

Solar Energy Corporation of India, New Delhi

SECI-SGM10-1-2015/10072015/Amendment-01

Date: 10/07/2015

Sr. No	Section No./Clause	Original Clause	Amended Clause
1	Section III: GCC Clause 49.3	The date of Comprehensive Operation & Maintenance Contract period shall begin on the date of demonstration of guaranteed PR. However, operation of the Power Plant means operation of system as per bid and workmanship in order to keep the project trouble free covering the guarantee period. The contractor must demonstrate the committed CUF at the end of every year in accordance with commitment made in the Techno-Commercial Enclosures of the Bid.	The date of Comprehensive Operation & Maintenance Contract period shall begin on the date of Final Acceptance of the plant. However, operation of the Power Plant means operation of system as per bid and workmanship in order to keep the project trouble free, covering the guarantee period. The contractor must demonstrate the committed CUF at the end of every year in accordance with commitment made in the Techno-Commercial Enclosures of the Bid.
2	Section IV: SCC Clause 5	Final check-up of equipment and pre – commissioning, commissioning and putting the system into successful operation for performance demonstration while feeding power to the grid while keeping the plant up for 100%	Final check-up of equipment and pre- commissioning, commissioning and putting the system into successful operation for performance demonstration while feeding power to the grid. During the performance demonstration of the plant, plant shall up and running for 100% of the time excluding the grid outages. However, during the complete O&M period plant uptime shall not be less than 99%.
3	Section V: Technical Specs. Clause 2.7	Component and equipment reliability: Each component offered by the bidder shall be of established reliability. The minimum target reliability of each equipment shall be established by the bidder considering its failure, mean time between failures and mean time to restore, such that the availability of complete system is assured. The guaranteed annual system availability shall not be less than 99.9%. Bidder recommendation of the mandatory spares shall be on the basis of established reliability.	Component and equipment reliability: Each component offered by the bidder shall be of established reliability. The minimum target reliability of each equipment shall be established by the bidder considering its failure, mean time between failures and mean time to restore, such that the availability of complete system is assured. The guaranteed annual system availability shall not be less than 99%. Bidder recommendation of the spares shall be on the basis of established reliability.
4	Section V: Technical Specs. Clause 3.7.6	Construction of 10m wide motorable approach road from main road for easy access to site & 3.75m wide internal roads with 0.5m wide well compacted shoulders on each side with WBM base to carry safe and easy transportation of equipment and material at the project site during and after construction.	Construction of 0.5km (approx.), 5 m wide motorable approach road with 1m shoulder on both sides from main road for easy access to site & 3.75m wide internal roads with 0.5m wide well compacted shoulders on each side with WBM base to carry safe and easy transportation of equipment and material at the project site during and after construction.
5	Section V: Technical Specs. Clause 5.24	All materials used for manufacturing solar PV module shall have a proven history of reliability and stable operation in external applications. It shall perform satisfactorily in relative humidity up to 100% with temperature between -10°C to +85°C (cell) and shall withstand adverse climatic conditions, such as high speed wind, blow with dust, sand particles, saline climatic / soil conditions and for wind 180 km/hr on the surface of the panel.	All materials used for manufacturing solar PV module shall have a proven history of reliability and stable operation in external applications. It shall perform satisfactorily in relative humidity up to 95% with temperature between -10°C to +85°C. The materials shall withstand adverse climatic conditions, such as high speed wind (180kmph), blow of dust and sand particles, saline climatic/soil conditions.
6	Section V: Technical Specs. Clause 6.1	Module Mounting Structure (Fixed/Single Axis/Double Axis):	Module Mounting Structure (Fixed):
7	Section V: Technical Specs. Clause 6.1.7	The array structure shall be made of hot dipped galvanized steel of suitable size. The thickness of galvanization should be as per the relevant standards for galvanization but minimum of 80 microns. It is to ensure that before galvanization the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale, acid or alkali or such foreign material as are likely to interfere with the galvanization process. The bidder should ensure that inner side should also be galvanized.	The array structure shall be made of mild steel members of suitable size with weather protection coating. The coating shall be as per ASTM A792/ A792M-10 standard Al-Zn alloy with hot dip process and thickness of 150GSM on both sides. It is to ensure that before coating that the steel surface shall be thoroughly cleaned of any paint, grease, rust, scale, acid or alkali or such foreign material as are likely to interfere with the coating process. The bidder should ensure that inner side should also be coated.
8	Section V: Technical Specs. Clause 6.1.10	All fasteners shall be of stainless steel of grade SS 316 and must sustain the adverse climatic conditions. Two numbers of anti-theft fasteners of stainless steel on two diagonally opposite corners for each module shall be provided. If any lower grade stainless steel (SS 304, SS 302 or equivalent) fasteners are used they must have must have protective coating to ensure the life of 25 years.	All fasteners shall be of stainless steel of grade SS 316 and must sustain the adverse climatic conditions. Two numbers of anti-theft fasteners of stainless steel on two diagonally opposite corners for each module shall be provided. If any lower grade stainless steel (SS 304, SS 302 or equivalent) fasteners are used they must have must have anti corrosion protective coating to ensure the life of 25 years.
9	Section V: Technical Specs. Clause 6.5.4	Galvanic Isolation: The PCU inverter shall have provision for galvanic isolation.	Galvanic Isolation: The PCU inverter shall have provision for galvanic isolation with external transformer

