

- xiv. String Monitoring System: String Monitoring System designed exclusively for parallel connection of the photovoltaic field strings, allowing for protection in the case of breakdown & monitoring the entire photovoltaic field, by means of the following checks.
- Reading the string currents (10 channels available)
 - Reading the total voltage of the field
 - Checking the fuses positioned in the system, to protect the photovoltaic panels.
 - Checking the state of the internal protection against over-voltages.
 - Should be very low power consumption.
- a. Monitoring of various parameters at string level should be made possible in the main control room at site by installing the suitable string monitoring system any fault at string level could be recognizable by that system.
- b. A provision should be present for remote monitoring of the power plant at string detail over the web.
- c. The Contractor shall provide to GSECL the detailed specifications, and all administrative rights/ privileges/ passwords to the string monitoring system.
- xv. Weather Station and Data logger
- a. Contractor shall provide the data over remote web-server with rights to control or modify the same through appropriate arrangements.
- b. Contractor shall provide necessary licensed software and hardware solution to offer monitoring of electrical parameters of grid and solar generator monitored at individual string level over remote web server. The Contractor shall provide all necessary accessories like power supply, connection cords, sensors, active SIM card with appropriate data plan etc. so as to make the system complete in all respect.
- c. The cost of data plan during the project and O&M shall be borne by the Contractor. At the end of the O&M, the same shall be transferred to GSECL at no extra cost.
- d. It shall also have local data logging and communication through Bluetooth / Wi Fi and Ethernet port.
- e. The Remote Monitoring System shall be capable of sustaining maximum – minimum temperature, rainfall, wind gusts and UV radiation. The enclosure shall be IP65 for outdoor installation / IP21 for indoor installation.
- f. The Remote Monitoring System shall have capability to log and send data from weather sensors.
- g. The data shall be available for every minimum 15 minutes interval.

- h. The system shall have sufficient internal memory storage to retain data for one complete year and shall have provision of expanding memory through external memory card / USB drive.
- i. The system shall be able to communicate wirelessly in a close proximity
- j. The Contractor shall provide to the Company the detailed specifications, and all administrative rights/ privileges / passwords to the string monitoring system.
- k. The Contractor shall provide following measuring instruments with all necessary software & hardware compatible with the Data logging and web based monitoring system.
 - i. **Pyrometer:** The Contractor shall provide two no. of pyranometers for measuring incident global solar radiation, one each on the horizontal surface and in the same orientation (inclination and azimuth) as the photovoltaic modules. The pyranometers shall have following specifications mentioned in Table 5-12.

Table 5-12 Specification of Pyranometers

Sr.	Particulars	Specification
1	Class	II
2	Spectral Response	0.31 to 2.8 micron
3	Sensitivity	Approx. 9 micro - volt/w/m ²
4	Time response (95%)	Max 15 sec.
5	Non linearity	±0.5%
6	Temperature Response	±2%
7	Temperature Response	Max ±2%
8	Tilt error	±0.5%.
9	Zero offset thermal radiation	±7 w/m ²
10	Zero offset temperature change	±2 w/m ²
11	Operating temperature range	- 40 deg. to +80 deg.
12	Uncertainty(95% confidence Level)	Hourly- Max-3%
13	Daily-	Max -2%

14	Non stability	Max $\pm 0.8\%$
15	Resolution	Min + / - 1 W/m ²
16	Input Power for Instrument & Peripherals	230 VAC (If required)
17	Output Signal	Analogue form which is compatible with the data

- ii. Temperature Sensor: The Contractor shall provide suitable nos. of RTD type temperature sensors with required weather shield as per Indian Standards, so as to individually and simultaneously measure both, ambient temperature, and module temperature. To measure module temperature, the temperature sensors shall be located on the back of representative modules and on front glass surface. Care must be taken to ensure that the temperature of the cell in front of the sensor is not substantially altered due to the presence of the sensor. Instrument shall have a range of -5°C to 60°C.
- iii. Anemometer and Wind Vane: The Contractor shall provide double cup anemometer on tubular type made up of hot dipped Galvanized Iron. Velocity range upto 65 m/s, accuracy limit of 0.1 m/s. the anemometer shall have valid calibration certificates which should be produced during one month of the installation.
- iv. Each instrument shall be supplied with necessary cables. Calibration certificate with calibration traceability to World Radiation Reference (WRR) or World Radiation Centre (WRC) shall be furnished along with the equipment. The signal cable length shall not exceed 20m. Bidder shall provide Instrument manual in hard and soft form.
- v. The data acquisition system shall measure, continuously record power at PV module ambient temperature near array field, cell temperature, wind velocity, AC and DC (string level) side power of each inverter, power characteristics of the HT side, fault messages, alarms etc. in Indian Standard Time.
- vi. Reliable sensors for solar insolation, temperature & other weather & electrical parameters are to be supplied with data logger unit.
- vii. All data shall be recorded chronologically date wise. The data file should be MS Excel compatible. The data logger shall have internal reliable battery backup and data storage capacity to record all sorts of data simultaneously round the clock. All data shall be stored in a common work sheet chronologically. Representation of monitored data in graphics mode or in tabulation form. All instantaneous data can be shown in the Computer Screen.
- viii. Provision should be available for Remote Monitoring and Data Retrieval over web server. Moreover, Successful Bidder shall also provide one no. of PC with required

hardware and licensed copies of software to make it fully functional for normal operation and data logging through Bluetooth / Wi Fi / RS port from the site.

- ix. The Bill of Materials associated with the equipment must clearly indicate especially the details about the PC and other accessories.
- x. The Data Acquisition System should be housed in appropriate enclosure to sustain outdoor environment as per generation design guidelines laid for enclosures. The same shall have provision of locking the same to prevent unauthorized operation. Remote Monitoring System (RMS) shall provide following data at a 15 minute interval.
- Power, Current and Voltage at individual solar PV strings (Instantaneous)
 - Ambient temperature near array field, cell temperature measured at module front and back surface
 - Wind Speed
 - Cumulative AC and DC side Power of each inverter
 - Cumulative AC and DC energy of each inverter
- a. Solar irradiation/isolation over horizontal and in-plane of the module
- b. Voltage, frequency and other important electrical parameters etc. in the local grid.
- c. Any other parameter considered necessary by supplier based on current prudent practice
- d. RMS shall have feature to be integrated with the local system as well remotely via the web using either a standard modem or a GSM/WIFI modem. The Bidder shall provide compatible software and hardware so that data can be transmitted via Standard modem.
- e. RMS shall be provided with independent solar PV based power supply along with maintenance free battery having 3 days autonomy.
- f. The RMS shall be compatible to the requirements for measuring and reporting the performance-ratio of the power plant.
- g. The contractor shall provide all administrative rights/ privileges/ passwords of the RMS system to GSECL.
- h. The Bidder shall submit the data sheet with technical specifications of the RMS system in the Bid.

