

**LEGEND :-**

PLANT BOUNDARY	
ROAD	
RIVER	
CONTOUR	
SPOT LEVEL	

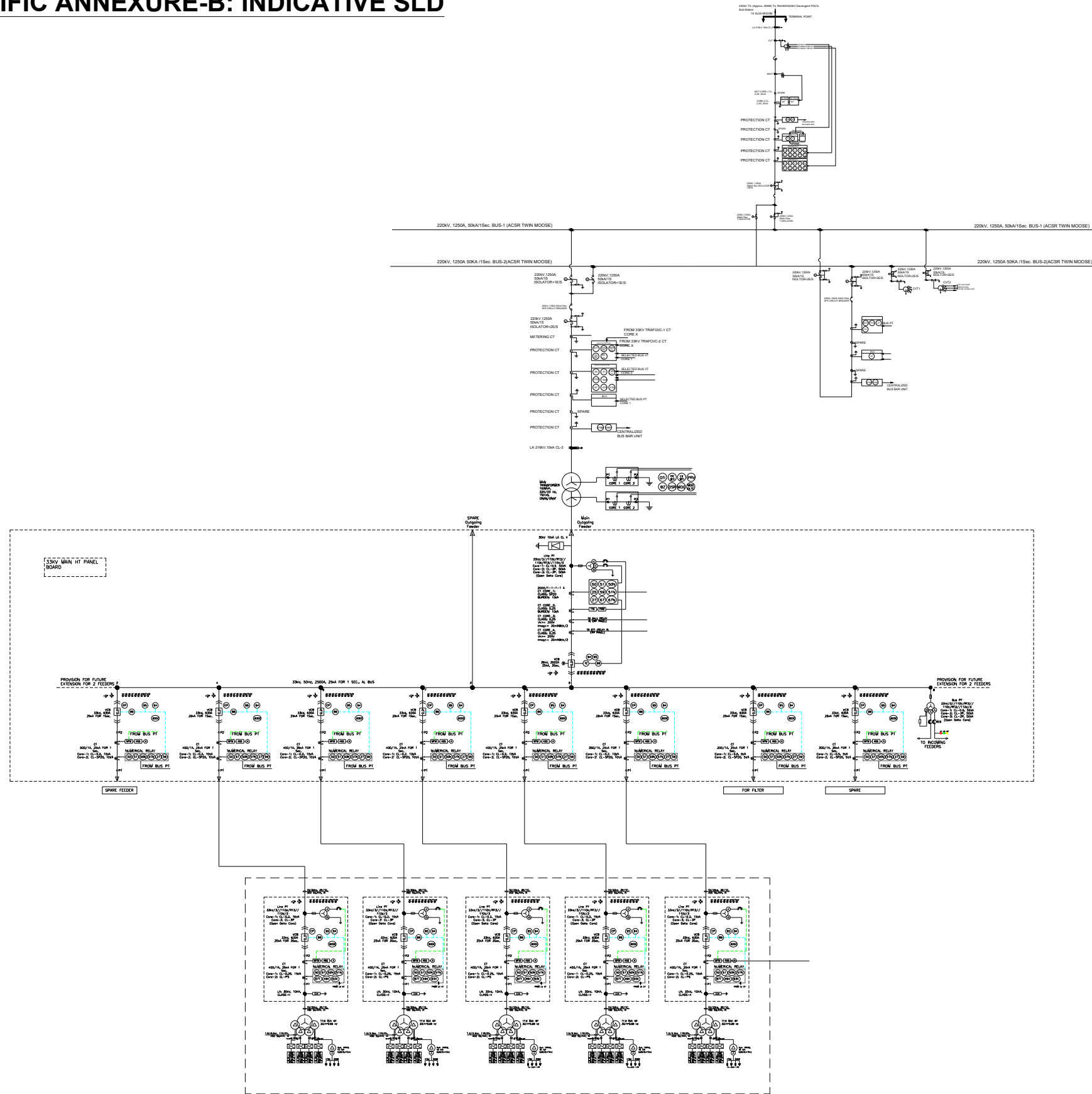
**BOUNDARY COORDINATES**

UTM ZONE = 43 P		
S.No	Easting	Northing
A	667522.35	1592095.16
B	669471.01	1592095.16
C	669497.16	1592557.90
D	669436.05	1592651.49
E	669214.47	1592744.51
F	668590.71	1592916.03
G	667909.77	1593088.63
H	667522.35	1593086.14



PROJECT NAME	88MW SOLAR PV PLANT CHITRADURGA KARNATAKA		
DRAWING TITLE	SPECIFIC ANNEXURE - A- TENTATIVE LAND LAYOUT		
DRAWING NO.	-----		
ISSUED	<input type="checkbox"/> FOR REVISION <input type="checkbox"/> FOR FABRICATION <input type="checkbox"/> GOOD FOR CONSTRUCTION		
	DRAWN BY	CHKD. BY	APPR. BY
	-----	-----	-----
DATE	-----	-----	-----
SHEET	SHEET SIZE	REV	SCALE
1 OF 1	A3	-----	-----

# SPECIFIC ANNEXURE-B: INDICATIVE SLD



TENTATIVE BOQ		
PERTICULARS	QTY.	UNIT
TOTAL SOLAR AC CAP.:	88	MW
TOTAL DC CAP.:	123.00	MWp
SINGLE INVERTER CAP.:	4.4	MVA
TOTAL NOS. OF INVERTER:	20	NOS.
TOTAL INVERTER CAP.:	88	MVA
SINGLE MODULE CAP.:	0.585	KWp
TOTAL NOS. OF MODULE:	1,55,568	NOS.
MODULE/ STRING:	28	NOS.
TOTAL NOS. OF STRINGS:	5,556	NOS.
SCBS WITH 17 INPUTS:	204	NOS.
SCBS WITH 18 INPUTS:	116	NOS.
IDT CAP.:	17.6	MVA
TOTAL NOS. OF IDTS:	5	NOS.
19/33KV, 185SQMM, AL:		MTRS.
19/33KV, 300SQMM, AL:		MTRS.
1.9/3.3KV, 400SQMM, AL:		MTRS.

- NOTES:
1. This SLD is Indicative only intent to highlight T&D philosophy.
  2. Equipment type, rating shall be decided during detailed engineering.
  3. Protection scheme shall be as per CEA guideline to be followed.
  4. Logic and scheme shall be decided during detailed engineering.



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DRAWING TITLE	SPECIFIC ANNEXURE-B: INDICATIVE SLD		
DRAWING NO.			
ISSUED	<input type="checkbox"/> FOR REVISION <input type="checkbox"/> FOR FABRICATION <input checked="" type="checkbox"/> GOOD FOR CONSTRUCTION		
	DRAWN BY	CHKD. BY	APPR. BY
DATE			
SHEET 1 OF 1	SHEET SIZE A3	REV 01	SCALE N.T.S

**SUB-SECTION E**  
**SPECIFIC ANNEXURE C**  
**Project Specific Technical**  
**Details**

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## 1 DESIGN PHILOSOPHY

- 1.1 Bidder is free to propose his design of the solar plant including solar plant layout, solar block sizing, inverter sizing, inverter-transformer sizing etc. subject to meeting the boundary conditions/design parameters as specified in the **Clause 3** below.
- 1.2 Bidder would be required to submit design details for 585Wp Modules as well as actual Wp that would be supplied by Employer, during detailed engineering. However, for the purpose of bidding consideration, only the design for 585Wp is to be considered as mentioned in Scope of Works of this tender document.

### 1.3 Solar PV Module – Input Details:

Owner shall provide the exact PV Module characteristics including datasheet and other documents after the award to BOS Contractor. There might be changes in the dimensions, weight, and Isc as per the actual PV Module compared to the inputs provided by Owner at **Clause 3** of this document. BOS bidder may suitably design the BOS system to consider such minor changes.

## 2 GENERATION GUARANTEE

- 2.1 The annual generation shall be finalized during detailed engineering through PV Syst document (P75 value), based on the boundary conditions and design parameters specified by SECI.
- 2.2 Bidder shall submit PV Syst report complying with the design parameters specified in **Clause 3** below and the actual Module PAN file supplied by Employer to arrive at the **TARGET GENERATION ( $G_{T\_ref}$ )** (P75 value) for first year O&M at 220kV plant end ABT Meter.
- 2.3 However, this target generation figure for first year O&M shall be revised as per the outcome of O&M Target Generation Test (OTGT), based on following variations in the –
- (i) Actual Loss Parameters
  - (ii) Results of O&M Target Generation Test
  - (iii) Any other factors considered reasonable by the Employer
- 2.4 O&M Test Factor (OTF) accepted during OTGT shall be considered for generation guarantee during O&M period.



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Karnataka

- 2.5 Generation Guarantee for N<sup>th</sup> year of O&M period and Liquidated Damages for shortfall in performance during O&M period is calculated as per **SS-F: Operation & Maintenance Agreement** of this Tender Document.
- 2.6 **Note:** Kindly Refer to GA-H: Functional Guarantee Test Procedure and SS-F: Operation & Maintenance Agreement of this Tender Document for more details.



