

August 19, 2009 - revised
Final Draft Report
Expedited System Impact Assessment
Hydro One Networks Inc.

1.0 GENERAL DESCRIPTION

Hydro One proposes to refurbish or replace a number of disconnect switches that have reached the end of their useful life. These refurbishments and replacements will take place during 2009. Outages will be communicated to the IESO via the normal outage management process. New or refurbished disconnect switches will be referred to as replacements for the purposes of this assessment.

The replacement disconnect switches will operate and remain in their original configuration and location. The location, operating designations and the ratings of the replacement disconnect switches are shown at the end of this report in Appendix 1.

Various details for the replacement disconnect switches are currently not available and will be provided by Hydro One prior to receiving final approval to connect from the IESO.

Specifications of disconnect switches for locations with voltages below 50 kV are not part of this assessment.

2.0 REQUIREMENTS

Maximum permissible voltage ranges for the 230 kV and 500 kV systems in Ontario, as specified by the Market Rules in Appendix 4.1, are shown below in Table 1. Some recognized contingencies (e.g. load shedding, open line end) can cause temporary voltage increases above these maximum continuous voltages. Connection equipment must remain in service and not automatically trip for voltages up to 5% above the maximum continuous voltages for up to 30 minutes to allow the system to be re-dispatched to return voltages to their normal range. This reparation period will be as short as possible, and will not take longer than 30 minutes.

Maximum Permissible Voltage Ranges in Southern Ontario		
	Maximum continuous voltage range	Maximum voltage during reparation period (30 minutes without tripping)
230 kV system	220 - 250 kV	262.5 kV
500 kV system	490 - 550 kV	577.5 kV

Table 1 – Voltage Ranges in Southern Ontario

The Transmission System Code (TSC) indicates that the transmission system has to be designed to sustain short circuit currents of 63 kA for the 230 kV system and 80 kA (usually limited to 63 kA) for the 500 kV system.

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 as specified in Appendix 4.16. The IESO will continue to require the status associated with the replacement disconnect switches.

Hydro One must provide the maximum voltage ratings, the continuous current ratings and the short circuit capability ratings for the replacement disconnect switches prior to receiving approval to connect from the IESO.

3.0 ASSESSMENT & CONCLUSIONS

The installation of disconnect switches whose short circuit capability is lower than the TSC requirements is a risk assumed completely by Hydro One who must ensure that the short circuit current seen by these disconnect switches does not exceed the short time rating of the new equipment. Should future system changes result in fault currents greater than the installed switch ratings, Hydro One will be required to change these disconnect switches at their expense.

Short circuit ratings and maximum voltage ratings are not available for the disconnect switches that are being refurbished. These ratings must be provided by Hydro One prior to receiving final approval to connect from the IESO.

It can be concluded that these replacements will have no material adverse effect on the integrated power system subject to the requirements in section 5.

Appendix 1 - Equipment Rating

Location	Identifier	Continuous Voltage Rating (Nominal)		Continuous Current Rating		Short Circuit Current Rating	
		Existing Equipment	Replacement Equipment	Existing Equipment	Replacement Equipment	Existing Equipment	Replacement Equipment
Agincourt TS	T6-C10A	196 kV ⁱ	250 kV	1200 A	1200 A	Details not known	63 kA
	C10A-G	196 kV ⁱⁱ	250 kV	1200 A	1200 A	Details not known	63 kA
Bruce A TS	D1L23-L	230 kV	Details are not currently available and will be provided prior to equipment being put in service	3000 A	Details not known	Details not known	Switches are being refurbished. Short circuit values will be provided prior to equipment being put in service.
	L24T25-L	230 kV		3000 A	Details not known	Details not known	
Cherrywood TS	KL5-K	230 kV		2000 A	Details not known	Details not known	
	DL31-D	230 kV		3000 A	Details not known	Details not known	
Essa TS	18-E26	230 kV		1200 A	Details not known	100 kA	
	E26-G	230 kV		Details not known	N/A - grounding switch	100 kA	
	18-E27	230 kV		1200 A	Details not known	100 kA	
	E27-G	230 kV		Details not known	N/A - grounding switch	100 kA	
Lennox TS	KL520-L	500 kV		4000 A	Details not known	Details not known	
	KL520-K	500 kV		4000 A	Details not known	Details not known	
Seaforth TS	T5-L22	230 kV	1200 A	Details not known	Details not known		
	T6-L23	230 kV	1200 A	Details not known	Details not known		
Thornton TS	H24C-G	230 kV	Details not known	N/A - grounding switch	Details not known		

ⁱ Voltage rating is line to line with a high BIL rating.

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