5.3.34 Testing Instruments For Electral and Electronics

The Contractor shall also provide required set of onsite testing instruments/equipment Whenever need arises for testing, instruments i.e. Rheostats, CRO, Function generator, inverter testing kit for commissioning, testing and O & M of plant bidder shall have to be arranged at their cost. The instruments /equipment's viz earth resistance tester, insulation tester, millimetres, clamp meters , transformer oil BDV kit, Relay testing kit, infra-red thermal imaging hand held temperature meter etc.. shall have to be supplied

5.4 11 KV bay at GETCO S/S and Bus bar extension.

11 Kv construction, erection, testing and commissioning of 11 KV bay & required Switchgear panels along with accessories required at GETCO Sikka S/s and Bus bar extension shall be carried out under supervision of GETCO and as per GETCO guidelines. Also Contractor has to select GETCO registered vendor for EPC work of 11 KV bay and Bus as well as 11 KV line(if U/G cable not selected) from solar plant to DISCOM / GETCO S/s.

5.5 Area Lighting

The system provides lighting and electric power supply for lighting to solar plant areas, boundary fencing, roads, Peripheral roads inside boundary wall etc. In addition, it also provides lighting to selected areas during plant emergency conditions.

The design shall be such as to provide minimum lighting levels as specified for different areas.

- General Outdoor Area : 10 Lux average
- Main Roads : 20 Lux
- Secondary Roads: 10 Lu
- Near Equipment : 50 Lux
- Main Control Room : 400 Lux
- Conference Room/ Staff Room : 300 Lux
- Other Room : 200 Lux

The lighting system shall comprise Normal A.C. Lighting, Emergency A.C. Lighting and Emergency D.C. Lighting

--- End of Section---

6 General Terms and Conditions

6.1 Use of Contract Documents & Information

- 6.1.1 The Contractor shall not, without GSECL's prior written consent, disclose the Contract or any provision thereof or any specification, plan, drawing, pattern therewith to any person other than person employed by the Contractor in performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend strictly for purpose of performance only.
- 6.1.2 The Contractor shall not, without GSECL's prior written consent, make use of any document or information except for purpose of performing the Contract.
- 6.1.3 Any document other than the Contract itself shall remain the property of GSECL.

6.2 Patent Rights

- 6.1.10 6.2.1 The Contractor shall indemnify GSECL against third party claims of infringement of patent, trademark or industrial design rights arising from use of goods/design or any part thereof.

6.3 Materials and Workmanship

- 7.3.1 All materials shall be of the best quality and workmanship capable of satisfactory operation under the operating and climatic conditions as may be specified. Unless otherwise specified, they shall conform in all respect to the latest edition of the relevant Bureau of Indian Standard (BIS) specification wherever Indian specifications apply or British Standard (BS) or International Electro-technical Commission (IEC) or internationally accepted standard.
- 7.3.2 The Contractor shall supply and deliver all equipment and materials for installation at site. The Contractor shall arrange for transportation, loading and unloading and safe storage of materials at project site at his own cost and risk.
- 7.3.3 If the Contractor offers equipment manufactured in accordance with other international well recognized standards, he shall, in that case, supply a copy in English of the Standard Specification adopted and shall clearly mention in what respect such standard specification differs from Indian Standard Specifications. The plant, equipment, and materials offered by the Contractor should comply with one consistent set of Standards only as far as possible.
- 7.3.4 No deviation in foreign exchange rate shall be admissible at any point of time after submission of the Bid.

7.4 Inter-changeability

- 7.4.1 All the parts shall be made accurately to standard gauges and specifications so as to facilitate replacement and repairs. All corresponding parts of similar apparatus shall be inter-changeable.

7.5 Packing and Marking

- 7.5.1 The Contractor shall be responsible for securely protecting and packing the plant and equipment as per prescribed standards in force to withstand the journey and ensuring safety of materials and also arrival of materials at destination in original condition and good for contemplated use. Packing case size and weight shall take into consideration the remoteness of the goods' final destination and absence of heavy material handling facilities at all points in transit.

- 7.5.2 Packing lists of materials shall be provided in each package to facilitate checking up of the contents at the destination.
- 7.5.3 In order to import any items, associated with the Project, from abroad or from any other state in India, the Contractor shall have to arrange any clearance, permission, if required at his own risk, from any Government (Government of State and Government of India) or any Government (Government of State and Government of India) controlled organization for transportation of materials from manufacturing shop to delivery at any site. Necessary certificates if so required shall be issued by GSECL within reasonable time after getting written request from the Bidder along with the necessary documents substantiating necessity of such approvals. All packing material is the property of GSECL and shall be immediately deposited by the Contractor to GSECL's Store at Project Site.

7.6 Negligence

- 7.6.1 If the Contractor neglects to manufacture or supply the plant and equipment with due diligence and with expeditiousness or refuses or neglects to comply with any reasonable order given to it in writing by GSECL or contravenes any provisions of the Contract, GSECL may give seven (7) seven days' notice in writing to the Contractor, to make good the failure, neglect or contravention complained of. If the Contractor fails to comply with the notice within reasonable time from the date of serving thereof, in the event of failure, neglect or contravention capable of being made good within that time, then in such case, if GSECL thinks fit, it shall be lawful for it to take the manufacture or supply of plant wholly or in part, out of the Contractor's hand and give it to another person on Contract at a reasonable price and GSECL shall be entitled to retain any balance which may be otherwise due on the Contract by it to the Contractor or such part thereof as may be necessary, to the payment of the cost of manufacture or supply of such plant as aforesaid.
- 7.6.2 If the cost of executing the work as aforesaid shall exceed the balance due to the Contractor and the Contractor fails to make good such deficiency, GSECL shall take action in the manner it may consider deem fit in terms of the Contract.

