Q. Preamble: Throughout the Federal/Provincial Joint Review Panel process related to the Muskrat Falls construction project, various Dam Break Studies were undertaken. For example, in April 2008, Hatch Ltd. presented The Lower Churchill Project Gl1190-Dam Break Study Volume 1, which analysed several dam break scenarios but is strictly limited to concrete dams on the south side of the river. (see http://www.ceaa.gc.ca/50/documents_staticpost/26178/39444/at-01.pdf)

In May, 2010, a Supplemental Dam Break Analysis was carried out by Hatch Ltd. Extending the area of analysis to include Sheshatshiu and North West River but, again, is strictly limited to concrete dams on the south side of the river. (see http://www.ceaa.gc.ca/050/documents_staticpost/26178/44546/v2-f.pdf )

In December, 2010, as the result of a request from the Federal Provincial Joint Review Panel to Nalcor, Hatch Ltd. Conducted a further dam break analysis, inundation mapping, and consequence assessment, which while strictly limited to concrete dams on the south side of the river, but this time for the case where Muskrat Falls was built first and failed. (MF1330-Hydraulic Modeling and Studies 2010 Update Report 3: Muskrat Falls Dam Break Study (see http://www.pub.nf.ca/applications/MuskratFalls2011/files/exhibits/abridged/CE-24-Public.pdf)

None of these studies considered the possible failure of the North Spur portion of the Muskrat Falls reservoir containment system. Such a study is essential to determine the risk of such a failure as well as the duration of any resulting forced outage at the Muskrat Falls generating station.

Has any dam break study specifically addressed the possible failure of the North Spur? If so, please provide a copy. If not, why not?

A. Consistent with the role of environmental assessment as a planning tool, the dam breach studies presented during the environmental assessment process were based on feasibility level engineering design data based on the progress of the project at the time.

Completion of dam breach studies based on final design information (including the North Spur) is required pursuant to the requirements of the Lower Churchill Project's Permit to Alter a Body of Water issued by the Water Resources Division, Department of Environment and Conservation, Government of Newfoundland and Labrador and also under the Canadian Dam Association (CDA) Dam Safety Guidelines. These studies will be completed and submitted to the Water Resources Divison prior to impoundment of the Muskrat Falls reservoir.

It should be noted that a dam breach study does not assess the probability (one component of risk) of a failure of the Muskrat Falls dam, but rather the consequences of such an event if it were to happen. Similarly, a dam breach study does not inform the duration of an outage arising from a breach.

In the (very) unlikely event of a dam breach at Muskrat Falls, several options are available to Hydro. As stated in Hydro's response to GRK-NLH-004: "Upon the completion of the Labrador-Island Link and the Maritime Link, the Island of Newfoundland will, for the first time, have access to electricity from neighbouring utilities. This is a benefit other electrical systems throughout North America have enjoyed for decades to improve reliability through a larger pool of generation resources and to reduce costs through both the economic export and import of electricity. These transmission interconnections will, if necessary, enable the Energy Control Centre operators to utilize emergency support from neighbouring utilities

and to obtain power through electricity market arrangements either through the Quebec or Maritime Link interconnections."

In addition, with a continued 60 MW interruptible arrangement, Hydro will have sufficient installed capacity to supply full load until at least 2025. Beyond the 1650 MW load level, there are options available to supplement capacity that Hydro will explore including:

- Additional industrial and commercial interruptible load arrangements;
- Customer demand side management initiatives;
- Additional imports via the Maritime Link when existing constraints in the Maritime/New England systems are mitigated; and
- Potential on-Island capacity additions.

Hydro will continue to monitor load forecast and generation availability on an ongoing basis and make adjustments to reserve capacity as required in as cost effective a manner as possible.

Finally, the *Electrical Power Control Act 1994*, Part III Power Emergencies, enables the Lieutenant-Governor in Council to declare a state of emergency and appoint an emergency controller who may redirect all generation and transmission assets in the province to supply the most critical and essential loads to minimize the overall impact of any shortfall.