December 10, 2012

Mr. Ted Lyberogiannis
Sustainment Manager - Transmission Stations Planning
Hydro One Networks Inc.
483 Bay Street
Toronto, Ontario
M5G 2P5

Dear Mr. Lyberogiannis:

Hydro One like-for-like HV disconnect switch replacements & refurbishments
Notification of Conditional Approval of Connection Proposal
CAA ID Number: 2010-EX465

Thank you for the information regarding Hydro One's sustainment programs for replacement and refurbishment of high voltage (HV) disconnect switches. The IESO has concluded that the proposed changes will not result in a material adverse impact on the reliability of the integrated power system. The IESO is therefore pleased to grant **conditional approval** as detailed in the attached System Impact Assessment report. Please note that any further material change to your proposed modifications may require a re-assessment by the IESO, and may result in a nullification of the conditional approval.

You may now initiate the IESO's **Facility Registration/Market Entry** process. To do so, please contact Registration & Compliance Support at market.entry@ieso.ca as soon as possible prior to each of the energization dates. The SIA report, attached hereto, details the requirements that your company must fulfill during this process, including demonstrating that the equipment *as installed* will not be materially different from the equipment *as approved* by the IESO. The document entitled **Market Entry: A Step-by-Step Guide** describes the key steps in the Market Entry process.

When your company has successfully completed the IESO's **Facility Registration/Market Entry** process, the IESO will provide you with a **final approval**, thereby confirming that the facility is fully authorized to connect to the IESO-controlled grid.

For further information, please contact me via connection.assessments@ieso.ca.

Yours truly,

Michael Falvo
Manager – Market Facilitation
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Final Report - Expedited System Impact Assessment - Addendum
Hydro One Networks Inc.

1.0 GENERAL DESCRIPTION

Hydro One has an ongoing sustainment program to replace or refurbish HV disconnect switches that have reached the end of their useful life. A replacement HV disconnect switch may also be identified and sourced during a project involving other HV equipment, e.g. a new line section or a transformer replacement, to name two examples.

Outages to perform these replacements or refurbishments will be communicated to the IESO via the normal outage management process.

1.1 Replacement disconnect switches

For the purpose of this Expedited System Impact Assessment (ESIA), a replacement disconnect switch is any new disconnect switch that will be put into service to replace an existing disconnect switch.

1.2 Refurbished disconnect switches

For the purpose of this ESIA, a refurbished disconnect switch is an existing disconnect switch where Hydro One performs any maintenance that does not result in the replacement of the entire disconnect switch and all of its components. Maintenance could include one or more of the following activities:

- refurbish the jaw;
- refurbish the blade contact;
- refurbish the blade hinge;
- replace all shunts;
- refurbish the pedestal bearing assembly
- replace pedestal bearing assembly
- refurbish the gearbox(s)
- refurbish operating rods and linkages
- replace operating rods;
- replace insulators;
- refurbish arcing hardware;
- refurbish or replace the mechbox:
- refurbish the grounding switch; and
- upgrade permanent grounding.

1.3 Disconnect switches not covered by this assessment

This ESIA does not cover any new disconnect switch that will be put into service where no disconnect switch existed previously nor any operational upgrade such as a replacement disconnect switch to be put into service to break load current when this was not possible prior to the replacement. These installations and others not identified here will be assessed under separate SIAs.

2.0 REQUIREMENTS

All disconnect switches, whether replacements or refurbishments, must meet the following requirements:

2.1 Telemetry

The Market Rules, Chapter 4, section 7.4 require that each transmitter connected to the IESO-controlled grid shall provide the IESO on a continual basis with on-line monitored status of disconnect switches as specified in Appendix 4.16 or as determined by Market Entry for disconnect switches that are not currently monitored.

2.2 Maximum Voltage

The Market Rules require that high voltage equipment in Ontario must have maximum continuous voltage ratings as listed in table 1.

Permissible Voltage Ranges in Ontario (Appendix 4.1, reference 2 of the Market Rules)		
	Voltage range	**Maximum continuous voltage**
115 kV system – southern Ontario	113 - 127 kV	127 kV
115 kV system – northern Ontario	113 - 132 kV	132 kV
230 kV system	220 - 250 kV	250 kV
500 kV system	490 - 550 kV	550 kV

Table 1 – Permissible Voltage Ranges in Ontario

2.3 Fault Levels

The Transmission System Code (TSC), Appendix 2 establishes maximum fault levels for the transmission system and requires that new equipment be designed to withstand the fault levels in the area where the equipment is installed. The maximum 3 phase symmetrical fault levels and the single line to ground (SLG) symmetrical fault levels are listed in table 2. The TSC requires that new equipment be designed to withstand the fault levels in the area where the equipment is installed. If any future system changes result in an increased fault level higher than the equipment's capability, the connection applicant is required to replace the equipment with higher rated equipment capable of withstanding the increased fault level, up to maximum fault level specified in the TSC.

Hydro One is proposing to install disconnect switches that meet the maximum fault levels specified in the TSC, Appendix 2. In cases where the existing disconnect switch already exceeds the TSC requirements, the new disconnect switch must have at least the same withstand capability as the replaced disconnect switch. In either instance where this is not possible, Hydro One will advise the IESO in advance and provide rationale for each exception.

Maximum Permissible Fault levels in Ontario (Appendix 2 of the Transmission System Code)		
	maximum 3 phase symmetrical fault level	**single line to ground (SLG) symmetrical fault level**
115 kV system	50 kA	50 kA
230 kV system	63 KA	80 kA (usually limited to 63 kA)
500 kV system	80 kA	80 kA (usually limited to 63 kA)

Table 2 – Permissible Fault levels in Ontario

2.4 IESO Market Entry/Facility Registration process specific to replacement disconnect switches

Hydro One must complete the IESO **Market Entry/Facility Registration** process for replacement disconnect switches. During this process, Hydro One must provide the maximum voltage ratings and the continuous current ratings for the replacement disconnect switches prior to receiving final approval from the IESO.

2.5 Requirements specific to refurbished disconnect switches

Hydro One have provided the following statement regarding the specifications of refurbished disconnect switches:

> "Refurbished disconnect switches will have equal or better ratings for maximum voltage, as well as continuous and short-time capabilities, as compared with the existing switches. There will be no changes in configuration and the refurbished equipment will not become the limiting component, i.e. not lead to reductions in transfer capability."

Hydro One is not required to complete the IESO Market Entry/Facility Registration process for refurbished disconnect switches.

3.0 ASSESSMENT & CONCLUSIONS

It can be concluded that these replacement or refurbished disconnect switches will have no material adverse impact on the integrated power system subject to the requirements in section 2.

The IESO and Hydro One Networks will review this blanket approval annually.