7.7 Statutory Responsibility

- 7.7.1 The Contractor shall comply with all applicable laws, by laws, rules, and regulations and shall procure and maintain their validity all necessary Municipal, Panchayat and Government permits & licenses etc. at its own cost.

7.8 Insolvency and Breach of Contract

- 7.8.1 GSECL may at any time by notice in writing summarily terminate the Contract without compensation to the Contractor in any of the following events:
- a. If the Contractor at any time, is adjudged insolvent or have a receiving order or order from administration of its state made against it or shall take any proceeding for compensation under any Insolvency Act for the time being in force or make any conveyance or assignment with its creditors or suspend payment. If the Contractor being a company is wound up voluntarily or by the order of a court or a Receiver, Liquidator or manager on behalf of the Debenture holder is appointed or circumstances have arisen which entitle the Court or debenture holder to appoint a Receiver, Liquidator or Manager.

7.9 Timeline

7.9.1 The Contractor shall provide full program of the supply in detail and delivery schedule along with work schedule thereto. Strict adherence and guaranteed delivery schedule mentioned in terms and conditions shall be the essence of the Contract and delivery schedule must be maintained.

7.9.2 The work must be completed as per the Timeline below from the date of handing over of site. Zero date is the date of issue of Notice to Proceed.

Sr no	Capacity of project.	Project completion period
1	Gandhinagar TPS 2.5 MW	09 months from the date of LOA
2	Sikka TPS 2.0 MW	09 months from the date of LOA

7.9.3 The Contractor shall also provide a Bar/ PERT Chart indicating completion schedule for various items involved in the work within the stipulated completion period and the Contractor should strictly adhere to that schedule.

7.9.4 The issue of Notice to Proceed shall be considered as the Zero Date unless it is mentioned in LOI

6.9.5 The Bar/ PERT Chart provided by the Contractor shall submitted to GSECL for approval prior to commencement of the execution of the Project. All comments and modifications provided by GSECL shall be incorporated and adhered to by the Contractor in the Timeline, Bar/ PERT Chart, detailed execution plan, etc. for execution of the Project.

7.10 Delay in Execution or Failure to Supply

7.10.1 Any delay in completion of the work shall attract liquidated damage/ penalty for late completion as per Liquidated Damage (Clause 7.11) of this Tender.

7.10.2 If the Contractor fails to deliver the plant or fails to start the work within specified time frame after issue of LoI or leaves the work site after partial execution of the work, GSECL shall have the right to get the work done through any other agency at the risk and cost of the Contractor. Further to this, GSECL may, without prejudice to the right of the Contractor to recover damages for breach of trust of the Contract, may impose penalties.

7.11 Liquidated Damages for Delay and Underperformance

A. Delay in Commissioning

7.11.1 In case the Contractor fails to achieve successful Commissioning of plant by the due date indicated in Timeline Clause 7.9.2, then GSECL shall levy the Liquidated Damages on the Contractor. ~~50% of name plate capacity i.e. (AC) to be consider for partial commissioning, subject to confirmation from GUVNL for purchase of power.~~ Operational Acceptance Test (OAT) shall start only when full capacity is commissioned by the Contractor.

- a) Delay up to 30 days: Amount of Rs. 4,500/MW/Day shall be deducted as penalty for the first 30 days of delay calculated on per day basis and proportionate to the capacity not commissioned.
- b) Delay of more than 30 days and up to 60 days: Amount of Rs. 5,500 /MW/day shall be deducted on per day basis and proportionate to the capacity not commissioned.
- c) Delay of more than 60 days: Amount of Rs. 6,500 /MW/day shall be deducted on per day basis and proportionate to the capacity not commissioned.

7.11.2 Maximum applicable Liquidated Damages: The upper ceiling for total liquidated damages for delay shall be maximum 10% of the EPC Contract Price. For calculation of penalty, date of LOA shall be the reference date.

B. Underperformance

7.11.3 6.11.3 At the time of the Operational Acceptance Test, any shortfall in the Performance Ratio (PR) as determined through the Test Procedure Testing will attract imposition of Liquidated Damages after one (1) unsuccessful chance. For any shortfall in PR below 0.75 by the Bidder for the second (2) time, a penalty of 1% of the EPC Contract Price (including taxes & duties) shall be levied. In case the first the Test is unsuccessful then penalty shall not be charged but the Contractor has to make the necessary corrections to conduct the test again within the stipulated maximum 30 days, so as to demonstrate the PR equal to or more than 0.75. In the second (2nd) time, a penalty at the rate specified above shall be levied on the Contractor. The penalty shall be deducted from the pending payment and Performance Bank Guarantee. However, if Contractor feels that NEEGG may not be achieved and want to carry out further correction, the same will be allowed for the one more time i.e. 3rd time but PG Test and O&M period shall start from such later date. In case the Contractor is successful in 3rd attempt then 1% of the EPC Contract Price (including taxes & duties) deducted after unsuccessful 2nd attempt shall be returned. However, if the Contractor fails in the 3rd attempt as well then the penalty deducted at the time of 2nd unsuccessful attempt shall not be returned.

C. Performance Guarantee Test / Final Acceptance Test

7.11.4 6.11.4 If the “Actual Delivered Energy” at metering point is less than the Base NEEGG (corresponding to NEEGG quoted for 1st year of O&M) based on the procedure mentioned in the Appendix 16, then the penalty at rate of Rs.4.25 per kWh shall be charged for the shortfall.

