

**April 26, 2011 TIR Addendum WEBINAR Part I  
FREQUENTLY ASKED QUESTIONS AND ANSWERS  
TECHNICAL INTERCONNECTION REQUIREMENTS**

**Webinar I**

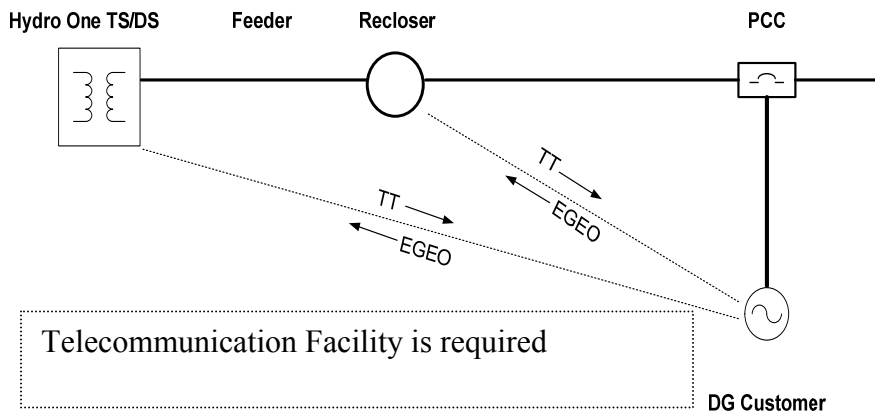
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**Control & Telecommunication Requirements:**

**1. Why has a section been added on Telecommunications Requirements?**

The current version of the TIR only mentioned control and telecommunications requirements, however Telecommunication Facility is also required to transport protection signals, such as Transfer Trip from the Hydro One TS/DS or Recloser to the DG and DG End Open from the DG to Hydro One TS/DS and Recloser. Telecommunication facility is also required for real-time monitoring and control to ensure that critical alarms are received at the Ontario Grid Control Centre and to provide control capability to the operators to intervene efficiently when required.

**a. Example of Protection Applications**

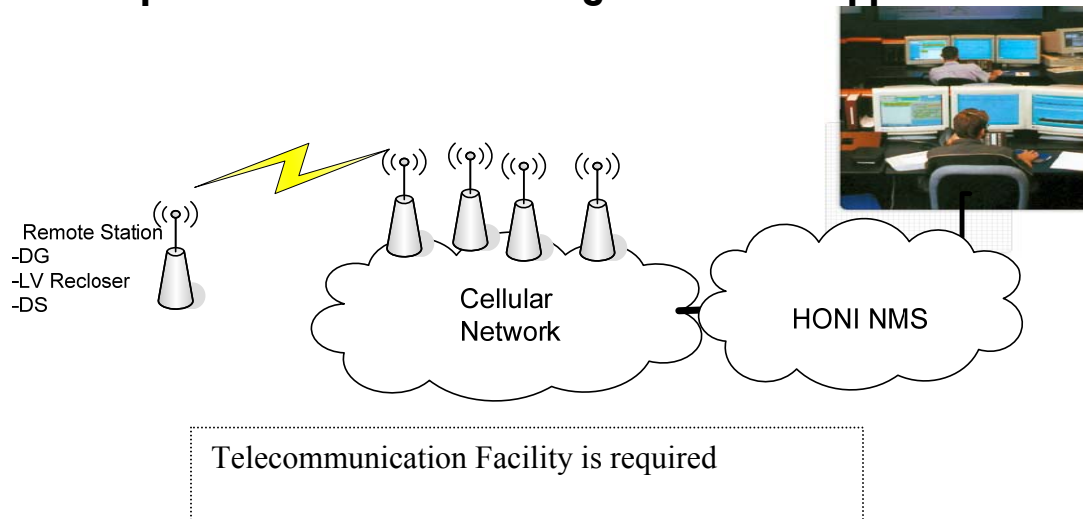


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**b. Example of Real-Time Monitoring and Control Applications**



**2. What is defined as Telecommunication Facility?**

Telecommunication facility is defined as the transport mechanism to provide remote connectivity between Hydro One's Distribution System and the DG facility. Telecommunication facility can be a wireless infrastructure, Optical Fiber and Leased circuits.

