

September 18, 2012

Mr. Wilfred Meston, P. Eng.
Vice President Operations
Kitchener-Wilmot Hydro Inc.
PO Box 9010
301 Victoria St. South
Kitchener, Ontario
N2G 4L2

Dear Mr. Meston:

***Replacement of T14 at Kitchener MS#7
Notification of Conditional Approval of Connection Proposal
CAA ID Number: 2012-EX629***

Thank you for the information regarding the proposed replacement of T14 at Kitchener MS#7. 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 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 facility is fully authorized to connect to the IESO-controlled grid.

For further information, please contact me via connection.assessments@ieso.ca.

Yours truly,

Michael Falvo
Manager – Market Facilitation
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cc: IESO Records

**Final Report - Expedited System Impact Assessment
Kitchener-Wilmot Hydro Inc.**

1.0 GENERAL DESCRIPTION & PROPOSED MODIFICATIONS

Kitchener-Wilmot Hydro Inc. is proposing to replace the failed T14 at Kitchener MS#7 with a new unit. The expected in-service date for the replacement T14 will be communicated to the IESO.

Kitchener MS#7 is a 110/14.2 kV DESN transformer station on the 115 kV circuits D7F and D9F out of Detweiler TS and Hanover TS.

2.0 TECHNICAL SPECIFICATIONS

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

Kitchener MS#7		
Values for replacement equipment specified at the time of order. Actual values are to be provided prior to in-service dates.		
Transformer	Existing T13 & T14	Replacement T14
Configuration	Three phase	Three phase
Transformation (kV)	115/14.2	115/14.2
Winding Configuration	Delta/Wye	Delta/Wye
Thermal Rating	30.0 MVA ONAN 40.0 MVA ODAF 50.0 MVA ODAF	30.0 MVA ONAN 40.0 MVA ODAF 50.0 MVA ODAF
Continuous Thermal Rating (summer 35°C)	50.0 MVA	50.0 MVA
10-DAY Thermal Rating (summer 35°C)	60.0 MVA	60.0 MVA
15-MIN Thermal Rating (summer 35°C)	60.0 MVA	60.0 MVA
Positive Sequence Impedance (H-L)	R = 0.279% X = 12.83% on 15.0 MVA base	R = 0.279% X = 12.85% on 15.0 MVA base
Impedance to Ground	HV – Ungrounded LV – 1.5 Ω neutral grounding reactor	HV – Ungrounded LV – 1.5 Ω neutral grounding reactor
Under-load tap-changer	14.2 ± 2.13 kV 24 Steps	14.2 ± 2.13 kV 24 Steps

Table 1 – Comparison of Existing and Replacement Transformer at Kitchener MS#7

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.

Reactive Power Requirements

The Market Rules require that the proponent have the capability to maintain a power factor within the range of 0.9 lagging and 0.9 leading as measured at the defined metering points at Kitchener MS#7.

IESO Monitoring Requirements

In accordance with Section 7.4 of Chapter 4 of the Market Rules, the connection applicant shall provide to the IESO the applicable telemetry data listed in Appendix 4.17 of the Market Rules on a continual basis. The data shall be provided in accordance with the performance standards set forth in Appendix 4.22, subject to Section 7.6A of Chapter 4 of the Market Rules. For this proposed project, the IESO will continue to require the operating quantities associated with the new transformer.

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

4.0 ASSESSMENT & CONCLUSIONS

4.1 10-Day Summer Transfer Capabilities

The 10-DAY summer transfer capability for a DESN at Kitchener MS#7 is determined by removing the transformer with the highest 10-DAY thermal rating from service.

The 10-DAY summer ratings of these two transformers at Kitchener MS#7 are listed in the table below.

10-DAY Summer Thermal Ratings (35°C) for Transformers T13/T14 DESN at Kitchener MS#7		
Transformer	Existing T13 & T14	Existing T13 & New T14
T13	O/S (60.0 MVA)	60.0 MVA
T14	60.0 MVA	O/S (60.0 MVA)
10-DAY Summer Transfer Capability (with highest rated transformer out of service)	60.0 MVA	60.0 MVA

Table 2 – 10-DAY Summer Thermal Ratings for T13/T14 DESN at Kitchener MS#7

For the T13/T14 DESN at Kitchener MS#7, the existing 10-DAY summer transfer capability is 60.0 MVA. The 10-DAY summer transfer capability will remain the same when the new T14 is put into service.

4.2 Peak Loads and Projections

Revenue meter information from June 21, 2011 through September 13, 2012 was used to evaluate the load on the T13/T14 DESN at Kitchener MS#7. The peak load of 48.95 MVA on the T13/T14 DESN at Kitchener MS#7 occurred on July 21, 2011 at 17:00. The figure below shows the loading at the HV side of the T13/T14 DESN during the daily on-peak hours, which are defined as 7 a.m. until 11 p.m.