### 3 BASIC ENGINEERING DESIGN PARAMETER OF SOLAR PV PLANT

S. No.	Parameter	Value
1	Geographical site	
	(i) Latitude	14.400556° N
	(ii) Longitude	76.560833° E
	(iii) Altitude	609 m
	(iv) Time zone	5.5
	(v) Data source	SolarGIS TMY P50
2	Reference PV Module (for Bidding Purpose only)	
	PV Module Wattage*	585 Wp TOPCon Module
	PV Module Characteristic* (Bidder may perform PVSyst Simulations for any Mono PERC PV module - matching the module dimensions for Bidding Purpose)	For 585Wp - 2382mm x 1134mm Module Cable Length- 1200mm 28 modules in series
4	Module Orientation	
	(i) Field type	Fixed Tilt, South Facing
	(ii) No. of orientations	1
	(iii) Tilt <sup>§</sup>	10°
	(iv) Min Pitch <sup>§</sup>	6.5 m
	(v) Azimuth	0
4	System	
	(i) Planned power (MWp)	123,200 kWp
	(ii) Planned AC Capacity (MW)	88,000 kW
	(iii) PV Module PAN file	As provided by Employer during Detailed Engineering
5	Inverter Characteristics	As per BoS Contractor (shall provide OND file)
6	PV Syst Simulation Parameters	

S. No.	Parameter	Value	
(i)	Thermal Loss Factor (Uc, Uv)	Uc - 29 Watts/m <sup>2</sup> -K Uv - 0.0 Watts/m <sup>2</sup> -K	
(ii)	DC Cabling loss at STC	as per system design chosen by bidder/contractor (Maximum limit as per <b>Clause 2.5</b> of SS-B: TS-Electrical)	
(iii)	AC Cabling loss at STC	as per system design chosen by bidder/contractor (Maximum limit as per <b>Clause 6.5</b> of SS-B: TS-Electrical)	
(iv)	Transformer Loss (for MV transformer, i.e. for IDT)	As per Transformer data sheet (Maximum 1.5%)	
(v)	Power Transformer Loss	As per Actual data sheet (Maximum 1.5%)	
(vi)	Module Quality/Efficiency Loss	0.0%	
(vii)	Module mismatch losses – Power Loss at MPP	1.0 %	
(viii)	LID loss factor	First year degradation of PV module provided by the Employer (for TOPCon Modules)	
(ix)	Soiling Loss	1.00% (maximum)	
(x)	IAM Losses	As per PV Module Characteristic	
(xi)	Auxiliary Energy Loss	As per design	
(xii)	Auxiliary Power Loss at Pooling Substation	As per Actual outside PVSYST	
(xiii)	As per Actual outside PVSYST	As per Actual outside PVSYST	
Q	Weather Data Variability & Simulation Parameters Uncertainties	Annual variability of solar radiation	2.5 %
		PV Module modelling uncertainty	1.00%

S. No.	Parameter	Value	
		Inverter efficiency uncertainty	0.5%
		Soiling and Mismatch Uncertainties	1.00%
		Degradation uncertainty	1.00%
		GHI modelling uncertainty	5.0%

\* The parameters may be suitably modified based on the actual module panel dimensions and site conditions.

§ The parameters may be suitably modified based on the actual module panel dimensions and site conditions, provided the revised orientation results in improved energy generation, subject to prior approval of the Owner.

**Note:** The Bidder shall mandatorily restrict the output of the Solar PV Plant at the Injection Point in Energy Yield Simulation such that the power injected into the grid does not exceed the contracted plant capacity at any time.

#### 4 SOLAR INSOLATION DATA FOR PROPOSED SITE

Month	Reference Global Horizontal Irradiation (GHI <sub>ref</sub> )* (kWh/m <sup>2</sup> )
January	176.1
February	183.5
March	215.1
April	206.9
May	196.8
June	152.7
July	136.7
August	143.2
September	147.8
October	157.6
November	143.6
December	155.3
<b>Annual</b>	<b>2015.3</b>

\*The GHI values provided herein are indicative only. The final reference values shall be as per SolarGIS TMY P50, to be provided by the BoS Contractor during the detailed engineering phase.

## 5 PV MODULE - PERFORMANCE DETERMINATION

5.1 The procurement of Solar PV modules is NOT the Scope of the BoS Bidder. However, any shortfall in generation during OTGT and during O&M Period resulting from the non-performance of the PV Modules (Defective Modules) shall be intimated by the BoS Bidder to the Owner at the earliest.

5.2 The responsibility for measuring the PV module performance output by using necessary equipment, shall lie with the BoS Contractor. The equipment used by BoS contractor for PV MODULE performance measurement shall be calibrated.

5.3 In case of shortfall in Generation during O&M Period or in case of  $OTF < 1$  during OTGT Test, if the Contractor attributes the shortfall to non-performance of the PV Modules supplied by the Owner, then the Contractor shall be required to carry out the following activities:

5.3.1 The Contractor shall perform the following tests, as per the Manufacturer's guidelines (but not limited to), and furnish a comprehensive report to the Owner:

- (i) Flash test
- (ii) Electroluminescence (Not applicable for thin-film modules)

5.3.2 All such tests for determination of Defective Modules shall be performed by the BoS Contractor at an NABL accredited lab or at a test laboratory compliant with ISO 17025 for testing and calibration.

5.3.3 The determination of the lot size for such tests, shall be jointly decided by the Owner and the BoS Contractor.

5.3.4 The BoS Contractor shall initiate the testing process by randomly selecting samples from the identified lot. The number of samples shall be selected as per the inspection level specified below and in accordance with ISO 2859-1 (Single Sampling Plan for Normal Inspection):

Sr. No.	Test	Inspection level
1	Flash Test	Special inspection level S-1
2	Electroluminescence	Special inspection level S-1

5.3.5 The selected samples shall be tested for Flash Test and Electroluminescence Test (if applicable) as per the module manufacturer's guidelines.

5.3.6 **Flash Test:** A module shall be declared defective if its output power is derated by more than  $\pm 2\%$  of its deemed  $W_p$  capacity, considering the allowed yearly degradation.

5.3.7 **Electroluminescence Test:**

(i) The Contractor shall verify EL images of PV Modules as per the Electroluminescence Inspection Criteria provided by the Module Manufacturer (and duly approved by the Employer)

(ii) The EL image shall have sufficient resolution for analysis of defects

5.3.8 **Decision Rules for Defective Modules:** The following Acceptance Quality Limit (AQL) shall be applied for determining the acceptance or rejection of the lot, as per ISO 2859-1:

Defect Type	AQL (%)
Major (Ma)	2.5
Minor (Mi)	4

5.3.9 The BoS Contractor shall submit the complete testing report along with supporting data and analysis to the Employer.

5.3.10 If the selected lot is within the AQL limits mentioned above, the BoS Contractor's claim regarding defective modules shall be rejected.



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# **SECTION - VII**

# **SUB-SECTION F**

## **OPERATION & MAINTENANCE AGREEMENT**



## 1 CONTRACT PERIOD

The term of employment under this Agreement shall begin on the date of signing of this O&M Agreement, by and between the Employer and the Contractor (the “Effective Date” or “Commencement Date”) and unless terminated earlier as set forth herein, shall continue through and including the tenth (10th) anniversary of the Effective Date.

Unless otherwise agreed, the Effective date shall be the date of Issue of Operational Acceptance by the Employer.

**Note:** Operational Acceptance of the Plant Facilities by the Employer shall be a necessary condition for signing of the O&M Agreement. The Contractor shall, however, maintain the plant facilities, in the interim period between the Plant Commissioning and the signing of the O&M Agreement

## 2 CONTRACTOR’S OBLIGATIONS

### 2.1 Services

During the Term of the Contract, the Contractor shall perform the services in accordance with the Operation and Maintenance Scope of work as described in Annexure-1 (Scope of Work for Operation and Maintenance) (hereafter the “Services”), and also in accordance with the other conditions as prescribed related to the operational performance under Section - VII of the Bid Document.

2.2 The Contractor shall be deemed to have allowed correct and sufficient O&M Price to cover all its obligations under the Contract and to have allowed the necessary resources to enable it to perform the Services to the standards and in the manner required. The Contractor’s failure to acquaint itself with or assess any applicable condition shall neither relieve it from the responsibility for performing its obligations under the Contract nor entitle the Contractor to any additional costs or any other relief.

2.3 To the extent the Contractor reasonably believes that it is necessary to enhance the overall performance or safety of the Plant, the Contractor may propose changes and improvements to the Plant [(including the software included with respect thereto)]. The Contractor shall ensure that no modification of any equipment, change of software settings or any other alteration of equipment shall:

- (i) cause a negative impact on the performance of the safety and reliability of the Plant;
- (ii) adversely impact the Warranties;



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- (iii) adversely affect the warranties provided by the Contractors under the Contract;
  - (iv) conflict with the requirements under the contract; or
  - (v) bypass any protective equipment.
  - (vi) Violates any National/International Trade & IPR laws.
- 2.4 Any proposed modifications/changes shall not be carried out without the approval of the original equipment manufacturer and the Employer and in accordance with Performance Standards, and Technical Specifications. The Employer shall be notified of the proposed modifications along with reasons and technical note for such modifications, changes, alterations, etc., and after the modifications are carried out in accordance with the contract, an alterations activity report is to be shared with the Employer.
- 2.5 The Contractor shall, while rendering the Services, observe and comply with all the Applicable Laws, Good Solar Industry Practices, Ministry of New & Renewable Energy (MNRE), Ministry of Power (MoP), CEA, CERC, GRID India, SLDC/RLDC, Local DISCOM & TRANSCO, CTU guidelines and Performance Standards pursuant to the contract. The Employer shall have the right to, to the extent applicable to Services rendered by the Contractor, conduct monthly audit on Applicable Laws, health, safety and environment and all other relevant compliances. The Contractor shall provide all necessary access and supporting documents during audit which are applicable to the same. However, such audits will be planned well in advance in coordination with the Contractor, without affecting the site operation plan.
- 2.6 The Contractor shall provide and make available as necessary, all such skilled, experienced and qualified labour and other competent personnel as are required to perform the Services the Contractor shall ensure that its Personnel hold and continue to maintain all qualifications and licenses as required under Applicable Law to allow its Personnel to lawfully undertake performance of the Services and carry out the Contractor's other obligations under the contract. For works/services being performed on a continuous basis, the O&M Price shall be deemed to include and the Contractor shall obtain all required Government Approvals and bear any costs related thereto (including any shift or permitted overtime working, allowances, wage orders, night shift differentials, etc.).
- 2.7 The Contractor shall ensure that all its Personnel deployed for providing the Services have undergone adequate safety training and are appropriately skilled, qualified and experienced in performing the Services for solar farms of a similar size, scope and complexity as the Plant. The Contractor shall be responsible for all matters relating to labor



