

March 22, 2011

Mr. Charles Wickham
General Manager Eastern Operations
Capital Power Corporation
Suite 1301, 200 University Avenue
Toronto, ON
M5H 3C6

Dear Mr. Wickham:

***Permanent Tunis T1 Replacement
Notification of Conditional Approval of Connection Proposal
CAA ID Number: 2011-EX535***

The IESO has now had an opportunity to review and assess your company's proposed replacement of the T1 transformer. The IESO has concluded that the proposed connection 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 System Impact Assessment report. Please note that any further material change to your proposed connection may require a re-assessment by the IESO, and may result in a nullification of the conditional approval.

You may now initiate the IESO's "Market Entry" process. To do so, please contact Market Entry at 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 "**External Guidelines for Connection to the IESO**" provided in the approval email describes the key steps in the Market Entry process.

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

For further information, please contact the undersigned.

Yours truly,

Michael Falvo
Manager – Market Facilitation
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cc: IESO Records

**Final Report - Expedited System Impact Assessment
Capital Power Corporation**

1.0 GENERAL DESCRIPTION & PROPOSED MODIFICATIONS

Tunis GS is a 60 MW generating station connected to the 115 kV circuit A5H between Hunta TS and Ansonville TS. Transformer T1 failed in September 2010 and was replaced with a temporary rental unit. Expedited SIA report [2010-EX506](#) provides details of that temporary replacement unit.

Now a permanent replacement transformer has been specified for an in-service date of October 2011.

2.0 TECHNICAL SPECIFICATIONS

A comparison of the technical specifications between the original (failed) transformer, the temporary rental replacement transformer and the permanent replacement transformer is given in the following table.

Tunis GS			
Transformer	Failed T1	Temporary Replacement T1 (Rental unit)	Permanent Replacement T1
Configuration	Three phase	Three phase	Three phase
Transformation (kV)	128/13.8	115/13.8	128/13.8
Winding Configuration	Wye/Delta	Wye/Delta	Wye/Delta
Thermal Rating	27.0 MVA ONAN 36.0 MVA ONAF 45.0 MVA OFAF	30.0 MVA ONAN 44.0 MVA ONAF 56.0 MVA OFAF	30.0 MVA ONAN 40.0 MVA ONAF 50.0 MVA OFAF
Continuous Thermal Rating (summer 30°C)	27.0 MVA	30.0 MVA	30.0 MVA
10-DAY Thermal Rating (summer 30°C)	N/A	N/A	N/A
15-MIN Thermal Rating (summer 30°C)	N/A	N/A	N/A
Positive Sequence Impedance	R = not available X = 7.2 % on 27 MVA base	R = 0.343% X = 8.37% on 30 MVA base	R = 0.26% X = 7.5% on 30 MVA base
Impedance to Ground	Ungrounded	Ungrounded	Ungrounded
Under-load tap-changer	N/A	N/A	N/A
Off-load tap-changer	Tap 1: 134.4 kV Tap 2: 131.2 kV Tap 3: 128.0 kV Tap 4: 124.8 kV Tap 5: 121.5 kV	Tap 1: 123.625 kV Tap 2: 120.75 kV Tap 3: 117.875 kV Tap 4: 115.0 kV Tap 5: 112.125 kV	Tap 1: 134.4 kV Tap 2: 131.2 kV Tap 3: 128.0 kV Tap 4: 124.8 kV Tap 5: 121.6 kV
In service off-load tap position	Tap 3: 128.0 kV	Tap 1: 123.625 kV	Tap 3: 128.0 kV

3.0 REQUIREMENTS

Capital Power 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.

Capital Power is required to meet the requirements with respect to protection system for the new transformer and coordination with the existing protection system, as outlined in the Transmission System Code.

In accordance with the telemetry requirements for a generation facility (see Appendices 4.15 and 4.19 of the Market Rules) the connection applicant must install equipment at this project with specific performance standards to provide telemetry data to the IESO. For this proposed project, the IESO will continue to require the operating quantities associated with this transformer.

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

4.0 ASSESSMENT & CONCLUSIONS

The information provided by Capital Power shows that the technical characteristics of the permanent replacement transformer are similar to or better than those of the temporary replacement transformer.

According to the Market Rules, Appendix 4.1, the permissible voltage at the primary side of the transformer can vary from 113 kV to 132 kV in northern Ontario. With the voltage at 132 kV, the replacement transformer's OLTC can vary the low voltage bus across the voltage range as shown below.

Secondary Voltage Range with primary voltage = 132 kV	
Temporary Replacement T1 (rental unit) (in-service off load tap set at 123.625 kV)	Permanent Replacement T1 (in-service off load tap set at 128.0 kV)
13.8 kV winding	
13.6 – 15.0 kV	13.6 – 15.0 kV

Table 1 – Secondary Voltage Ranges for Temporary Replacement and Permanent Replacement Transformer

It can be concluded that the installation of the permanent replacement T1 transformer at Tunis GS is not expected to have a material adverse impact on the IESO controlled grid.