

Date : 4/12/2012 11:05:31 AM

From : "Paul Wilson"

To : "Bown, Charles W."

Subject : NFL2 SCOPE OF SERVICES - Government of Newfoundland - Muskrat Falls DG3 review rev1.docx

Attachment : NFL2 SCOPE OF SERVICES - Government of Newfoundland - Muskrat Falls DG3 review rev1.docx;

Hello Charles, this is the revised SOW for our conference call at 9:00 am today.

Paul Wilson

Scope of Services (Draft)

Date: April 11, 2012

Revision 2

1. Government of Newfoundland and Labrador's Objective

MHI (the Consultant) shall review all work completed by the Proponent (Nalcor) for in preparation for Decision Gate 3 since Decision Gate 2. The review shall include an assessment of the Cumulative Present Worth (CPW) Analysis of the various Projects including a reasonableness assessment of all inputs into that analysis. The test of reasonableness for this assessment is generally defined as following Good Utility Practices of the majority of electrical utilities in Canada.

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 is an independent contractor and not an agent or employee of the Client.

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 normally provided in performance of services similar to the Services required under the 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) The Consultant to perform a review of all work performed by Nalcor and their consultants or others related to the Muskrat Falls and Labrador Island HVdc Link (LIL) and the Isolated Island Option subsequent to Decision Gate 2. The level of review shall be sufficient for the Consultant to report on whether the work was performed with the degree of skill, care and diligence required by customarily accepted professional practices and procedures normally completed in the performance of similar work.

The Technical Assessment used as inputs into the CPW and Financial Analysis models will included:

- i. Load Forecast Update review including

- a. An assessment of the 2012 Load Forecast Accuracy for the Island and Labrador
- b. Assessment of risk associated with the large industrial loads demand on the Island and Labrador

Information required:

- Updated 2012 Load Forecast
- Large industrial load assessments, Corner Brook, Rio Tinto in Labrador, Vale
- load requirements, any other new loads
- Government initiatives/program/strategic plans related to industrial development and maintenance

- ii. Review of Reliability Assessment of both options (Relative Probabilistic Assessment) if available. Assessment of the relative power system reliability including and identification of issues related to the reliability of the Island power system, and the impact of both HVdc links (LIL HVdc Link and the Emera Maritime Link) on the supply options.

Information required:

- Relative Probabilistic Reliability study for the entire Labrador and Island of Newfoundland Power system.
- Emera Link Reliability Study for Nova Scotia Power and the Island Power System
- Meetings with Nalcor System Planning Staff

- iii. Review of AC Integration Studies completed for the Muskrat Falls and LIL HVdc configuration options.

Information required:

- AC integration study report
- Meetings with Nalcor's System Planning Staff and the Consultant who performed the analysis

- iv. Review the Muskrat Falls GS post DG2 design reports, cost estimates, and construction schedules. Identify any technical weaknesses; review DG3 cost estimate inputs, and application of any EIS requirements for environmental compliance.

Information required:

- Muskrat Falls GS design definition
- Muskrat Falls updated design reports including AC switchyards, and transmission lines to Churchill Falls
- Muskrat Falls updated master cost estimate
- Muskrat Falls updated master project schedule

- Manufacturer cost estimates used as input into the master cost estimate
 - Relevant specifications/tenders/offers related to supply of material and services for Muskrat Falls GS.
 - Meetings with Nalcor or their consultant responsible for the Muskrat Falls GS design to review work done to date, and to answer any questions.
- v. Review the HVdc Converter Stations and associated ac switchyards. This will include review of the DG3 engineering to date, designs specifications, revised cost estimates, construction schedules, construction contractor requirements, DC project definition, Single Line Diagrams, specified performance metrics, DC computer models and system performance benchmarks.