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- relations, working conditions, training, employee benefits, safety programs and related matters pertaining to its Personnel. The Contractor shall at all times have full supervision and control over its Personnel and shall at all times maintain appropriate order and discipline among its Personnel.
- 2.8 Contractor shall be solely liable for and, at its sole cost and expense, arrange for the response, reporting, removal, transportation, disposal, investigation, cleanup or other remedial action (in all cases by licensed, insured, competent and professional contractors in a safe manner and in accordance with Applicable Laws) for any hazardous substances/waste existing at, in, on or under the Project.
- 2.9 The Contractor shall ensure availability of such Consumable Parts, Spare Parts, and Contractor's Equipment as may be necessary for the performance of the Services. The Contractor shall ensure that such Contractor's Equipment does not interfere with the operational or structural integrity of the Plant.
- 2.10 The Contractor shall make available to the Employer the Reference Documents set forth in the Reference Documents and shall also provide the Employer with updates and revisions to the Reference Documents to the extent such updates and revisions are necessary and applicable to the performance of the Services. The Contractor shall provide the Employer with a latest version of update available of all the Reference Documents at the time of termination of the contract.
- 2.11 The Contractor acknowledges and agrees that other contractors of the Employer may be present at the Plant and it shall cooperate with such other contractors to allow the performance of its and their respective obligations to occur concurrently.
- 2.12 The Contractor shall through relevant agencies, if applicable, promptly investigate all accidents, damage or destruction, diagnosis, assessment of any potential consequential effects, estimating cost of repair, arranging for any remedial action required, making of any claims under the insurance policies and co-operating with and making reports required by the Employer or insurers.
- 2.13 The Contractor shall ensure that any Warranties provided under the Project Contracts are not invalidated or adversely affected by any act or omission of the Contractor during the period of such warranties.
- 2.14 The Energy Management System (EMS)/ Power Plant Controller (PPC) and SCADA system shall be connected with the Plant and the Contractor shall make arrangements to provide monthly reports from the SCADA system. The Contractor shall arrange to connect the Plant to the SCADA system operating at the Site enabling the remote operation of the Plant by the Contractor and to provide access to information pertaining to the Plant to the



Employer's Representative at Site and SLDC/RLDC. The Employer may collect the data generated by the SCADA system in respect of the Plant from the Contractor.

- 2.15 Upon the expiry or earlier termination of the contract, the Contractor shall arrange to provide and install an additionally extended terminal from the SCADA system at the Site to enable the Employer to continue to access data relating to the Plant, at no Additional Cost and upon such terms as may be mutually agreed between the Parties at such time of expiry or earlier termination of the contract as the case may be.
- 2.16 The Contractor shall further provide support for the operation and maintenance of any Employer installed scope including any third-party support as may be required by any relevant Government Authority.
- 2.17 The Contractor shall notify and communicate to the Employer about any condition which may cause any malfunction or failure in the Project.

### **3 FUNCTIONAL GUARANTEES/WARRANTIES**

#### **3.1 Technical and Functional Performance Guarantee**

- 3.1.1 The Contractor shall be responsible for meeting the performance guarantee of the Plant Facility as described in the contract.
- 3.1.2 In case of failure to meet the functional guarantees as described in section 2.1.1 above, the Contractor shall be liable to pay applicable Liquidated damages as described in the Bid Document and represented in Annexure-2 of this document.

#### **3.2 General Repair Warranty**

- 3.2.1 All repairs and replacements performed by the Contractor pursuant to the contract, shall cover a warranty for defects in materials and workmanship for the entire terms of O&M contract.
- 3.2.2 The Contractor shall disassemble, repair or, replace and reinstall any defective Equipment parts and/or re-perform any defective work covered by this warranty, at no cost or expense to the Employer.
- 3.2.3 In the event that Contractor replaces Parts that failed during the final year of the Term in accordance with its obligations under the Contract, Contractor hereby warrants to Employer that the replacement Parts installed in the Plant Equipment during such period shall not fail due to a defect for one (1) year following the date of installation of such replacement Parts; provided that in no event shall any such warranty extend beyond earlier of (i) the period that is one (1) year following the expiration of the Term or (ii) the date of any termination of the contract for reasons other than attributable to Contractor. During such period, if the contract is not in effect for any reason other than being



terminated by Employer for cause, Contractor's obligation will be limited to supplying all needed Parts on to the Site delivered basis. For the avoidance of doubt, this Clause may survive the termination or expiry (as the case may be) of the contract for a period of one (1) year.

- 3.2.4 During Defect Liability Period if any repair and replacement are done, then the warranty of the equipment shall be extended from the data of such repair and replacement to the period of original equipment warranty w.r.t. that replaced component.
- 3.2.5 Any latent defect which may not come to knowledge or discovered in the course of normal inspection/operation during two years from the operational acceptance but, may arise within a period of 5(five) years from expiry of warranty period of two years, shall be under warranty by free replacement/rectification.
- 3.2.6 The acceptance of the equipment by employer shall in no way relieve contractor of his obligations under the contract.
- 3.3 Guarantee of compliance in relation to Curtailment Plans (acoustic or other curtailment plans)

The Employer may communicate to the Contractor any curtailment plans either linked to acoustic requirements; load management, or Applicable Law, the ("**Curtailment Plans**").

The Contractor shall ensure compliance with all Curtailment Plans provided by the Employer in accordance with Performance Standards and Technical Specifications. If either the Contractor or the Employer detects a variation with respect to the Curtailment Plans or in noise emission the Contractor will, at its own expense, characterise the problem, isolate the source of the problem and propose solutions to solve the problem to Employer (at the Employer' expenses in all cases other than cases where it's ascertained that the deviation was caused by a non-respect of the obligations under the contract).

3.4 Grid Connection and balance of electricity commitments

The Contractor acknowledges that to allow the Employer to inject the energy generated by the Plant Facility to the Grid and be eligible for the full tariff under the PPA, the Plant



and the Contractor must comply with the requirements prescribed by Applicable Law, Good Solar Industry Practices, Performance Standards and the Grid documents and that failure to comply with such requirements may cause the Employer to either: (i) not be able to collect the tariff energy injected; and/or (ii) be subject to penalties payable to the Grid operator and/or the DISCOM and/or the power purchaser and/or any Government body. The Contractor therefore undertakes to diligently comply the requirements referred to Grid Connection and balance of electricity commitments, as prescribed under the Grid documents as provided by or on behalf of the Employer from time to time (or of which the Contractor otherwise becomes aware), and/or with the reasonable requests of the Employer associated with the compliance therewith.

#### **4 PERFORMANCE STANDARDS**

- 4.1 Contractor shall perform its obligations under the contract in compliance with the contract and otherwise, as applicable, in accordance with the following order of precedence (collectively, the "Performance Standards") as from time to time in force:
- 4.1.1 the Applicable Laws, and the requirements from the Grid Operator/SLDC/RLDC;
  - 4.1.2 the Permits and all the related documents;
  - 4.1.3 the terms of the contract;
  - 4.1.4 the functional Guarantee;
  - 4.1.5 the Reference Documents including the manufacturers recommendations;
  - 4.1.6 Employer's health and safety manuals and procedures and ESMP;
  - 4.1.7 the Site Regulations;
  - 4.1.8 the Equator Principles and the Equator Principles Requirements;
  - 4.1.9 Good Solar Industry Practice;
  - 4.1.10 Any relevant and reasonable instructions issued by the Employer, relevant to the scope of the contract, to the Contractor at least 15 days before the implementation of such instructions without any cost to the Contractor.
  - 4.1.11 The terms of insurances directly relating to the Project and
  - 4.1.12 Comply with all operation and maintenance obligations as set out under the PPA or do anything which results in a breach of the Employer's obligations under the PPA.
- 4.2 If there is any inconsistency between the Performance Standards, [it shall be interpreted in the order of precedence listed above provided that (i) the application of a Performance Standard does not derogate, breach, contradict, obstacle or circumvent the application of a Performance Standards appearing above such standard in the above order of precedence, and, in addition, (ii) provided that this such application does not cause a



breach of Performance Standards or the Parties shall discuss and agree upon the manner in which such conflict shall be resolved.

4.3 Notwithstanding any other provision in the contract, the Contractor shall have no responsibility or obligation:

(a) to save and to the extent that the Contractor is required to do so pursuant to the provisions of Additional Services, to ensure that the Plant complies with the requirements of Applicable Law, Permits, if and to the extent that the same are introduced or amended following the Commencement Date; or

(b) subject to Additional Services, to ensure that the Plant or the Plant (as a whole or in part) complies with any noise or acoustic emissions requirements under Applicable Laws Permits.

Without prejudice to the foregoing, the Contractor is required to comply with the quality of supply limits determined in accordance with the Applicable Law and the Contractor will be deemed to have knowledge of its content.

