cost March 2015 | Variance PFC from Budget |
| <i>Expenditure Category</i> | <i>A</i> | <i>B</i> | <i>C</i> | <i>D=A-C</i> |
| NE-LCP Owners Team, Admin and EPCM Services | \$99,973 | \$75,560 | \$99,951 | \$22 |
| Feasibility Engineering | \$220 | \$220 | \$220 | \$0 |
| Environmental & Regulatory Compliance | \$710 | \$977 | \$1,019 | (\$309) |
| Aboriginal Affairs | \$188 | \$0 | \$188 | \$0 |
| Procurement & Construction | \$696,322 | \$279,058 | \$696,601 | (\$279) |
| Commercial & Legal | \$3,141 | \$2,211 | \$3,141 | \$0 |
| Contingency | \$31,391 | \$0 | \$30,824 | \$567 |
| Total for Sub-project | \$831,945 | \$358,026 | \$831,944 | \$0 |
| Total Project | \$6,990,414 | \$2,143,230 | \$6,990,414 | \$0 |

While the overall Project Budget remains unchanged, variances between the Project Budget and the Project Forecast Costs have occurred within and among the expenditure categories (refer to Appendix A for a description of these categories). Most variances reported by Nalcor between the Project Budget and the Project Forecast Costs at the end of March 2015 related to the transfer of budget allocations between the Contingency budget and the Procurement & Construction and the Environmental and Regulatory Compliance budget as additional budget allocations were required or permanent savings were identified. The reasons for these are discussed below.

The unallocated Contingency budget remaining available for the Muskrat Falls Project at March 2015 is \$213.2 million, an increase of \$13.3 million in available Contingency from the \$199.9 million available at the quarter ended December 2014. Table 3 below outlines the changes in Contingency by sub-project.

Table 3
Summary of Change in Project Forecast Contingency (in \$ thousands)

| Contingency | Project Forecast at Dec 2014 | Project Forecast at March 2015 | Variance |
|-----------------------------------|------------------------------|--------------------------------|-----------------|
| <i>Sub-Project</i> | <i>A</i> | <i>B</i> | <i>B-A</i> |
| Muskrat Falls Generating Facility | \$101,176 | \$103,780 | \$2,604 |
| Labrador-Island Transmission Link | \$65,332 | \$78,597 | \$13,265 |
| Labrador Transmission Asset | \$33,421 | \$30,824 | (\$2,597) |
| Total | \$199,929 | \$213,201 | \$13,272 |

Contingency Changes:

The reasons for the changes to the Contingency budget and the net increase of \$13.3 million in total available Contingency budget for the current quarter were reported as follows:

For the Muskrat Falls Generating Facility, the primary reasons for the increase in the available Contingency budget were:

1. actual costs for surveys included under “Environmental and Regulatory Compliance” were less than originally budgeted, and
2. there was a net reduction in costs included under the category “Procurement and Construction” due to
 - a reduction in air transportation services to exclude Astaldi personnel who were captured under contract CH0007,
 - an increase in costs for security and medical services in relation to construction of the North Spur,

- an increase in costs for site office supplies and geotechnical field investigation work for the North Spur and
- an increase for labour rate adjustments relating to the supply and installation of the Turbine and Generators.

The net effect was an increase in the available Contingency budget within the Muskrat Falls Generating Facility sub-project of \$2.6 million.

Commented [PH2]: The Labour Agreements were not in place when the Contract with Andritz was awarded. A Change Request was submitted by Andritz to reflect the cost increases resulting from the final labour rates in the Labour Agreement

Commented [MC3]: Question out to Nalcor as to what is the labour rate adjustment

For the Labrador-Island Transmission Link, the primary reasons for the increase in the available Contingency budget were as a result of a net reduction in costs budgeted under “Procurement and Construction” resulting from:

- a reduction in forecast costs for the AC substations;
- a decrease in the final quantities required for the horizontal directional drilling program for the Strait of Belle Isle;
- a decrease in the costs for the supply and install of the Electrode Sites due to substantive design optimization;
- an increase due to changes in foundation types and additional material required for the HVdc transmission line due to soil conditions; and
- reallocation adjustments from the LITL to the LTA in relation to the power transformers and AC substations.

Commented [MC4]: Waiting on confirmation from Nalcor

The net effect of was an increase in the available Contingency budget within the Labrador-Island Transmission Link sub-project of \$13.3 million.

For the Labrador Transmission Assets, the primary reasons for the drawdown of available Contingency were as follows:

1. Actual costs for avifauna management budgeted under “Environmental and Regulatory Compliance” were higher than originally budgeted due to resequencing of transmission line effort to concentrate on the LTA as opposed to the LITL and the associated time of year of this effort; and
2. A net increase in forecast costs budgeted under “Procurement and Construction” due to:
 - additional foundations and mechanical rock anchors for the HVac transmission line as well as additional material cost associated with the 735 kv line;
 - the requirement for additional personnel for Camp Services at Churchill Falls; and

- reallocation adjustments from the LITL to the LTA in relation to the power transformers and AC substations.

The net effect was a decrease in the available Contingency budget within the Labrador Transmission Asset sub-project of \$2.6 million.

Long-term Schedule

There have been no changes reported for the planned Milestone Schedule or the forecast Milestone Dates since the December 2014 Committee Report. Table 4 summarizes these Milestone Dates, with first power from Muskrat Falls still forecast for December 2017 and full power from Muskrat Falls forecast for May 2018.