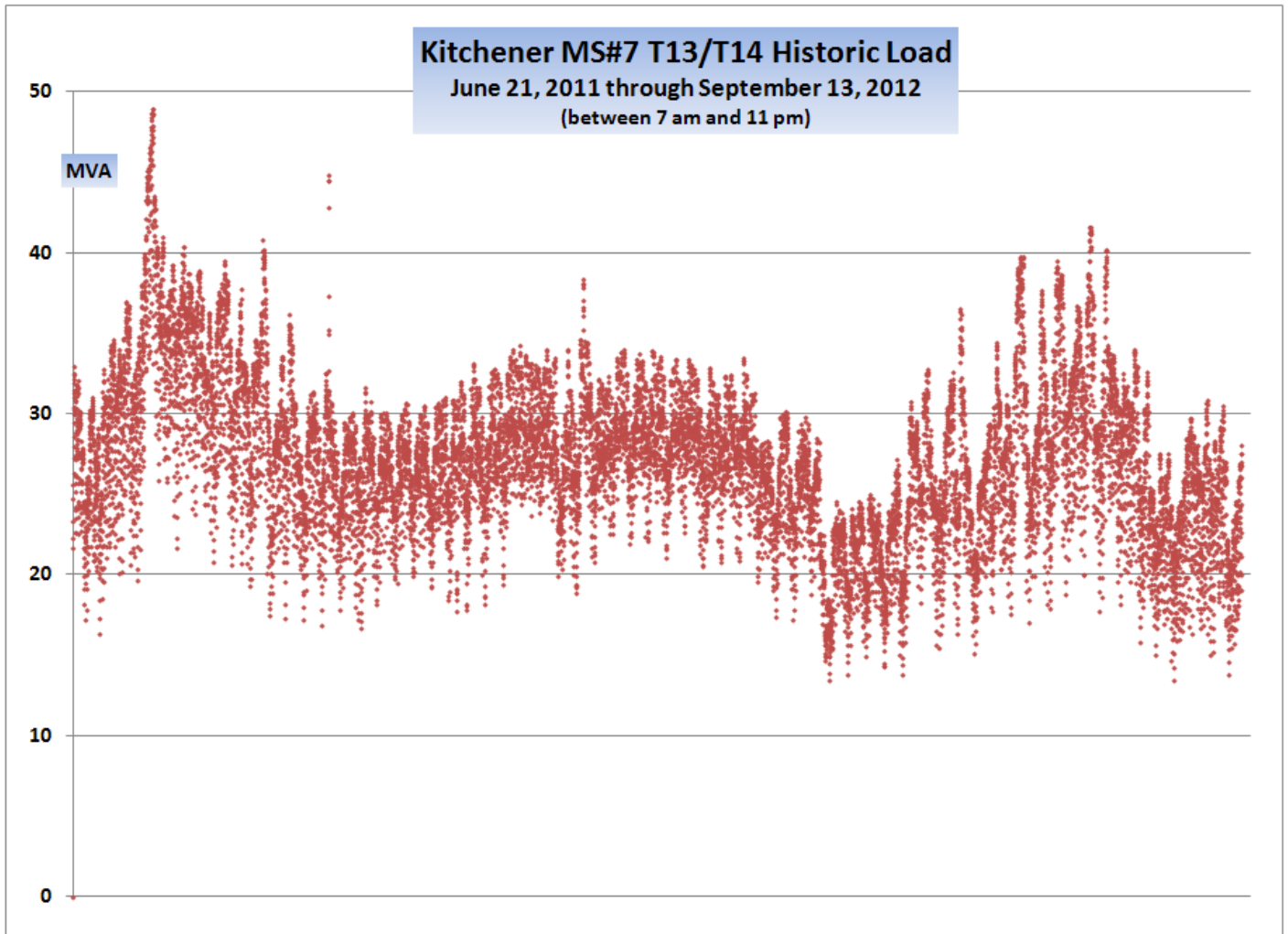


Figure 1 – T13/T14 DESN Load at Kitchener MS#7

The peak load at Kitchener MS#7 is lower than the current 10-DAY summer capability of 60.0 MVA. The load on the T13/T14 DESN at Kitchener MS#7 is projected to increase by 1% annually as shown in the table below.

Kitchener MS#7 T13/T14 Projected Peak Load Growth		
Year	Projected Peak Load (MVA)	10-DAY Summer Capability (MVA)
2011	48.95	60.0
2012	49.44	
2013	49.94	60.0
2014	50.43	
2015	50.94	
2025	56.27	

Table 3 – T13/T14 Projected Load Growth at Kitchener MS#7

The projected peak load is lower than the new 10-DAY summer capability of 60.0 MVA for the T13/T14 DESN at Kitchener MS#7.