4.4 The Contractor shall not do or omit to do anything in the performance or discharge of its obligations or the exercise of its rights under the contract or in breach of the contract, which would cause any breach of any of the terms of the Supply Contract, Works Contract, the Applicable Law, the Permits or the terms of any Permits or the Direct Contract, and should the Contractor be in breach of the Performance Standards, it shall, on demand of the Employer, indemnify the Employer against any direct Losses arising from a breach of this Clause by the Contractor, always subject to the aggregate liability cap of the Contractor (except as otherwise agreed herein).

4.5 If the Contractor is aware of a conflict between any of the above requirements, it shall inform the Employer accordingly and the Parties shall discuss and agree upon the manner in which such conflict shall be resolved.

## 5 EXCLUSION

### 5.1 General

(i) Force Majeure events as per GCC

5.2 The rights of the Contractor under Exclusions shall only apply to the extent that the Excluded Risk Event has caused actual delays or substantial interference to the performance of the Contractor's obligations under his Contract, which could not have been mitigated by the Contractor's best efforts, and to such portions of Contractor's obligations directly affected by such delays or interference.

### 5.3 Notification of Excluded Risk Event



To the extent Contractor has actual knowledge of any loss or damage to the Plant caused by or arising from an Excluded Risk Event, it shall give Employer immediate notice of the same and provide a written report to Employer within five (5) Business Days; and the employer and Contractor shall be mutually agreed upon within (30) business day. However, that any failure of Contractor to provide such notice shall not waive, prejudice or otherwise affect the other provisions in Exclusions, except to the extent that the failure to timely notify Employer results in any additional damage or loss to the Plant. Notwithstanding the foregoing, in case of delay to provide the aforementioned notice, the Contractor shall be liable towards the Employer for any additional damage or loss caused by the delay to notify the Employer.

## 6 ADDITIONAL SERVICES

- 6.1 Employer may, with respect to the Plant, request that Contractor perform work, provide services, or supply other equipment or parts, not included within Services for the successful operation of the plant for the duration of this O&M Agreement. Any such requested service or supply that the Parties mutually agree to in writing shall, subject to any specific terms and conditions agreed with respect to such service or supply, be an **“Additional Service”**.

## 7 SERVICE PERSONNEL

- 7.1 Contractor shall provide the Services and any Additional Services to be performed on Site using a sufficient number of suitably skilled, qualified and experienced (including any licensing, certifications or training required by Applicable Laws or the local transmission system operator) and adequately equipped and properly trained Personnel and/or Subcontractors, all appropriately skilled and experienced in their respective trades or occupations as may be reasonably necessary to fulfil its obligations hereunder in relation to the Services and Additional Services
- 7.2 The Employer may request the Contractor to remove (or cause to be removed) any Person or Subcontractor employed on the operation of the Plant, including the Contractor’s Representative if applicable, who:
- (i) engages in material or persistent misconduct or lack of reasonable care;
  - (ii) carries out duties incompetently or negligently;
  - (iii) fails materially to conform with any provisions of the Contract;
  - (iv) engages in conduct which is prejudicial to safety, health or the protection of the environment or in violation of any related Performance Standards or Applicable



Laws;

- (v) engages in conduct which might reasonably result in a breach of any provision of the contract and threaten public health, safety or security.

7.3 The Employer shall give notice to the Contractor of the same giving reasons and request the Contractor to replace such Personnel with a suitable candidate. The Contractor shall then as soon as reasonably possible but no later than seven (7) days upon receiving such notice from the Employer, Contractor will look in to the facts and claims of the case in all sincerity and deploy the required actions with the notice to the Employer.

7.4 Contractor shall have full supervision and control over its Personnel at the Site and shall maintain appropriate order and discipline among such personnel and shall cause any Subcontractor to maintain similar standards with respect to such Subcontractor's personnel at the Site.

7.5 The Contractor shall be responsible for all matters relating to labour relations, working conditions, training, employee benefits, employee drug testing in accordance with the Contractor's standard drug testing policy, safety programs and related matters pertaining to its employees and other Personnel engaged by the Contractor. The Contractor shall at all times have full supervision and control over its employees and other personnel engaged by it and shall at all times maintain appropriate order and discipline among its Personnel and shall cause any Subcontractor (or any subcontractor appointed by such Subcontractor) to maintain similar standards with respect to such Subcontractor's or any subcontractor appointed by such Subcontractor) employees and Personnel.

7.6 The Employer shall have the right, acting reasonably and following prior notification, to require the Contractor to remove from the Site any employee or Personnel of the Contractor or any of its Subcontractors (or any subcontractor appointed by such Subcontractor) engaged in activity which presents a risk of injury to persons or property at the Site.

## 8 SAFETY PRECAUTION

8.1 During performance of the Services, Contractor shall:

8.1.1 comply with the safety standards and any safety procedures established by Contractor and same shall be approved by employer after the Commencement Date;

8.1.2 take all precautions required by Applicable Laws or Site Regulations, or otherwise according to the Performance Standards, for the health and safety of Contractor, its Affiliates and Subcontractors in the performance of the Services and any other Persons with temporary or perpetual access to the Site; [provided that the foregoing shall not limit



Employer's responsibility for the safety of the Site as provided in Safety Precautions.

## 9 CONSUMABLES, SPARE PARTS, TOOLS AND EQUIPMENT

9.1 During the Term, Contractor shall provide equipment Spare Parts and Consumables and Tools, all as part of the Services and without Additional Cost to the Employer in accordance with the contract. Unless otherwise specified in the contract, the Contractor shall provide the Employer with an initial Spare Parts inventory. At the end of the Term or upon termination of the contract, the Supplier will replenish the equal quantity of the Spare Parts and Consumables and Tools as provided during the start of Contract.

### 9.2 Consumables and Tools

Contractor shall supply Consumables and Tools to the extent required for performance of the Services. All Consumables provided by Contractor in the performance of its Services, shall be compatible with the applicable requirements of the Reference Documents and Applicable Laws.

### 9.3 Equipment and Spare Parts

Contractor shall supply Equipment and Spare Parts to the extent required for its performance of the Services and to maintain its obligations thereunder. The Contractor has the right to use renovated Equipment and Spare Parts. If the Contractor intends to use any refurbished Major Components, it will seek prior written approval from the Employer. Contractor's right to procure and use renovated / refurbished Spare Parts is subject to: (i) standards of good workmanship and Good Industry Practice; (ii) compliance with the applicable requirements of the Reference Documents; (iii) the Spare Part(s) are of the type being replaced or of another type insofar as same does not invalidate any applicable Type Certification of the Equipment (iv) the same warranty as equivalent new parts in terms of scope, nature and duration, (v) being renovated in conformity with the original equipment manufacturer's standards, and (v) being listed in the monthly maintenance report when used (track record of the Part). All such renovated/refurbished parts will be allowed by Employer only for any long lead items and also considering uninterrupted generation from the Project. However, the contractor shall immediately reinstate and order new items in order to replace the refurbished items provided for emergency purposes.

### 9.4 Inspection of Replaced Parts

Contractor shall give to the Employer seven (7) days' notice of the time when the Replaced Part is being transported to the Site. Contractor shall permit Employer to inspect, at Employer's sole cost and expense, any Part which is removed and replaced



by a Spare Part pursuant to Consumables, Spare Parts, Tools and Equipment (such Part, a “Replaced Part”); provided however, any such inspection:

- (i) must not include physical alteration or disassembly of such Replaced Part; and
- (ii) must not result in any material increased costs to Contractor or delay Contractor in the performance of its obligations under the contract or any Contract with, or warranty from, its Subcontractors, unless Employer agrees to cover such material increased cost.

#### 9.5 Tools and Equipment

Contractor shall furnish its service personnel with such tools, instruments, or materials tools and equipment and equipment as are necessary to perform the Services (the “**Contractor’s Equipment**”).

#### 9.6 Prices of Consumables, Spare Parts and Contractor’s Equipment

Subject to GST, Taxation & Import Duties, the O&M Price payable to Contractor under the contract shall include (in addition to other components included in such Price) the Costs of any and all Equipment, Consumables, Spare Parts and Contractor’s Equipment required in connection with the performance of the Services.

#### 9.7 Risk of Loss or Damage to Consumables, Spare Parts and Contractor’s Equipment

Contractor shall:

- (i) be responsible at its own cost for the safe transportation and delivery to Site and adequate storage; of all Consumables, Spare Parts, and Contractor’s Equipment, in each case, required for the carrying out of the Services;
- (ii) bear the risk of loss and damage to all such Consumables and Spare Parts during transportation to the Site and, thereafter up to the date of their incorporation by Contractor into the Plant; and
- (iii) at all material times bear all risk in any and all Contractor’s Equipment on or off the Site and whether remaining separate or temporarily attached to the Plant.

#### 9.8 Title

Contractor shall retain title to any and all Contractor’s Equipment on or off the Site and whether remaining separate or temporarily attached to the Plant until transfer of Title occurs. Title to any Spare Part (or other Part) or Consumables provided by Contractor pursuant to the contract shall pass to the Employer upon:

- (i) incorporation by Contractor in the Plant free and clear of any Lien; or
- (ii) in the case of Additional Services, the date (if later) on which payment is made in



full for such Spare Part or Consumable.

Title to any Replaced Part shall vest in Contractor upon such replacement, except if the Parties agree differently from time to time. In case of Additional Services, Employer shall retain title to any Replaced Part.

## 10 COMMUNICATION AND REPORTING

During the Term, Contractor shall exchange information and reports on daily, weekly, monthly, quarterly and annual basis:

### 10.1 Monthly Reports

Contractor shall provide Employer with the Monthly Performance Report by no later than the fifth (5th) day from the end of each month

### 10.2 Emergency Notices

Upon obtaining actual knowledge thereof, Contractor shall promptly notify Employer verbally (with written notice to follow within three (3) Days) of any emergency or other hazardous condition or occurrence that Contractor reasonable believes could cause an immediate threat to the safe operation of the Plant and/or the safety of Persons.