The Committee has observed that the schedule performance measures for the Muskrat Falls Generating Facility continue to show schedule slippage for the facility, primarily with respect to progress on the Powerhouse ~~& Spillway and Intake~~. ~~Nalcor have advised that Spillway progress whilst behind the original contract schedule is on target to achieve River Diversion in 2016.~~—Comments from the Independent Engineer indicate that concrete placement ~~shows a slight increase over the previous month~~ progress is tracking behind plan. The Committee has noted significant growth in the gap being tracked by the Independent Engineer between actual concrete placement and planned concrete placement this last quarter. ~~The Committee has also noted that the Risk Log indicates that risks associated with the River Diversion for 2016 and the Powerhouse Concrete placement have increased from Medium to High during this quarter.~~

Commented [PH5]: Suggest rewording this it is misleading and requires some further explanation

~~Nalcor continuously monitors project risks and establishes risk levels and risk trends. the Committee has noted that Nalcor have increased the risk level from Medium Risk to High Risk for River Diversion and Powerhouse Concrete placement with the risk trend for River Diversion indicating “No Change” in Risk whilst the Powerhouse Concrete placement showing an “Upward Trend” in Powerhouse Concrete placement. This reflects the increased management attention being placed by Nalcor on the Contractors performance in this area.~~

Nalcor and the civil contractor for the Muskrat Falls Generating Facility continue to actively undertake mitigation measures to implement production improvements to address this schedule progress slippage at the Muskrat Falls site. The IE notes in the Draw Certificate dated April 28, 2015 for the month ended March 2015 that:

Commented [PH6]: This is incorrect the IE Draw Certificate issued in March is for the Month of March. The actual IE quote for the March Draw Certificate is shown below

~~[Nalcor] advised that [the civil contractor for the Muskrat Falls Generating Facility] have prepared a 120 day recovery plan to ramp up labor and production and get back on track. The number of pours is planned to double month over month March to May inclusive. This is supported by the~~

current period performance where the actual concrete placement more than doubles the planned progress for the same period.

Contractor has implemented organizational changes at the construction management level, with plans to improve production in development since re-start of 2015 operations

However, for the month ended April 2015, the IE notes the plan to double concrete pour rate month over month was not achieved as the actual concrete pours are only 35 percent more than the concrete pours in the last period.

Commented [PH7]: This is not in the March IE Draw certificate so should be removed

-[NTD: Confirm with IE that we can use quote]

Information reviewed by the Committee indicates that significant schedule productivity improvements are projected by the Muskrat Falls Civil Contractor Nalcor for the May through July 2015 period, Nalcor continues to monitor the concrete placement rates reported by the contractor. For the month ended May 2015, Nalcor has most recently advised the Committee that concrete pours have substantively increased, exceeding the planned targets of the latest 120 day plan.

The Committee notes that achieving these schedule productivity improvements and maintaining those productivity levels will be critical to maintaining the Critical Path and forecasted dates in the Milestone Schedule, especially for the Powerhouse and Intakes.

Table 4
Milestone Schedule

| Muskrat Falls Generating Facility | Planned Date September 2014 | Actual/Forecast December 2014 | Status |
|--|--|--|---------------|
| Project Sanction | December 2012 | December 2012 | Complete |
| North Spur Works Ready for Diversion | September 2016 | September 2016 | No change |
| River Diversion Complete | November 2016 | November 2016 | No change |
| Reservoir Impoundment Complete | November 2017 | November 2017 | No change |
| Powerhouse Unit 1 Commissioned - Ready for Operation | December 2017 | December 2017 | No change |
| First Power from Muskrat Falls | December 2017 | December 2017 | No change |
| Powerhouse Unit 2 Commissioned - Ready for Operation | February 2018 | February 2018 | No change |
| Powerhouse Unit 3 Commissioned - Ready for Operation | April 2018 | April 2018 | No change |
| Powerhouse Unit 4 Commissioned - Ready for Operation | May 2018 | May 2018 | No change |
| Full Power from Muskrat Falls | May 2018 | May 2018 | No change |
| Commissioning Complete - Commissioning Certificate Issued | June 2018 | June 2018 | No change |
| Labrador-Island Transmission Link | Planned Date September 2014 | Actual/Forecast December 2014 | Status |
| Project Sanction | December 2012 | December 2012 | Complete |
| SOBI Cable Systems Ready | October 2016 | October 2016 | No change |
| MF Switchyard and Converter Station Ready for Operation | February 2017 | February 2017 | No change |
| HVdc Transmission Line Construction Complete and Connected | June 2017 | June 2017 | No change |
| Soldier's Pond Switchyard & Converter Stn. Ready for Operation | October 2017 | October 2017 | No change |
| Ready for Power Transmission | October 2017 | October 2017 | No change |
| Soldier's Pond Synchronous Condenser Ready for Operation | November 2017 | November 2017 | No change |
| Commissioning Complete - Commissioning Certificate Issued | June 2018 | June 2018 | No change |
| Labrador Transmission Assets | Planned Date September 2014 | Actual/Forecast December 2014 | Status |
| Project Sanction | December 2012 | December 2012 | Complete |
| Hvac Transmission Line Construction Complete | June 2016 | June 2016 | No change |
| Churchill Falls Switchyard Ready to Energize | May 2017 | May 2017 | No change |
| Muskrat Falls Switchyard Ready to Energize | May 2017 | May 2017 | No change |
| Ready for Power Transmission | May 2017 | May 2017 | No change |
| Commissioning Complete - Commissioning Certificate Issued | June 2018 | June 2018 | No change |

Committee Observations

- Incurred costs: \$2.427 billion. Planned costs: \$2.584 billion. Variance of \$156.7 million, or 2.2 per cent
- Actual construction progress 25.2 per cent. Planned progress 31.4 per cent. Variance of 6.2 per cent
 - Progress on the Muskrat Falls Generating Facility continues to track slower than planned. [Significant schedule slippage relating to the Powerhouse and Intake has been noted.](#) Mitigation actions continue to be implemented to address this slippage
 - Progress on the Labrador-Island Transmission Link is tracking slightly behind plan
 - Progress on the Labrador Transmission Assets is tracking slightly behind plan
- Actual progress for the supply and installation of the Turbine Generators and the Powerhouse Hydro-Mechanical Equipment track behind plan but remain on track to meet the planned delivery date

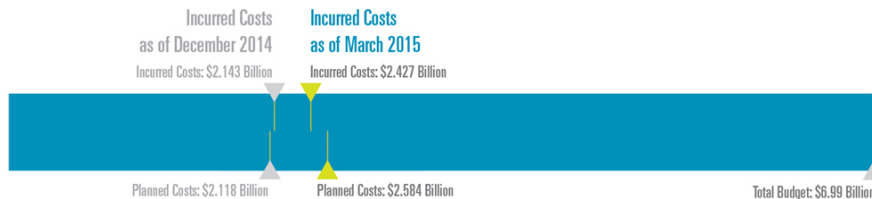
Muskrat Falls Project

This section provides an overview of the current costs and schedule, first on an overall Project basis, and then by each of the sub-projects.

