GRID-TIED PHOTOVOLTAIC (PV) SYSTEM: CHECKLIST AND DECLARATION OF COMPLIANCE TO SP POWERGRID'S (SPPG) TECHNICAL REQUIREMENTS

(To be submitted together with CS1 application)

For official use only	
Application No.	

PART I: INSTALLATION DETAILS

Consumer Name:				
Installation/Premises Address:				
Electrical Installation License No.:				
Installation Intake Voltage:				
Existing Approved Load:		kVA		
Existing Approved PV Capacity:		kWp		kWac[1]

PART II: PV SYSTEM DETAILS

PV System Information:

Short Circuit Current Contribution: _____ Amps

Metering Point	Location Description of Metering Point	kWp	kWac[1]	Owner of PV system[2]
1				☐ Consumer ☐ 3rd party
2				☐ Consumer ☐ 3rd party
3				☐ Consumer ☐ 3rd party
4				☐ Consumer ☐ 3rd party
	Total			

1. Base on inverter AC capacity.
2. If PV is owned by 3rd party, please state Company Name: _____

PV Inverter(s) Information:

Metering Point	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 PV 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, Flicker, DC Injection)
☐ Solar panel(s) Specifications
☐ Isolation Transformer Specifications (if used)
☐ Dynamic Simulation Model (for aggregated capacity ≥10MWac)
☐ Other Supporting Documents (if any)

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

1) Certificate of Compliance
2) Commissioning Declaration of PV System

PART IV: TECHNICAL REQUIREMENTS

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	*Total harmonic voltage distortion, V_{THD}*	< 5%	< 4%	< 3%	< 1.5%
	Individual harmonic voltage (odd)	< 4%	< 3%	< 2%	< 1%
	Individual harmonic voltage (even)	< 2%	< 2%	< 1%	< 0.5%
DC Injection	*Max DC injection per phase*	< 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 PV system DC injection at the PCC deviates from this requirement.				
Voltage Fluctuation	*Percentage difference from nominal voltage*	< ±3%			
Flicker	*Short term flicker severity, P_{ST}*	< 1.0			
	Long term flicker severity, P_{LT}	< 0.8			
Voltage Unbalance	*Max ratio of negative phase sequence to positive phase sequence voltage*	< 1%			

2) Protection

		Voltage Range (% of base voltage)		
		V < 50	50 ≤ V < 88	110 ≤ V < 120
Abnormal Voltage Response	*Minimum Holding Time (s) - requirement*	> 0.6	> 2.0	> 1.0
	Minimum Holding Time (s) - settings			
	Maximum Tripping Time (s) - requirement	<1.6	< 3.0	< 2.0
	Maximum Tripping Time (s) - setting			
	The PV system shall also cease to energize the transmission system for faults on the service connection between the PV system to the PCC, and prior to re-closure of the service connection of the transmission system circuit breaker.			

		Frequency Range (Hz)	
		47.5 ≤ f <52	47 ≤ f < 47.5
Abnormal Frequency Response	*Operating Time*	Continuous operation	Remain in operation for at least 20s each time frequency falls below 47.5Hz.

3) Reconnection

The solar photovoltaic generating unit 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 ±3% of the nominal value or distribution network voltage within ±6% of the nominal value.

4) Inverter Specification

Inverter power factor adjust range: 0.9 leading to 0.9 lagging.

Reactive power control mode: ☐ Q(V) Control[3]
If other mode is selected, please indicate the details: _____

3. For more details on the setting, please refer to "Transmission Code" F12.

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

We understand that consumers connected at HT and above with embedded generation (PV) are required to choose a backup scheme[4] 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**

4. 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 PV installation at the above premises, declare that I have evaluated and confirmed that the PV 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)