If, by reason of an emergency arising in the course of, as a result of or otherwise in connection with and during the performance of the Services, any protective or remedial work is necessary as a matter of urgency to prevent damage to the Plant, the Contractor must immediately perform that work, provided that, Contractor shall have no obligation to perform such portions of the protective or remedial work which would be in violation with the Performance Standards, be a material breach of the contract or would cause a threat to the safety of Persons or property or would otherwise not be reasonably practicable or possible; and provided further, that Contractor shall have no obligation to retrofit or upgrade the Plant except if otherwise agreed.

Without prejudicing the liability attributable to the Contractor for failure to comply with the provisions of the paragraph above, it is clarified that if the Contractor does not perform the protective or remedial works referred to above immediately, the Employer may appoint a Replacement Contractor to perform such works. If the work (or parts thereof) which were performed or caused to be performed by the Employer is work which the Contractor was liable to do at its own expense under the contract, the costs incurred by the Employer as a result of appointing a Replacement Contractor shall be [substantiated to the Contractor on an open book basis and be] considered due and payable to the Employer and Invoices and Payment and Set Off shall apply. It is further clarified that the impact of Replacement Contractor's actions shall not be considered as an Excluded Risk Event.

### 10.3 Meetings



A representative of each of Contractor and Employer (the “**Representatives**”) shall meet (either at the Site or alternatively at such other location as may be agreed between the Parties) at quarterly intervals or such other period as is agreed especially for the purposes set forth below:

- (i) to discuss projected dates for performance of the Services and the Additional Services in the following quarter;
- (ii) to discuss, the calculated Measured Average Availability of the Plant Facility for the past quarter under Annexure 2 [Functional Guarantees]; and
- (iii) to review the Services and Additional Services performed in the past quarter.

#### 10.4 Visitors Log Book

Contractor shall provide Employer with a log book for the Plant to record the identity and activity of all visitors to site. Such log book will be kept at the entry Gate location of Plant. The Contractor shall cause that all personnel and representatives of each Party or any third parties visiting the [site] shall be required to record their identity, the date, time and purpose of any visit to site, the nature of any work performed thereon and such other details for which log books may reasonably be used. It is clarified that the Contractor shall not permit unauthorised third party access to the Site unless such third parties have been authorised by the Employer, are required to inspect or access the Site in accordance with Applicable Law or for performance of Services. Copies of these logs shall be provided to the Employer within ten (10) Business Days following its written request. Contractor shall create a digital back up of such logs at least every month. The log book shall be in English only.

#### 10.5 Annual Calendaring of Maintenance Services

At the latest two (2) months after the beginning of commencement date, each year during the Term thereafter, the Contractor shall send to the Employer the projected dates and times for the immediately following period during which the Contractor shall perform the Maintenance/Preventive Services on the Plant, with the parties using reasonable efforts to minimize any Plant downtime during Operational Sunny periods (the “**Maintenance Services Calendar**”). Such Maintenance Services Calendar may be postponed by the Employer for 5 business days); provided, that the Maintenance Services Calendar shall be developed in accordance with the Operating Manual and the terms of the contract. The dates and times in the Maintenance Services Calendar may be amended thereafter by mutual Contract of the Parties. For clarity, the Maintenance Service Calendar shall include a maintenance plan established in accordance with the Maintenance Manual.

#### 10.6 Status Reviews



As reasonably required, or requested by the Employer, the Representatives shall meet to discuss and review (i) the information contained in the Monthly Performance Reports, (ii) the availability of the Plant, (iii) any technical issues which may have arisen with respect to the performance, availability or maintenance and servicing of the Plant Equipment, (iv) Maintenance Services and Repair Services performed during the preceding calendar month, (v) any and all failures by a Plant equipment, and (vi) Maintenance Services to occur during the next following a calendar month.

## 11 CONTRACTOR'S PERMITS

Prior to the time in which such Permits are required in order to perform when the relevant Services and/or Additional Services, as applicable, are to be performed, Contractor shall obtain and maintain, as applicable, throughout the Term of the Contract all Permits (the "Contractor Permits") required by the Applicable Law, Good Solar Industry Practices, Performance Standards and Technical Specifications which should be issued in the name of Contractor or are otherwise attributable or necessary to the provision of the Services and/or Additional Services, other than such Permits as are required to be obtained by Employer pursuant to *Employer Permits*.

## 12 CONTRACTOR'S MANAGER

On or prior to the commencement of the Term, Contractor shall designate a duly qualified and experienced person to manage and administer the Contractor's activities and shall provide notice thereof to the Employer, to act as its manager and coordinator of the contract on Contractor's behalf (the "**Contractor's Manager**"). The Contractor's Manager shall not have authority to amend or modify the contract or accept any commitment which would have an effect on the contract. In case the manager is on leave with prior intimation to employer, the deputy manager with equivalent qualification shall be provided at site by the Contractor

## 13 COOPERATION WITH OTHER SUBCONTRACTORS

Contractor acknowledges and agrees that the Employer or Other Subcontractors of Employer may be present at the Site and agrees, at no cost or expense to the Employer, to reasonably cooperate with such Other Subcontractors to allow the performance of its and their respective obligations to occur concurrently. Employer shall inform the Other Subcontractors of the clear demarcation of Contractor's scope of work so as to ensure non-interference in such work and operations by Employer's Other Subcontractors.



## 14 RESERVED RIGHTS

### 14.1 Plant

To the extent Contractor believes, in its reasonable discretion, that it is necessary to enhance the overall performance or safety of the Plant, Contractor may propose to Employer changes and improvements to the Plant (including the software included with respect thereto) and implement such changes or improvements proposed after obtaining the prior written consent of the Employer; provided that such changes and/or improvements shall not (i) be in conflict with the Performance Standards; (ii) adversely impact the technical performance of the Plant or the safety of the Plant; (iii) adversely impact the Availability Warranty in Annexure 2 [Functional Guarantees] (iv) increase the cost of operating the Plant; (v) place the Employer in breach of the technical requirements of the Power Purchase Contract; (vi) impair or vitiate any obligations of the Contractor under the contract; (vii) adversely affect the Supply Contract Warranties and the Works Contract Warranties; or (viii) result in non-compliance with the Type Certificate.

14.2 The Contractor shall only have the right to implement such changes or improvements if it has received the prior written consent of the Employer and such changes and improvements are carried out at no cost to the Employer and in accordance with Reserved Rights.

## 15 CERTAIN NOTIFICATIONS BY CONTRACTOR

15.1 Contractor shall, upon obtaining actual knowledge thereof, promptly give the Employer notice of:

- (i) any events or facts or observations that the Contractor believes could be reasonably likely:
  - a. to have a material adverse effect on the operation of any of the Plant or the performance of the Employer's obligations under the contract; or
  - b. to cause an immediate threat to the safe operation of the Plant (or any Plant therein) and/or the safety of Persons; provided that, in the case of this Clause, the Contractor shall provide immediate verbal notice of such event, fact or observation to the Employer with notice to follow within three (3) Business Days);
- (ii) any actual or proposed event that the Contractor believes would be reasonably likely to have a material adverse effect on the operation of any of the Plant or the performance of either Party's obligations under the contract;
- (iii) any (a) violation of Applicable Laws, or Permit, by the Contractor's agents,



officers, directors, employees, representatives and Subcontractors, Employer or any Other Subcontractor; or (b) any notices of Liens (or claims of Liens) or investigations by Governmental Authorities related to the Plant;

(iv) any actual or contemplated change in Law that Contractor believes would be reasonably likely to have a material adverse effect on the operation of any of the Plant or the performance of either Party's obligations under the contract.

15.2 If the Contractor does not comply with its obligations under Certain Notifications by Employer, the Contractor shall, subject to Limitations of Remedies and Liability, indemnify the Employer for any loss the Employer may suffer as a consequence, including, without limitation, compensation pursuant to Employer's Obligations.

## **16 ASSIGNMENT AND SUBCONTRACTING**

16.1 The Contractor shall not sublet, transfer or assign the contract or any part thereof without the prior written permission of Employer. The Contractor shall not subcontract any of the Services having a value of more than 30% of the Annual O&M Price of the concerned year, except upon the Employer's advance written approval of the subcontracting of such works. Such approval shall refer to the specific identity of the Subcontractor and to the scope and terms of the subcontract. In any event, the Contractor shall not subcontract all, or materially all of the Operation and Maintenance Services or the ultimate supervision of the performance of such services.

16.2 The Contractor agrees and acknowledges that any review, by approval of, or failure to approve, or rejection by the Employer as to any Subcontractor shall not relieve the Contractor of any of its obligations under the contract, and the Contractor shall be liable hereunder to the same extent as if any such Subcontract had not been entered into. The Contractor shall at all times ensure and cause the Subcontractors not to commit any act or omission which could release, void, impair or waive any guarantee or warranty on the Plant or any part thereof.

16.3 The Contractor shall supervise and direct the work of all Subcontractors and be fully responsible for the performance of the Subcontractors and to the methods, techniques, sequences and procedures of, and for coordinating the work of the Subcontractors and to the acts and omissions of all Subcontractors and their employees, directors, officers, advisors, agents and representatives, and those of their subcontractors ("Subcontractors' Parties). With regard to any Subcontract and Subcontractor's Parties, in particular, Contractor shall ensure that all wages, labor, health and safety and social related obligations are duly performed and timely discharged in accordance with Applicable Laws.



