

Intertie Protection Settings

Project Description

Project Name: _____

Hydro One Project ID#: _____

Setting Revision #: _____

CSA Certification for Inverters Attached (*if applicable*) Yes N/A

Inverter De-Rating Letter Attached (*if applicable*) Yes N/A

Submission Details

Settings Approved By (P. Eng Name): _____

Date: _____

P. Eng. Signature and Stamp:



- Please enclose all settings as one PDF file

Intertie Protection Settings

Intertie Relay Protection PTR: _____

Intertie Relay Protection CTR: _____

Interrupting Device Operating Time (in ms): _____

Is your site a three-phase DER facility (up to 500kW) comprised of a single three-phase inverter unit? Yes (see **note 1**) No

Function Requirement	Protection Element Function	ANSI Function (Setting Element)	Intertie Relay Used	Primary Pickup [V, Amps, Hz, Ω]	Secondary Pickup [V, Amps, Hz, Ω]	Relay Time Dial or Delay [ms]	Total Clearing Time [ms]*	TIR Section
1. Basic Anti-islanding	Over-Voltage	59 (OV1)						2.3.10, 2.3.11, 2.3.12 iii, Updated in Bulletin 4
		59 (OV2)						
	Under-Voltage	27 (UV1)						
		27 (UV2)						
	Over-Frequency	81O (OF1)						
		81O (OF2)						
Under-Frequency	81U (UF1)							
	81U (UF2)							
2. Tele-protection	Transfer Trip Receive	TTR		Transfer trip communication time [in ms]: _____				2.3.13
	DGEO/LSBS	DGEO		Signal set 1 second prior to energization: <input type="checkbox"/> Yes <input type="checkbox"/> No				2.3.14 - 2.3.16
3. Other passive anti-islanding	Rate of Change of Frequency (ROCOF)	81R		Rate of change of frequency [Hz/s]: _____ Measuring window [ms]: _____ Trip delay [ms]: _____ Voltage interlock - under-voltage pick-up [pu]: _____				2.3.12 iv
	Vector Surge	78		Phase shift [degrees]: _____ Voltage interlock- voltage threshold [pu]: _____				
	Directional Reactive Power Relay	32R		Setpoint [% of DGIT capacity]: _____ Time delay [ms]: _____				
4. Phase Fault Protection	Phase Over-Current	50						2.3.7
	Phase Inverse Timed Over-Current	51						
	Voltage Controlled Over-Current	51V						
	Directional Phase Over-Current	67						
	Phase Distance	21						
	Under-Voltage	27						

Function Requirement	Protection Element Function	ANSI Function (Setting Element)	Intertie Relay Used	Primary Pickup [V, Amps, Hz, Ω]	Secondary Pickup [V, Amps, Hz, Ω]	Relay Time Dial or Delay [ms]	Total Clearing Time [ms]*	TIR Section
5. Ground Fault Protection	Neutral Over-Current	50N						2.3.7
	Neutral Inverse Timed Over-Current	51N						
	Directional Neutral Over-Current	67N						
	Ground Distance	21N						
	Under-Voltage	27						
	Ground Over-Voltage	59G						
6. Open Phase and Phase Unbalance	Negative Sequence Current	46						2.2.2.2
	Negative Sequence Voltage	47						2.3.8
7. Ferro-Resonance	Peak Detecting Over-Voltage	59I						2.3.8
8. Synchronization	Synchronizing	25		Frequency difference [Δf, Hz]: _____ Voltage difference [ΔV, %]: _____ Phase angle difference [°ΔΦ, °]: _____				2.4.4
9. Breaker Failure		BF		Time delay for BF device to operate [in ms]: _____				2.3.4
10. Automatic Reconnection				Is automatic reconnection used? <input type="checkbox"/> Yes <input type="checkbox"/> No				2.4.7
11. Cumulative Instantaneous Overvoltage		59		EPS to exceed 138% of its nominal line-to-line fundamental frequency voltage for a duration exceeding one fundamental frequency period.				IEEE 1547: 2018 Section 7.4
12. Communication Link Fail				Time to trip [in seconds]: _____				2.3.13
13. Battery/DC Supply				Does facility meet requirements of TIR section 2.1.15? <input type="checkbox"/> Yes <input type="checkbox"/> No				2.1.15
14. Protection Failure	- DER facility's local interconnection protection system fail - Breaker trip coil or interrupting device fail - DC supply loss			Protection failure leads to disconnection of DER and HV ground sources with no intentional time delay: <input type="checkbox"/> Yes <input type="checkbox"/> No				2.3.18
16. Additional Settings	Please enclose additional unique settings relevant to this project on the next page in a similar format to this table							

*Total Clearing Time shall be inclusive of breaking time, coil energization time, and contact closure time.

Special Notes:

1. Three-phase DER facilities up to 500kW comprised of a single three-phase inverter unit that is CSA certified and bears certification mark recognized by OESC shall be deemed compliant to items 1-10 above. DER facilities that consist of multiple three-phase inverters or multiple single-phase inverters shall comply with section 2.3.6 of the TIR. Please submit document showing the ESA certification.
2. All protection elements must be shown on the single line diagram and their operation must be described in the protection philosophy documents that must accompany this submission.
3. Please refer to the notes in Table 10 of the TIR for more details.

Generic Inverter Manufacturer
123 Inverter Avenue
City, State/Province
Country
Postal Code
Tel: (555) 555-5555



DER Project Name
123 Project Street
City, Province
Postal Code

Hydro One Project ID#: XX,XXX

To whom it may concern,

The inverter(s) used for the above-mentioned project location have been locked by the manufacturer and cannot be field adjusted above the de-rated value in the field. The inverter serial number(s) and model(s) information is(are) listed below.

Inverter Model(s): _____

Inverter Serial Number(s): _____

Manufacturer: _____

Sincerely,

A handwritten signature in black ink that reads "Manufacturer's Rep". The signature is written in a cursive, flowing style.

Manufacturer's Representative
April 30, 2024