



CONNECTION ASSESSMENT & APPROVAL PROCESS ASSESSMENT SUMMARY

Applicant: Hydro One Networks Inc.

**Project: Hearst TS
Replace 34.5kV Oil Breaker JY**

CAA ID: 2002 – EX105

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

Date: February 18, 2003

1.0 Description of Proposal

Hydro One Networks Inc. is proposing to replace the existing 34.5kV 800A oil breaker JY at Hearst TS with a re-built oil breaker of identical ratings. Hearst TS is located in Northeastern Ontario and is radially connected to the Kapuskasing TS via the 115kV single circuit transmission line F1E. The station contains three 115-25kV step down transformers and the station electrical arrangement is as shown in Figure 1. The subject breaker is associated with the transformers T1 and T2, and is identified in Figure 1.

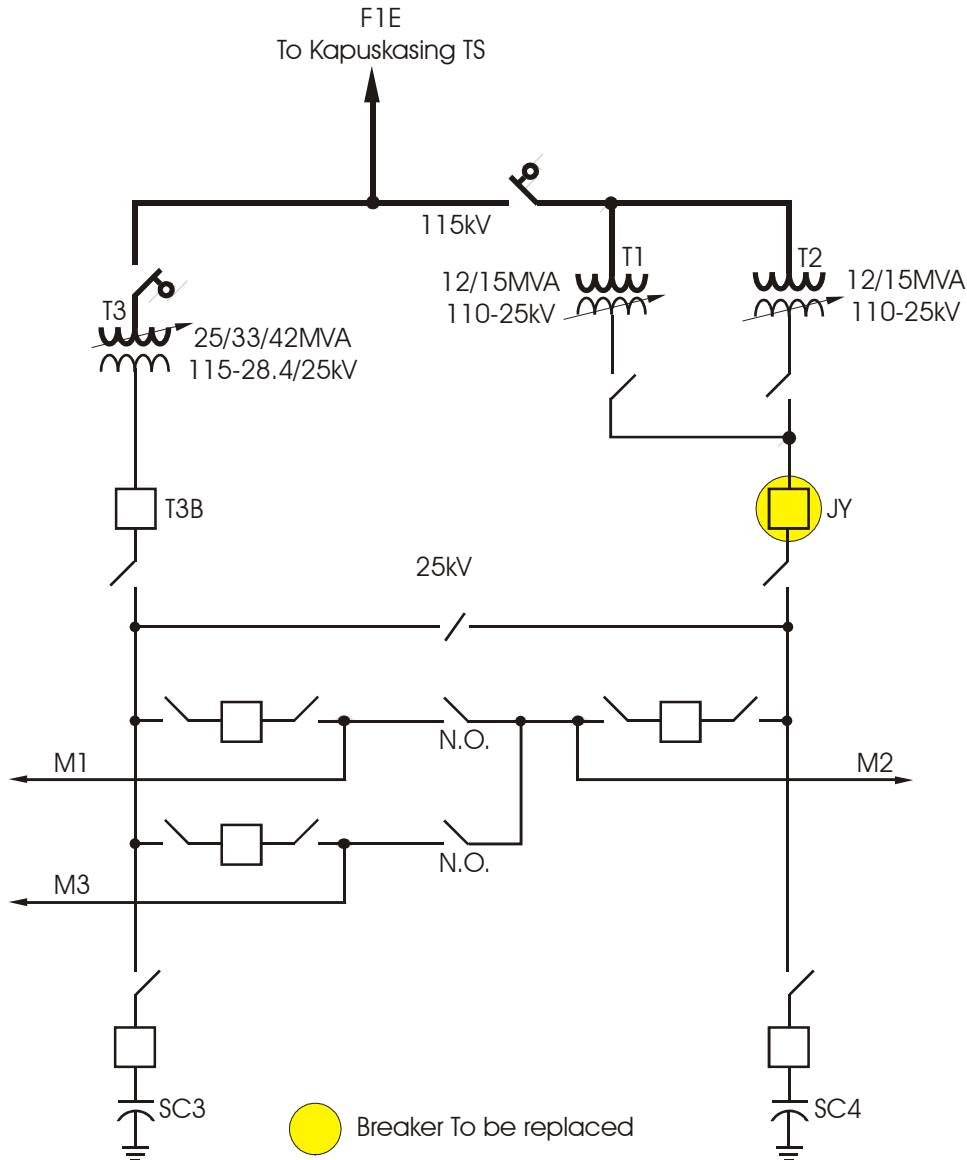


Figure 1: Hearst TS

The replacement breaker is rated as follow:

Type: Oil
 Maximum Voltage: 34.5kV
 Continuous Current: 800A
 Interrupting Capability: 500MVA Asymmetric (8.1kA Sym. and 8.4kA Asym. at 34.5kV)

The proposed work is scheduled for completion in 2003 under the proponent’s 2003 Breaker Replacement Program.

2.0 Assessment

Information from Hydro One Networks Inc. shows that the present maximum short circuit level at the 25kV level is about 7kA (Single line to ground fault with pre-fault voltage of 26.4kV). The interrupting capability of the replacement breaker would be adequate.

As shown in Figure 1, breaker JY is connected to the two transformers T1 and T2. The breaker should therefore match the combined thermal capacities of the two transformers. The combined thermal capacities of the transformers T1 and T2 and the operating ratings of the replacement breaker are listed in the following table.

Equipment	Summer (MVA/Ampere)		Winter (MVA/Ampere)	
	Continuous	10-day LTR ¹	Continuous	10-day LTR ¹
Transformers T1 & T2	30MVA/693A ²	42.2MVA/975A ²	30MVA/693A ²	46.4MVA/1072A ²
Replacement Breaker	36MVA ² /832A ³	37.4MVA ² /864A ³	47.8MVA ² /1104A ⁴	49.9MVA ² /1152A ⁴
Notes:				
(1) LTR = Limited time rating				
(2) Based on 25kV				
(3) Based on ambient temperature of 30°C				
(4) Based on ambient temperature of -20°C				

Table 1 – Equipment Ratings

A comparison of the transformer thermal capacities and the breaker ratings shows that the replacement breaker has a lower summer 10-day limited time rating (LTR) than the transformers. The breaker is the limiting element at Hearst TS. Although the transformers can supply up to 42.2MVA of load during the summer, the station summer load meeting capability would be limited by the breaker 10-day LTR to 37.4MVA.

The present summer peak load at Hearst TS is about 25MVA and that the average annual growth rate in Northeastern Ontario is expected to be less than 1%. The replacement breaker thus would be adequate for quite some time.

The proposal is essentially a like-for-like replacement of existing facility. Even though the breaker would limit the station load meeting capability, it would not have any impact on the operating reliability of 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.