It is agreed that if the responsibility of any such payments is transferred to the Employer pursuant to Applicable Law, the Employer shall have the right to adjust all such payments against the dues to the Contractor under the contract or otherwise recover the same from the Contractor under any other Contract. It shall be at Contractor's sole responsibility to ensure the payment and discharge of all its obligations with regard to the Subcontracts and shall indemnify the Employer and any Employer Indemnified Parties for any losses incurred by such parties in relation to the Subcontracts or to Subcontractor's Parties.

## 17 INSPECTION AND TESTING

- 17.1 The Contractor must provide the Employer, independent engineer, Grid Operator, Grid Administrator, and any other Contractor or Contractors employed by the Employer and their respective nominees, or other inspectors where required under the Applicable Law, the Permits, the Finance Documents and/or the Grid documents (collectively hereinafter referred to as the "**Project Parties**"), with access at any time to any place where the Services are being performed in order to inspect the progress and the manner of the Services, provided that the Employer (or its designated representatives) gives the Contractor twenty four (24) hours prior written notice.
- 17.2 The Project Parties and their respective nominees will have the right to examine and have access to documents relating to the Services
- 17.3 The Contractor must carry out all tests and/or inspections of the Plant or Spare Parts in a lawful, professional, timely, safe and environmentally responsible manner as may be necessary to ensure the safe, reliable, efficient, and optimal operation of the Plant and in accordance with the Performance Standards, Applicable Laws and Good Solar Industry Practice. All these tests and inspections are to be carried out at the Contractor's expense, as part of Services.
- 17.4 The Project Parties and their respective nominees are entitled to attend any test and/or inspection.
- 17.5 Whenever the Contractor is ready to carry out any test and/or inspection, the Contractor must give at least ten (10) days' advance notice to Employer of such test and/or inspection and of the place and time. The Contractor shall make its best efforts to obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Project Parties to attend the test and/or inspection.
- 17.6 The Contractor must provide the Employer with a report of the results of such test and/or inspection within five (5) days after the completion of that test or inspection in question.
- 17.7 If the Employer and/or any of the Project Parties fail to attend the test and/or inspection,



or if it is agreed between the Parties that the Employer and/or any of the Project Parties will not attend, then the Contractor may proceed with the test and/or inspection in the absence of the Employer's and/or any of the Project Parties' inspector and provide the Employer with a report in the approved form of the results.

17.8 If any Spare Parts or the Plant fails to pass any test and/or inspection, the Contractor must either rectify or replace those Spare Parts or repair the Plant and promptly repeat the test and/or inspection upon giving notice.

17.9 The Contractor agrees that neither the performance of a test and/or inspection of Spare Parts or the Plant, nor the attendance by the Employer's and/or any of the Parties' inspector nor the issue of any test report will release the Contractor from any of its obligations under the contract.

**17.10 Inspection during the Term and at the End of the Term:**

During the Term, the Plant may be submitted to a general inspection performed by a Contractor selected by Employer:

**17.10.1 Inspection during the Term**

From time to time during the Term, but not more than once every year (being specified that any additional tests and inspections instructed by the Employer under this Clause will be for the Employer's account unless the tests or inspections were necessary as a result of the failure of the Contractor to fulfil its obligations under the contract);

17.10.2 End of Contract inspection: six (6) to twelve (12) months before the end of the Term, at the convenience of the Employer.

Subject to the Employer's reasonable advance notice as to the date of such inspection, Contractor is required to attend and assist the Employer and the designated inspector in performing such tests, without additional cost.

17.10.3 The final report shall be sent to the Contractor by the Employer and if any defect or damage found, same shall be rectified/replaced.

17.10.4 Without relieving Contractor from its obligations and without limiting Employer's ability to reasonably pursue the reliefs available to it, if applicable:

(i) Contractor shall, promptly following receipt of the report, submit to the Employer (a) a recovery plan to remedy all breaches, defects and malfunctions detected in the report for which the Contractor is liable and shall perform such remedial actions without delay, and (b) provide detailed measures to be put in place to prevent such defaults from recurring;

(ii) if the Contractor fails to timely complete all remedial actions before the end of the Term, the Employer shall be entitled, at Contractor's cost and risk, to employ a Replacement Contractor to perform the works.



### 17.11 Employer Site Visit

- 17.11.1 If Employer decides to visit the Plant, Contractor shall provide personnel on the Site for mutual inspection with no additional cost to Employer. If the Contractor is reasonably unable to attend such visit for unexpected reasons and/or safety reasons, Contractor shall immediately inform the Employer. As the case may be, the Contractor shall reschedule a new visit within the next seven (7) days. Rescheduling of the visits thereof shall no occur more than once per year the Employer shall adhere to the HSE practices of the Contractor.
- 17.11.2 If, upon request of the Employer made in accordance with Employer Site Visit, the Contractor does not provide dedicated personnel for such visits, subject to the aforementioned rescheduling allowance, any downtime of Plant Equipment(s) to perform the inspections thereof shall be considered as unavailable for the purpose of availability calculation described in Annexure 2 [Functional Guarantees] [(however never exceeding eight (8) hours per given visit)]. Notwithstanding the foregoing, Employer may request that Contractor provide personnel on the Site for additional inspections as an Additional Service.
- 17.11.3 If, upon request of the Employer made in accordance with Inspection and Testing, for inspection of the Plant, the Contractor provides access to have services in the Plant Equipment examined available for inspection and Employer does not carry out such inspection, then any downtime of Plant Equipment(s) to perform the inspections thereof shall be considered as available for the purpose of availability calculation described in Annexure 2 [Functional Guarantees]

## 18 HAZARDOUS SUBSTANCES AND HAZARDOUS SITE CONDITIONS

- 18.1 Contractor shall not, nor shall it permit any other Person to bring any Hazardous Substances on the Site, other than Hazardous Substances to be used by Contractor or any Subcontractor in a manner that:
- (i) does not violate any Applicable Laws, or Permits; and
  - (ii) is consistent in quantity and with Good Solar Industry Practices for operating and maintaining solar energy conversion plants, such as motor fuels, solvents and lubricants (collectively, "**Permissible Materials**").
- 18.2 Contractor shall bear all responsibility and liability for:
- (i) any Hazardous Substances that are not Permissible Materials belonging to the Contractor or present on site; or
  - (ii) the handling of, or failure to handle, Permissible Materials in violation of



Applicable Laws or otherwise in any manner that constitutes negligence or willful misconduct by Contractor or any Subcontractor.

- 18.3 Contractor shall use Hazardous Substances in performance of the Services in accordance with the Performance Standards, Applicable Laws and Good Solar Industry Practices and shall not:
- (i) utilize, or permit or cause any Subcontractor to utilize, on the Site such Hazardous Substances as are prohibited under Applicable Law from being used in India; or
  - (ii) import or use at the Site such Hazardous Substances as are prohibited under Applicable Law.
- 18.4 Contractor shall maintain a regularly updated log of all material safety data sheets for all hazardous substances used in connection with performance of the Services at or near the Site, which shall be available for Employer to review upon reasonable request. Contractor shall maintain an accurate record and current inventory of all hazardous substances used in performance of the Services at or near the Site, which record shall identify quantities, location of storage, use and final disposition of such hazardous substances.
- 18.5 Contractor shall arrange and agree for the disposal, transportation, reporting and certification (including provision of waste disposal vouchers and other certificates as required by Applicable Law or Permits) of Hazardous Substances, including waste disposal vouchers, brought onto and released at the Site by Contractor or its Sub Contractors, which are expected to include but not be limited to used oil, grease and ethylene glycol, to the extent required by Laws, in each case, by licensed, insured, competent and professional Contractors in a safe manner and in accordance with Laws. As between the Parties, Contractor shall be solely liable for any response, removal, investigation, clean-up or other remedial action required by any Laws related to any Contractor,
- 18.6 In the event Contractor encounters any Hazardous Substance or other hazardous conditions at the Site that are inconsistent with the Performance Standard or would reasonably be expected to impact the performance of Contractor's obligations hereunder, Contractor shall promptly report the condition to Employer. In such event, Contractor shall stop work and remove, or take other actions necessary to remedy the hazards associated with, any Contractor Hazardous Substances such that Contractor can resume work.
- 18.7 The Contractor shall indemnify and hold harmless the Employer against any fine, penalty or third-party Claim incurred as a result of non-compliance by the Contractor with the terms



of the contract, Applicable Laws, Good Solar Industry Practice and more specifically, with its obligations under Hazardous Substances and Hazardous Site Conditions.

## 19 EMPLOYER'S OBLIGATIONS

During the Term, Employer shall perform the following obligations:

### 19.1 Access

19.1.1 On and from the Commencement Date, Employer shall provide the Contractor (and its Subcontractors) full, free and safe Access to the Plant for the purpose of enabling Contractor to fulfil its obligations under the contract.

Notwithstanding the foregoing, the Contractor shall be required to perform any works (including obtaining permits for such works) related to the Access to the Site required for the delivery of any Spare Parts, if so requested by the Employer in writing, on the Time to time Basis.

19.1.2 The Employer shall give to the Contractor and the Contractor's personnel unrestricted Access to the Site to enable Contractor and the Contractor's personnel to carry out all elements of the Services at any time from the Commencement Date until the end of the Term. Such Access shall include the provision by the Employer of:

- (i) such keys or access codes as may be required by the Contractor to gain unhindered access to the Site (as the case may be);
- (ii) Access to the access roads to and on the Site If there is any deviation, and such deviations are accepted by the transport contractor, then such deviations shall be accepted by the Contractor.

Notwithstanding anything else contained in the contract all Access to the Site and Plant is subject to the applicable site safety, security and environmental requirements and Applicable Law (and the Contractor should comply with the same). The Employer will have the right to limit Access or expel any Person off the Site in case of them not fulfilling the Emergency plan of the Site, the Emergency plan of the Plant Facility.

