Methodology for the Assessment of Distributed Generation Capacity at ENWIN Utilities

Overview

ENWIN Utilities operates several 115 kV/27.6 kV Distribution Electrical Supply Network (DESN) stations, along with feeders from Hydro One-owned stations. Generation capacity is assessed using separate methods based on station ownership.

For ENWIN-owned stations, capacity is based on short-circuit limits from Hydro One's station fault levels. For Hydro One–owned stations with ENWIN feeders, capacity values are given by Hydro One.

For Hydro One and ENWIN, station thermal capacity depends on transformer size and station load.

Along with Hydro One fault level and station configuration data, ENWIN maintains detailed records of each Distributed Energy Resource (DER) in its distribution area. This includes the relevant station and feeder, capacity, type (inverter or non-inverter, exporting or non-exporting), and status (connected, applied, allocated), ensuring ENWIN has an accurate account of generation connected to its feeders.

For an overview of available DER hosting capacity, you may visit the Ontario Energy Board's Centralized Capacity Information Map.

ENWIN encourages all customers—whether planning a new connection, expansion, or relocation—to reach out to ENWIN directly.

ENWIN-Owned Distribution Stations

Station-Level Assessment

- ### Short Circuit Capacity Assessment

Each year, ENWIN requests updated fault-level data from Hydro One for all ENWIN-owned distribution stations. Using this information, the maximum available short-circuit (S/C) level at the 27.6 kV bus is established. If dual buses exist, the higher fault level value is conservatively adopted for evaluation purposes.

The available short-circuit growth capacity is calculated as the difference between the maximum allowable fault level (760 MVA) and the current fault level at the 27.6 kV bus. True available short-circuit capacity is then determined by subtracting the short-circuit contribution from all installed and allocated generators at the station.

Available upstream Short-Circuit (S/C) capacity of the station LV bus = Maximum Allowed S/C Capacity (760MVA) – present short-circuit capacity at the 27.6kV Bus.

True available S/C capacity = Total available S/C capacity at the 27.6kV bus – S/C capacity of installed and presently allocated capacity generators.

- ### Thermal Capacity Assessment

A station's thermal generation capacity depends on both transformer ratings and how much the station is loaded. This capacity is determined by taking 60% of the largest transformer in the DESN and adding the station's minimum load. To find out how much thermal capacity is available for new generators, you subtract the amount already used by existing and planned generators from the total thermal capacity.

Available thermal capacity of the station Bus = Maximum Capacity of a single Transformer in DESN * 60% + Minimum Load of the Station.

Available Thermal Capacity for Generation = Available Capacity at the Station Bus – thermal capacity of installed and currently allocated generators

All generation applications connected to the station collectively share both the available thermal and short-circuit capacities.

Feeder-Level Assessment

Feeder-level assessments must comply with both feeder-specific constraints and overall station limitations.

Exporting generation on an individual feeder is limited to a maximum of 19 MW. This constraint does not apply to non-exporting generation.

The total available exporting generation capacity on a feeder is determined as the minimum of the following:

- Remaining feeder export capacity (19 MW minus existing exporting generation)
- Available station thermal capacity
- Available station short-circuit capacity.

For non-exporting generators, feeder capacity allocation is restricted by the station’s available short-circuit capacity.

Total capacity for micro generators (≤12 kW) = Minimum of (10% of the feeder peak value load, 60 % of feeder minimum Load) - Existing total micro generators connected or allocated capacity.

Hydro One–Owned Stations, ENWIN-Owned Feeders

Where Hydro One owns the supply station and ENWIN owns only the feeders, capacity assessment follows a modified process.

Station-Level Assessment

- **Short Circuit Capacity Assessment**

Hydro One provides upstream available capacity values for each feeder. Station-level total short-circuit capacity is estimated using non-inverter-based, non-exporting generation upstream capacity of the feeder, assuming short circuit contribution is equivalent to five times the generator nameplate rating.

Total available upstream S/C capacity of the Station = 5 * Non-Inverter Based Non – Exporting generator capacity of a feeder in that station + Allocated capacity not used

- **Thermal Capacity Assessment**

Thermal capacity estimation follows the same approach as ENWIN's own stations. The thermal capacity of a station is determined by the station transformer's size, the greater the transformer capacity and the higher the station's minimum load, the larger the thermal capacity available for generation.

Available thermal capacity of the Station Bus = Maximum Capacity of a single Transformer in DESN * 60 % + Minimum Load of the Station.

Available Thermal Capacity for Generation = Available Capacity at the Station Bus – thermal capacity of installed and presently allocated generators

Feeder-Level Assessment:

When assessing feeder capacity, ensure it meets both feeder and station constraints.

Exporting generation on an individual feeder is limited to a maximum of 19 MW. This constraint is not applicable to non-exporting generation.

Total export Generator Capacity of the feeder = The minimum of (19 MW – Total existing export generation in the feeder), (Available - Station thermal Capacity Limit) or (Available - Station Short Circuit Capacity Limit)

For non-exporting generators, regarding capacity allocation, the feeder's total available generation is restricted by the station's total short-circuit available capacity.

Total capacity for micro generators (<12 kW) = Minimum of (10% of the feeder peak value load, 60 % of feeder minimum Load) - Existing total micro generators connected or allocated capacity.

For more information on Hydro One's Station Capacity Calculator click the link below:
https://www.hydroone.com/business-services/generators/station-capacity-calculator