



CONNECTION ASSESSMENT & APPROVAL PROCESS

ASSESSMENT SUMMARY

Applicant: Hydro One Networks Inc.

Project: Halton TS:

Install two additional 27.6kV feeder positions

CAA ID No. 2003-EX139

***Long Term Forecasts & Assessments Department
Consistent Information Set Department***

Date: 24th July 2003

ASSESSMENT SUMMARY

HYDRO ONE NETWORKS Inc.

HALTON TS: Install two additional 27.6kV feeder positions

1.0 General Description

Halton TS, which is tapped off the radial section of the 230kV circuits T38B & T39B from Trafalgar TS to Meadowvale TS, has two 75/100/125MVA transformers, T3 & T4. These transformers are each equipped with dual 27.6kV secondary windings, with one winding of each transformer connected to the J-Busbar and the other to the Q-Busbar.

The 27.6kV switchyard presently has ten feeder positions.

The T3/T4 DESN station has a summer 10-day limited-time-rating of 218MVA, while the peak load recorded during the summer of 2002 was 93MW (~100MVA).

Hydro One is proposing to install two additional 27.6kV feeder positions at the T3/T4 DESN station to supply the growing load in the area.

The new feeder positions are scheduled to be in-service on 31st May 2004.

2.0 Proposed Facilities

The ratings for the two new feeder positions are to be as follows:

- Continuous current rating: 1200A
- Nominal voltage for the breakers: 36kV
- Short-circuit rating: At least 25kA
- Breaker interrupting time: 5 cycles

A 3-pole gang-operated disconnect switch is to be installed between the two new feeders on the feeder-side of the LV breakers.

3.0 Forecast Load Growth

The load at Halton TS is forecast to increase by approximately 1MW per year to the year 2010 and then at a slower rate through to the year 2015, when the peak load is expected to reach approximately 105MW.

The peak load during the summer-2002 at Meadowvale TS, which is supplied from the same radial circuits, was 174MW. This is forecast to increase to approximately 189MW in 2010 and to 197MW in 2015.

The Trafalgar DESN, which is also supplied from the same radial circuits, had a peak load of 25MW during the summer 2002, and this is forecast to grow to approximately 40MW in 2010, and approximately 50MW by 2015.

No other loads are supplied from the main section of these circuits between Burlington TS and Trafalgar TS.

Consequently, the approximate combined load to be supplied from circuits T38B & T39B is as follows:

	2002 (Actual)	2010	2015
Combined Peak Load on circuits T38B & T39B	292MW	329MW	352MW
	325MVA	365MVA	390MVA

The total load to be supplied via the two radial 230kV circuits T38B & T39B, would therefore be below the 500MW threshold for which a 'continuous' supply is required, as stated in the IMO's criteria.

With all transmission elements in-service pre-contingency, any subsequent design-criteria contingency must not result in the simultaneous loss of 500MW or more of load.

4.0 Assessment

The proposed increase in load resulting from the installation of the two new 27.6kV feeders at Halton TS would be well within the capacity of the existing transformers. Furthermore, the total load supplied from circuits T38B & T39B would be within the continuous rating of the companion circuit in the event of a single-circuit contingency involving either of these circuits.

Subject to ensuring that the facilities at Halton TS, following the installation of the two 27.6kV feeders, will continue to comply with the following Market Rule Requirements, the additional feeders are not expected to adversely impact on the IMO-controlled grid:

i. Power Factor

Reference 1 of Appendix 4.3 of the Market Rules states that:

Connected wholesale customers connected to the IMO-controlled grid shall operate at a power factor within the range of 0.9 lagging to 0.9 leading as measured at the defined metering point.

Since the defined meter point is required to be at a voltage above 50kV, then the 'effective' point for determining the power factor would be at the HV terminals of the two step-down transformers.

If it is expected that the power factor could be less than 0.9 lagging, then consideration should therefore be given to making provision within the design of the new facilities for the inclusion of shunt capacitor banks.

ii. Under-Frequency Load Shedding

Reference 2 of Appendix 4.3 and Section 10.4 of Chapter 5 of the Market Rules require that:

Facilities be installed to enable automatic under-frequency load shedding (UFLS) of at least 30% of the total peak load to be initiated in response to reductions in frequency.

However, Hydro One has the option of providing this capability at other transformer stations as long as the capability to reject at least 30% of the total peak load of each group of transformer stations is maintained.

iii. Voltage Reduction

Reference 4 of Appendix 4.3 and Section 10.3 of Chapter 5 of the Market Rules require that:

Facilities be installed to allow the distribution voltage to be reduced by 3% & 5% within 5 minutes of receiving instructions from the IMO for the reductions.

4.0 Notification of Approval

Subject to meeting the requirements of the Market Rules, it is therefore recommended that a Notification of Approval of the Connection Proposal be issued.