7.12 Penalty for Loss of Generation during O&M

- 7.12.1 For each Contract Year, the Contractor shall demonstrate “Actual Delivered Energy” at the Metering Point as compared to the ‘Base NEEGG’ for the particular year (calculated as per the methodology given in Appendix 16 Part C).
- 7.12.2 If for any Contract Year, it is found that the ‘Actual Delivered Energy’ is less than ‘Base NEEGG for the particular year, the Contractor shall pay the compensation to GSECL equivalent to Rs 4.25 per kWh of under-generation. The same shall be recovered from payments yet to be made by GSECL to the Contractor and/or from the Bank Guarantees available with GSECL.
- 7.12.3 In case of any defect in the system after Commissioning, the Contractor shall repair it within forty eight (48) hours. After 48 hours, Penalty shall be charged and the same shall be deducted /**recovered from payments yet to be made by GSECL to the Contractor and / or** from the Bank Guarantee submitted to GSECL. A penalty at the rate of Rs. 4.25 per kWh shall be charged by the company for the loss of generation due to that effect post 48 hours. The loss of generation shall be calculated with respect to the NEEGG of that particular year based on the actual radiation.
- 7.12.4 However, in case the Contractor fulfils the NEEGG at the end of the year then the amount deducted as a penalty for loss of generation as per this Clause shall be adjusted in the Contractor’s bill or reimbursed. In case the Contractor fails to meet the NEEGG at the end of the year then above-mentioned penalty shall be adjusted from the penalty calculated at the end of the year for the shortfall in the generation so that there is no duplication of penalty for the same loss of generation. The first 48 hours shall not be considered for the penalty in case of any defect.
- 7.12.5 In case the Project fails to generate any power continuously for 6 months any time during the O&M period, it shall be considered as an “Event of Default”.
- 7.12.6 Upon occurrence of any Event of Default mentioned in Clause 7.12.4 herein above, GSECL shall have the right to encash the entire amount of O&M Bank Guarantee submitted by the Contractor and withheld any other pending payment.
- 7.12.7 The Company reserves the right to perform random audits of weather monitoring system of the plant anytime during the entire O&M period. If any discrepancy is found between the measured parameters, the difference between the measured parameters by GSECL from secondary sources and the weather monitoring system installed by the Contractor at the site will be factored in calculating the adjusted NEEGG during the entire year. However, GSECL will have the final authority to decide on this matter. GST & cess will be applicable on penalties at prevailing applicable rates.

7.13 DSM charges

- 7.13.1 EPC/O&M contractor shall be responsible for carrying out scheduling & forecasting work.
- 7.13.2 All cost associated towards scheduling & forecasting activity like charges for Qualified Co-ordinating Agency (QCA), additional SCADA requirements if any for accurate scheduling & forecasting work, related to DSM regulation by GERC in existence and amended from time to time, shall be in the scope of EPC/O&M contractor.
- 7.13.3 GSECL shall bear 50% of DSM charges and EPC/O&M contractor shall have to bear remaining 50% DSM charges.

7.14 Defect Liability

- 7.14.1 The Contractor must warrant that the facilities or any part thereof shall be free from defects in the design, engineering, materials and workmanship of the Plant and Equipment supplied and of the work executed.
- 7.14.2 If it shall appear to the authorized representative of the Company that any supplies have been executed with unsound, imperfect or unskilled workmanship, or with materials of any inferior description, or that any materials or articles provided by the Contractor for the execution of Contract are unsound or otherwise not in accordance with the Contract, the Contractor shall on demand in writing inform the authorized representative of the Company specifying the item, materials or articles complained of, notwithstanding that the same may have been inadvertently or otherwise passed, certified and paid for. The Contractor shall forthwith rectify or remove and replace that item so specified and provide other proper and suitable materials or articles at its own charge and cost, and in the event of failure to do so within a period to be specified by the authorized representative of the Company in its demand aforesaid, the Project Manager may on expiry of notice period rectify or remove and re-execute the time or remove and replace with others, the materials or articles complained of as the case may be at the risk and cost in all respects of the Contractor. The decisions of the authorized representative of the Company as to any question arising under this Clause shall be final and conclusive.
- 7.14.3 The Contractor shall be liable for the operation and maintenance of the Facility and
- 7.14.4** Consequently shall be required to rectify any defects that emerge during the operation of the Facilities for the entire term of this Contract. Defect Liability Period shall be eighteen (18) months from the date of **Commissioning or twelve (12) months from the completion of last Operational Acceptance Test, whichever is later.**
- 7.14.5 If during the Defect Liability Period any defect found in the design, engineering, materials and workmanship of the Plant and Equipment supplied or of the work executed by the Contractor, the Contractor shall promptly, in consultation and agreement with GSECL regarding appropriate remedying of the defects, and at its cost, repair, replace or otherwise make good (as the Contractor shall, at its discretion, determine) such defect as well as any damage to the Facilities caused by such defect.
- 7.14.6 Furthermore, without prejudice to the generality of the foregoing, it is clarified that the Contractor shall also be responsible for the repair, replacement or making good of any defect or of any damage to the Facilities arising out of or resulting from any of the following causes:
- a. Improper operation or maintenance of the Facilities by the Contractor during operation and maintenance of the Facility; or
 - b. Operation of the Facilities violating specifications of the Facilities.
- 7.14.7 GSECL shall give the Contractor a notice stating the nature of any such defect together with all available evidence thereof, promptly following the discovery thereof. GSECL shall afford all reasonable opportunity for the Contractor to inspect any such defect.

- 7.14.8 GSECL shall provide the Contractor all necessary access to the Facilities and the Site to enable the Contractor to perform its obligations.
- 7.14.9 The Contractor may, with the consent of the Company, remove from the Site any Plant and Equipment or any part of the Facilities that are defective, if the nature of the defect and/ or any damage to the Facilities caused by the defect is such that repairs cannot be expeditiously carried out at the Site.
- 7.14.10 If the repair, replacement or making good is of such a nature that it may affect the efficiency of the Facilities or any part thereof, the Company may give to the Contractor a notice requiring that tests of the defective part of the Facilities shall be made by the Contractor immediately upon completion of such remedial work, whereupon the Contractor shall carry out such tests.
- 7.14.11 If such part fails the tests, the Contractor shall carry out further repair, replacement or making good (as the case may be) until that part of the Facilities passes such tests. The tests, in character, shall in any case be not inferior to what has already been agreed upon by GSECL and the Contractor for the original equipment/part of the Facilities.
- 7.14.12 If the Contractor fails to commence the work necessary to remedy such defect or any damage to the Facilities caused by such defect within a reasonable time (which shall in no event be considered to be less than seven (7) days), the Company may, following notice to the Contractor, proceed to do such work, and the reasonable costs incurred by GSECL in connection therewith shall be paid to GSECL by the Contractor or may be deducted by the Company from any monies due to the Contractor or claimed under the Performance Guarantee, without prejudice to other rights, which GSECL may have against the Contractor in respect of such defects.
- 7.14.13 If the Facilities or any part thereof cannot be used by reason of such defect and/ or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Company because of any of the aforesaid reasons. Upon correction of the defects in the Facilities or any part thereof by repair/ replacement, such repair/ replacement shall have the defect liability period of eighteen (18) months from such replacement.
- 7.14.14 In addition, the Contractor shall also provide an extended warranty for any such component of the Facilities and for the period of time. Such obligation shall be in addition to the Defect Liability Period specified under Clause 6.14.

