CONNECTION ASSESSMENT & APPROVAL PROCESS

ASSESSMENT SUMMARY

APPLICANT: *Hydro One Networks Inc.*

PROJECT: *Fort Frances TS:*
Replace Existing Oil-Filled Reactors R2A and R2B
With a New Air-Core Unit

CAA ID: *2002-EX038*

Long Term Forecasts & Assessments Department

DATE: *May 23, 2002*

Station A Box 4474 Toronto ON M5W 4E5 Canada **tel** 905.855.6100 **fax** 905.855.6372 www.theIMO.com

ASSESSMENT SUMMARY

Fort Frances TS:
Replace Existing Oil-Filled Reactors R2A and R2B
With a New Air-Core Unit

1.0 BACKGROUND

An automatic reactor switching scheme is available for operation in the Northwestern System, primarily for voltage control. The reactors are located at Kenora TS, Fort Frances TS and MacKenzie TS. These are automatically switched into and out of service, via voltage sensing relays, with manual cancellation to disable the switching scheme during system disturbances.

2.0 PROPOSAL

Fort Frances currently has two 13.8 kV, 15 MVAR oil-filled reactors, designated R2A and R2B, connected to the tertiary winding of autotransformer T2. The two 15 MVAR reactors are normally switched simultaneously.

Hydro One Networks Inc. plans to replace the existing oil-filled reactors R2A and R2B at Fort Frances TS with a new 40 MVAR air-core unit.

The new reactor specifications are as follows:

Type:	3 Phase, 60 Hz, Outdoor, Dry Type
Normal Voltage:	13.8 kV
Rated Voltage:	14.5 kV
Connection:	Ungrounded Wye
Lightning Impulse Level:	110 kV fully insulated
Operation above rated voltage:	1.095 pu continuous
Average Winding Temperature Rise:	Not exceeding 90°C at 40 MVAR
Winding Hotspot Rise:	Not exceeding 115°C at 40 MVAR
Winding Insulation Temperature Class:	220°C
Average Ambient Temperature:	30°C
Maximum Ambient Temperature:	40°C
Minimum Ambient Temperature:	-50 °C
Impedance Linearity:	Up to 1pu of the rated voltage – 1% 1.05 – 1.2 pu of the rated voltage – 5%
Variation of Impedance between coils:	No more than ±1.5% for the physical arrangement – Pyramid type per Trench dwg:99-22484-13

Hydro One has advised that the proposed new 40 MVAR unit is capable of autotripping with a delay of 1.4 sec if the HT voltage is less than 220 kV, as required by the IMOs System Control Orders.

The scheduled in-service date for the work is June 30, 2002.

3.0 IMPACT ASSESSMENT

It is noted that, originally, there was a 40 MVAR reactor connected to the tertiary of T2. This unit failed and was replaced with 2 x 15 MVAR units in the last few years. Since the system is designed to accommodate switching of a the original 40 MVAR reactor with similar impedance to the proposed new reactor, this replacement is considered a like for like replacement, with no adverse system impacts.

4.0 REQUIREMENTS FOR CONNECTION

Based on the above, it is concluded that the proposed reactor replacement will not have any adverse system impacts. The project may, therefore, proceed subject to meeting all applicable market rules and regulatory requirements

5.0 NOTIFICATION OF APPROVAL OF THE CONNECTION PROPOSAL

Based on the results of this Assessment, it is recommended that the Applicant should receive a "Notification of Approval of the Connection Proposal" for this project. The Applicant is required to obtain the necessary approvals as may be required by the OEB and other regulatory authorities, including requirements of the facility registration process.