GENIVAR

Distributed Generation
Technical Interconnection Requirements

Prepared for
PUC Services Inc.

January 26, 2012

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Revision History

Date	Revision	Description
January 2012	Rev. 0	New report

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1. Purpose

This report provides recommended technical interconnection requirements for generation projects connecting to PUC's feeders. The focus in this report is on requirements that affect the power quality and reliability of the distribution system. The generation facilities must satisfy local and national standards and codes, in addition to these requirements.

2. Interconnection Requirements

The interconnection requirements in Table 1 are based largely on Hydro One's requirements, [1, 2].

Table 1 - Interconnection Requirements

Category	Hydro One's Requirement	Recommended Requirement for PUC	Comments
Voltage control	DG shall not actively regulate voltage at the point of connection	DG shall not actively regulate voltage at the point of connection The generator should be able to operate within the voltage range specified in CSA Standard CAN3-C235-83	Same as HONI
Power factor	DG Facilities > 30 kW shall be capable of operating in the power factor range of +/-0.9 (i.e. 0.9 lagging and leading DG Facilities < 30 kW shall not be required to adjust their power factor.	DGs larger than 1 MW, shall have the capability to operate at a power factor between 0.95 lagging and 0.95 leading	
Power quality	Sections 2.2.2 and 2.2.3 of HONI's TIR	Appendix A	Most of HONI's requirements apply also to PUC
Protection anti islanding	Upon loss of voltage in one or more phases of HONI's Distribution System, the DG Facility shall automatically disconnect from HONI's Distribution System within 500 ms	Upon loss of voltage in one or more phases of PUC's feeder, the DG shall automatically disconnect from PUC's system within 500 ms	Similar to HONI, but can be faster depending on realistic equipment capability.

3. References

[1] *Distributed Generation Technical Interconnection requirements*, Hydro One Networks Inc., Rev 2, June 2011

[2] *Technical Interconnection Requirements for Distributed Generation - Micro Generation & Small Generation*, 2010 Hydro One Networks Inc., DT-10-20

Appendix A – Power Quality Requirements

A.1 General

a. The DG Facility shall be designed, built and maintained in accordance with all applicable codes, regulations and standards, along with the requirements of this document.

b. The interconnection of the DG must not materially compromise the reliability or restrict the operation of PUC's system.

c. The interconnection must not degrade power quality below acceptable levels listed below.

d. During normal operation, the DG shall be loaded and unloaded gradually to allow adequate time for regulating devices to respond and avoid excessive voltage fluctuations

A.2 Voltage and Current Harmonics

a. The DG shall not inject harmonic current that causes unacceptable voltage distortion on PUC's system

b. The DG shall follow the requirements of CAN/CSA C61000-3-06 with regards to voltage and current harmonic limits

c. The total harmonic distortion (THD) of the DG at the point of connection to PUC shall not exceed 3%

A.3 Voltage and Current Unbalance

a. The DG shall not cause deterioration of existing unbalance voltage and current conditions at the point of connection to PUC system.

b. A single phase DG shall not cause a voltage unbalance greater than 2% at the point of connection to PUC's system.

c. The phase-phase voltage unbalance at the unloaded DG terminals of a three-phase DG must not be greater than 1%.

A.4 Fast Voltage Fluctuations (Flicker)

a. The DG facility shall conform to the flicker requirements in CAN/CSA C61000-3-7.