7.15 Termination for Default

- 7.15.1 The Company may, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Contractor, terminate the Contract in whole or in part if the Contractor fails to deliver or execute any or all of the goods within the time period(s) under the Contract or any extension thereof granted by GSECL pursuant to the clause for Delay in Execution or Failure to Supply or, If the Contractor fails to perform any other obligations(s) under the Contract.
- 7.15.2 In the event the Company terminates the Contract in whole or in part, pursuant to above, the Company may procure, upon such terms and in such manner as it deems appropriate, goods similar to those undelivered, the Contractor shall be liable to the Company for any excess costs for such similar goods. However, the Contractor shall continue the performance of the Contract to the extent not terminated.

- 7.15.3 In case the Contractor is not able to demonstrate the “Actual Delivered Energy” as per the “Base NEEGG” based on the procedure mentioned in Appendix 16 during the Performance Guarantee Test and after the penalties levied as mentioned in Clause 6.12.; GSECL reserves the right to terminate the Contract at its discretion if there are no efforts are made from the Contractor to correct the issues regarding plant performance.
- 7.15.4 In case termination of the Contract due to default, the Contractor may be blacklisted by GSECL and its associate companies, etc. for future work.

7.16 Breach and Cancellation of the Contract

- 7.16.1 In case of non-performance in any form or change of the covenant and conditions of the Contract by the Contractor, the Company shall have the power to annul, rescind, cancel or terminate the order and upon its notifying in writing to the Contractor that it has so done, this Contract shall absolutely determine. The decision of the Company in this regard shall be final and binding.
- 7.16.2 The Company may cancel the order or a portion thereof, and if so purchase or authorize purchase of the plant/equipment not so delivered or order Plant/ Equipment of similar description (opinion of the Company shall be final) at the risk and cost of the Contractor.

7.17 Force Majeure

- 7.17.1 In the event of either party being rendered unable by Force Majeure to perform any obligation required to be performed by them under this Contract, relative obligation of the party affected by such Force Majeure shall be treated as suspended during which the Force Majeure Clause lasts.
- 7.17.2 The term “Force Majeure” shall have herein mean riots (other than among the Contractor’s employee), Civil commotion, War (whether declared or not), invasion, act of foreign enemies hostilities, civil war, rebellion, revolution, insurrection, military coup, damage from aircraft, nuclear fission, embargoes, quarantines, acts of god such as earthquake (above 7.0 magnitude on Richter scales), lightning, unprecedented floods, fires not caused by the Contractors negligence and other causes which the Contractor has no control and accepted as such by GSECL whose decision shall be final and binding. Normal rainy season and monsoons are not Force Majeure.
- 7.17.3 Upon occurrence of such causes and upon its termination, the party alleging that it has been rendered unable as aforesaid, thereby, shall notify the other party in writing by registered notice within 24 (twenty four) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of its claim.
- 7.17.4 Time for performance of the relative obligation suspended by the Force Majeure shall stand extended by the period for which such clause lasts.
- 7.17.5 If works are suspended by Force Majeure conditions lasting for more than two (2) months, GSECL shall have the option of cancelling this Contract in whole or part thereof, at its discretion.
- 7.17.6 The Contractor shall not claim any compensation for Force Majeure conditions and shall take appropriate steps to insure men and materials utilized by it under the Contract well in advance.

7.18 Progress Report of Work

- 7.18.1 The Contractor shall submit a weekly progress report on execution of works conforming to bar/ PERT Chart and format provided by GSECL. In case of any

slippage(s) or delay in execution of work reasons for such delay along with details of hindrances will be submitted by the Contractor along with modified Bar/ PERT Chart mentioning the action plan being taken to keep the due date of completion of project unchanged. If required, the Contractor shall use additional manpower to keep the due date of completion of Project unchanged.

7.18.2 The authorized representative of the Contractor shall review the progress of the Project work every fortnight on a prefixed day at project site with GSECL or its representative as per the network and record the minutes.

7.19 Insurance

7.19.1 During the construction period, i.e. before the Commissioning of the Project, all insurance related expenses shall be borne by the Contractor. The goods supplied under the Contract shall be fully insured against the loss or damage incidental to manufacture or acquisition, transportation, storage, delivery, theft, natural or other disaster, etc. in such a manner that the Company shall not incur any financial loss, as long as the construction of the Project continues to remain under the custody of the Contractor.

7.19.2 In case of any loss or damage or pilferage or theft or fire accident or combination of the said incidents etc. under the coverage of insurance, the Contractor shall lodge the claim as per rules of insurance. Any FIR required to be lodged to local Police Station shall be the responsibility of the Contractor.

7.19.3 The Contractor shall arrange to supply/ rectify/ recover the materials even if the claim is unsettled for timely completion of the Project. The final financial settlement with the insurance company shall be rested upon the Contractor.

7.19.4 In case of any delay of the Project attributable to the Contractor, the Contractor himself in consultation with the Company should take the extension of insurance. Any financial implications shall, however, be borne by the Contractor.

7.19.5 The Contractor shall arrange for providing insurance coverage to its workmen under Workmen's Compensation Act or similar Rules and Acts as applicable during execution of work for covering risk against any mishap to its workmen. The Contractor shall also undertake a Third Party Insurance. The Company shall not be responsible for any such loss or mishap.

