

<p><b>Newmarket-Tay Power Distribution Ltd.</b></p> <p><b>Conditions of Service</b></p>	<p><b>Number:</b> NT POWER COS-350-01</p> <p><b>Issue Date:</b> July, 2007</p>
<p><b>Embedded Generation</b></p>	<p><b>Next Review Date:</b> February, 2015</p>

## 1. Preamble

This section pertains specifically to *generators with embedded generation facilities* in Newmarket-Tay Power Distribution Ltd.'s (NT POWER's) service area. This section outlines items which are not covered under any other section.

## 2. Embedded Generation Connection - General

All *generators with embedded generation facilities* shall execute a *Connection Agreement* and *Settlement Agreement*, and, if required, an *MSP Agreement* with NT POWER. *Generators with embedded generation facilities* connected to NT POWER's *distribution system* prior to the date of these *Conditions of Service* shall, subject to any agreement between the *generator with an embedded generation facility* and NT POWER otherwise, execute a *Connection Agreement* with NT POWER.

In accordance with NT POWERCOS-210-07 and NT POWERCOS-220-01 of these *Conditions of Service*, NT POWER shall not *connect any embedded generation facility* where there is not an executed *Connection Agreement* and, if required, an *MSP Agreement*.

The *Connection Agreement* will be maintained by NT POWER. The *Connection Agreement* will comply with the *OEB DSC Appendix E*, see NT POWERCOS Appendix "K". There are three different *Connection Agreements* based on the size of the embedded generator: Large ( $\geq 10\text{MW}$ ); Small and Midsized ( $\leq 10\text{MW}$  and  $\geq 10\text{ kW}$ ); and Micro ( $\leq 10\text{kW}$ ).

NT POWER shall not allow *generators with an embedded generation facility connections* directly to the *distribution system* in a manner that may materially adversely impact power quality, reliability, efficiency, or the safety of *Consumers* or NT POWER's personnel.

When technical alternatives to *connecting* to NT POWER's *distribution system* do not exist and the *connection* of an *embedded generation facility* will not impact the safety of the *Consumers* or NT POWER's personnel, or the reliability of the *distribution system*, NT POWER may at its sole discretion consider the connection of the *embedded generation facility*. The *generators* with *embedded generation facilities* shall be responsible for all costs associated with NT POWER performing studies and developing plans for risk mitigation that are to the satisfaction of NT POWER. NT POWER will not charge for the preparation of an offer to connect for a *micro-embedded load displacement generation facility*.

### 3. Connection Process

The connection process varies based on the size of the proposed *embedded generation facility*. The *OEB DSC* Appendix F.1 contains the process and a corresponding flow chart for each size of a proposed *embedded generation facility*. NT POWER will provide the necessary information, and offers, in the time frames stipulated in the appropriate section shown below.

- For a Micro *generation facility* (= 10 kW) see *OEB DSC* Appendix F.1.1
- For a Small *generation facility* (= 500 kW connected at < 15 kV, or = 1 MW connected at = 15 kV) see *OEB DSC* Appendix F.1.2
- For a Mid-Sized *generation facility* (= 10 MW but > 500kW connected at < 15 kV, or = 10 MW but  $\geq$  1 MW connected at = 15 kV) see *OEB DSC* Appendix F.1.3
- For a Large *generation facility* (= 10 MW) see *OEB DSC* Appendix F.1.4

Applications for the connection of Small, Mid-Sized and Large *generation facilities* will be placed in a queue on a first-come, first served basis. The queuing process shall conform to the *OEB DSC* Section 6.2.4.1. Applications for the connection of a Micro *generation facility* will be processed when received and in accordance with the *OEB DSC* Sections 6.2.6 and 6.2.7.

Additional information may be required for proposed net metering generation facilities. There is a maximum cumulative generation capacity available in NT POWER's service area for net metering generation facilities; therefore the number of net metering generation facilities will be limited.

