

Date : 4/30/2012 4:42:14 PM

From : "Bown, Charles W."

To : "'Paul Wilson'"

Cc : "Allen Snyder (amsnyder@shaw.ca)" , "Mack Kast (mkast@mts.net)"

Subject : RE: NFL2 SCOPE OF SERVICES - Government of Newfoundland - Muskrat Falls DG3 review

Attachment : mhi scope.docx;

Paul;

I have attached a revised Scope of Services that address the timing and availability of data necessary for you to complete your review. Acknowledging that timely access to data and obtaining a full understanding of the changes that have occurred since DG2 are critical, we have incorporated a meeting with Nalcor staff to accompany the delivery of each major data set. I am available at your convenience to review and discuss.

Charles

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**From:** Paul Wilson [mailto:plwilson@mhi.ca]

**Sent:** Thursday, April 19, 2012 1:35 PM

**To:** Bown, Charles W.

**Cc:** Allen Snyder (amsnyder@shaw.ca); Mack Kast (mkast@mts.net)

**Subject:** NFL2 SCOPE OF SERVICES - Government of Newfoundland - Muskrat Falls DG3 review

Hello Charles, it was a pleasure to meet with you and Walter over the last two days. As a result, we have gained a better understanding of the project constraints, goals, and inputs for this important review project. Al and I have revised the scope of work which now captures all the important elements required and factors in the data availability and schedule. We have also removed the items that do not require our involvement, in particular the power system reliability review, Muskrat Falls Hydrology review, and the detailed HVdc converter station review.

I will begin to estimate the amount of effort and pricing for your consideration and wait to hear from you if this scope of work is agreeable.

My regards,

**Paul Wilson, P. Eng.**

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Manitoba Hydro International's Review of the  
Muskrat Falls and Labrador Island HVdc Link (LIL)  
and the Isolated Island Options for the Government of Newfoundland and Labrador

## Scope of Services

Date: April 30, 2012

### 1. Objective

MHI (the Consultant) shall review work completed by the Proponent (Nalcor) since Decision Gate 2 (DG2) in preparation for Decision Gate 3 (DG3). The review shall include an assessment of the Cumulative Present Worth (CPW) Analysis of the various components for each of the two Options, including a reasonableness assessment of all inputs into that analysis. The tests of reasonableness for this assessment are generally defined as the work following:

- (a) Good project management and execution practices, and
- (b) Good Utility Practices of the majority of electrical utilities in Canada while recognizing the unique electrical isolated system on the Island of Newfoundland and common accepted practice in Newfoundland and Labrador regarding the electrical system.

The Consultant will also provide such advice and other services as may be required from time to time by the Government of Newfoundland and Labrador (Client).

### 2. Services

The Consultant acknowledges that the Client is relying on the skill and knowledge of the Consultant in performing the Services. The Consultant shall exercise the degree of skill, care and diligence required by customarily accepted practices and procedures for such a Contract.

The Consultant shall only use key personnel to perform the Services who have been named by the Consultant in the Proposal and who have been accepted by the Client. The Consultant may only substitute or replace the accepted key personnel with the prior written agreement of the Client.

The Services which the Consultant shall perform or cause to be performed with diligence, skill and care include the following:

- a) A review of work performed by Nalcor related to the Muskrat Falls and Labrador Island HVdc Link (LIL) and the Isolated Island Option subsequent to DG2. The level of review shall be sufficient for the Consultant to report on whether Nalcor has performed work with the degree of skill, care and diligence required by customarily accepted professional practices and procedures completed in the performance of similar work. This work will be undertaken by examination of design reports, technical documentation

or memos, in direct meetings with Nalcor, or with other data and information provided by Nalcor during meetings and working sessions. The Request for Information process will not be implemented as part of these services, nor will any preparation for public hearings be taken into consideration.

A high level review will focus on the reasonableness of existing engineering or financial documents used in the development of the CPW analysis including design documents, design studies, material and equipment specifications, cost estimates and schedules. No new information data or reports are required for this review to proceed. MHI's final report will include a review of which documents were reviewed, identification of salient points necessary for the CPW analysis, and if the various studies were reasonable, and where applicable, prepared in accordance with good practices. The technical assessment will focus on the following areas that are generally used as inputs into the CPW analysis:

- i. Review of Load Forecast Update including:
  - An assessment of the reasonableness of the 2012 Load Forecasts for the Island Interconnected System. Two load forecasts are being prepared, the first for the Isolated Island Option, and the second for the Interconnected Island Option.