7.19.6 Comprehensive insurance is to be arranged by the Contractor during the O&M period of the Contract.

7.19.7 At the end of the term of insurance undertaken by the Contractor, the Contractor shall provide all the necessary documents to the satisfaction of the Company in order to enable the Company to take up the insurance of the Plant.

7.20 Statutory Acts, Rules and Standards

7.20.1 The work shall be executed in conformity with the relevant standard of Bureau of Indian Specification (or equivalent International Standard), Electricity Rules, 2010 (as amended up to date), Indian Electricity Act, BARC/DAE rules, Explosive Act 1948, Petroleum Act 1934, National Building Code and relevant Rules in vogue at the time of execution including operation and maintenance period.

7.21 Tools and Tackles

7.21.1 The Contractor shall provide technically suitable tools and tackles for installation & erection of Plant and Machineries conforming to relevant BIS safety and technical standards for proper execution of work. The Company, in no way, shall be responsible for supply of any tools and tackles for implementation of the work and also to carry out operation and maintenance activities.

7.22 Safety Measures

7.22.1 The Contractor shall have to provide necessary and adequate safety measures including personal protective equipment and precautions to avoid any accident, which may cause damage to any equipment/ material or injury to workmen. The Company shall not be responsible for any such accidents.

7.23 Hazardous Material

7.23.1 Any hazardous material used during construction or used as part of the plant has to be taken back by the supplier for recycling or dumping purpose after its operating/ working life, so that it may not affect the environment or any living being. The Contractor shall comply with the State Pollution Board regulation.

7.24 Stoppage of Work

7.24.1 The Company shall not be responsible and not liable to pay any compensation due to stoppage of work as a reaction from local public due to any undue action on the part of the Contractor causing annoyance to local people.

7.25 Hindrance Register

7.25.1 The Contractor may also maintain a Hindrance Register where reasons for delay may be recorded from time to time and at the time of occurrence of the hindrance and get it duly certified by the Project Manager or his authorized representative.

7.26 Responsibility of the Contractor

7.26.1 The Contractor shall provide guarantee and be entirely responsible for the execution of the Contract in accordance with this Tender including but not limited to its specification, schedules, and annexure. The Contractor shall further provide guarantee and be responsible for the quality and workmanship of all materials and completed works, correct designs and drawings, correct delivery of material, erection, testing and commissioning including operation and maintenance.

7.27 Right of the Company to Make Change(s) in Design

7.27.1 All designs shall be approved by GSECL prior to the execution of such designs.
7.27.2 The Company shall have the right to make any change in the design, which may be necessary in the opinion of GSECL to make the plant and materials conform to the provisions and contents of the specification without extra cost to GSECL.

7.28 Manuals

7.28.1 The Contractor shall supply all necessary erection and commissioning manuals, O&M manuals etc. as and when required. Six sets of test results, manuals etc. shall be submitted by the Contractor on completion of the work in hard and soft copies.

7.29 Governing Language

7.29.1 The Contract shall be written in English Language. All correspondence and documents pertaining to the Contract, which are exchanged by the Company and Contractor, shall be written in English.

7.30 Order Amendments

7.30.1 No variation in or modification of the terms of the contract shall be made except by written amendments issued by the Company.

7.31 Assignments or Subletting of Contract

7.31.1 The Contractor shall not, without the prior consent in writing of the Company, assign or sublet or transfer its Contract in whole or in part, its obligations to perform under the Contract or a substantial part thereof, other than raw materials, or for any part of the work of which makers are named in the Contract, provided that any such consent shall not relieve the Contractor from any obligation, duty or responsibility under the Contract.

7.32 Subcontracts

7.32.1 The Contractor shall notify the Company in writing of all subcontracts awarded under the Contract if not already specified in his Bid. Such notification in its original Bid or later shall not relieve the Contractor from any liability or obligation under the Contract.

7.32.2 Subcontracting a work shall not, under any circumstances, relieve the Contractor from its obligations towards the Project and the Company.

7.32.3 In case, the Contractor engages any Subcontractor to carry out a part of the work, the Subcontractor should have requisite Government License for carrying out such part of the work.

7.33 Inspection and Testing

7.33.1 The Company or its authorized representative including appointed Consultant for the project shall have, at all times, access to the Contractor's premises and also shall have the power to inspect and examine the materials and workmanship of project work during its manufacture, shop assembly and testing. If part of the plant is required to be manufactured in the premises other than the Contractor's, the necessary permission for inspection shall be obtained by the Contractor on behalf of GSECL or its duly authorized representative.

7.33.2 GSECL shall have the right to serve notice in writing to the Contractor on any grounds of objections, which he may have in respect of the work. The Contractor has to satisfy the objection, otherwise, the Company at his liberty may reject all or any component of plant or workmanship connected with such work.

7.33.3 The Contractor shall issue request letter to GSECL or his authorized representative for testing of any component of the plant, which is ready for testing at least fifteen (15) days in advance from the date of actual date of testing at the premises of the Contractor or elsewhere. When the inspection and the tests have been satisfactorily completed at the Contractor's works, GSECL shall issue a certificate to that effect. However, the Company at its own discretion may waive the inspection and testing in writing under very special circumstances. In such case, the Contractor may proceed with the tests which shall be deemed to have been made in GSECL's presence, and it shall forthwith forward six (6) sets of duly certified copies of test results and certificates to the Company for approval of the Company. The Contractor, on receipt

of written acceptance from GSECL, may dispatch the equipment for erection and installation.

- 7.33.4 For all tests to be carried out, whether in the premises of the Contractor or any Subcontractor or the supplier, the Contractor, shall provide labour, materials, electricity, fuel, water, stores, apparatus and instruments etc. free of charge as may reasonably be demanded to carry out such tests of the plant in accordance with the Contract. The Contractor shall provide all facilities to GSECL or its authorized representative to accomplish such testing.
- 7.33.5 The Company or his authorized representative shall have the right to carry out inward inspection of the items on delivery at the Site and if the items have been found to be not in line with the approved specifications, shall have the liberty to reject the same.
- 7.33.6 If the Company desires, testing of any component(s) of the plant be carried out by an independent agency, the inspection fee, if any, shall be paid by the Company. However, the Contractor shall render all necessary help to GSECL whenever required free of charge.
- 7.33.7 The Contractor has to provide the necessary testing reports to GSECL as and when required.
- 7.33.8 Neither the waiving of inspection nor acceptance after inspection by GSECL shall, in anyway, absolve the Contractor of the responsibility of supplying the plant and equipment strictly in accordance with specification and drawings etc.

