**ANNEXURE 7**

1. **Plant Availability Factor (PAF)**
2. Yearly plant availability factor shall be calculated as per the following formula:

**100 − {[1 − 𝐷𝐹𝑥 𝑁]𝑥 [Σ𝑖𝑊𝑖𝐻𝑖 /(8760 − 𝐺𝑜𝑢𝑡)] 𝑥 100}**

Where,

DF = Plant degradation factor, as per Manufacturer Power Output Warranty (1% per year for this case)

N = Number of years of operation from the date of operational acceptance of the project i.e.01st July 2017.

Wi = Equipment weightage factor

Hi = Equipment yearly unavailability hours

8760 = Total Number of solar hours in non-leap year. It shall be replaced by 8784 hours in leap year.

Gout = Total Grid outage hours in the year (as certified by DISCOM / NRSE Division, Electricity Dep’t. A&N Administration

1. Availability factor shall be calculated (rounded off upto 2 decimal place) on annual basis from the date of LOA till the culmination of the O&M period.
2. Availability of the following equipment along with the respective weightage factor shall be used for the calculation of availability factor.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sl. No. (i)**  | **Equipment (Ei)** | **Weightage Factor (Wi) per Equipment** | **System** **Downtime Period** | **Wi x Hi** |
| **Eq. tripping time (A)** | **Eq. re-start time (B)** | **Hi =** **B-A** |
|  | Main Outgoing Feeder, Transformer and associated AC Cable | 1.0 |  |  |  |  |
|  | Inverter and associated Cables | Each Inverter capacityPlant’s Installed Inverter Capacity |  |  |  |  |
|  | PV String and associated Cables | Each PV string CapacityPlant’s Installed DC Capacity |  |  |  |  |
|  | Plant BoS (Energy Meter, LA, Earthing, LT Panel switches, MCCBs, AC/DC fuses, All other spares / consumables which are not included in Owner’s supplied material as mentioned at Para B of SoW and required for uninterrupted O&M of the plant) | 0.2 |  |  |  |  |

1. Final PAF will be the weighted average of all plants put together over the year.

PAF(total) = (**Σ PAFi** x **Pni**) / **ΣP ni**

Where:

PAFi = PAF of an individual plant

Pni  = Nominal power rating of an individual plant as per Annexure 9

1. In case of outage of more than one equipment in the same path of power flow, outage of equipment with highest weightage factor shall be considered.
2. Grid outage hours shall not be considered for calculation of availability. The contractor shall submit grid outage certification from ED-A&NA.
3. Any outages which are not attributable to the O&M contractor shall be considered nil. The O&M contractor shall submit documentary evidence after the occurrence of any fault such as reasons of fault, error code in case of inverter, root cause analysis, etc. SECI will examine the fault details to determine whether the faults are attributable to SECI, O&M contractor, Grid or any other. Contractor shall abide by SECI’s decision in this respect.
4. For calculation of PAF, the O&M contractor shall submit the PAF checklist on monthly basis as per Annexure 9.

**Annexure 8**

**Routine & Preventive Maintenance schedule**

The Contractor shall follow the following Routine & preventive maintenance schedule as a minimum requirement. If required, additional maintenance activities other than the following schedule will be proposed by the Contractor.

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | Equipment | Routine | PM Frequency |
| Daily  | Fortnightly | Monthly | Quarterly | Half yearly | Yearly |
|  | General inspection of the Inverter  | X |  |  |  |  |  |
|  | Inverter  |  |  | X |  |  |  |
|  | String Voltage (DC voltage) |  |  | X |  |  |  |
|  | String Amp (DC current) |  |  | X |  |  |  |
|  | AC Voltage Level |  |  | X |  |  |  |
|  | SPV Module Cleaning (wet/dry) |  | X |  |  |  |  |
|  | Module visual inspection |  | X |  |  |  |  |
|  | IR thermography |  |  |  |  | X |  |
|  | MC4 connectors checking |  |  | X |  |  |  |
|  | Earth pit checking |  |  | X |  |  |  |
|  | Fire Fighting systems |  |  | X |  |  |  |
|  | ACDB Checking |  |  | X |  |  |  |
|  | Meter Reading  | X |  | X |  |  |  |
|  | LT Panel |  |  |  |  | X |  |
|  | CT/PT |  |  |  |  |  | X |
|  | DC / AC Transmission line |  |  | X |  |  |  |
|  | Display Boards |  |  |  | X |  |  |
|  | Mechanical Maintenance of the plant (structure, cable conduit, cable entries, fasteners, etc) |  |  |  |  | X |  |
|  | Trimming of trees | As per requirement |
|  | Lighting Arrestor |  |  |  |  | X |  |

*Note: The above checklist is indicative only and SECI may suggest modification during execution of O&M of the plant.*

O&M contractor shall submit the quarterly invoice only if the compliance of above checklist has been completed and certified by SECI’s authorised representative.