### 4. General Technical Information Requirements

All *generators* with *embedded generation facilities* shall provide NT POWER with the following documentation to ensure that the *distribution system* is adequately protected from potential damage or increased operating costs resulting from the *connection* of the *embedded generation facility*:

- (a) for *micro-embedded load displacement generation facility* (<10Kw) supply information as stated in *OEB DSC* Appendix F.1.1 Steps 3 and 4;
- (b) for *small embedded generation facility* (>10Kw and <500Kw) supply information as stated in *OEB DSC* Appendix F.1.2 Steps 3, 4 and 5;
- (c) for *mid-sized embedded generation facility* (>500Kw and <10Mw) supply information as stated in *OEB DSC* Appendix F.1.3 Steps 3, 4 and 5; and
- (d) for *large embedded generation facility* (>10Mw) supply information as stated in *OEB DSC* Appendix F.1.4 Steps 3, 4 and 5.

All documentation and studies outlined above will be analyzed and approved by NT POWER, and these costs shall be borne by the *generator* with the *embedded generation facility*, unless otherwise stated in the *OEB DSC* Appendix F.

The *embedded generation facilities* must also meet the technical requirements as identified in the *Connection Agreement* and the *OEB DSC* Appendix F.2 Technical Requirements.

*Generators* with *embedded generation facilities* connected to the *distribution system* prior to the date of these *Conditions of Service* shall submit the above-referenced technical information to NT POWER.

## 5. Interface Protection and Isolating Devices

The *generators* with *embedded generation facilities* shall supply, install, own, and maintain an interface protection that minimizes the frequency and severity of disturbances on the *distribution system* and the impact on other *Consumers*. The interface protection shall be capable of automatically isolating the *embedded generation facility* from the *distribution system* in the following situations:

- (a) internal faults within the *embedded generation facility*;
- (b) external faults in the *distribution system*; and
- (c) abnormal system conditions, including, but not limited to open phase and islanding, over/under voltage and over/under frequency.

The *generators* with *embedded generation facilities* shall supply, install, own, and maintain a disconnecting device at the connection point with the *distribution system* for the purpose of isolating the *embedded generation facility* in case of *emergency* and for work protection. The disconnecting device shall:

- (a) be located at or near to the *ownership demarcation point of connection* of the *embedded generation facility* to the *distribution system*, and must be readily accessible;
- (b) provide a visible indication of the open main current-carrying path that isolates the *embedded generation facility* from the *distribution system*;

- (c) have a three-pole gang operated switch mechanism suitable for load break operations at rated load. (Subject to NT POWER's prior written approval, Single Phase *embedded generating facilities* may use single pole switches or openers);
- (d) meet *Ontario Electrical Safety Code* requirements;
- (e) be rated for maximum fault current available at that location on the *distribution system*;
- (f) be lockable in the open position;
- (g) be suitable for safe operation under the conditions of use; and
- (h) have an interlock, which will prevent back-feed in the event of an outage on the *distribution system*.

These devices must be operated at least once a year, unless specified otherwise in the *Connection Agreement*, and the verification report of the operation of the devices shall be retained by the *generator with embedded generation facilities* and shall be provided to NT POWER upon request.

## 6. Metering for Embedded Generation Facilities

The *meter installation* shall be installed at the *ownership demarcation point* of the *embedded generation facility* to the *distribution system*. At NT POWER's discretion, secondary metering will be installed and applicable loss factors will be applied to the generation output in accordance with the loss factors applied for retail settlements and billing.

The *generators with embedded generation facilities* shall install a *four-quadrant interval meter* in accordance with the *Distribution System Code* and NT POWER's standard metering requirements. The *generators with embedded generation facilities* shall provide NT POWER with the technical details of the *meter installation*.

*Generators with embedded generation facilities over 500kW or wholesale market participants* shall install an *IESO approved meter installation*, and it shall be maintained by an *IESO registered meter service provider* approved by NT POWER. All costs associated with an *IESO meter installation* shall be borne by the *generator with embedded generation facility*.

