Q. From discussions with Nalcor, MHI understands that the transmission line sections have been designed to different requirements due to varying geographical and environmental conditions. Please provide a copy of this design. Provide any transmission line design concept documents, detailed design reports, drawings, tower designs, cost estimates, line route selection details, transmission line reliability design criteria, risk analysis, for the HVDC overhead transmission line, and associated AC transmission lines from the Converter stations

A. Nalcor has applied results from extensive research, long term monitoring, and operational experience in the development of design criteria for the Labrador Island Transmission Link. The results of these work activities are compiled and summarized in Exhibit 97 - Meteorological Loading Review.

Appendix A of Exhibit 97 provides a geographical reference for the 11 different line sections developed based on meteorological loading. The meteorological loading for these areas and design criteria are presented in Section 3. The regions have been categorized as follows:

1) Average Sections (6 sections in central and northern Newfoundland as well as Labrador). The governing design in these sections is wind loading, based on a maximum 176 km/h (110 mph) gust. Radial glaze ice loading in these regions is 50 mm.

2) Eastern Section. The governing design is 75 mm radial glaze ice loading.

3) Alpine Sections (4 sections in central and northern Newfoundland). These sections are subject to rime icing due to their elevation and topographical features. Further study is ongoing in these areas using numerical weather models and data from test spans located in the Long Range Mountains in western Newfoundland.

The design details requested in this question are not available, as these issues are the subject of detailed design efforts by SNC Lavalin and will not be completed before 2012.

Q. From discussions with Nalcor, MHI understands that a mechanical fuse concept has been adopted for the HVDC transmission line. The conductor design will drop the conductor to save the tower due to high icing and wind loading over ratings. Have sufficient investigations been done to prove the concept of the mechanical fuse to save the tower during a catastrophic event? Please provide supporting information why this technology was chosen. What is the risk of an incorrect mechanical fuse failure and how would this be prevented/mitigated?

A. This concept has not been adopted for the Labrador Island Transmission Link. Nalcor has no plans to utilize the mechanical fuse concept, or any other load control device, in the design of the HVac or HVdc overhead line systems.

Nalcor will coordinate the structural design of the various components of the transmission line in accordance with the methodologies outlined in CAN/CSA-C22.3 No. 60826:06.

Q. Does the change of the ac transmission interconnection to Churchill Falls used in the 1999 optimization report affect the optimal installed capacity needed to dispatch the energy available at Muskrat Falls under the current arrangement?

A. The change in the interconnection to Churchill Falls has no impact on the optimum capacity needed to dispatch energy from Muskrat Falls. The AC transmission system is not a limiting factor for the hydraulic optimization of the plant. Under the current arrangements the majority of deliveries are over the DC system.

Q. From discussions with Nalcor on the Muskrat Falls pumpwell system, it was suggested that it will be required only for the next ten years. Why would that be the limit since the system will be in operation for 30 or more years? When the MF project is commissioned, what is the expected life of the current system? Is there a backup supply system in place to provide power in case of a future catastrophic failure of the pumpwell system?

A. The current pumpwell system was installed in 1981 as an interim measure to prevent continued regression of the slopes of the spur due to landslide activity. In 2007, a field program was carried out to assess the condition of the system with the objective of recommending measures to extend the life of the existing system and ensure its continued operation until complete reconstruction of the area as part of the development of Muskrat Falls. At that time it was planned to construct Gull Island prior to Muskrat Falls, hence it was envisioned that measures needed to be taken to extend the life of the existing system approximately 10 years. However, with the decision to develop Muskrat Falls first, the stabilization of the spur will take place earlier and will include installation of new wells, downstream erosion protection and fill, local top cutting of the spur, removal of high, steep slopes, and upstream erosion protection and stabilization berms for wave protection. In essence, recommendations from the 2007 field program and subsequent report (MF1260) were intended to ensure continued reliability and functionality of the existing system until these long-term measures could be implemented.

As noted, it is currently planned to integrate the existing pumpwell system into the final pumpwell system. Cleaning and inspection of the wells in 2009 indicated that the majority of the wells were in good condition, with very little corrosion or fouling of the wells. With some upgrading and routine preventative maintenance it is anticipated that the current well system will be suitable for this integration.

The pumpwell system is currently powered via TL240, the transmission line from Churchill Falls to Happy Valley Goose Bay. There is currently no independent back-up power system on site. However, if necessary, power can be supplied by portable generators. The final design of the pumpwell system will include a back up power supply.

Q. The report “Studies for Island Pond Hydroelectric Project”, (2006) by SNC-Lavalin presents no new data or analysis with respect to hydrology but relies on results from previous studies. The hydrological analysis would be contained in the Prefeasibility Study (1986), the re-optimization of Round Pond (1987), the Feasibility Study (1988) and possibly Island Pond and Granite Canal Final Feasibility Studies (1988), all studies executed by Shawmont Newfoundland. The relevant documents from these studies are required in order to evaluate the completeness of the hydrological analysis. Please provide.

A. Please see attached sections from the Island Pond Development Pre-feasibility Report (1986) and the Island Pond Development Final Feasibility Study (1988). Please note that Exhibit-60 contains the relevant sections from both documents.

The other reports noted above, as well as the Island Pond/Granite Canal Re-optimization and Cost Update Study (1997) and the Island Pond/Granite Canal Re-optimization and Cost Update Study Addendum No. 2 (1997) – AGRA Shawmont, did not contain any relevant sections.

In the event that these projects became part of the preferred alternative, Nalcor would integrate the information in these reports with NL Hydro’s comprehensive hydrological data set for the entire Bay d’Espoir complex, reflecting experience and data enhancements developed since the 1990’s. Further hydrological work is not warranted at this time since these projects are not part of Nalcor’s preferred alternative.

Q. Please provide "Appendix F Geotechnical Site Investigations - Proposed Island Pond Hydro Electric Development (as prepared by AMEC)" for Exhibit 5b - Studies for Island Pond Hydroelectric Project.

A. Please see Exhibit 69 - *Studies for Island Pond Hydroelectric Project - 2006 - Appendix F - Geotechnical Site Investigations.pdf.*