10	Section V: Technical Specs. Clause 6.7.1	All cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, humidity, dirt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. (Note: IEC standards for DC cables for PV systems is under development, the cables of 600 – 1800 volts DC for outdoor installations should comply with the draft EN 50618/ TUV 2PfG 1169/09.07 for service life expectancy of 25 years)	All DC cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, humidity, dirt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. DC cables used from solar modules to the array junction box shall be solar grade copper with XLPO insulation and rated at 1.1kV only. However, the cables used from array junction box to inverter can be of XLPO Aluminum with 1.1kV as per the latest standards. (Note: EN 50618/ TUV 2PfG 1169/09.07 for service life expectancy of 25 years) Bidder should ensure the life expectancy of 25years and shall provide the test certificates for all the cables used in the plant.
11	Section V: Technical Specs. Clause 6.9.1	The source of over voltage can be lightning or other atmospheric disturbance. Main aim of over voltage protection is to reduce the over voltage to a safe level before it reaches the PV or other sub-system components as per IEC 60099-4:2014 / IS: 2309 – 1989 (Reaffirmed – 2005), Edition 3.1 (2006-01).	The source of over voltage can be lightning or other atmospheric disturbance. Main aim of over voltage protection is to reduce the over voltage to a safe level before it reaches the PV or other sub-system components as per NFC 17-102. Bidder is to provide ESE type lightning arrester, placed at strategic location to protect the plant from lightning and shall not cause any shadow on the solar modules.
12	Section V: Technical Specs. Clause 6.30.3	The ACSR bus bars are an underground system of wires strung between two supporting structures and supported by strain type insulators. The stringing tension may be limited to 500-900 kg depending upon the size of the conductor used. These types of bus bars are suitable for earthquake prone areas.	The ACSR bus bars are an overground system of wires strung between two supporting structures and supported by strain type insulators. The stringing tension may be limited to 500-900 kg depending upon the size of the conductor used. These types of bus bars are suitable for earthquake prone areas. All the bus bars are to be provided with insulating sleeves with appropriate color.
13	Section V: Technical Specs. Clause 8.12.2	Bidder is to provide RCC hume pipe at the crossing of road and drains and at required locations. The peripheral drain shall be of brick pitching which is backed up by cement mortar bed and all joints are filled up with cement mortar in C.M. 1:4, no pointing and plastering is required. All other internal drains i.e. on both side of central road, pathways to inverter room, control room, switchyard are to be done by excavating the drain of required size and with required trapezoidal section.	Bidder is to provide RCC hume pipe at the crossing of road and drains and at required locations. The peripheral drain shall be of brick pitching which is backed up by cement mortar bed and all joints are filled up with cement mortar in C.M. 1:4, no pointing and plastering is required. Alternately, stone pitching with pointing can also be proposed. Drains are required to be provided with weep holes with PVC pipes at an interval of 2m. All other internal drains i.e. on side of central road, pathways to inverter room, control room, switchyard are to be done by excavating the drain of required size and with required trapezoidal section.
14	Section V: Technical Specs. Clause 8.1	Topographical survey shall have to be done by the Successful Bidder of the proposed site at 5 m interval with the help of Total Station or any other suitable standard method of survey. All necessary Reduced Levels (RL) as entered in the Field Book have to be submitted along with pre contour layout of the total site. The formation levels of the proposed power plant have to be fixed with reference to High Flood Level of the proposed site. The ground level and plinth level of structures shall be fixed taking into consideration the highest flood level and surrounding ground profiles	Topographical survey shall have to be done by the Successful Bidder of the proposed site at 10 m interval with the help of Total Station or any other suitable standard method of survey. All necessary Reduced Levels (RL) as entered in the Field Book have to be submitted along with pre contour layout of the total site. The formation levels of the proposed power plant have to be fixed with reference to High Flood Level of the proposed site. The ground level and plinth level of structures shall be fixed taking into consideration the highest flood level and surrounding ground profiles
15	Section V: Technical Specs. Clause 8.15	Contractor has to design as per relevant IS codes, submit and take approval from client / consultant and construct 5 lacs litre underground RCC water tank with silting chamber for filtration of the water before the inlet which will match with invert level of Storm water drain. Design of RCC water tank shall be such that it shall resist Earth pressure and Water pressure and satisfy all IS codes.	Contractor has to design as per relevant IS codes, submit and take approval from client / consultant and construct underground or Overhead RCC water tank at strategic location to hold water, required for cleaning all the Solar Modules for at least two cycles while estimated cleaning cycle is once per week.

16	Section V: Technical Specs. Clause 3.18	Establishing a system to maintain an inventory of spare parts, tools, equipment, consumables and other supplies required for the facility's hassle free operation	<p>Establishing a system to maintain an inventory of spare parts, tools, equipment, consumables and other supplies. The bidder has to supply 0.25% of the total capacity of solar modules of same rating as mandatory spares and to be included in the contract price. the same will be issued to the contractor on replacement basis during O&M period.</p> <p>Moreover, the Contractor shall keep and maintain the inventory of recommended spares for the hassle free operation during the complete O&M period with out any additional cost to SECI.</p> <p>Also, at the end of 4th year of O&M period, contractor shall supply a list of all recommended spares, as per the operational requirement of the plant and with reference to the mean time between failures, along with the detailed specification, suppliers details and tentative cost for future purchase. SECI at its discretion, will purchase the spare as required for future operation.</p>
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