### 19.2 Employer's Permits

Contractor, on behalf of the Employer, shall obtain and maintain all Permits and any Permits required by Applicable Law to be obtained in the name of the Employer in order to (i) perform Employer's obligations under the contract and (ii) enable Contractor to lawfully access the Site at the point of entry to the Site and the Plant].

## 20 SITE REGULATIONS

Employer shall (directly or through a Subcontractor, advisor or agent) provide the Site



Regulations and revisions thereof from time to time, and shall require the Other Subcontractors and their respective agents and employees to, (i) comply with the Site Regulations; and (ii) take all necessary precautions (as required by Applicable Law or otherwise) for the health and safety of all Persons (including Contractor's personnel) at the Site.

## 21 CERTAIN NOTIFICATIONS BY EMPLOYER

21.1 Employer shall, upon obtaining actual knowledge thereof, promptly give the Contractor, as soon as practicable, notice of:

21.1.1 Any events or facts or observations that the Employer believes has determined that would:

- (i) have a material adverse effect on the operation of any of the Plant or the performance of the Contractor's obligations under the contract; or
- (ii) to cause an immediate threat to the safe operation of the Project (or any Plant therein) and/or the safety of Persons; provided that, in the case of this current Sub-Clause, the Employer shall provide as soon as possible verbal notice of such event, fact or observation to the other;

21.1.2 any (a) violation of Applicable Laws, including environmental Laws or the terms of any Permit, by Contractor or any Other Subcontractor or (ii) any notices of Liens (or claims of Liens) or investigations by Governmental Authorities related to the Project.

21.2 Failure to furnish notice pursuant to Certain Notifications by Employer shall not affect the Contractor's obligations to perform its obligations. Contractor.

## 22 EMPLOYER 'S OWNERSHIP OF ENERGY, EQUIPMENT, SPARES AND PROJECT BENEFITS

22.1 The Contractor acknowledges that ownership of the Energy or any benefits arising out of the operation of the Plant remains at all times, and in all circumstances with the Employer at all times and the Contractor has no legal or equitable title to or interest in the Energy or other benefit.

22.2 The ownership of all item supplied by the Contractor, including under Additional Services shall be transferred to the Employer at the end of the term of the contract:

- (i) such items becoming a permanent part of the Plant against the mutually agreed payment by both the parties

22.3 The ownership of any item (not including Energy or benefits arising out of the operation of the Plant) supplied by the Contractor as part of the Services shall be transferred to the



Employer upon such items becoming a permanent part of the Plant.

- 22.4 The Contractor agrees that any benefits, including any carbon credits, renewable energy certificates or similar royalty or credit that may arise as a result of having the Project undertaken belong to the Employer and the Contractor shall provide all reasonable assistance requested by the Employer in order to obtain such rights and benefits.

## 23 PRICE AND PAYMENT

### 23.1 Total Annual O&M Cost

Commencing on the Commencement Date and for the remainder of the Term, Employer shall, in consideration of the Contractor providing the Services and its prior receipt of an invoice with respect thereto, pay in accordance with Invoices and Payment to Contractor an annual O&M cost in INR in equal quarterly instalments at the end of every quarter for each year till contract period in the amounts set forth in and payable in accordance with Price Schedule No 5/SOR-5 [Schedule of Rates] of the bidding documents for the plant facilities. The yearly breakup of the Total O&M price shall be in line with the Price Schedule No 5/SOR-5.

Against the successful Operation and Maintenance of the entire Plant Facility payment will be released on quarterly basis at the end of every quarter for each year during the currency of the Contract Period.

**The O&M of the plant will commence from the date of Operational Acceptance of the plant(s).**

The Contractor acknowledges that the Total Annual O&M cost forms the sole and exclusive consideration and reimbursement due to the Contractor for the performance of the services included under the Services and Spare Parts and that the Contractor shall not be entitled to any additional amount for their performance, for whatever reason, including, amount others due to increased costs, changes in applicable GST, customs or duties (including, without limitation those set forth in GST, Taxation and Import Duties below), and except as may be specifically provided in the contract.

### 23.2 Payment of amounts due to the Contractor:

Amount shall not be considered as due and payable and the period for the payment of any Price stipulated under the contract shall not commence until the Contractor has duly fulfilled and delivered all obligations and deliverables required from the Contractor until the date of submission of the invoice for the payment to the Employer with relation to such invoice and/or within the period for which the Price included in the invoice are due.

## 24 INVOICES AND PAYMENT



- 24.1 Contractor shall submit Goods & Service Tax (GST) compliant invoices to Employer for the amounts due under Total Annual O&M cost above and for any other amounts that may be due under the contract.
- 24.2 The Total Annual O&M Cost shall be invoiced by the Contractor quarterly against the completion of concerned quarter and each invoice may be submitted by Contractor no later than the day after the completion of the quarterly period in question and, subject to the terms of the contract, shall be paid by the Employer no later thirty (30) days from the date of submission of the invoice along with all other requisite documents (If so required). The Employer shall make payments by wire transfer to the bank account designated from time to time and owned by Contractor. The payment of any invoice shall be subject to the Contractor submitting to the Employer the Monthly Performance Reports.
- 24.3 Additional Services may, for purposes of this Invoices and Payment, be invoiced upon full and proper completion of each individual task and shall, subject to the terms of the contract be paid by the Employer within thirty (30) days from the date of submission of the invoice along with all other requisite documents (If so required).
- 24.4 VOID.
- 24.5 To the extent permitted by Applicable Laws, if the amount of an invoice is disputed by the Employer, the Employer shall be entitled to withhold payment of the disputed amount for the next invoice (or part thereof), until the dispute is resolved between the Parties under Law Dispute Resolution or otherwise. The Employer shall pay at the applicable time the undisputed amount of such invoice including any undisputed portion of the invoice item in dispute. Further, the Employer shall be entitled to withhold payment of any amount due to the Contractor, if, at the time, the Contractor is in breach of one or more of its material obligations in terms of the contract.
- 24.5.1 Subject to the provisions on the contract, the Contractor warrants that it has, and will be deemed to have, done everything that would be expected of a prudent, competent and experienced Contractor and in accordance with Good Solar Industry Practices in:
- (i) assessing all risks which it is assuming under the Contract; and
  - (ii) ensuring that the O&M Price contain allowances to protect it against any of these risks eventuating,
- and that it will not make a claim for an increase in the O&M Price if any of those risks eventuate.
- 24.5.2 Except for Liens arising out of a failure of the Employer to make any payment when due hereunder to Contractor or any other Person providing labour or services to the Project under Contract to the Employer, the Contractor acknowledges and agrees that it shall



not file, claim or register any Liens and shall use its best efforts to prevent any Liens from being filed, claimed or registered by any Subcontractor or by any employee, or agent of the Contractor or Subcontractor, against the Services, Additional Services, the Plant as a whole or any part thereof, or any real or other property of the Employer, for any works done or any Services and/or Additional Services rendered under the Contract or any subcontract let by the Contractor and shall procure that all subcontracts contain undertakings to the like effect.

24.5.3 The Contractor shall indemnify the Employer against any loss, damage, cost or expense (including legal fees) of the Employer arising out of or in connection with any Lien being filed, claimed or registered as referred to Invoices and Payment.

24.5.4 The delay or failure of a party to pay any amounts due hereunder, or the withholding of any amounts which are claimed by a party to be due, shall not release the other Party from any of its obligations or liabilities under the contract.

## 25 SCADA, EMS

Contractor shall be required from time to time to update the SCADA and PPC/EMS software, as required for the ongoing adequate operation of the Plant Facility. Such updates shall also be provided to the Employer at no additional costs.

## 26 INSURANCE

### 26.1 Contractor 's insurance

The Contractor, at his own cost and expense, shall take out and maintain in full force and effect and shall cause its Subcontractors to take out and maintain in full force and effect, throughout the Term of the Contract and any extensions thereof, the following insurance policies from reputable insurers and shall provide the Employer with copies of the corresponding insurance certificates:

- (a) Covering physical loss or damage to the all plant facilities at the Site, with an extended maintenance coverage for the Contractor's liability in respect of any loss or damage for the entire term of the contract.
- (b) Workers compensation insurance, as required by the Applicable Law and Contracts made with employees.
- (c) Group Medical Claim, Group Term Policy & Group Personal Accident Insurances covering the financial consequences cause by damage and loss arising from sickness, disease, injury or death of any person employed by the Contractor in respect of the services performed Automobile Public Liability insurance, as



required by the Applicable Laws, for all vehicles and automotive equipment owned hired, rented, leased and non-owned by the Contractor and used in the performance of the Services.

- (d) Comprehensive General third-party liability insurance including product and contractual liability covering the financial consequences of the liability arising out loss or damage caused to third parties or to the employer as consequence of the performance of the services.
- (e) All other insurance like – transit insurance (Marine/ Cargo/ others as applicable), Construction All Risk, Erection All Risk, workmen compensation, fire, third party liability, insurance against Insurance against theft, fire, act of God, Contractor's Equipments, machinery breakdown policy, business interruption insurance, Property damage Insurance & Environmental risk insurance as required during the O&M period of the Plant shall be in the contractor's scope & shall borne by the Contractor.

The Service Provides shall ensure that under the aforementioned insurance policies, each of the insured has the ability to claim thereunder for a minimum period of three (3) months from the date of expiry of the insurance policies for any claims that arose prior to the expiry date.