A *generator with embedded generation facilities* that may, at any time, deliver energy to the *distribution system* shall be responsible for the ownership, installation and maintenance (using a registered *meter service provider*), of an approved *IESO meter installation*.

Settlement for *net metering generation facilities* will be in accordance with the *OEB DSC Section 6.7.3*.

*Embedded generation facilities* that receive *energy* e.g. for station use or back-up supply, shall be placed in the appropriate *rate* class and billed for the *energy* consumed.

## 7. Transformers

Any step-up transformation equipment required to step-up the *embedded generation facility's* output voltage to the primary voltage of NT POWER's *distribution system* shall be supplied, installed, owned and maintained by the *generator* with the *embedded generation facility*.

For *Consumers connected* to the *distribution system* that wish to install an *embedded generation facility* with a total installed generation capacity of less than 10 kW, NT POWER may, at its sole discretion, permit the *embedded generation facility* to be *connected* through NT POWER's existing transformer. In such cases, the *generator* with the *embedded generation facility* shall be responsible for any and all damage to the NT POWER *distribution system* caused by the operation of the *embedded generation facility*.

## 8. Maintenance Schedules

*Generators* with *embedded generation facilities* must implement and adhere to a regular scheduled maintenance plan to assure both NT POWER and the *generator* with the *embedded generation facility* that the connection devices, protection and control systems are maintained in good working order. The provisions of said maintenance plan are to be listed in the *Connection Agreement*.

NT POWER, in its sole discretion, may request to witness the re-verification of any protections that could adversely impact the *distribution system*. The *generator* with the *embedded generation facility* shall pay for the re-verification and provide NT POWER a copy of the report giving the results of the re-verification of the protections.

## 9. Reporting Requirements

All *generators* with *small, mid-sized* and *large embedded generation facilities* shall report any significant event to NT POWER within 5 business days. The *Connection Agreement* may include a list of events deemed significant and provide a standard report format.

The *generator* with the *embedded generation facility* shall keep a written log of the operation of its protections that result in the tripping of its interrupting devices. On request, the *generator* with the *embedded generation facility* must provide a copy of the log to NT POWER. The log shall contain, at a minimum, the following information:

- (a) date and time of event/operation of protections;
- (b) which relay or protection feature of the relay initiated the trip;
- (c) conditions and unit output at the time of the trip that may be related to the operation (e.g. Lightning, outage of feeder etc.)

## 10. Capital Contribution

When NT POWER is required to do an *expansion* or *enhancement* to the *distribution system* to *connect* an *embedded generation facility* (an “Expansion”), NT POWER will perform an economic evaluation to determine the *generator’s* share of the present value of the projected capital costs and ongoing maintenance costs of the Expansion (the “Expansion Costs”). NT POWER will use the Discounted Cash Flow Model and assume that future revenue and avoided costs will be zero. See also NT POWERCOS-210-00.

## 11. Compliance

All equipment of *generators* with *embedded generation facilities* must meet, at a minimum, NT POWER requirements, *Electrical Safety Authority* requirements, and the *OEB DSC Appendix F.2 Technical Requirements*.

NT POWER may require that the equipment deemed non-compliant be brought into actual compliance at the *generator with embedded generation facility’s* expense with NT POWER’s performance requirements within a timeframe established by NT POWER. This applies at NT POWER’s sole discretion, where there is:

- (a) a material deterioration of the *distribution system* reliability resulting from the performance of the *generator with embedded generation facility’s* equipment; or
- (b) a material negative impacts on the power quality of an existing or a new *Consumer* resulting from the performance of the equipment at the *embedded generation facility*; or
- (c) a material increase in generating capacity at the site where the equipment deemed compliant is located.

## 12. Disconnection of Embedded Generation Facility

If the *generator with embedded generation facilities* is not in compliance in accordance with Section 10 above, or the conditions required in the *Connection Agreement*, it may be subject to *disconnection*.

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