7.34 Authorized Test Centres

- 7.34.1 The PV modules, inverters, transformers, panels, wires, etc. deployed in the power plants shall have valid test certificates for their qualification as per above specified IEC/ BIS Standards by one of the reputed labs of the respective equipment (preferably NABL Accredited Test Centres) in India. In case of module or other equipment for which such Test facilities may not exist in India, test certificates from reputed ILAC Member Labs abroad will be acceptable.

7.35 Delivery of Equipment

- 7.35.1 The Contractor shall deliver the equipment of the plant and machineries in accordance with the terms of the Contract at the time(s) to the place(s) and in the manner specified in the Contract. The Contractor shall comply with instructions that may be given by the Company from time to time regarding the transit of the plant and material.
- 7.35.2 Notification of delivery or dispatch in regard to each and every consignment shall be made to the Company immediately after dispatch or delivery from the manufacturing works. The Contractor shall supply to the consignee Invoice in triplicate and packing account of all stores delivered or dispatched by him.
- 7.35.3 In case of any occurrence of loss or damage in transit, it shall be the liability of the Contractor to initiate or pursue the claim with the Insurance company. It should take immediate steps to repair the damaged apparatus or replacement there to.

7.36 Liabilities during Transit

- 7.36.1 The Contractor shall be responsible for loss, damages, or depreciation to goods or of plant, equipment, and machineries up to delivery at the Site.

7.37 Deduction from Contract Price

- 7.37.1 All costs, claims, damages or expenses, which the Company may have paid for which the Contractor is liable, will be deducted by the Company from deposited bank

guarantees or from any money due or which become due to him under this Contract or any contract are being executed elsewhere with the Company.

7.37.2 Any sum of money due and payable to the Contractor, as per the Contract Agreement, may be appropriated by the Company and set off against any claim of the Company, for the payment of a sum of money arising out of or under any other contract made by the Contractor with the Company. It is an agreed term of the Contract that the sum of money, withheld or obtained under this clause by the Company, will be kept withheld or retained as such by the Company or till this claim arising out of in the same Contract is either mutually settled or determined by the arbitrator, or by competent court, as the case may be, and that the Contractor shall have no claim for interest or damages whatsoever on this account or any other account in respect of any sum of money withheld or retained under this clause and duly notified as such to the Contractor.

7.38 Terms of Payment

(a) Supply and 10 years O&M: The Company shall pay the Contractor in the following manner for supply of material and at the following time for achieving the respective milestone for the Supply. The Tender is for a comprehensive EPC Contract of Supply, Works and O&M. There shall be 3 (three) different Contracts signed for Supply, Works and O&M. However, a single LoI shall be issued to the Successful Bidder. The payment terms for Supply, Works and O&M is given below.

Payment milestones for supply(For each site)

1.	Advance Payment (5% of Supply Price excluding taxes & duties) against : (i) Acceptance of LoI (ii) Submission of Advance Bank Guarantee of equivalent amount (iii) Submission of Performance Bank Guarantee (validity as per clause no 3.11.6 (1)) -10% of the total EPC Contract Price Interest free Advance shall be given	5% of Supply Contract value (Excluding Taxes and duties.)
2	Supply and receipt of PV modules at site on pro-rata basis for each 500KWp PV module consignment.	40% of Supply Contract value
3	Completion of Erection of MMS Column Post including civil Foundation of each 500KW (AC) on pro-rata basis.	10% of Supply Contract value
4	Erection of PV Modules on prorata basis, for each 500KW(AC) pro-rata basis	10% of Supply Contract value
5	Supply of BOS on each 500 KW (AC) Block on Pro rata basis.	10 % of Supply Contract value

Bid for Design, Engineering, Supply & Procurement, construction, operation and maintenance of grid connected Solar PV Plant of 2.5 MW at Gandhinagar TPS & 2 MW at Sikka TPS in the State of Gujarat.

6	Completion of Erection & Installation of each 500KW(AC) block	10% of Supply Contract value
7	Upon Completion of Successful Performance and Operational Acceptance Test	10% of Supply Contract value
8	Upon Completion of the Facilities of the project.	5% of Supply Contract value

7.38.1 (b) Payment Terms for the Works shall be as per the following table (For all three sites)

Sr.	Milestone for Works and O&M	Amount
1	Mobilization Advance Payment: Interest free 5 % of works price Against mobilization at site and submission of BG of equivalent amount.	5% of Work Contract Value
2	On completion of soil investigation and Topo survey & Finalization of MMS pile design.	5 % of Work Contract Value
3	Against monthly RA bills for the Works executed at site	60 % of Work Contract Value
5	Upon Successful Commissioning of the entire Project Against PV Module Bank Guarantee (if PV Module insurance is not available).	10 % of Work Contract Value
6	Upon Successful OAT	20 % of Work Contract Value
1.	On Successful Operation and Maintenance of the Solar PV Power Plant on quarterly basis for each year till 10 years	Year 1: OM-1 Year 2: OM-2 Year 3: OM-3 Year 4: OM-4 Year 5: OM-5 Year 6: OM-6 Year 7: OM-7 Year 8: OM-8

		Year 9: OM-9 Year 10: OM-10
--	--	--------------------------------

Note:

1. Bank Guarantee against mobilization **& supply** Advance shall be submitted for initial validity of 12 (Twelve) months and shall be extended till adjustment of the entire amount.
2. All works shall be considered for payment on pro-rata basis of payment milestones per approved billing break up to be approved after award of contract.
3. The Contractor shall submit all the invoices related Project and invoices of the O&M to notified officer (will be informed to successful bidder) with copy to Chief Engineer (P&P), Corporate Office, GSECL, Vadodara. All material shall be consigned to notified officer (will be informed to successful bidder)
4. The payment for works shall be released on monthly basis.
5. Mobilization Advance Payment shall be adjusted in monthly RA bills on pro-rata basis. Supply advance shall be adjusted from subsequent bills on pro rata basis.
6. For payment against milestone 3 of works, the joint recording of work done at site shall be attached with the invoice.”
7. EPC Contract Price of Supply means the Supply part of the EPC Contract Price.
8. Contract Value of Works means the Contract value of the Works part of the EPC Contract Price.
9. Commercial Operation Date” (COD): with respect to the Project/Unit shall mean the date on which the project /unit is commissioned (certified by GEDA) and available for commercial operation and such date as specified in a written notice given at least 10 days in advance by the EPC Contractor to Owner /GUVNL.
10. While making payment for each invoice, amount of GST & applicable cess will be kept under retention till submission of documentary proof of payment of GST or till reflection of payment of GST pertains to respective bill amount in GST return for concern Invoice after due verification.
TCS is 0.1% will be applicable as per the Govt. Notification on total order value of supply including GST.