Current Cost

Cumulative to the end of March 2015, the incurred costs for the Muskrat Falls Project totaled \$2.427 billion as compared to the planned costs of \$2.584 billion, a variance of \$156.7 million or 2.2 per cent lower than planned [December 2014 Report was 1.2 per cent higher than planned].

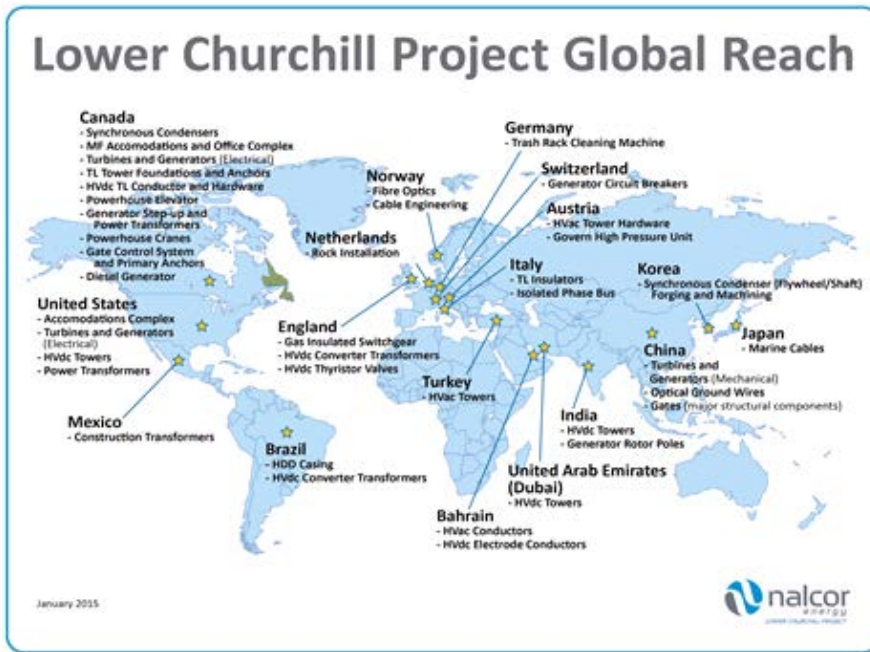
Figure 1
Muskrat Falls Project - Incurred Costs at March 2015
(including December 2014 comparison)



Current Schedule

Nalcor monitors and reports schedule progress on all activities, both construction and manufacturing. Construction activities include all those activities occurring at site locations in the province. Manufacturing activities include those supply/install contracts that take

place outside the Province (e.g. the generators are being manufactured in China). [See attached graphic for details](#)

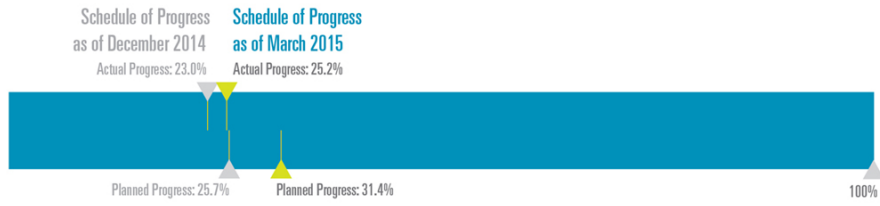


Construction activities are mainly monitored and reported on an ongoing installation/construction progress basis, while Manufacturing activities are generally monitored and reported based on a Milestone and/or delivery date basis.

1. Construction Activities

Construction has continued to advance on the Muskrat Falls Project during this past quarter. As outlined in Figure 2 and detailed in Table 5, overall Project schedule progress is 25.2 per cent as compared to a planned schedule progress of 31.4 per cent, a variance of 6.2 per cent lower than planned [December 2014 Report variance was -2.7 per cent]. This progress variance continues to relate primarily to the Muskrat Falls Generating Facility which continues to track behind schedule.

Figure 2
Muskrat Falls Project – Schedule of Progress at March 2015
(including December 2014 comparison)



This schedule progress is distributed amongst the three sub-projects as follows:

Table 5
Planned Construction Schedule Progress vs. Actual Schedule Progress – December 2014

| Muskrat Falls Project: Sub-Project | Planned Schedule Progress – March 2015 | Actual Schedule Progress – March 2015 | Variance – March 2015 | Variance - December 2014 |
|------------------------------------|--|---------------------------------------|-----------------------|--------------------------|
| Muskrat Falls Generating Facility | 38.0% | 26.3% | -11.7% | -5.7% |
| Labrador-Island Transmission Link | 21.9% | 20.5% | -1.4% | -0.2% |
| Labrador Transmission Assets | 39.4% | 38.4% | -1.0% | 1.0% |
| Total | 31.4% | 25.2% | -6.2% | -2.7% |

2. Manufacturing Activities

The six material manufacturing supply and install contracts awarded to date are as follows:

- the Turbines and Generators;
- the Powerhouse Hydro-Mechanical Equipment;
- the HVdc Convertors and Transition Compounds;
- the Submarine Cable for the Strait of Belle Isle crossing;
- the AC substations; and,
- the Synchronous Condensers for the Soldiers Pond Switchyard

A summary of progress on these manufacturing activities is outlined below:

The **Turbine and Generators** contract continues to track behind the original contract schedule based on the Contractor report. The contractor reports the Project progress at 30.68% complete as compared to a planned progress of 40.97%. Nalcor advises that this is within the contract schedule variance tolerances and the equipment remains on track to meet the planned delivery dates. The Independent Engineer continues to note in its Draw Certificate dated April 28, 2015 that:

there is considerable float between the site need date in the Integrated Project Schedule and the CH0030 contract schedule, which was put in place long before the CH0007 Contract schedule and that there is currently no cause for concern, however the Project team are monitoring manufacturing delivery dates to ensure that the site need dates are not compromised.

