

December 18, 2015

Ms. Julia Mullaley  
Clerk of the Executive Council  
Cabinet Secretariat  
Government of Newfoundland and Labrador  
Confederation Building  
St. John's, NL A1B 4J6

Dear Ms. Mullaley:

**Re:     Review of Muskrat Falls Project Cost and Schedule Management Processes and Controls**

Lower Churchill Management Corporation (LCMC) has had an opportunity to review the recent Ernst and Young (E&Y) report commissioned by the Oversight Committee to review the cost and schedule management processes and controls implemented by LCMC for the construction of Muskrat Falls, the Labrador-Island Transmission Link, and the Labrador Transmission Assets.

External reviews are a valuable mechanism to confirm that appropriate practices are being applied and to identify opportunities for further improvement. We look at this review in the same light as previous work commissioned internally by the project team and the feedback provided by the Independent Engineer (IE). We also believe it is important to provide context for such reports, as there is often information and background that provides some additional insight into the rationale for certain project decisions and processes. This letter, in response to the E&Y report, was written from that perspective. The major points outlined by E&Y have been addressed below; they are listed and addressed individually in tables of concordance attached to this letter.



As noted in the report, LCMC has implemented a suite of project control processes for project cost and schedule, a Project Execution Plan, and coordination procedures for administering, controlling, and managing contractors' costs and schedules. Reporting is also issued to provide updates on cost and schedule for the project. The project management controls and processes were developed early in the project development for standard project management oversight within the company. At that time, Nalcor did not design for these materials to be used in a public oversight process. As you will see noted below, Nalcor recognizes the different requirements of internal oversight related to project leadership and decision making versus the requirements of the Oversight Committee and the company will adjust process controls and management to address the needs of the Oversight Committee; in particular, in providing cost and schedule risk reports at a time and level that allows the Committee to identify and quantify project cost and schedule risks.

Contractor management is an important and strategic consideration for the project team, as progress must be monitored, while at the same time avoiding claims arising from directing their activities. We acknowledge that E&Y noted that cost and schedule risks are subject to active and formalized management and that the project team has been staffed with resources experienced in cost and schedule management.

We concur with the key schedule management process and control issues highlighted by E&Y and have been actively working with our contractors to see them addressed.

The baseline documents identified in issue number 1 (baseline schedules and control documents) are contractor deliverables. As contractors are engaged, our approach is to provide feedback and comments so that deficiencies in these documents can be rectified by the applicable contractor before this information is incorporated into the Integrated Project Schedule (IPS). All approved baseline contractor schedules have been incorporated into the schedule, and issues arising from unapproved schedules are being addressed directly by the project team. The noted documentation gaps in the IPS development and management processes have not precluded development and management of the schedule, and they will be closed by year-end 2015.



A decision to re-baseline project cost and schedule is made at the project leadership level and not by the Project Control team. Consequently, it is not in their mandate and therefore not in their process or procedure. However, it is part of the Project Control team processes and procedures to monitor and report cost and schedule performance and provide the necessary management information to project senior management to take necessary action including: contingency draw-down status, comprehensive trend identification, trend analysis, mitigation plans and actions, and potential cost, schedule and quality impacts when appropriate analysis is completed.

Project senior management's decision to re-baseline cost or schedule and seek related Approval for Expenditure (AFE) is an internal project process based on an evaluation of trends in project performance and the underlying risks associated with project execution that remain after mitigation strategies have been implemented.

In response to E&Ys finding that the Oversight Committee's understanding of such conditions and processes is an important foundation as it conducts its oversight activities, Nalcor will add a formal alert process to the regular monthly interface meeting agenda with the Oversight Committee. This will provide a summary of potential emerging vulnerabilities and opportunity trends, associated mitigation activities and a range of potential cost, schedule and quality impacts, provided the necessary analysis has progressed to the point where such impacts can be quantified. In addition, Nalcor will provide the Oversight Committee with an outlook, if and when a re-baseline may occur, and the rationale for such a decision.

In relation to E&Y's comments regarding contingency forecasting, a comprehensive contingency analysis was undertaken at Decision Gate 3 (DG3). Subsequent contingency forecasting is based on an outcome of multiple inputs including actual contractor bids, detailed oversight of the contractor and procurement performance, all summarized into a comprehensive trend analysis process. This process highlights issues and opportunities early, incorporates mitigation activities and assesses potential impacts in the future. The current approach to contingency is both deliberate and planned and intended to drive the project team to control costs within tight limits. We believe it prudent to avoid



excessive contingencies which are reflective of our desire to deliver the project at the lowest possible cost.