Information required:

- Information as listed above
 - HVdc updated master cost estimate
 - HVdc updated master project schedule
 - HVdc risk analysis report
 - Relevant specifications/tenders/offers related to the supply of material and services for the HVdc Converter Stations, and associated ac equipment required to support the dc conversion process.
 - Shore electrode design review, cost estimates, and construction schedules.
 - Meetings with Nalcor or their consultant responsible for the HVdc Converter Station design to review work done to date, and to answer any questions.
- vi. Review of the overhead HVdc transmission line including reliability design criteria, route selection and final metrology review, engineering review of tower and line designs, review of cost estimates, cost estimate sensitivity to various reliability design criteria, and construction schedules.

Information required:

- Information is listed above
 - Transmission Line updates to master cost estimate
 - Transmission Line updates to master project schedule
 - Transmission Line risk analysis report
 - HVdc neutral line design specifications, design drawings, construction schedules, line routes, cost estimates.
 - Meetings with Nalcor or their consultant responsible for the transmission line design to review work done to date, and to answer any questions.
- vii. Strait of Belle Isle (SOBI) marine crossing review will include a review of the technical and economic offers in order to assess their reasonableness to meet the design

specification proposed in RFP No. LC-SB-003, Strait of Belle Isle Submarine Cable Design, Supply, and Install. The cost estimates and construction schedule will be reviewed. Results of the Horizontal Directional Drilling test program will be reviewed. The SOBI risk analysis project update will be reviewed.

Information required:

- Information as listed above
- Design specifications and supporting documentation for transition stations.
- SOBI updates to master cost estimate
- SOBI updates to master project schedule
- SOBI risk analysis report
- Meeting with the Nalcor SOBI project manager to obtain any updates or identified risks relevant to the DG3 decision.

- viii. Assessment of any new material related to wind farms will be performed. Nalcor's reassessment of maximum wind penetration study will be reviewed if available.

Information required:

- Wind farm updates to master cost estimate
- NLH wind farm maximum penetration study

- ix. The Holyrood Thermal Generating Station plans, cost estimates, and schedules will be reviewed if there are any evident departures from the original Decision Gate 2 plan.
- x. Risk Analysis review. Review Nalcor most recent risk analysis assessment for gaps, suitability to task, and appropriateness of reserve margins for costs estimate contingency.

Information required:

- Strategic Risk Assessment Updated Report, and Westney update if available

- xi. The Cumulative Present Worth study will be reassessed with DG3 inputs in both capital expenses and operating expenses, fuel price variability, and escalation, for the two options as originally presented in DG2. Departures from these plans will be identified and the impact on CPW assessed. Sensitivities performed in the DG2 review will also be reassessed with DG3 inputs.

Information required:

- Disclosure of all input capex and opex input costs
- Disclosure of all escalators used
- Disclosure of input fuel prices used, and 2012 PIRA fuel price forecasts
- Nalcor participation to recalculated required sensitivities using Strategist.

xii. (Optional). In order to assess the necessity of both the Emera export deal and the Federal Loan Guarantee prior the DG3 project sanction decision, a review of the Integrated Financial Forecast (10 and 20 year periods) for Nalcor is recommended. This would be a full revenue/expense model and process review, together with a minimum rate base study. A sensitivity analysis would also be carried out to gauge the impacts of capital cost overruns, fuel price variability, fiscal performance with and without the Emera export revenues and supply, and impact of the Federal Loan Guarantee. Note: this may be very labour intensive review and may not be possible within the time frame available.

Information required:

- Under discussion internally

b) Preparation of a final report which will 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 significant data gaps and issues, if any.

c) Provision of ongoing support to the Client.

| Schedule | Scheduled Completion Date |
|--------------------------------|-------------------------------|
| Kick off Meeting: | April 11 th , 2012 |
| First Draft Report | May 15 th , 2012 |
| 2 nd Draft Report | May 29 th , 2012 |
| Submission of final report | June 5 th , 2012 |
| Presentation to the Government | TBD |
| Completion of Services | June 30 th , 2012 |

Note: This is a very aggressive schedule and completion on these milestones is dependent on the availability of information from Nalcor, and availability of the expert resources from MHI.