



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

**Applicant: Hydro One Networks Inc.**

**Project: A.W. Manby TS – Replace 115kV and 230kV  
Line and Transformer Disconnect Switches  
and 115kV Grounding Switch**

**CAA ID: 2002 – EX085**

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

**Date: November 9, 2002**

**A.W. Manby TS – Replace 115kV and 230kV Line and Transformer Disconnect Switches and 115kV Grounding Switch**

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## 1.0 Description of Proposal

Hydro One Networks Inc. is proposing to replace a number of line and transformer disconnect switches and a grounding switch at A.W. Manby TS with new units. The proposal includes the replacement of:

1. The two 230kV 1,200A disconnect switches T8-H3, T9-A2 associated with the 236.8-121-13.4kV 150/200/250MVA autotransformers T8 and T9 with new 230kV 2,000A disconnect switches that can withstand up to 63kA short circuit current.
2. The 115kV 2,000A disconnect switch T8-K2 and the 115kV 3,000A disconnect switch T9-D associated with the 236.8-121-13.4kV 150/200/250MVA autotransformers T8 and T9 with new 115kV 2,000A disconnect switches that can withstand up to 63kA short circuit current.
3. The two 230kV 1,200A disconnect switches T13-A1 and T14-H1 associated with the 220-28kV 50/67/83/93MVA step-down transformers T13 and T14 with new 230kV 1,200A disconnect switches that can withstand up to 44kA short circuit current.
4. The 115kV 1,200A line disconnect switch H2JK and grounding switch H2JK-G associated with the A.W. Manby TS to Toronto John TS transmission circuit H2JK with new 115kV 2,000A line disconnect switch capable of withstanding 63kA short circuit current and a new 115kV grounding switch.

## 2.0 Assessment

With the exception of the 115kV transformer disconnect switch T9-D, new switches of a rating that is either the same or better than the existing rating are to be used. For the existing 115kV 3,000A transformer disconnect switch T9-D, the applicant is proposing to use a lower rated 2,000A 115kV disconnect switch.

The maximum continuous thermal rating of transformer T9 is 250MVA (1193A @ rated voltage 121kV) with the corresponding summer and winter 10-day limited time ratings of about 310MVA (1479A @ rated voltage 121kV) and 354MVA (1689A @ rated voltage 121kV) respectively. A continuous rating of 2,000A for the new transformer disconnect switch will therefore be adequate.

The new 230kV 1,200A disconnect switches for the two step-down transformers T13 and T14 have a short duration current carrying capacity of only 44kA, while the remaining replacement switches are rated for 63kA. Information from Hydro One Networks Inc. indicates that the present maximum symmetrical short circuit current at the A.W. Manby TS 230kV bus could reach 42.5kA. A disconnect switch that can withstand 44kA short circuit current is barely adequate with practically no margin for future system development. Within the greater Toronto area and vicinity, there are potential generation developments that could push the short circuit level at A.W. Manby TS 230kV bus beyond 44kA. In addition, the Transmission System Code specifies that new facilities installed on the 230kV transmission system should be rated at 63kA.

## 3.0 Conclusions and Recommendations

The proposal is essentially a like-for-like replacement of existing facilities and would not have any adverse impact on the IMO-controlled grid. However, the maximum short circuit level at A.W. Manby TS is such that the installation of equipment that can withstand 63kA short circuit current is warranted.

## 4.0 Notification of Approval

Based on the above assessment, it is recommended that a Notification of Approval for this proposal be issued to the applicant, subject to meeting the requirement that all the new replacement disconnect switches be capable of withstanding a maximum fault level of 63kA.