Information to be made available during the review which is to be carried out in St John's:

- Updated 2012 Load Forecasts for each option

The information and data will be reviewed during meetings with Nalcor personnel responsible for System Planning.

Outcomes:

- A report on the reasonableness of the 2012 load forecast as the basis for the development of the Generation Expansions Plans and the subsequent CPW analysis.

- ii. Review of the AC integration studies completed for the Muskrat Falls and LIL HVdc configuration options to establish the reasonableness of their use as DG3 cost inputs.

Information required available during the review which is to be carried out in St John's:

- AC integration studies report

The information and data will be reviewed during meetings with Nalcor personnel responsible for System Planning.

**Outcome:**

- A report on the reasonableness of the results of the AC Integration Studies as input to the CPW analysis.

- iii. Review of the Muskrat Falls GS post DG2 design changes, cost estimates, and construction schedules to determine their reasonableness as inputs to the CPW analysis.

Information to be made available during the review which is to be carried out in St John's:

- Muskrat Falls GS Current Basis of Design
- Muskrat Falls GS updated design data and information including AC switchyards and transmission lines to Churchill Falls
- Muskrat Falls updated master cost estimate
- Muskrat Falls updated high level master project schedule

This information and data will be reviewed during meetings with Nalcor personnel responsible for the Muskrat Falls GS design to review work completed subsequent to DG2.

**Outcome:**

- A report on the reasonableness of the MF capital cost estimate and schedule as inputs to Nalcor's DG3 CPW analysis.

- iv. Review of the HVdc Converter Stations and associated AC switchyards. This will include a review of the single line diagram, revised cost estimates, construction schedules, and DC project definition to determine their reasonableness as inputs to the CPW analysis.

Information to be made available during the review which is to be carried out in St John's:

- Information as listed above
- HVdc updated master cost estimate
- HVdc updated master project schedule
- Shore electrode cost estimates, and construction schedules.

Note: This information and data will be reviewed during meetings with Nalcor personnel responsible for the HVdc Converter Stations design and AC switchyards.

**Outcome:**

- A report on the reasonableness of the transmission capital cost estimates and schedule as inputs to Nalcor's DG3 CPW analysis.

- v. Review of the overhead HVdc transmission line and associated AC collector transmission lines including its reliability design criteria, route details and final meteorology review to assess the reasonableness of the transmission line design parameters as inputs to the CPW analysis.

Information to be made available during the review which is to be carried out in St John's:

- Information as listed in the above paragraph
- Transmission line design basis
- Transmission line updates to the master cost estimate
- Transmission line updates to the master project schedule

This information and data will be reviewed during meetings with Nalcor personnel responsible for the transmission line design.

Outcomes:

- A report on the reasonableness of Nalcor's transmission line engineering criteria as inputs to the transmission line engineering design, and ultimately as inputs to Nalcor's DG3 CPW analysis.

- vi. Review of the Strait of Belle Isle (SOBI) marine crossing cost estimates and construction schedule to assess their reasonableness as inputs to the CPW analysis.

Information to be made available during the review which is to be carried out in St John's:

- Marine crossing capital cost estimates
- Marine crossing master project schedule

This information and data will be reviewed during meetings with Nalcor personnel responsible for Marine Crossing.

Outcomes:

- A report on the reasonableness of Nalcor's SOBI cost estimate schedule as input to the DG3 CPW analysis.

- vii. A review of the reasonableness of changes made by Nalcor to other cost inputs from DG2 to DG3 for both the Isolated Island and Interconnected Island alternatives.

Information to be made available during the review which is to be carried out in St. John's:

- Changes in costs between DG2 and DG3
- Supporting information to explain the changes in costs.

This information and data will be reviewed during meetings with Nalcor personnel responsible for the cost input.

**Outcome:**

- A report on the reasonableness of Nalcor's adjustments to other costs for the Isolated Island and Interconnected Island alternatives between DG2 and DG3.

b) Preparation of a final report anticipated to include, as a minimum the following:

- An executive summary;
- A description of the Consultant's review team;
- A description of the methodology used to complete the Services;
- A summary of the results of the review, including a discussion of the materiality of any observations and recommendations made as well as a discussion of the steps taken to address such matters.

c) Provision of ongoing support to the Client.

**Schedule Item Scheduled Completion Date (tentative)**

Kick off Meeting: April 17<sup>th</sup>, 2012

First Draft Report July 6th, 2012

2nd Draft Report July 23rd, 2012

Submission of Final Report July 31st, 2012

Presentation to the Government TBD

Completion of Services September 30th, 201