E&Y noted that it did not review the project's DG3 documentation. The process used by LCMC to develop the DG3 cost estimate was, however, reviewed by the IE as part of its initial review. The IE noted in its November 2013 report that:

*The cost estimating methodology employed by Nalcor utilizes a deterministic approach to calculate the project's direct and indirect costs and a risk-adjusted analytical technique to develop a contingency allocation for defined tactile risks. Finally, a separate escalation analysis has been developed to calculate and fund anticipated changes in forward price levels via an allowance into the capital budget. The IE notes that Nalcor follows standard estimating practices as put forward by the Association for the Advancement of Cost Engineering International (AACEI), including 69R-12, 58R-10, 18R-97, and 17R-97.*

The approaches to contingency development contemplated by E&Y were undertaken at project sanction in December 2012. Our current approach, which we believe to be appropriate and prudent at this stage of project development, is to continue to engage in direct discussion on emerging risks and cost pressures and take management action when they have emerged. This discussion will be supported by the regular risk ranging and trend analysis documentation as previously noted.

E&Y has suggested thresholds for variance management, reporting and escalation are not defined and they expect them to be in place to assist in giving a clear indication of the severity of issues and need to escalate to the Oversight Committee. Nalcor has set the threshold for variance on any work as zero. Authority to expend funds beyond the approved amount for any work package does not exist, and additional funds must be acquired through the change control process before additional expenditures can be authorized. That being said, as we noted above, we are adding a process to our Oversight Committee interface which will address this suggestion by clearly indicating the type and severity of issues to the Oversight Committee.



In relation to the note that fully quantified risks or trends may not be documented for certain challenges, we note that the internal project risk management framework captures such risks; however, quantification of risks is a function of many variables and detailed analysis needs to be completed prior to quantification. This obviously takes time and resources and can only be completed when the analysis is reasonably progressed. The trends are assessed on an ongoing basis by project leadership, as indicated by E&Y in their previous comments.

In summary, we believe that continued focus on, and enhanced discussion of project risks that could materially impact cost and schedule, as well as their mitigation strategies, is a valuable and important oversight tool to ensure a rigorous focus on cost and schedule to project completion. While E&Y and the other external organizations that have reviewed LCMC's processes and practices have consistently concluded that appropriate controls for cost and schedule are in place, we appreciate and understand the unique needs of the Oversight Committee and the important role it plays in advising Cabinet and are adjusting our reporting and alert processes with the Oversight Committee as discussed above.

Sincerely,

A handwritten signature in blue ink, appearing to read "Gilbert J. Bennett".

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**Gilbert J. Bennett, P. Eng., FCAE**  
Vice President

cc. Mr. Ed Martin, CEO & President, Nalcor Energy



**Table 1 - LCMC RESPONSE TO KEY FINDINGS AND OBSERVATIONS IDENTIFIED BY E&Y**

<b>E&amp;Y Comment</b>	<b>LCMC Response</b>
<p>1. Key project control processes have been developed, including:</p> <ul style="list-style-type: none"><li>a. Core project management and control processes for cost and schedule, including the development of an Integrated Program Schedule (IPS) for the program, identification of baseline, committed and incurred costs as well as linkage of cost and schedule baselines to change management processes and controls;</li><li>b. A Project Execution Plan defining the basis of the schedule and the estimate, and key assumptions supporting Project baseline cost and schedule; and</li><li>c. Coordination procedures for administration, execution control and management of the contractors' cost and schedule.</li></ul>	LCMC concurs with these observations.

**Table 1 - LCMC RESPONSE TO KEY FINDINGS AND OBSERVATIONS IDENTIFIED BY E&Y**

<b>E&amp;Y Comment</b>	<b>LCMC Response</b>
2. Project reporting summarizes key information on construction cost and schedule, including: <ol style="list-style-type: none"><li>a. Schedule forecast and progress leveraging the IPS, including critical path and float review; and</li><li>b. Cost forecasting, including Estimate to Complete, Estimate at Complete, variances and trends, as well as basic contingency forecasting.</li></ol>	LCMC concurs with these observations.
3. Nalcor's continued efforts to work with contractors on maintaining a disciplined approach to project management, control and reporting.	LCMC concurs with these observations.
4. Proactive measures were being taken to manage potential claims.	LCMC concurs with this observation.
5. Cost and schedule issues and risks arising during the Project were subject to active and formalized management.	LCMC concurs with this observation.

**Table 1 - LCMC RESPONSE TO KEY FINDINGS AND OBSERVATIONS IDENTIFIED BY E&Y**

<b>E&amp;Y Comment</b>	<b>LCMC Response</b>
6. A matrix organizational structure had been established, responsible for managing the Project as a whole. Key roles in this organizational structure had been staffed with resources experienced in cost and schedule management.	LCMC concurs with this observation.

