

June 10, 2009

Mr. Dave Sinclair  
President & CEO  
Kenora Hydro Electric Corporation Ltd.  
Box 2680- 215 Mellick Ave.  
Kenora, ON  
P9N 3X8

Dear Mr. Sinclair

***Substation Rebuild at Kenora MTS  
Notification of Conditional Approval of Connection Proposal  
CAA ID# 2009-EX434***

Thank you for the detailed information regarding the substation rebuild at Kenora MTS.

The IESO has determined that this project 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** for the modification detailed in the attached assessment report subject to your signed acknowledgment below. Any material changes to your proposal may require re-assessment by the IESO in accordance with Market Manual 2.10, and may nullify your conditional approval.

**Final approval** to connect the facility to the IESO-controlled grid will be granted upon successful completion of the IESO Market Entry process including, without limitation, satisfactory completion of the requirements set out in the System Impact Assessment report. During this process you shall demonstrate the requirements have been fulfilled and the equipment installed has characteristics no worse than those in the proposal assessed by the IESO. Please contact [market.entry@ieso.ca](mailto:market.entry@ieso.ca) if you have not received a Facility Registration Summary package within the next 10 days.

For further information, please contact the undersigned.

Yours truly

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cc: IESO Records

Kenora Hydro Electric Corporation Ltd. acknowledges receipt of the System Impact Assessment Report setting out the IESO requirements for final approval, and commits to fulfill these requirements, and all other applicable Market Rules, before receiving final approval to connect to the IESO-controlled grid.

Dated: \_\_\_\_\_

Per: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**ASSESSMENT SUMMARY**  
**Kenora Hydro**

**1.0 GENERAL DESCRIPTION & PROPOSED MODIFICATIONS**

Kenora Hydro is planning to replace the existing T3 transformer at Kenora MTS with a new T4 and a new disconnect switch. The expected in-service date is June 2009.

Kenora MTS is fed from the 115 kV circuits 15M1 from Rabbit Lake TS. The new configuration of Kenora MTS is shown in figure 1 below.

There is no new load associated with this project.

**2.0 TECHNICAL SPECIFICATIONS**

A comparison of the technical specifications between the existing and the replacement T4 is given below. The new T4 used to be T2 before being hit by lightning. It was repaired and is now in place as T4. The new T4 will be placed in a different location than the old T3 which is the reason for using T4 as the nomenclature.

<b>Kenora MTS</b>			
<b>Transformer</b>	<b>Existing T1 &amp; end of life T3</b>	<b>Existing T2 (replaced in 2008)</b>	<b>Replacement T4 (originally T2 before it was hit by lightning and rebuilt as T4)</b>
<b>Configuration</b>	Three phase	Three phase	Three phase
<b>Transformation (kV)</b>	115 / 12.5	115 / 12.5	115 / 12.5
<b>Winding Configuration</b>	D / Y	D / Y	D / Y
<b>Thermal Rating</b>	9.0 MVA ONAN 12 MVA ONAF	10.0 MVA ONAN 12.5 MVA ONAF (55°C) 14.0 MVA ONAF (65°C)	9.0 MVA ONAN 12 MVA ONAF
<b>Continuous Thermal Rating (summer 30°C)</b>	9.0 MVA	10.0 MVA	9.0 MVA
<b>15 Minute Thermal Rating (summer 30°C)</b>	Not applicable		
<b>10 Day Thermal Rating (summer 30°C)</b>			
<b>Positive Sequence Impedance (H-X)</b>	R = xx % X = 6.0% on 9 MVA base	R = xx % X = 7.69% on 10 MVA base	R = xx % X = 6.28% on 9 MVA base
<b>Impedance to Ground</b>	solidly grounded	solidly grounded	solidly grounded
<b>Under-load tap-changer</b>	None	12.47 ± 1.247 kV 32 steps	None
<b>Off-load tap-changer</b>	HV Tap 1: 132.25 kV Tap 2: 129.375 kV Tap 3: 126.5 kV Tap 4: 123.625 kV Tap 5: 120.75 kV Tap 6: 117.875 kV Tap 7: 115.0 kV	HV Tap 1: 120.75 kV Tap 2: 117.875 kV Tap 3: 115.0 kV Tap 4: 112.125 kV Tap 5: 109.25 kV	HV Tap 1: 132.25 kV Tap 2: 129.375 kV Tap 3: 126.5 kV Tap 4: 123.625 kV Tap 5: 120.75 kV Tap 6: 117.875 kV Tap 7: 115.0 kV
<b>In service off-load tap position</b>	Tap 5	Tap 1	To be advised

The technical specifications of the new disconnect switch is given in Table 1 below.

<b>Disconnect Switch Specifications</b>	
<b>Kenora MTS - T4-L</b>	
<b>Configuration</b>	3 phase
<b>Rated Voltage</b>	138 kV
<b>Maximum Continuous Rated Voltage</b>	145 kV
<b>Load Interrupting Current</b>	1200 A
<b>Short Circuit Symmetrical Duty Rating</b>	61 kA

**Table 1 – Specifications of New Transformer Disconnect Switch at Kenora MTS**

### **3.0 REQUIREMENTS**

The proponent 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.

Appendix 4.1, reference 2 of the Market Rules states that equipment on the 115 kV grid in the north may be exposed to voltages as high as 132 kV. In addition, some recognized contingencies (e.g. load shedding, open line end) can cause a temporary voltage increase above the maximum continuous voltage. For these conditions, connection equipment may be exposed to voltages approximately 5% above the maximum continuous operating voltage for the period of time that it takes the IESO to direct operations to restore a normal voltage profile and to prepare for the next contingency. This reparation period will be as short as possible but it should not take longer than 30 minutes. Therefore, the IESO requires that 115 kV connection equipment in northern Ontario:

- must have a maximum continuous voltage rating of at least 132 kV; and
- must be able to sustain operation at voltages up to 139 kV for up to 30 minutes.