Commented [PH8]: The Draw certificate issued in March covers the March period –the comment is the same in any case

[NTD: Confirm with IE that we can continue to quote]

The contractor's report for the **Powerhouse Hydro-Mechanical Equipment** for the month of March 2015 states the project progress is at 13.38% complete as compared to a planned progress of 22.71%. Nalcor advises that this is within the contract schedule variance tolerances and the equipment remains on track to meet the planned delivery dates.

Commented [PH9]:

The contractor's report for the **HVdc Convertors and Transition Compounds** for the month of March 2015 reports that the cumulative progress is 10.1% complete as compared to a planned progress of 13.8%. Nalcor advises that this is within the contract schedule variance tolerances and the equipment remains on track to meet the planned delivery dates.

Commented [MC10]: Report was previously outstanding. Now received and tracking behind schedule. Nalcor has advised it remains on Track. IE has not yet commented as report was only recently posted to dataroom.

For the quarter ended March 2015, the **Submarine Cable for the Strait of Belle Isle** crossing continues to track on schedule with a cumulative progress of 43.09% complete as compared to a planned progress of 43.23%.

The reports issued by the contractors for the recently awarded contracts for the **AC substations and the Synchronous Condensers** state that they are currently working with Nalcor to develop the initial baseline schedule. Nalcor advises that once developed and approved, the Contractors will begin reporting progress against these baselines. Nalcor further advises that the work under these contracts is currently progressing as planned.

[NTD: Awaiting March report].

Commented [MC11]: These reports remains unavailable for the month of March as they have not been accepted by Nalcor and have been returned to the Contractors with their comments. Need to determine how we want to comment in current Report

Sub-Project: Muskrat Falls Generating Facility

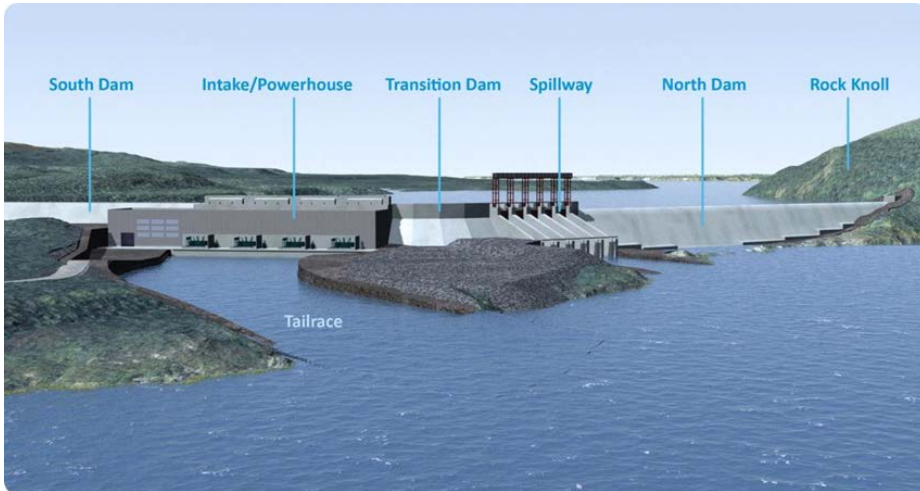
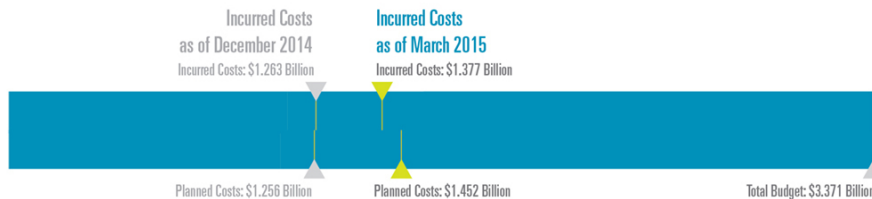


Figure showing the Muskrat Falls Generating Facility

Current Cost

The generating facility comprises 48.2 per cent of the total Project Budget. As of the end of March 2015, the incurred costs for the generating facility totaled \$1.377 billion as compared to the planned costs of \$1.452 billion, which was \$75.1 million or 5.2 per cent lower than planned [December 2014 Report variance was 0.6 per cent higher than planned].

Figure 3
Muskrat Falls Generating Facility - Incurred Costs at March 2015
(including December 2014 comparison)



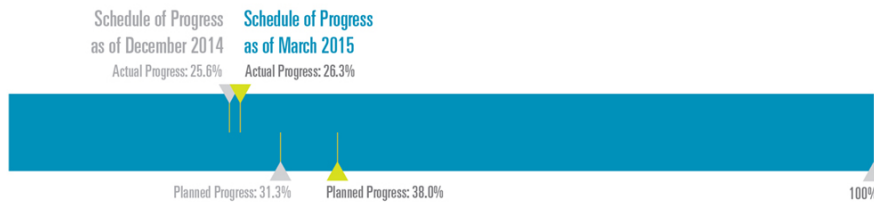
The Committee noted that the costs are lower than planned and queried Nalcor as to what were the main drivers for this cost variance. Nalcor advised that following its layoffs at the end of December 2014, the civil contractor only began recalling labour early in the first

quarter of 2015. This slow recall was a deliberate and measured process to allow progress enhancement planning to be completed. With the slower ramp up of workers early in the year, this contributed to the incurred costs associated with the Intake, Powerhouse, Spillway, and Transition Dams to be less than planned for the first quarter of 2015.

Current Schedule

As of the end of March 2015, the actual construction progress for the generating facility was 26.3 per cent complete as compared to a planned progress of 38.0 per cent complete, a variance of 11.7 per cent behind the planned schedule [December 2014 Report variance 5.7 per cent behind the planned schedule].

Figure 4
Muskrat Falls Generating Facility – Schedule of Progress at March 2015
(including December 2014 comparison)



The variance between actual progress and planned progress has grown since the previous quarter [-5.7 per cent in December 2014 to -11.7 per cent in March 2015]. This schedule variance is mainly attributable to three activities within the generating facility sub-project:

- o the North Spur Stabilization;
- o the Spillway & Gates; and,
- o the Powerhouse & Intake.

