Q. MHI is aware that a comprehensive reliability report for the entire project has been requested from Nalcor by the Board in a letter July 12, and this document was filed August 17, 2011.

Is there an operational based reliability report or conceptual design document considering the forced outage rate and scheduled outage rate? Have all equipment and systems been looked at from an operations and maintenance perspective using an N-1 criteria or considering the criteria required by Nalcor? Detailed areas to be covered should include but not be limited to:

a) Are there two or three auxiliary supply feeds (station service) for the bipole? Considering a potential extensive forced outage to one feed (station service) there would be an entire bipole feed from one station service transformer for an extended period. Is this acceptable? Is there a spare station service or other alterative feed? The same question applies to the battery banks and chargers.

b) How many relay buildings are being considered in the AC switchyard of the converter station? What is the physical separation between the buildings? Are there duplicate control and protections from different suppliers?

c) Has separation of equipment and controls supplies been considered to limit the amount of power lost for any event?

d) What is the Forced Outage Rate (FOR) and scheduled outage rate target?

e) Has a design report been issued detailing all these requirements? If so please provide.

f) Is there a contingency plan in place or being considered, if the reliability criteria cannot be met? For example, documents indicate that there is one synchronous condenser (SC) provisioned as a spare. If one SC is out of service for maintenance, and a second one trips off, what are Nalcor's operating plans?

A. No operational based reliability report or similar design document has yet been completed for the project. As Nalcor is now entering the detailed design phase of the project, issues such as those identified in this question are under assessment. The following represents the current thinking within Nalcor regarding the specific operational considerations outlined in the question, and are reflective of the assumptions built into the cost estimates developed at the feasibility level for inclusion in the CPW analysis.

a) In addition to two independent station service supplies, the bipole will be equipped with a standby diesel generator. The station service supplies will be derived from the AC switchyard.

At Soldier's Pond, station service AC power is available from Western Avalon (Bay d'Espoir), Holyrood (combustion turbine), and/or Hardwoods (combustion turbine) terminal stations if the bipole is out of service.

At Muskrat Falls, station service AC power is available from the 4 units at Muskrat Falls, Churchill Falls, or from Happy Valley Goose Bay (combustion turbine).

There will be two independent auxiliary ac power supplies for each Converter Station. The same applies to the dc power supply, with two independent full capacity battery banks per Converter Station, each with its own redundant charger per battery bank.

b) Nalcor's approach is to use a single building for each ac switchyard. The building will house duplicate protection and control systems. While control equipment may be provided by a single manufacturer, protection equipment will be provided by separate manufacturers.

c) Equipment and control supplies will be independent and physically separated.

d) A forced outage rate of 0.89% has been used for planning and conceptual design purposes. Planned maintenance scheduling has not been explicitly modeled in Strategist. It is assumed that maintenance will be performed in off-peak months (April - November). A detailed review of these outage rates is ongoing by SNC – Lavalin, and the results of these studies will determine the outage rates to be used in the functional specifications. Planned maintenance scheduling will be further refined in final design once the vendor has been selected.

e) The design brief and design criteria, which will include the details of all these requirements for Converters, have not been issued yet.

f) Nalcor is of the view that the reliability criteria are reasonable and achievable. In response to the specific question regarding synchronous condensers, there will be a spare synchronous condenser. Planned maintenance will be scheduled during low HVdc power transmission periods so that a forced outage of a synchronous condenser (leaving one synchronous condenser in service) will not adversely affect system operation.