Please be aware that revenue metering installations must comply with the appropriate Measurement Canada requirements as well as the Market Rules for the Ontario electricity market. For more details the applicant is encouraged to seek advice from their Metering Service Provider (MSP) or from the IESO metering group.

The Transmission System Code (TSC), Appendix 2 establishes maximum fault levels for the transmission system. For the 115 kV system, the maximum 3 phase symmetrical fault level is 50 kA and the single line to ground (SLG) symmetrical fault level is 50 kA.

The Transmission System Code (TSC) requires that new equipment be designed to sustain the fault levels in the area where the equipment is installed. If any future system enhancement results in an increased fault level higher than the equipment's capability, the applicant is required to replace the equipment at the applicant's expense with higher rated equipment capable of sustaining the increased fault level, up to the TSC's maximum fault level of 50 kA for the 115 kV system.

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

### **4.0 ASSESSMENT & CONCLUSIONS**

The replacement transformer T4 is identical to the existing T1 transformer and very similar to T2.

The new disconnect switch will meet the short circuit requirements and the maximum voltage requirements stated in section 3.

This expedited System Impact Assessment concludes that the installation of the new transformer T4 in place of the end of life T3 and the new disconnect switch at Kenora MTS is not expected to have a material adverse impact on the IESO-controlled grid.

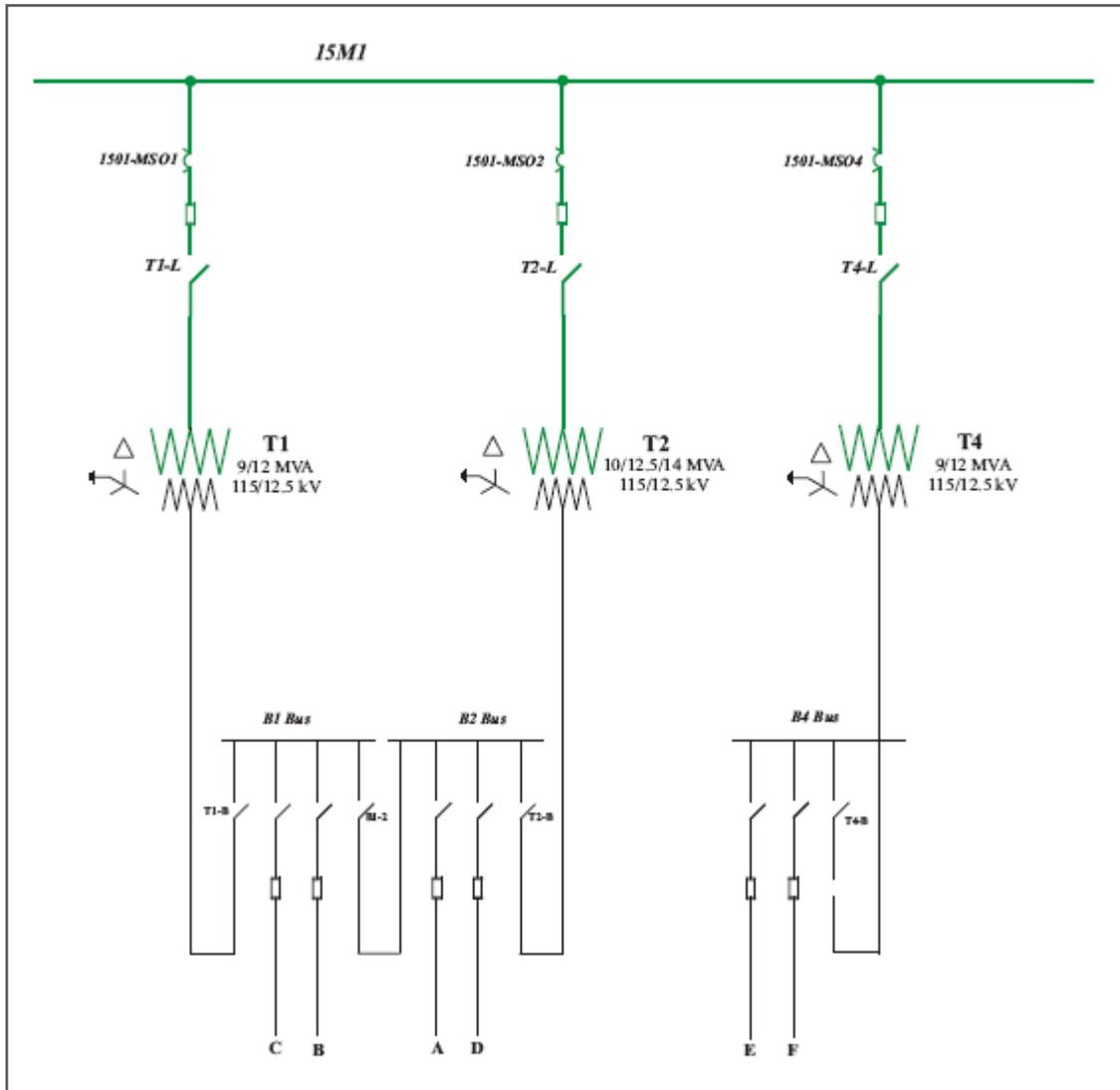


Figure 1 – Kenora MTS Future Configuration