7.39 Payments

- 7.39.1 Subject to any deduction which the Company may be authorized to make under this Contract, and or to any additions or deductions provided for in this Contract, the Contractor shall be entitled to payment as follows:
- a. All payments shall be made in Indian Rupees, unless otherwise specified in the LoI/Contract Agreement. All payment shall be made on the basis of actual measurement for the quantified items as per schedule of works.
 - b. The Contractor shall submit the bill / invoice for the work executed showing separately GST and any other statutory levies in the bill / invoice.

- All taxes and deductions shall be applicable as per prevailing income tax and other statutory rules and provisions in force.
- Payment shall be released by the Sr. Accounts Officer/ Accounts Officer, GSECL, through RTGS/NEFT.

7.40 Warranty/ Guarantee

- 7.40.1 The Plant shall perform as per the Guaranteed Performance indicated by the Bidder in its Financial Proposal.
- 7.40.2 PV modules used in grid connected solar power plants must be warranted for peak output power at Standard Testing Condition (STC), which shall not be less than 90% at the end of ten (10) years and not less than 80% at the end of twenty five (25) years. The first year degradation shall not be more **2.5% for poly** and **3% for mono** of the PV Module capacity and in subsequent years it shall be 1% **maximum**.
- 7.40.3 The mechanical structures, electrical works, all plant equipment and components and overall workmanship of the grid solar power plants shall be warranted for a minimum of 5 years.
- 7.40.4 The Contractor shall ensure that the goods supplied under the Contract are new, unused and of most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract.
- 7.40.5 The warranty / guarantee period shall be as follows:
- a. Solar PV Modules: Modules shall be warranted for a minimum period of 25 years in the Bidder's detailed Warranty/ Guarantee certificate. Same shall be furnished with its Bid.
 - b. Inverters: Inverters shall be warranted for the guarantee period provided by the original equipment manufacturer. Same shall be furnished with its Bid.
 - c. Transformers, associated switchgear and others: Bidder shall furnish in detail its warranties/ guarantees for these items.
- 7.40.6 During the period of Warranty/ Guarantee the Contractor shall remain liable to replace/ repair any defective parts, that becomes defective in the Plant, of its own manufacture or that of its Subcontractors, under the conditions provided for by the Contract under and arising solely from faulty design, materials or workmanship, provided such defective parts are not repairable at Site. After replacement the defective parts shall be returned to the Contractors works at the expense of the Contractor unless otherwise arranged.
- 7.40.7 At the end of Guarantee period, the Contractor's liability shall cease. In respect of goods not covered above, GSECL shall be entitled to the benefit of such Guarantee given to the Contractor by the original Contractor or manufacturer of such goods.
- 7.40.8 During the Operation and Maintenance and Guarantee period, the Contractor shall be responsible for any defects in the work due to faulty workmanship or due to use of sub-standard materials in the work. Any defects in the work during the guarantee period shall therefore, be rectified by the Contractor without any extra cost to GSECL within a reasonable time as may be considered from the date of receipt of such intimation from GSECL failing which GSECL shall take up rectification work at the risk and cost of the Contractor.

7.40.9 Material Warranty:

Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than ten (10) years from the date of sale to the GSECL:

- Defects and/or failures due to manufacturing defects and/or failures due to materials, including PID defect
- Non-conformity to specifications due to faulty manufacturing and/or inspection processes.

If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at GSECL's sole option.

(a) Performance Warranty:

The manufacturer should warrant the output of Solar Module(s) If, Module(s) fail(s) to exhibit such power output in prescribed time span, the Contractor will either deliver additional PV Module(s) to replace the missing power output with no change in area of land used or repair or replace the PV Module(s) with no change in area of land used at GSECL's sole option. Total land available from GSECL is fixed and the bidder shall design the plant so that in this case he has enough space within this land to accommodate additional capacity.

7.40.10 Insurance or Bank Guarantee

A) **Bank Guarantee against PV Modules Warranty:** The Successful Bidder shall provide security in form of Bank Guarantee of Rs 10 lac per MW (DC capacity) valid for 25 Yrs from the start date of O & M period.

<Or>

(B) **Insurance:** Successful Bidder shall provide the insurance for PV module power output warranty as per the technical specification backed up through an insurance policy by a reputed insurance company. This shall cover the PV module power output warranty in case of insolvency or bankruptcy of the PV module manufacturer. The Bidder shall submit a suitable insurance from Third Party.

However, Bidder shall provide notarised undertaking for followings.

- (i) Bidder will be fully liable and responsible for the performance of supplied Solar PV Module for entire project life of 25 Years.
- (ii) Failing to which Bidder will make all arrangement at their risk and cost to replace or make it good in order to keep Solar PV plant under smooth operation and meeting the obligation of Guarantee/warranty.
- (iii) in case of any failure of Solar PV Module or any spare part of it under guarantee Bidder will be liable to replace it and all relevant expenses shall be borne by them
- (iv) Bidder will indemnify to GSECL for any loss and/or damage from time to time and will undertake all the relevant procedure of insurance claim for guarantee/warranty at their own with the PV module supplier/ insurer at no cost to GSECL.

In case of failure to meet performance warranty of Solar PV modules, Bidder will make all arrangement at their risk and cost to replace or make it good in order to keep Solar PV plant under smooth operation and meeting the obligation of warranty.