The progress status of each of these activities is summarized in Table 6 below as follows:

Table 6
March 2015 - Construction Activity for the Muskrat Falls Generating Facility
- Planned Progress vs. Actual Progress

| Construction Activity | March 2015 Cumulative % | | | December 2014 Variance |
|--------------------------|-------------------------|--------|----------|------------------------|
| | Planned | Actual | Variance | |
| Activity | A | B | B - A | C |
| North Spur Stabilization | 21.4% | 0.2% | -21.2% | -12.2% |

Commented [PH12]: Need to add a footnote that the N Spur schedule will be revised in the next re-baseline

| | | | | |
|---------------------|-------|-------|--------|-------|
| Spillway & Gates | 40.3% | 31.3% | -9.0% | -3.6% |
| Powerhouse & Intake | 28.2% | 9.9% | -18.3% | -9.9% |

The Committee questioned Nalcor as to 1) why has schedule progress continued to slip for these activities; 2) what impact does this schedule slippage have on the overall project schedule and delivery dates; and 3) how does Nalcor plan to recover this schedule slippage;

1) Why has schedule progress continued to slip for these three activities?

With respect to the North Spur Stabilization Works, Nalcor advised that the slippage recorded in the current schedule is not reflective of the revised plan for this work activity. As reported in the September 2014 Oversight Committee report, the planned date for the North Spur Works Ready for Diversion Milestone was been revised from November 2015 to September 2016. Nalcor advises that the progress will continue to track behind current plan for this scope of work until a new baseline of the work schedule is set based on this revised execution strategy and that there is no change in the completion date for this scope.

With respect to the Spillway & Gates Nalcor advised that

The changes to the Contractors Construction management organization had not taken full effect for the reporting period. This coupled with the Contractor's decision to demobilize the workforce prior to the Christmas break and slowly build up the workforce as the winter effect on production is eased has resulted in further schedule slippage against the original contractor's schedule. However despite this the Contractor is projecting that the Spillway concrete work will be significantly complete in 2015.

With respect to the Powerhouse and Intake, Nalcor advised that:

Commented [MC13]: Awaiting revised response on this from Nalcor. Highlighted section reflects original response.

The Powerhouse and Intakes are showing a continued progress slippage against the original Contractor's schedule. The changes to the Contractor's Construction management organization had not taken full effect for the reporting period. This coupled with the Contractor's decision to demobilize the workforce prior to the Christmas break and slowly build up the workforce as the winter effect on production is eased has resulted in further schedule slippage against the original contractor's schedule. The Civil Contractor is projecting a steady increase in concrete placement month over month as the weather improves. There is slower than planned progress for concrete production for the Spillway & Gates, and the Powerhouse & Intake. However, restorative measures put in place to regain concrete production are taking effect. Progress, while behind the original plan, has met the contractor adjusted forecast for the last two months of this quarter. Nalcor are continuing to work closely with the Contractor in order to ensure a plan is developed and implemented to minimize future slippage going forward.

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2) There has been no change in the reported Critical Path and Milestone Dates. Does this schedule slippage jeopardize the Critical Path and Milestone dates?

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Nalcor advised that "The project schedule overall is showing a 6.2% variance between the Planned and Actual percentage complete, with the Muskrat Falls Generation component showing an 11.7% variance between Planned progress and Actual progress. The Powerhouse and Spillway has the Contractor's full attention and Nalcor are actively managing the Contractor within the bounds of the Contract and providing support to the Contractor to improve production, overall productivity and organizational enhancements. It should be noted that whilst there is a variance between the Planned and Actual progress the progress is following the current forecast curves. There are ways to mitigate these variances by adjusting the sequence of activities, increasing the workforce, increasing the number of work-fronts available and streamlining support functions such as procurement, planning and adding equipment such as cranes, facilities and heavy equipment. The Contractor is responsible to take such actions as necessary to fulfill the obligations in the Contract and is doing so. Nalcor is working with the Contractor to take these mitigating steps in order to make the improvements in concrete placement. Nalcor requires these improvements to be substantive and sustainable, in order to determine the overall effect (if any) on subsequent Milestones. The Contractor's actual performance and concrete placement rates over the summer months will be essential to determine if the current schedule slippage impacts Project Milestones. In accordance with standard schedule management practices, Nalcor is carefully assessing the forecasted production outlooks being provided by the Contractor for CH0007 so as to confirm the critical path and milestone dates remain valid (e.g., adequate float remains available within the schedule to accommodate critical path and maintain milestone dates)."

3) What is the ~~recovery~~ plan to ~~deal/mediate~~with this schedule slippage?

Commented [PH15]: Please do not use the word "Recovery" it has adverse commercial interpretations that could compromise our Contractual position with the Contractor in case of a Claim

Nalcor advised as follows that they "continued to work with the Contractor throughout the 1st quarter of 2015 and well in to the 2nd quarter. The recovery plans, and mitigating measures remain as

outlined in the Oversight Committee Report — Period Ending December 2014 and are being monitored by Nalcor. The responsibility to deal with Contractor performance rests solely with the Contractor, however Nalcor are working with the Contractor and supporting the Contractor in all matters that can contribute to increased production, concrete placement, organizational effectiveness, productivity enhancements acting within the bounds of the Contract that is in place with the Contractor. The Contractor has taken the following actions :

- Safety improvement initiatives to reduce near miss rates - including training on lifting and rigging activities to improve safety
- Contractor Project Management organizational changes of personnel and effectiveness
- Contractor Construction Management organizational changes and improvements
- Additional tower cranes, equipment and facilities to support construction
- Increased work fronts in the powerhouse and intakes
- Increased labour and increased trades
- Improved indirect to direct labour ratios
- Initiatives to improve overall site productivity
- Improved sub contractor management

These actions combined with the improving weather conditions are designed to increase production rates and concrete placement rates that the Contractor is projecting for the coming months.

