

October 18, 2012

Mr. Ted Lyberogiannis  
Sustainment Manager - Transmission Stations Planning  
Hydro One Networks Inc.  
483 Bay Street  
Toronto, Ontario  
M5G 2P5

Dear Mr. Lyberogiannis:

***Replacement of T14 & T15 at Claireville TS  
Notification of Conditional Approval of Connection Proposal  
CAA ID Number: 2012-EX616***

Thank you for the information regarding the proposed replacement of T14 and T15 autotransformers at Claireville TS. The IESO has concluded that the proposed changes will not result in a material adverse impact on the reliability of the integrated power system. The IESO is therefore pleased to grant **conditional** approval as detailed in the attached expedited System Impact Assessment report. Please note that any material changes to your proposal may require a re-assessment by the IESO and may nullify your conditional approval.

You may now initiate the IESO's **Facility Registration/Market Entry** process. To do so, please contact Registration & Compliance Support at [market.entry@ieso.ca](mailto:market.entry@ieso.ca) as soon as possible prior to your expected energization date. The SIA report, attached hereto, details the requirements that your company must fulfill during this process, including demonstrating that the equipment *as installed* will not be materially different from the equipment *as approved* by the IESO. The document entitled [Market Entry: A Step-by-Step Guide](#) describes the key steps in the Market Entry process.

When your company has successfully completed the IESO's **Facility Registration/Market Entry** process, the IESO will provide you with a **final approval**, thereby confirming that the equipment is fully authorized to connect to the IESO-controlled grid.

For further information, please contact me via [connection.assessments@ieso.ca](mailto:connection.assessments@ieso.ca).

Yours truly,

Michael Falvo  
Manager – Market Facilitation  
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cc: IESO Records

**Final Report - Expedited System Impact Assessment – revised May 3, 2013**  
**Hydro One Networks Inc.**

**1.0 GENERAL DESCRIPTION & PROPOSED MODIFICATIONS**

Hydro One Networks Inc. is proposing to replace autotransformers T14 and T15 at Claireville TS with new units due to end of life concerns. The expected in-service dates will be communicated to the IESO.

**2.0 TECHNICAL SPECIFICATIONS**

The technical specifications of the existing and replacement T14 and T15 are given in the following table.

<b>Claireville TS</b>		
<b>Values for replacement equipment specified at the time of order. Actual values to be provided prior to in-service dates.</b>		
<b>Transformer</b>	<b>Original Transformers</b>	<b>Replacement T14 &amp; T15</b>
<b>Configuration</b>	Three phase	Three phase
<b>Transformation (kV)</b>	500/240/28.0	500/240/28.0
<b>Winding Configuration</b>	Wye/wye/delta	Wye/wye/delta
<b>Thermal Rating</b>	450 MVA ONAN 600 MVA ODAF 750 MVA ODAF	450 MVA ONAN 600 MVA ONAF 750 MVA ONAF
<b>Continuous Thermal Rating (summer 35°C)</b>	750.0 MVA	750.0 MVA
<b>10-DAY Thermal Rating (summer 35°C)</b>	988.0 MVA (T13) 992.0 MVA (T14) 750.0 MVA (T15) 1147.0 MVA (T16)	1130.0 MVA
<b>15-MIN Thermal Rating (summer 35°C)</b>	1227.0 MVA (T13) 1304.0 MVA (T14) 1125.0 MVA (T15) 1396.0 MVA (T16)	1500.0 MVA
<b>Positive Sequence Impedance (H-L)</b>	R = 0.140% (T14); 0.145% (T15) X = 12.77% (T14); 12.84% (T15) on 750 MVA base	R = 0.148% (T14); 0.15% (T15) X = 13.33% (T14); 13.26% (T15) on 750 MVA base
<b>Impedance to Ground</b>	HV - 0 Ω LV ungrounded	HV - 0 Ω LV ungrounded
<b>Under-load tap-changer</b>	N/A	500 ± 50 kV 20 steps
<b>Off-load tap-changer</b>	Tap 1: 525.0 kV Tap 2: 512.5 kV Tap 3: 500.0 kV Tap 4: 487.5 kV Tap 5: 475.0 kV Tap 6: 462.5 kV	N/A
<b>In service off-load tap position</b>	Tap 3: 500.0 kV	N/A

**Table 1 – Comparison of Existing and Replacement Autotransformers at Claireville TS**

### **3.0    REQUIREMENTS**

Hydro One must notify the IESO as soon as it becomes aware of any changes to the assumptions made in the connection assessment. The IESO will determine whether these changes require a re-assessment.

#### **Protection Requirements**

Hydro One is required to meet the requirements with respect to protection systems for the new transformers and coordination with the existing protection systems, as outlined in the Transmission System Code.

#### **Monitoring Requirements**

The Market rules (Chapter 4 section 7.4) require that the transmitter shall provide the IESO on a continual basis with on-line monitored quantities as specified in Appendix 4.16. For this proposed project, the IESO will continue to require the operating quantities associated with the new transformers. Among other things, end to end telemetry testing must be completed by the applicant along with the IESO to ensure that standards are met and sign conventions are understood.

Provided that the TSC requirements are satisfied, the IESO does not have additional requirements.

### **4.0    ASSESSMENT & CONCLUSIONS**

#### **4.1    Replacement Transformers**

The replacement T14 & T15 at Claireville TS will provide a better voltage regulation capability in the GTA by having ULTCs, and will have a better supply capability by having a higher 10 day LTEs than the end of life T14 & T15.

#### **4.2    Conclusions**

The information provided by Hydro One shows that the technical characteristics of the replacement T14 and T15 are equal to or better than those of the end of life units.

It can be concluded that the replacement of T14 & T15 autotransformers at Claireville TS will not result in a material adverse impact on the reliability of the integrated power system provided that all requirements in this report are met.