# SOLAR POWER GENERATION-CHECK LIST

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| **A.** | **Installation Details** | |
| 1. | Name & Address of Installation | |
| 2. | Contact Number | |
| 3. | Classification (LT/MV/HT/EHT) | |
| 4. | Date of receipt of completion report | |
| 7. | Capacity of SPV System | |
| **B** | **SPV Module** | |
| 1. | Details of MNRE approval test for SPV Module/NABL accredited lab approved . | |
| 2. | Type of SPV module | Thin film / Polycrystalline/Monoperk/etc |
| 3. | Degree of ingress protection (IP) | |
| 4. | Open circuit voltage | |
| 5. | Short curcut current | |
| 6. | Nominal efficiency | |
| 7. | Maximum output (Peak Power) | |
| 8 | Number of PV Module connected in series in a string | |
| 9 | Number of strings | |
| 10 | Whether Maximum PV array voltage limited to 1000V in case of roof top solar PV installation as per section 6.1.1 of IEC/IS 62548:2016 or later | |
| 11 | Total number of PV modules | |
| 12 | Total installed capacity | |
| 13 | Type of system | Grid interactive system / Off grid system/Hybrid |
| **C** | **Roof top solar installation** | |

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| 1 | Details of pathways (minimum 75cm) as per Regulation 121 (i) | |
| D | **Ground Mounted Solar installation** | |
| 1 | Cable laying details(shall be laid in trenches) as per Regulation 121 (iii) | |
| 2 | Solar instalation fencing protection details as per Regulation 121 (iv) | |
| **E** | **Whether DCDB provided**<br>If yes, details of switch board | Yes/No |
| **F** | **DC side protection** | |
| 1 | Rating of Power cables for inter connection of Modules (panels within array). | |
| 2 | Whether DC cable UV protected as per Regulation 121 (vii) | |
| 3 | Check whether all connections are correctly tightened to avoid point of failure over time . (Section 6.3 of IEC/IS 62548:2016 or later) | |
| 4 | Check whether all connections are properly locked in to place (Section 6.3 of IEC/IS 62548:2016 or later) | |
| 5 | Check whether all crimp connection are performed according to manufacturer’s instruction (Section 6.3 of IEC/IS 62548:2016 or later) | |
| 6 | Check and verify inulation resistance measured by insulation monitoring system in solar inverter is according to table – 2 of IEC/IS 62548:2016 or later and as per regulation 121(3)(v) | |
| 7 | Protection by residual current monitoring system shall be checked and confirmed as per section 6.4.2.4 of IEC/IS 62548:2016 or later | |
| 8 | Requirement of string over current protection shall be checked and verified according to section 6.5.2 of IEC/IS 62548:2016 or later<br>((Ns-1) x Isc_mod) > Imod_max_ocpr<br>Where Isc_mod :- short circuit current of PV module or PV string at test condition (STC) specified by manufacturer<br>Imod_max_ocpr :- PV module maximum over current protection rating detrmined by IEC 61730-2 (This may be specified by manufacturer)<br>Ns :- total number of parallel connected string . | |
| 9 | Requirement of lightning protection shall determined as per IEC 62305 -2 .(section 6.6 of IEC/IS 62548:2016 or later) and as per regulation 121(3)(i) | |
| 10 | SPD shall be provided in both AC and DC side (section 6.6.2.2 of IEC/IS 62548:2016 or later). It shall be checked and verified . | |

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| 11 | Type of Cable | |
| 12 | Cable size for PV string shall be according to section 7.3.7 and table 5 of IEC/IS 62548:2016 or later<br>mimum Current carrying capacity of cable for PV string<br>For single sting array : 1.25 x Isc _mod<br>for all other cases In + 1.25 x Isc_mod x (Npo-1)<br>In is the current rating of nearest down stream over current protection devices<br>Npo is the total number of parallel connected string protected by nearest over current protecting devices . It shall be checked and verified . | |
| **G** | **PV string combiner box details if required** | |
| 1 | Whether each PV array provided with a switch - disconnector to provide isolation of the PCE (inverter) as per section 5.1.4.2 of IEC/IS 62548 : 2016 or later | Yes/No |
| **H** | **Inverter** | |
| 1 | Make | |
| 2 | Serial Number | |
| 3 | Rating of inverter | |
| 4 | Total number of inverter | |
| 5 | Total capacity of inverter | |
| 6 | Power quality details of inverter | |
| | (i)AC voltage | |
| | (ii)frequency | |
| 7 | Type of inverter | |
| 8 | Whether automatic syncrhonisation testing for inverter to output of grid done during commissioning stage | |
| 9 | DC current injection % | |
| 10 | THD % | |
| 11 | Type of installation Indoor/outdoor | |
| 12 | Degree of ingress protection for inverter . | |
| 13 | Location of solar inverter (shall be in periphery of building in case of roof top SPV) Regulation 121(1) (vii) | |
| **I** | Details of Disconnection switch /circuit breakers to discconnect SPV installation from system (AC side) as per Regulation 121 (v) | Rating : A<br>Type : |
| **J** | **Metering Provided** | |
| 1 | Details of Net meter | |
| 2 | Details of check meter | |
| **K** | **Test result** | |
| 1 | Earth resistance | |

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| 2 | Insulation Resistance value | |
| 3 | Total voltage harmonic distortion(during commissioning stage ) | |
| 4 | Individual voltage harmonic distortion (during commissioning stage ) | |
| 5 | DC current injection % (during commissioning stage ) | |
| 6 | Whether PV module characteristic verified in the presence of consumer (P-V curve , I-V curve etc as per manufacturer data ) | |
| **L** | **Earthing** | |
| 1 | Details of earthing. | |
| 2 | Whether inverter frame earthed as per regulation 121(2)(ii) | |
| 3 | Whether PV module frame , mounting structure and non current carrying metal parts earthed and interconnected as per regulation 121(2)(iv) | |
| 4 | Check that minimum size of bonding conductor is 6mm2 copper or equivalent and shall conform to Section 7.4.2 of IEC/IS 62548:2016 or later | |
| 5 | If seperate earth electrode is provided for PV array , these elelectrodes shall be interconnected to the main earthing terminal of electrical installation by main equipotential bonding conductors as per Section 7.4.2.3 of IEC/IS 62548:2016 or later . This shall be checked and verified . | |
| 6 | No. of earth pits. | |
| **M** | **Details of following protection shall be furnished and shall be checked as per Regulation 121 (ix)** | |
| 1 | Over load protection | |
| 2 | Surge current protection | |
| 3 | Surge voltage protection (SPD) as per regulation 121(3)(ii) | |
| 4 | Short circuit protection | |
| 5 | High temperature protection | |
| 6 | Over voltage (passive anti islanding protection for solar inverter) | _____V |
| 7 | Under voltage( passive anti islanding protection for solar inverter) | _____V |
| 8 | Over frequency (passive anti islanding protection for solar inverter) | _____Hz |
| 9 | Under frequency (passive anti islanding protection for solar inverter) | _____Hz |
| 10 | Reverse polarity | |
| 11 | Reverse power relay (in case of ongride solar inverter synchronized with DG set ) | |

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| 12 | Active anti islanding certificate details from manufacturer | |
| 13 | Whether earth fault protection provided in solar inverter | |
| 14 | Whether insulation monitoring system provided in solar inverter for the protection of unearthed DC system | |
| 15 | Lighning protection system details | |
| 16 | Details of fire detection system and automatic fire suppression system required as per Regulation 121(4) | |
| **N** | **Remarks** | |

***Regulation means :- Central Electricity authority(Measures relating to Safety and Electric Supply )Regulation , 2023 .**