**3. What impact will the changes proposed have on DGs?**

The proposed new section **won't impose changes** for the DGs which must comply to the Technical Interconnection Requirements (TIR) for Transfer Trip, DG End Open, Real-time Control and Monitoring. The new section provides a more comprehensive understanding of the needs for telecommunication facilities to support both real-time protection and control operations requirements. Telecommunication facility is essential and critical to maintain the reliability and safety of the Power System Operations.

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**4. Why can Cellular Based Wireless infrastructure not be used for Teleprotection signals?**

There are three main considerations which explain why cellular infrastructure isn't suitable for protection applications:

1. Latency: Teleprotection has very stringent requirements for delay. The latency for the cell infrastructure is beyond the requirements for Teleprotection.
2. Throughput: The cellular system is mainly dedicated for low bandwidth applications that are suitable for control and monitoring but can not accommodate the bandwidth required to meet teleprotection requirements
3. Quality of Service: Teleprotection signal requires a dedicated telecommunication facility, or if a shared facility is used, then there must be some mechanisms in place to prioritize.

**5. Why does an LDC or embedded DG need to meet these requirements?**

As per Section 1 of the TIR:

Connection of DG supply sources to HONI Distribution System feeders impacts the steady-state and transient voltage profiles and current distribution along the feeder in response to changing supply, load and fault conditions. These impacts must be controlled to:

- Preserve acceptable safe operation of the Distribution System for the general public, customers and LDC employees that work on the Distribution System.
- Maintain reliability and quality of service to HONI customers.
- Abide by the requirements of the Ontario Energy Board Distribution System Code (OEB DSC), Ontario Electrical Safety Code (OESC) and applicable CSA and IEEE standards.

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- Be compatible with HONI's standard operating, protection control and metering systems and practices.

**6. What is required if the LDC does not require the DG to provide this telemetry information?**

HONI will require the DG to provide this information directly to the HONI DG hubsite via a wireless or other solution as defined in the TIR.

**7. Why does HONI need to know what DG's are connected to the LDC?**

DG connections to an LDC impact both the HONI DX system and the HONI TX system. HONI must be aware and have monitoring capability and transfer trip capability of those DG's to operate the TX and DX system in a safe manner and to maintain reliable operation of the TX and DX system.

**8. Monitoring is not required for less than or equal to 250kW projects. Therefore, 250 kW does not require monitoring, but 251 kW does?**

If the capacity is legitimately below or equal to 250 kW then monitoring is not required at the time of connection under this clause of the TIR.

Monitoring may still be required by Hydro One. HONI can use the connection agreement and conditions of service to exercise our discretion on the installation requirements.

Reference: Section 2.5.1 (vi) "Monitoring and control may be required as a result of Renewable Energy Supply Integration initiatives regardless of the capacity, as will be determined by HONI."

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**TIR Section 2.5.4.1 (ii) states:**

- II. Provisions for other quantities may be required and shall be determined by HONI.
  
- III. The actual implementation to install the SCADA link and modem is not required, but may be requested by Hydro One at a later date, to be implemented at the DGs cost within 90 days.

**What are the reasons that HONI will require this?**

At this point, the need is speculative. It may be driven by operating requirements, safety or other.

- 9. Given the popularity of inverter-based DG in other jurisdictions (e.g. Germany), have there been any efforts by HONI to interface with engineers from these jurisdictions with respect to communication requirements required for <1.5MW generators, and how it has already been dealt with?  
Can you let us know what other jurisdictions are requiring SCADA for generators less than 1.5 MW?**

We did compare against other Canadian/US jurisdictions. The requirements vary by utility and are in most cases subject to the discretion of the distributor. ATCO for instance requires telemetry for generators  $\geq 200$  kW.

**10. New Sections 2.6 states**

**2.6.1 General**

- i. DG owners shall provide the GPS coordinates of the DG Facility to assist in the evaluation of wireless communication alternatives.

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**What is the GPS required format?**

GPS format shall be: The latitude, longitude in decimal degrees (DD). This format is used for DGs, GIS, for FreeWave Radio, WiMAX. The projection model to be used is NAD83.