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Progress on the Spillway at the Muskrat Falls Site – December 19, 2014



Progress on the Spillway, June 5, 2015

Sub-Project: Labrador-Island Transmission Link

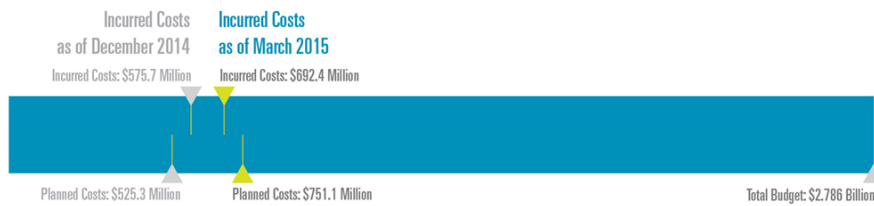


Figure showing the route for the Labrador-Island Transmission Link by Segment

Current Cost

The Labrador-Island Transmission Link comprises 39.9 per cent of the total Project Budget. As of the end of March 2015, the incurred costs for the Labrador-Island Transmission Link totaled \$692.4 million as compared to the planned costs of \$751.1 million, which was \$58.7 million or 7.8 per cent lower than planned [December 2014 Report variance was 9.6 per cent higher than planned].

Figure 5
Labrador-Island Transmission Link - Incurred Costs at March 2015
(including December 2014 comparison)



Nalcor advise that this variance has been driven by the Contractor’s decision to slowly ramp-up production on the HVdc line, while adopting more aggressive advancement of the HVac transmission line between Muskrat Falls and Churchill Falls. This was undertaken because:

- the Contractor determined that they could achieve better overall production by concentrating on one line at a time.
- material fabrication (tower steel from three factories around the world) has been slower than expected; and
- the deliberate decision to allow the right-of-way clearing and access development advancement along the HVdc route in the interior of Labrador to progress further in advance of the installation process.

Combined, these have been largely responsible for lower incurred costs on the LITL.

Current Schedule

As of March 2015, the actual construction progress for the Labrador-Island Transmission Link was 20.5 per cent as compared to a planned progress of 21.9 per cent complete, a variance of 1.4 per cent behind planned schedule [December 2014 Report variance was 0.2 per cent behind planned schedule].

Figure 6
Labrador-Island Transmission Link – Schedule of Progress at March 2015
(including December 2014 comparison)



Nalcor advised that there was some slippage in schedule performance due to mainly due to winter conditions being harsher than normal as outlined in the Risk section of this report. They anticipate recovery once conditions improve.

Sub-Project: Labrador Transmission Assets

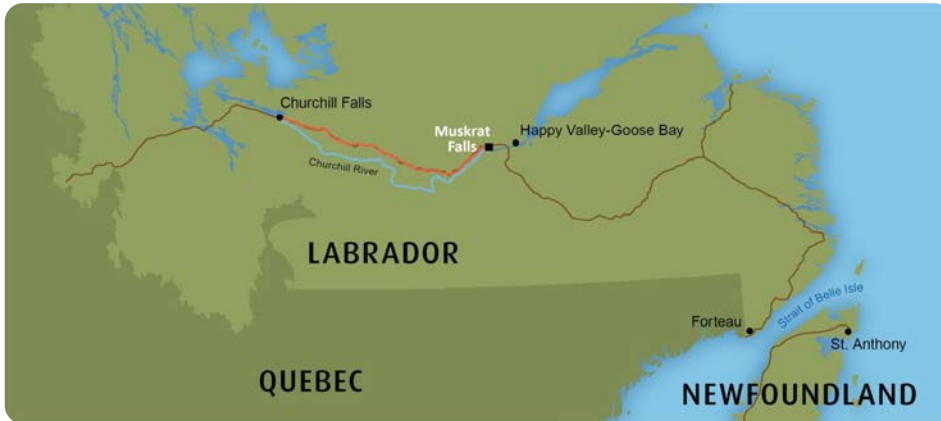
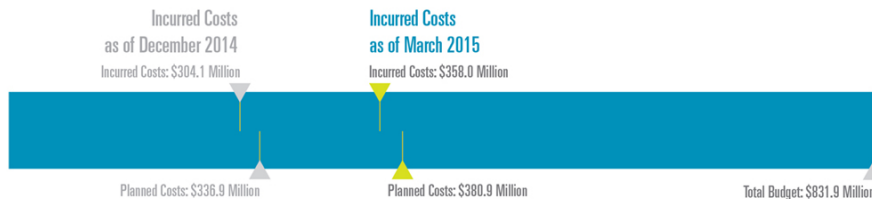


Figure showing the route for the transmission line for the Labrador Transmission Assets

Current Cost

The Labrador Transmission Assets comprise 11.9 per cent of the Total Project Budget. As of the end of March 2015, the incurred costs for the Labrador Transmission Assets totaled \$358.0 million as compared to the planned costs of \$380.9 million, which was \$22.9 million or 6.0 per cent lower than planned [December 2014 Report variance was 9.7 per cent lower than planned].

Figure 7
Labrador Transmission Assets - Incurred Costs at March 2015
(including December 2014 comparison)



Nalcor advised that the main factor driving lower than planned costs is related to the harsh winter conditions, particularly in January and February. While progress has been ahead of plan in areas of anchor and foundation installations and tower assembly (lower cost intensive items), tower erection and conductor stringing (higher cost intensive items) has been impacted.

Current Schedule

As of the end of March 2015, the actual construction progress for the Labrador Transmission Assets was 38.4 per cent complete as compared to a planned progress of 39.4 per cent complete, a variance of 1.0 per cent lower than planned schedule [December 2014 Report variance was 1.0 per cent ahead of planned schedule].

Figure 8
 Labrador Transmission Assets – Schedule of Progress at March 2015
 (including December 2014 comparison)



Nalcor advised that there was some slippage in schedule performance due to mainly due to winter conditions being harsher than normal as outlined in the Risk section of this report. They anticipate recovery once conditions improve.



LTA Stringing Operations

Project Risks

Given the size and complexity of the Muskrat Falls Project, it is important that any risks are proactively identified and monitored and that mitigation measures are implemented as appropriate. The Committee continues to review Nalcor's monthly risk report and meets regularly with Nalcor officials to discuss major project risks and mitigation strategies.

