

**DISTRIBUTED ENERGY RESOURCE (DER) SYSTEM: CHECKLIST AND DECLARATION OF COMPLIANCE TO
SP POWERGRID'S (SPPG) TECHNICAL REQUIREMENTS**

(To be submitted together with CSI application)

For official use only

Application No.

PART I: INSTALLATION DETAILS

Consumer Name:

Installation/Premises Address:

Electrical Installation License No.:

Installation Intake Voltage:

Existing Site Approved Load: kVA / kW (to delete accordingly)

PART II: DER SYSTEM DETAILS

Total Short Circuit Current Contribution: Amps

Existing DER System Details				
Metering Point	Description of Metering Point Location	kWp/kWh	kWac ^{1,3}	System Type
				<input type="checkbox"/> PV <input type="checkbox"/> BESS <input type="checkbox"/> Others:___
				<input type="checkbox"/> PV <input type="checkbox"/> BESS <input type="checkbox"/> Others:___
				<input type="checkbox"/> PV <input type="checkbox"/> BESS <input type="checkbox"/> Others:___
Total Existing Generation Capacity				

Applied DER System Details					
Metering Point	Description of Metering Point Location	kWp/kWh	kWac ^{1,3}	System Type	Owner of DER system ²
				<input type="checkbox"/> PV <input type="checkbox"/> BESS <input type="checkbox"/> Others:___	<input type="checkbox"/> Consumer <input type="checkbox"/> 3 rd party
				<input type="checkbox"/> PV <input type="checkbox"/> BESS <input type="checkbox"/> Others:___	<input type="checkbox"/> Consumer <input type="checkbox"/> 3 rd party
				<input type="checkbox"/> PV <input type="checkbox"/> BESS <input type="checkbox"/> Others:___	<input type="checkbox"/> Consumer <input type="checkbox"/> 3 rd party
Total Applied Generation Capacity					

Total Generation Capacity kWp/kWh kWac^{1,3}

1. Based on inverter rated AC capacity.

2. If DER is owned by 3rd party, please state Company Name:

3. The Consumer shall declare if the Owner of the applied DER system has an aggregated Generation Capacity of ≥ 1MWac installed in this premise. If yes, the Owner of the applied DER system shall furnish the Wholesaler/Generation License at point of Turn-On.
 No Yes

New DER Inverter(s) Information:

S/N	Brand	Model	Rated Power (kWac)	Quantity

PART III: DOCUMENT CHECKLIST

Please check the boxes to acknowledge that you have submitted the following documents:

- Letter of Consent
- Single Line Diagram [SLD] (from DER System to Point of Common Coupling [PCC])

- PQ Compliance Report
- Short Circuit Current Contribution Report
- Inverter(s) Specifications
- Voltage and Frequency Protection Settings
- Inverter(s) Type Test Reports (Harmonics, Voltage Unbalance, Flicker, DC Injection)
- Solar panel(s)/Batteries Specifications
- Isolation Transformer Specifications (if used)
- Dynamic Simulation Model (for aggregated capacity as per Transmission Code C7.2)
- Other Supporting Documents (if any)

Please submit the following documents to the respective Distribution Network (DN) sections upon commissioning of the DER system.

- 1) Certificate of Compliance
- 2) Commissioning Declaration of DER System

PART IV: TECHNICAL REQUIREMENTS
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We confirm that the application complies with the following requirements at PCC:

1) Power Quality

		Voltage at PCC [kV]			
		0.23 / 0.4	6.6 / 22	66	230 / 400
Harmonics	<i>Total harmonic voltage distortion, V_{THD}</i>	< 5%	< 4%	< 3%	< 1.5%
	<i>Individual harmonic voltage (odd)</i>	< 4%	< 3%	< 2%	< 1%
	<i>Individual harmonic voltage (even)</i>	< 2%	< 2%	< 1%	< 0.5%
DC Injection	<i>Max DC injection per phase</i>	< 0.5% of inverter rated output current	DC injection is deprecated		
	The LEW shall submit technical justification in the PQ compliance report for consideration, if the DER system DC injection at the PCC deviates from this requirement.				
Voltage Fluctuation	<i>Percentage difference from nominal voltage</i>	< $\pm 3\%$			
Flicker	<i>Short term flicker severity, P_{ST}</i>	< 1.0			
	<i>Long term flicker severity, P_{LT}</i>	< 0.8			
Voltage Unbalance	<i>Max ratio of negative phase sequence to positive phase sequence voltage</i>	< 1%			

2) Protection

		Abnormal Voltage Range [% of nominal voltage]		
		$V < 50$	$50 \leq V < 88$	$110 < V < 120$
Abnormal Voltage Response	<i>Minimum Holding Time (s) - requirement</i>	> 0.6	> 2.0	> 1.0
	<i>Maximum Tripping Time (s) - requirement</i>	≤ 1.6	≤ 3.0	≤ 2.0
	The DER generating unit shall be capable of disconnecting from the transmission system if under or over voltage is detected at the connected person's incoming switchboard or at the generating unit terminal. Depending on the abnormal voltage range, the generating unit shall remain in operation for a minimum holding time and disconnect before the maximum tripping time as specified above.			

		Frequency Range (Hz)	
		$47.5 \leq f \leq 52$	$47 \leq f < 47.5$
Abnormal Frequency Response	<i>Operating Time</i>	Continuous operation	Remain in operation for at least 20s each time frequency falls below 47.5Hz.

3) Reconnection

The DER system shall also cease to energize the transmission system for faults on the service connection between the DER system to the PCC. The DER system may reconnect to the transmission system 1 minute after the voltage and frequency at its connection point have recovered and remained within the ranges listed as follows:

- (a) Frequency within 49.8Hz and 50.2Hz;

- (b) Transmission network voltage within $\pm 3\%$ of the nominal value or distribution network voltage within $\pm 6\%$ of the nominal value.

4) Inverter Specification

Reactive power control mode: Q(V) Control⁴

If other mode is selected, please indicate the details: _____

4. By signing below (Part IV), you agree that the above reactive power control mode will be set before inverter(s) energization, in compliance with the requirements stipulated in the Transmission Code. For more details on the settings, please refer to Transmission Code F12.

PART V: CHOICE OF BACKUP SCHEME FOR EMBEDDED GENERATION (DER)
(Must be filled for Intake Voltage at HT and above)

We understand that consumers connected at HT and above with embedded generation (DER) are required to choose a backup scheme⁵ for their service connection.

Please prepare a Supplemental Agreement for Consumer based on the backup scheme of their choice (please tick one backup scheme):

- 1) **Summation Scheme (please tick one metering option):**
 - Installation of Summation meters
(Where there are no generation meters installed, summation meters will be provided by SPPA)
 - Generation meters
(If generation meters are already installed, there is no need to install additional summation meters as the generation meters can double up as summation meters)
 - Solar Generation Profile
(Applicable for contestable consumers who have embedded generation (PV) below 10 MWac and are registered with SPS/EMC)
- 2) **Capped Capacity Scheme**
- 3) **Extended Capped Capacity Scheme**

5. For more details on backup scheme, please refer to Handbook on “How to Apply for Electricity Connection” (Appendix 39).

PART VI: DECLARATION OF COMPLIANCE TO SPPG’S TECHNICAL REQUIREMENTS

I, _____ (LEW No.: _____),
(Name)

the undersigned Licensed Electrical Worker (LEW) for the DER installation at the above premises, declare that I have evaluated and confirmed that the DER system complies with the above, including requirements as per “Technical Requirements of Distributed Generation (DG) and New Extra High Tension (EHT) Connection”.

Signature: _____

Date: _____
(DD/MM/YYYY)