**11. What are the definitions of licensed/unlicensed and under which free wave comes?**

**Licensed:** An application must be filled to Industry Canada to obtain a license to deploy radio equipment for specific applications. It is restricted, controlled, regulated and secure. For example, the future WiMAX infrastructure will operate in the licensed band at 1.8 GHz. A licensed spectrum ensures the reliability and security to a critical infrastructure such as smart grid demands are achievable. In addition, HONI currently used licensed microwave radios to support critical applications for the transmission system therefore licensed requirements aren't new to HONI.

**Unlicensed:** Spectrum made available to any users who comply with a set of pre-defined technical rules for hardware and deployment methods to reduce interference without requesting any licensed from Industry Canada. For instance, FreeWave Radio operates in an unlicensed band 900 MHz uses Spread Spectrum technology to mitigate interference. Typically unlicensed band are very congested, subjected to interference and unsecured. Any Radio vendor who support 900 MHz are eligible to do so, for instance GE DGT could also be used to a similar application as FreeWave radio. Many more operate on unlicensed spectrum, mostly in the 900 MHz band, sharing it with hundreds of millions of other devices from cordless phones to wireless internet service providers and so on.

The intent of the TIR update is to add the licensed spectrum requirements and to support the existing unlicensed asset" Freewave Radio" but not to be specific on technology, product or vendor. That's explained why the terms" Licensed/Unlicensed" is more appropriate to be used.

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**12. The IESO is developing requirements for DGs to send forecasting data (e.g. solar irradiance, wind speed, etc.) to the IESO and they allow for such data to be sent via HONI (the Distributor). Would HONI indeed enable this, and does that require any other amendments to TIR?**

The IESO has formed a group Visibility Technical Working Group (VTWG) that is developing standards and means to get the data from the DG to the IESO in an economic and reliable manner. Currently, Hydro One is looking at the feasibility of using our facilities to transport this data.

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**New Line Requirements:**

**13. If the New Line requirement is just a clarification, why not just leave it out of the TIR?**

Hydro One strives for transparency in performing Connection Impact Assessments in line with the Ontario Energy Board's Distribution System code. As such, we would prefer to make ALL of our requirements publically available, in the most possible detail. This additional clarification is proposed to be published in Hydro One's Technical Interconnection Requirements with that philosophy in mind.

**14. My DG facility has more than one interface transformer, but the total projected length of my collector system is less than 200 m. Isn't this new requirement unnecessarily increasing my required equipment costs?**

Please note that faults on the collector system, including any line on the high-voltage side of the interface transformer, as well as the low-voltage side of the interface transformer, may cause Hydro One protection operations. As such, when counting the length of the collector system, the length of all line/cabling must be included. With this in mind, Hydro One does not foresee the possibility of a DG facility that has more than one interface transformer, and a TOTAL collector system of less than 200m. Under this situation, with or without this clarification, an automatic isolating device would still be required.

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**NOP41 Requirements:**

**15. What is covered in NOP41?**

The governing principles of the Hydro One embedded generation metering policy, and the responsibilities of all types of generators that wish to connect to the Hydro One Distribution System. The policy outlines for instance, the generators' responsibilities regarding applicable standards and payment for facilities required to connect the facility. Furthermore it describes requirements regarding metering type, location and access.

**16. Why has NOP41 been removed from the TIR?**

To facilitate updates to the TIR and NOP41, both documents are available on the Hydro One Feed-in Tariff website.

**17. What if I have a question about metering that is not explained in the TIR?**

Refer to NOP41, which is located on the Hydro One Feed-in Tariff website. If the answer is not apparent, contact the Hydro One Business Customer centre at 1-877-447-4412..

**18. What if I am a Legacy generator already connected to the Hydro One distribution system that is applying for a FIT or HCI contract with the OPA? Does NOP41 still apply to me?**

Yes. All Legacy generators applying for FIT or HCI contracts will be required to have metering that adheres to NOP41 and meets the Hydro One retail metering standards.

**19. Will NOP41 have references to NOP031 removed or will NOP031 be published too?**

The references to NOP031 in NOP41 will remain and NOP031 will be published as well.