<b>Table 2 - LCMC RESPONSE TO KEY SCHEDULE MANAGEMENT PROCESS AND CONTROL RISKS AND ISSUES IDENTIFIED BY E&amp;Y</b>	
<b>E&amp;Y Comment</b>	<b>LCMC Response</b>
1. Certain baseline documents defining contractor schedules as well as the documents defining the control of project schedules were not yet complete.	The baseline documents identified (baseline schedules and control documents) are contractor deliverables. As contractors are engaged, our approach is to provide feedback and comments so that deficiencies in these documents can be rectified by the applicable contractor before this information is incorporated into the Integrated Project Schedule (IPS). All approved baseline contractor schedules have been incorporated into the schedule, and issues arising from unapproved schedules are being addressed directly by the project team. The noted documentation gaps in the IPS development and management processes have not precluded development and management of the schedule, and they will be closed by year-end 2015.
2. Contractors' schedule updates were not being systematically rolled up into the Nalcor Integrated Project Schedule (IPS) that forms the basis of the reporting to the Oversight Committee.	Please refer to the response to #1 above.
3. A completion date has not been established for finalizing an integrated baseline of contractor and IPS schedules to correct the issues noted in #1 and #2 above.	Please refer to the responses to #1 and #2 above.
4. The IPS development and maintenance process is not fully documented.	The level of documentation is sufficient to maintain the IPS; however, any documentation gaps will be addressed by year-end 2015.

**Table 3 - LCMC RESPONSE TO KEY COST MANAGEMENT PROCESS AND CONTROL RISKS AND ISSUES  
IDENTIFIED BY E&Y**

E&Y Comment	LCMC Response
<p>1. The conditions and processes for re-baselining cost and schedule are not defined in the Cost Control processes and procedures. The OC understanding of such conditions and processes is an important foundation as it conducts its oversight activities.</p>	<p>A decision to re-baseline project cost and schedule is made at the project leadership level and not by the Project Control team. Consequently, it is not in the Project Control team's mandate and therefore not in their process or procedure. However, it is part of the Project Control team's processes and procedures to monitor and report cost and schedule performance and provide the necessary management information to project senior management to take necessary action including: contingency draw down status, comprehensive trend identification, trend analysis, mitigation plans and actions, and potential cost, schedule and quality impacts when appropriate analysis is completed. Project senior management's decision to re-baseline cost or schedule and seek related Approval for Expenditure (AFE) is an internal project process based on an evaluation of trends in project performance and the underlying risks associated with project execution that remain after mitigation strategies have been implemented. These processes are designed for internal project utilization, and, in our experience, function well. In response to E&amp;Y's finding that the Oversight Committee understanding of such conditions and processes is an important foundation as it conducts its oversight activities, Nalcor will add a formal alert process to the regular monthly interface meeting agenda with the Oversight Committee. This will include providing a summary of potential emerging vulnerabilities and opportunity trends, associated mitigation activities and a range of potential cost, schedule and quality impacts, provided the necessary analysis has progressed to the point where such impacts can be quantified. In addition, Nalcor will provide the Oversight Committee with an outlook, if and when a re-baseline may occur, and the rationale for such a decision.</p>

<b>Table 3 - LCMC RESPONSE TO KEY COST MANAGEMENT PROCESS AND CONTROL RISKS AND ISSUES IDENTIFIED BY E&amp;Y</b>	
<b>E&amp;Y Comment</b>	<b>LCMC Response</b>
<p>2. Nalcor uses a relatively basic approach to its updating of forecasted contingency requirements, which in our experience is not consistent with the expected practices for a project of this scale and complexity. Given this, it is not clear whether the cost contingency as forecasted in reports for the Project will be adequate.</p>	<p>A comprehensive contingency analysis was undertaken at DG3. Subsequent contingency forecasting is based on an outcome of multiple inputs including actual contractor bids, detailed oversight of the contractor and procurement performance, all summarized into a comprehensive trend analysis process. This process highlights issues and opportunities early, incorporates mitigation activities and assesses potential impacts in the future. The current approach to contingency is both deliberate and planned and intended to drive the project team to control costs within tight limits. We believe it prudent to avoid excessive contingencies which are reflective of our desire to deliver the project at the lowest possible cost.</p>
<p>3. The Project does not define thresholds for variance management, reporting and escalation purposes. We would normally expect these to be in place as they assist in giving clear indications of the severity of issues and the need to escalate to key stakeholders, such as the OC.</p>	<p>Nalcor has set the threshold for variance on any work as zero. Authority to expend funds beyond the approved amount for any work package does not exist, and additional funds must be acquired through the change control process before additional expenditures can be authorized. That being said, as we noted above, we are adding a process to our Oversight Committee interface which will address this suggestion by clearly indicating the type and severity of issues to the Oversight Committee.</p>

<b>Table 3 - LCMC RESPONSE TO KEY COST MANAGEMENT PROCESS AND CONTROL RISKS AND ISSUES IDENTIFIED BY E&amp;Y</b>	
<b>E&amp;Y Comment</b>	<b>LCMC Response</b>
4. Fully quantified risks or trends have not been documented for certain significant challenges on the project. The scale of potential challenges is also not quantified in the summary reporting made available to the Oversight Committee.	The internal project risk management framework captures such risks; however, quantification of risks is a function of many variables and detailed analysis needs to be completed prior to quantification. This takes time and resources and can only be completed when the analysis is reasonably progressed. The trends are assessed on an ongoing basis by project leadership, as indicated by E&Y in their previous comments. The scale of potential challenges will be addressed in the process we are adding to the Oversight Committee interface.