Based on the Committee's review of the risk [register for the period ending 31 March 2015 reports](#), it focused on providing updates with respect to the following risks:

1. Risk for Project Schedule Delays

With the continued slippage in schedule progress at the Muskrat Falls generating facility, [specifically the Powerhouse and Intakes](#), the Committee has observed changes in the risk trend levels for some risks as well as an increase in the Risk level for some key risks.

- [Productivity of Labour](#) – The Risk Level ranked is ranked as medium at the end of the quarter, but the trend shows an increasing risk;
- Contractor Performance causing schedule delays - The Risk Level ranked is ranked as medium at the end of the quarter, but the trend shows an increasing risk;
- Powerhouse Concrete Placement – The Risk level has risen from Medium to High in current quarter and continues to trend as an increasing risk
- River Diversion in 2016 – Risk level has risen from Medium to High in current quarter however, the trend is currently static.

The Committee questioned Nalcor as to the what were the primary driver(s) for these shifts in the Project Risk levels? Nalcor advised that:

• [Productivity of Labour](#)

- ~~Nalcor advised that the increasing trend reported is associated with the Muskrat Falls generating facility and the civil Contractor. Seasonal layoffs were made in December 2014, and craft labour recall was slow to start in the new year. This was a deliberate action to allow productivity mitigation planning to be completed, which included recruiting additional construction supervision personnel and the training/orientation of these people. The layoffs and slower ramp up of the craft labour in the 1st quarter of this year also required specific the attention of Nalcor, the civil Contractor, and the related labour unions. Plans were devised including mitigations strategies to address issues, and various actions were defined and implemented. Positive results of these efforts are not expected until late in the~~

Commented [PH17]: PLEASE REMOVE> This issue is subject of an ongoing commercial discussion with the Contractor and it will potentially undermine our commercial position by making reference to it in this Report

~~spring as the craft labour pool is reemployed as planned, and builds up to forecast levels for summer of 2015.~~

- Contractor Performance causing schedule delays
 - The risk level for the Contractor performance and the related trend is associated with the Muskrat Falls generating facility and the eCivil Contractor. Nalcor and the eCivil Contractor are working together to improve construction organization and project management functions that support construction. Plans devised, including mitigations strategies, have been developed and implementation began late in the 1st quarter of 2015. The results of these efforts are not expected to be realized until late in the spring and into the summer of 2015.

- Powerhouse Concrete Placement
 - ~~The civil Contractor has re-sequenced its work efforts to concentrate on the spillway and therefore concrete placement in the powerhouse is occurring at a reduced rate. Concurrent with this initiative, the Contractor is reviewing its execution plans and work effort will resume at the powerhouse in the second quarter. Re-assessment of the progress on these major activities will be performed once improved and sustained production and concrete placement rates are achieved, once the Contractor submits a revised schedule and execution strategy, expected in mid-May of this construction year.~~
 -

- River Diversion in 2016
 - Being ready for river diversion in 2016 is directly related to the civil construction associated with the MF generating facility, more especially with the work on the Spillway. Therefore, as time passes and the improved rate of concrete placement remains a work-in-progress for the civil contractor, the risk to achieving river diversion in 2016 increases. To date, however, no change has been made to the target milestones.

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The Committee notes that these increases in the Risk levels appear consistent with the March 2015 schedule progress forecast. This forecast requires significant productivity improvements in concrete placement and schedule performance over the upcoming Spring and Summer with those projected improvements consistently maintained on a go-forward basis.

The Committee notes that if these productivity improvements are not achieved and maintained, there is a potentialsignificant likelihood that a subsequent Milestone dates will not be achieved, resulting in a potential delay of first power.

Commented [PH18]: The Committee is of course entitled to passing such an opinion however it is quite a bold statement to make at this stage and can be used by Contractor's to request release from Liquidated Damages – I suggest at this stage until all schedule analysis has been carried out by those planning and construction experts once we get actual sustained concrete placement rates later this year that the Committee consider being less definitive

2. Major Contracts not yet awarded – Update

In the December 2014 Committee Report, there were two major contracts for the Muskrat Falls Generating Facility, remaining to be awarded; the construction of the North and South Dams; and the supply and installation of the Mechanical and Electrical Auxiliaries. The Committee asked Nalcor to provide an update on the status of these contracts.

Nalcor advised that with respect to these two remaining contracts; Contract CH0009 for the construction of the North and South Dams continues to undergo clarifications and negotiations with award planned in 2015 and that bids for Contract CH0031 for the supply and installation of the Mechanical and Electrical Auxiliaries are currently being reviewed ~~with~~ award planned for 2015.

The Committee notes that until these contracts are awarded, the associated costs and any impact on the Contingency budget for the Project remain uncertain.

Commented [PH19]: Please do not put in a date at this stage – we are reviewing the timing and do not want to make such a statement which could put us in a bind commercially

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3. Weather impact on Project Schedule - Update

The Committee requested an update from Nalcor as to what impacts the weather has had on the Project Schedule during the quarter ended March 2015.

Nalcor advised that:

Harsh winter conditions, particularly in January and February, including a great deal of snow fall, have had an impact on all work fronts (i.e., Muskrat Falls generating facility, the Labrador Island Link and the Labrador Transmission Assets), in particular all work efforts at the Powerhouse and Spillway, and the right of way access works. Snow fall in January and February, as represented by total precipitation, was about 85% above normal (almost double) in the Happy Valley-Goose Bay area (ref. Environment Canada). Temperatures were also colder with an Average daily mean for January of -21.0 vs. a norm of -17.6 (3.4 degrees colder on average each day of the month) and for February of -22.0 vs. a norm of -15.7 (6.3 degrees colder on average each day of that month) (ref. Environment Canada). Combined, this has resulted in higher than normal transportation difficulties, equipment breakdowns, and extra work in snow clearing and removal. These challenges have contributed to lower than planned productivity performance.

Other Oversight Activities

The Committee provides the following update with respect to additional oversight activities.

Independent Engineer

During the week of March 16 to 20, 2015 the Independent Engineer accompanied representatives of Nalcor Energy on factory visits to the Andritz facility in Chengdu, China where the turbines and generators are being manufactured and to the Nexans facility in Futtsu, Japan where the submarine cables for the Strait of Belle Isle cable crossing are being manufactured.