4.3 Load Angle & Power Factor

The Market Rules require that the proponent have the capability to maintain a power factor (pF) within the range of 0.9 lagging and 0.9 leading as measured at the defined metering points at Kitchener MS#7. This power factor range translates into a load angle range of ± 0.45 radians. All the points above 0.45 radians indicate a lagging power factor below 0.9. All points below -0.45 radians indicate a leading power factor below 0.9.

Revenue meter information from June 21, 2011 through September 13, 2012 was used to evaluate the load angle at Kitchener MS#7. The figure below illustrates the load angle on the LV side of Kitchener MS#7 during the daily on-peak hours, which are defined as 7 a.m. until 11 p.m.

There are no low voltage shunt capacitors at Kitchener MS#7.

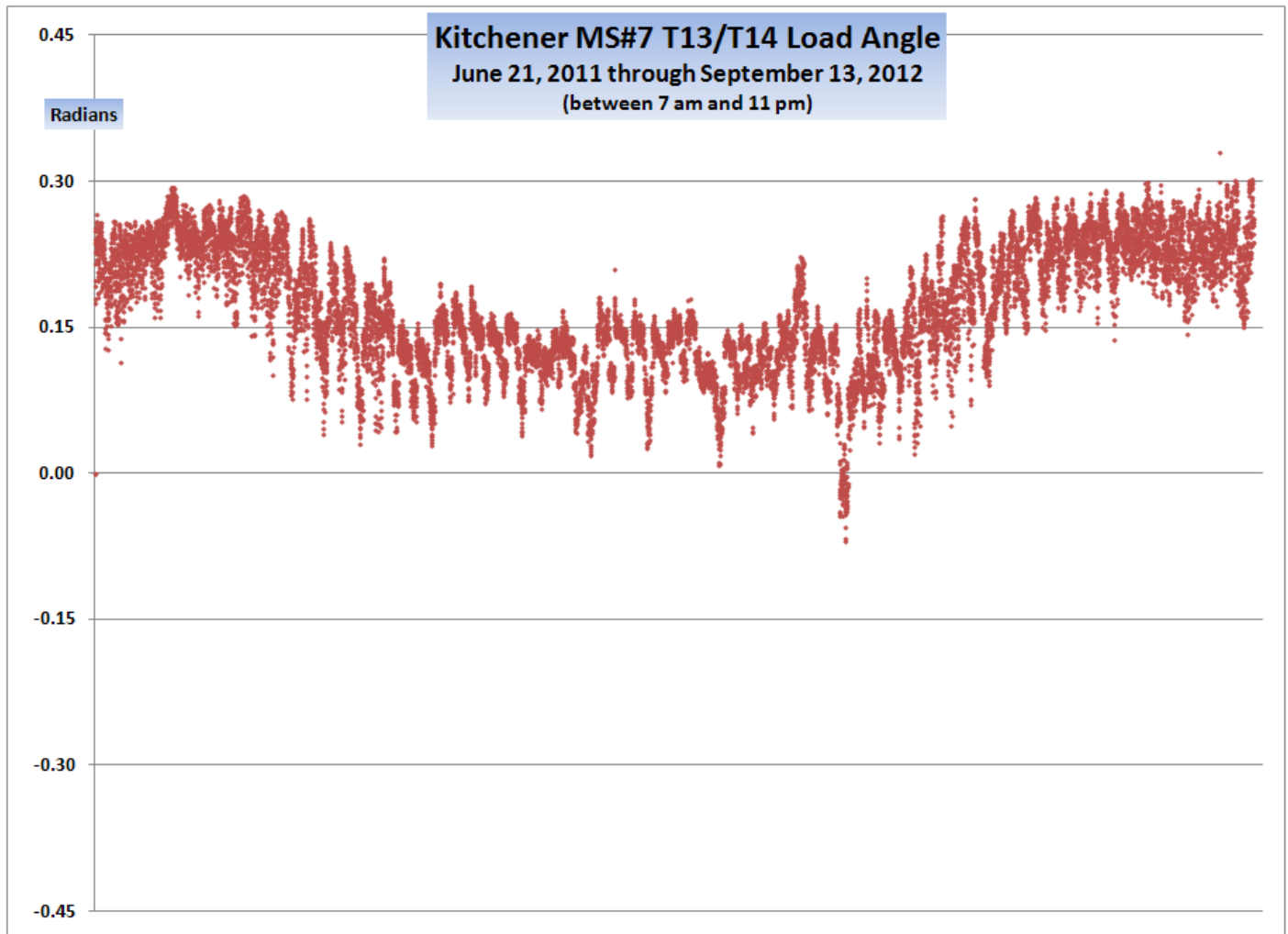


Figure 2 – Load Angle at Kitchener MS#7

Between June 21, 2011 and September 13, 2012, the load angle at Kitchener MS#7 was within the IESO required limits.

4.4 Conclusions

It can be concluded that the replacement of T14 at Kitchener MS#7 with a new transformer will not result in a material adverse impact on the reliability of the IESO-controlled grid.