



# **CONNECTION ASSESSMENT & APPROVAL PROCESS ASSESSMENT SUMMARY**

**Applicant: Hydro One Networks Inc.**

**Project: Ramore TS – Build New 115-27.6kV Station**

**CAA ID: 2002-EX059**

**Long Term Forecasts & Assessments Department**

**Date: August 23, 2002**

## Assessment Summary

### Hydro One Networks Inc.

#### Ramore TS – Build New 115-27.6kV Station

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## 1.0 Description of Proposal

Hydro One Networks Inc. (HONI) continuously assesses its current transmission and distribution assets to ensure that its transmission and distribution systems are performing at an acceptable level, are in compliance with any regulatory standards, and are capable of meeting its customers current and future needs. As part of this assessment effort, Hydro One Networks Inc. has developed a transmission station refurbishment and replacement strategy to systematically address their population of aging transformer stations. Ramore TS has been identified as a prime candidate under this strategy.

Ramore TS was constructed in 1935 for 25Hz operation and was converted to 60Hz operation in 1958. The station currently has a 3-phase 110-28.4kV 8MVA transformer with a motorized disconnect switch for isolation and two low voltage feeders. Ramore TS is connected to the Ansonville TS to Kirkland Lake TS 115kV transmission circuit A9K and is currently supplying about 6MVA of load in the Ramore-Matheson area north of Kirkland Lake. HONI's 10-year load forecast predicts that the annual load growth at Ramore TS will range from 0.4% to 1.4%.

The applicant is proposing to replace the aging Ramore TS with a new 115-27.6kV station within the existing property. The proposal includes:

- Construction of a new 115-27.6kV station containing one 3-phase 10/13/16.7MVA 115.5-27.6kV transformer and two 27.6kV feeder positions with provision to connect a Mobile Unit Substation in case of protracted transformer outage. Figure 1 is a single line diagram of the new station.
- Removal of all existing 25Hz and 60Hz facilities.

The new transformer, circuit switcher, and low voltage circuit recloser ratings are:

#### Transformer:

Nominal Rated Voltage:	HV – 115.5kV; LV – 27.6kV
Maximum Voltage:	HV – 127.05kV; LV – 30.365kV
Configuration:	3-Phase
Temperature Rise:	65°C
Thermal Rating:	10/13/16.7MVA; ONAN/ONAF/OFAF
Connection:	H – Delta; L – Wye grounded
HV fixed taps:	115.5, 118.39, 121.27, 124.16, 127.05kV
LV ULTC:	±3.366kV in 32 Steps

#### Circuit Switcher:

Nominal Rated Voltage:	138kV
Maximum Voltage:	145kV
Continuous current carrying capacity:	1200 Amp
Short circuit capability:	20kA Symmetrical

#### LV Circuit Recloser:

Rated Voltage:	34.5kV
Continuous current carrying capacity:	560A
Short circuit capability:	8kA Symmetrical

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## 2.0 Assessment

The existing facilities at Ramore TS have deteriorated to a state that it is more economical to replace them than to refurbish the facilities. The applicant is proposing to replace the existing Ramore TS with a new station having a maximum capacity of 16.7MVA, which is twice the current station capacity of 8MVA. The Ansonville TS to Kirkland Lake TS 115kV transmission circuit A9K has a summer thermal capacity of 270A (54MVA @ 115kV) and a winter capacity of 370A (74MVA @ 115kV). The circuit has enough capacity to support the new higher capacity Ramore TS.

The new transformer impedance is about 8.72% on 10MVA base and is about 20% lower than the impedance of the existing transformer (11.13% on 10MVA base). The short circuit levels at Ramore TS, Ansonville TS, and Kirkland Lake TS will increase slightly. The current short circuit levels at Ramore TS 115kV and 27.6kV buses are about 3500A and 2200A respectively. The short circuit interrupting capabilities of the new Ramore TS, Ansonville TS, and Kirkland Lake TS are well above the expected short circuit levels in the area.

The addition of circuit switcher as the high voltage interrupting device is an improvement in the isolation of Ramore TS station fault over the existing arrangement of relying on coverage provided by A9K line protection.

There is no under frequency load shedding (UFLS) scheme at the existing Ramore TS and HONI is not proposing to install any UFLS at the new station. It has been decided that UFLS is not required at Ramore TS at this time. IMO periodically review the UFLS requirements in the system and will inform HONI if in the future it is deemed necessary to have UFLS at Ramore TS.

This proposal is essentially a like-for-like replacement of existing facilities and will have no adverse impact on the IMO controlled grid.

## 3.0 Notification of Approval

Based on the above assessment, it is recommended that a Notification of Approval for this proposal be issued to the applicant.

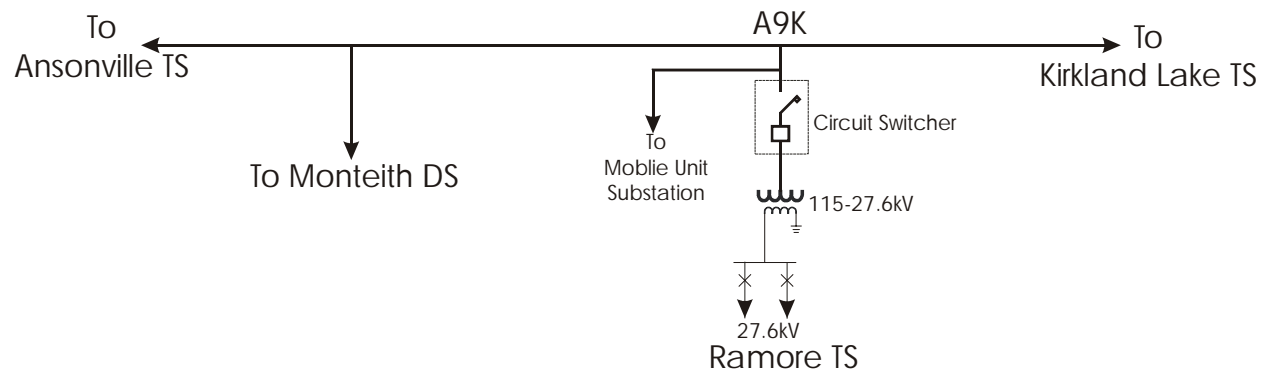


Figure 1