The Independent Engineer has not yet issued its report on those factory site visits. A copy of this report will be made available when issued by the Independent Engineer.

Nalcor's External Auditor

Nalcor's Combined Audited Statements for the Lower Churchill Project Companies for the year ended December 31, 2014 have been completed by Deloitte, LLP in their capacity as Nalcor's external auditor. Copies of these statements have been posted to Nalcor's site in April 2015

NTD: Add some metrics, such as "Net Assets were Blah.. [HARMAN]

The full statements can be found on the Committee's website at:

<http://gov.nl.ca/mfoversight/> or on Nalcor's website at:
<http://www.nalcorenergy.com/uploads/file/APR%201%202015%20LCP%20COMBINED%20DEC%202014%20-%20ISSUED%20FINAL.pdf>

In July 2014 the Committee issued a letter to Nalcor requesting its external auditor undertake additional procedures with respect to the validity of costs charged to the Muskrat Falls Project when undertaking their audit for the fiscal year ended December 31, 2014. Specifically, the Committee requested that:

- a) Additional audit sample testing for the Lower Churchill Project Companies; and
- b) Additional procedures be applied to these companies to:
 - a. Ensure all expenditures were approved as budget items; and
 - b. Review Nalcor's overhead classification and allocations and test to ensure that any transactions were appropriately classified and allocated.

In April 2015 representatives of Deloitte, LLP met with the Committee and issued a letter to Nalcor reporting on these additional procedures applied and that that as a result of applying these procedures they found no issues of concern. In their letter issued to Nalcor (see Appendix XXX) Deloitte, LLP reports that:

We have performed the following additional procedures ...:

- *Compared all samples selected as part of the year end audit to the approved capital budget for the following Companies to ensure each expenditure is an approved budget item by performing the following procedures:*
 - *For each selection, obtained the total expenditures incurred for the respective contract to the date of the invoice selection and compared the balance to the commitment amount for the respective contract and ensured the amount billed to date did not exceed the commitment amount; and*
 - *For each selection, compared the commitment amount to the budget amount for the respective contract included in the Authorization for Expenditure approved by the Board of Directors of the Companies in June 2014 and ensured the commitment did not exceed the budget amount.*
- *We obtained an understanding of the methodology used by the Companies to record internal shared costs and Overhead allocations to the Project.*
- *For each sample selected, we verified that the expenditure was allocated to the Project in accordance with the Companies' methodology and is consistent with the appropriate standards under the International Financial Reporting Standards.*

As a result of applying the above procedures, we found no exceptions.

Other Assurance Reviews

In fulfilling its mandate, throughout the construction period the Committee will examine issues such as whether management processes and controls are well-designed and followed. The Committee provides the following update with respect to three areas of focus for review:

1. Project Controls for Risk Management

Nalcor's Internal Audit Department has completed its review and report on the Project controls and procedures for risk management. The primary objectives of the audit were to determine if the risk management framework for the Project is consistent with best practices and is being effectively implemented. The Internal Audit report indicates that

adequate resources have been allocated within the project to manage risk, and consistent with best practices risks are being categorized and ranked properly. In addition, an in-depth review of a sample of key risks found that there were no current issues and the risks were being effectively managed. Representatives of the Committee including representatives of Ernst & Young, LLP have reviewed these audit plans and final reports. Based on this review it has been concluded that Nalcor's risk management plan for the Project effectively identifies and manages risks that could prevent the project from achieving its objectives.

Commented [PH21]: I STRONGLY SUGGEST THAT THE EAND Y REFERENCE IS NOT INCLUDED> A MONTE CARLO RISK ANALYSIS WILL ADD NO VALUE AT THIS STAGE _ WE KNOW THE RISKS VERY CLEARLY AND ARE ACTING ON THEM WITH ALL EFFORTS AND DUE DILIGENCE. ENA Y SCOPE DID NOT INCLUDE RISK

2. Project Controls for Change Management

Nalcor's Internal Audit Department completed its review and report on the Project controls and procedures for change management. The objectives of the audit were to determine if the Project change management plan and procedures are consistent with best practices and to ensure that change management has adequate design and support. The audit involved a comprehensive review of the Project Charter, change management procedures, and human resources involved in the change management process. Representatives of the Committee including representatives of Ernst & Young, LLP have reviewed these audit plans and final reports. The review indicates that there was a low risk issue identified relating to the timelines of Project Change Notice approvals. Management has committed to identify criteria and method to better document approvals during urgent or emergency events. Based on the Committee's review it has been concluded that Nalcor's change management process is in alignment with best practices and is operating within a properly designed control environment.

Commented [MC22]: EY has expressed reservations on one component of the review of the Risk Management audit relating to integration of "Monte Carlo" simulations. Waiting on language from EY.

Commented [MC23]: EY did not express any reservations during the Reliance review on Change Management plan. Waiting on confirmation.

3. Project Controls for Cost and Schedule

As noted in the September 2014 Committee Report, Ernst & Young, LLP (EY), in its role as consultant to the Committee has been engaged to undertake a review of the Project Controls for Cost and Schedule. EY has completed its execution of this work and is currently finalizing their report. This report was not available at time of issuance of this report. The Committee will post the EY report to the Committee website when completed and will include the contents of that report in the next Committee report for the quarter ended June 2015.

Next Report

The Committee will continue its oversight of the construction of the Project in accordance with its mandate and the Oversight Framework. The next report will be for the quarter ended June 2015.

Appendix A

Project Budget Summary Expenditure Categories

The summary expenditure categories are described as follows:

NE-LCP Owners Team, Admin and EPCM Services: includes the labor, facilities and overhead costs of the LCP Project team as well as costs of SNC Lavalin.

Feasibility Engineering: includes the cost of early stage engineering activities which are now complete.

Environmental & Regulatory Compliance: includes costs associated with environmental assessment, permits, licenses and similar such costs.

Aboriginal Affairs: includes costs associated with activities in the aboriginal communities along with obligations under the Impact and Benefits Agreement.

Procurement & Construction: includes costs associated with the major construction activities and the award of contracts.

Commercial & Legal: includes costs associated with insurance, legal and other commercial activities.

Contingency: provision for additional expenditure, if required.