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor, except for the Third-Party Liability and Workers' Compensation Insurances, and the Contractor's Subcontractors shall be named as co-insureds under all insurance policies taken out by the Contractor, except for the Cargo, Workers' Compensation. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

Annual Status Report of Insurance Claims: The Contractor shall include the status of Insurance Claims made or required to be made during the year as part of the Annual Reporting Requirements.

## 26.2 Contractor's Insurance for the Plant Facility

The Contractor shall take out and maintain an insurance policy, seamlessly with CAR policy taken earlier during construction phase, preferably from same insurance company for the plant facility during the entire term of the contract

In the event of any incident or damage or loss that would be reasonably expected to result in an insurance claim, the Contractor shall:

- (a) Notify without delay to the Employer
- (b) Prepare and conduct all and any claims made under the policies effected by it, and



all monies payable by any insurers shall be paid to the Contractor take all reasonable measures to mitigate the loss, its effects and to protect salvage.

- (c) Collaborate with Employer and the insurer and provide them with all information and documents they may request.
- (d) Arrange immediate reinstatement of the damage to the employer's satisfaction, without waiting for the settlement for the corresponding insurance claim.
- (e) Claim in pursuant to the contract to the insurance agencies, if the claim is accepted or rejected or not accepted or partly accepted by the insurance agency then it will not limit the contractor obligation in any case and also if any losses on account of this shall be in the scope of contractor.

### 26.3 General Insurance Requirements

26.3.1 The Contractor shall, provide copies of the corresponding insurance certificates mentioned above.

26.3.2 If the Contractor fails to effect or maintain any insurance policy required hereunder, or fails to produce copy of the corresponding insurance certificates, the Employer may (but as no obligation), without prejudice to any other right or remedy available to it under the contract, procure the insurance for the relevant coverage and/or pay the premiums due. Such payments shall be recoverable and deducted from the payments to be made to the Contractor by the Employer under the Contract. In the event if Contractor does not pay the premium, then the Employer may pay the premium however in such case the obligations of Contractor to undertake the coverage shall continue as envisaged, irrespective of premium being paid by Employer. The Premium if paid by the Employer shall be recovered from the Annual O&M Fees payable by the Employer to the Contractor.

26.3.3 The Contractor shall comply with the conditions stipulated in each of the insurance policies to be affected under the Contract and shall not make any alteration to the terms of any policy subscribed by it so it deviates from the requirements herein.

26.3.4 The Contractor must promptly notify to the Employer any notification received from an insurance company regarding any actual alteration to one of their policies.

26.3.5 On occurrence of any loss covered by an insurance policy contemplated under Insurance, the Contractor shall, as soon as reasonably possible, notify to insurance companies for the policy subscribed by it. The Contractor shall also take any appropriate measure to mitigate the effects to the loss to the maximum extent possible. The Contractor shall assist any assessment mandated by the insurance companies.

26.3.6 The required coverages referred to and set forth in this Article 33 (*Insurance*) shall in no



way affect or limit the Contractor's liability with respect to its obligations under the Contract.

26.4 The Contractor shall also arrange suitable insurance to cover following during the O&M Period:

- (a) **Machinery Breakdown:** Electrical & or machinery breakdown of any machinery or other equipment resulting in costly repairs or even replacement of the solar panel.
- (b) **Business Interruption:** Cover for period of operational downtime i.e., covering the cash flow of the solar business as a result of an insured peril, for example fire or storm damage, machinery breakdown or equipment failure.
- (c) **Property Damage:** The insurance should cover material damage due to external causes such as fire, theft, vandalism, sabotage, hail damage, snow load, lightning strike, overload, operational mistakes, clumsiness, negligence & theft.
- (d) **Employers Liability:** Provides cover against the risk of accident from usual workplace risks such as working at height & manual handling during construction & O&M period.
- (e) **Environmental Risk Insurance:** Environmental damage coverage indemnifies solar system owners of the risk of either environmental damage done by their development or pre-existing damage on the development site.



## ANNEXURE-1

### Scope of Work for Operation and Maintenance

- i) The Contractor shall prepare the initial Annual Operating Plan for the Plant Facility and shall also indicate the proposed resources (manpower, material & machinery) that would be deployed for O&M.
- ii) The Contractor shall be responsible for the smooth day-to-day operation of the Plant Facility.
- iii) The Contractor shall provide necessary routine and preventive maintenance schedules of the plant for the Employer's approval and shall carry out all routine and preventive maintenance accordingly.
- iv) The Contractor shall perform periodic overhauls and preventive maintenance required for the Plant in accordance with the recommendations of equipment manufacturers and as per the O&M manuals.
- v) Contractor shall perform all break down maintenance and other maintenance in the Plant Facility. The Contractor shall be responsible for achieving the performance guarantee of the plant as indicated in the contract.
- vi) The Contractor shall operate and maintain fire protection system and safety equipment for the plant.
- vii) The Contractor shall do maintenance of electricity system including overhead lines in the Plant Facility area up to the Point of Interconnection (POI) to the grid at the site. Necessary co-ordination shall be made by the Contractor with STU/CTU, SLDC/RLDC and other agencies as may be required during the Operation and Maintenance term for smooth operation of the plant.
- viii) Contractor shall work in coordination with the Employer or any Employer's designated party to optimize the Plant production.
- ix) The Contractor shall provide required spare plant Equipment, Spare Parts, tools and tackles, consumables required for comprehensive operation and maintenance of the plant facility. The Contractor shall make arrangement to procure required spare parts, or equipment/s as required, overhauling of parts, tools and equipment, required to operate



and maintain the Plant in accordance with the recommendations of individual original equipment manufacturer at his own cost. Cost of imported Equipment & spare parts, if any, shall be included in the O&M quoted cost. The List of Consumables, Spare Parts, tools and equipment shall be finalised in consultation with the Employer or Employer's representative. List of recommended spare parts shall be submitted by the Contractor at the beginning of services; however, the complete recommended spares will be in the scope of contractor only. In case any equipment or spares is not listed in the mandatory spares list but is required vitally for the operation of the plant, then the same shall be procured and provided by the contractor without any additional cost.

- x) It is the responsibility of the Service Provide to store the materials in appropriate stock yard or container at the site so as to ensure timely availability of the materials.
- xi) The Contractor shall employ only such personnel who are adequately qualified and experienced for operating and maintaining such power generating sets. The Contractor shall ensure that such personnel are on duty at the plant at all times, 24 (twenty-four) hours a day and 7 (seven) days a week commencing from the Date of Operational acceptance.
- xii) Contractor shall carry out all day-to-day operation and maintenance for the Plant Facility as set forth herein. Contractor shall perform the Work and supply all required spare parts in a prudent and efficient manner and in accordance with manufacturers and systems designers' specifications, the Annual Operating Plan for the Plant and all operation and maintenance manuals, all Indian applicable laws including environmental protection, pollution, sanitary, labour act, factory act, employment and safety laws, ("Government Rules") and Prudent Utility Practice. The contractor shall adhere to all labour laws which are applicable and as specified in the EPC contract document.
- xiii) Contractor shall arrange necessary security staff for watch and ward of the Plant Facility round the clock at his own cost, the details of which shall be furnished along with the bid.
- xiv) Contractor shall be responsible for:
- Maximizing plant capacity utilization,
  - Reducing plant downtime,
  - Optimizing the useful life of the equipment of the power plant.



xv) The Contractor shall maintain all accounting records regarding the facility in accordance with the generally acceptable accounting principles under the Laws of India.

xvi) The Contractor shall maintain accurate and up-to-date operating logs, records and monthly reports regarding operation and maintenance of the Plant facility (Such records shall be distinctly recorded for Solar PV Plant, in order to have clear data for assessment of any individual component of the Plant Facility) which shall include details of power output, other operating data, repairs performed and status of equipment. All such records to be maintained for a minimum of 60 (sixty) months after the creation of such record or data and for any additional length of time required by regulatory agencies with jurisdiction over the Parties. Upon expiry of term, the Contractor shall hand over all such records to EMPLOYER. However, EMPLOYER shall have access to all such records at any time. Generation and O&M reports should be made available to EMPLOYER on daily and monthly basis in required formats as well as the Quarterly and Annual Performance Reports shall be provided. Contractor shall provide communications as well as daily, weekly, monthly, quarterly and annual reports to the employer in the desired format as per the Contract with the Employer or Employer's Engineer.

xvii) The Contractor shall develop and implement plans and procedures including those for firefighting, maintenance planning, procuring and inventory control of stores and spares, plan to meet emergencies, plant safety and security; and such other facilities and systems as may be necessary to commence Contractor's ongoing responsibilities.

xviii) The Contractor shall provide copies of all necessary documents including the following:

- Operation and maintenance manuals shall be prepared and approval shall be accorded from Employer within three months from the date of Operational acceptance.
- Failure Analysis/history/trouble shooting details of all the Equipment
- Identification of Equipment needing preventive maintenance
- List of Vendors indicating name and addresses during operation and maintenance with credentials
- root cause analysis report for any major failure.
- Record of consumables / spare parts

xix) The Contractor shall be responsible for conveying following details to the Employer on daily basis as well as on monthly basis (by the end of 5th day of each month) by fax/ e-



mail giving the detail of plant performance during previous month.

- Power generated at all Solar PV Plant
- Power fed to the grid
- Internal power loss and internal consumption
- Power consumption for captive use (if any)
- Reactive power consumption
- Downtime of Plant Facilities including Solar PV Plant and other infrastructure of the Plant facility.

xx) The Contractor shall be responsible for liaising with statutory authorities—and local authorities in order to ensure smooth operation of the Power Plant.

xxi) Contractor shall provide constant remote surveillance to the Plant Facility

xxii) Contractor shall provide updates and revisions to Reference Documents, as and when applicable.

xxiii) Shall implement software updates to control and monitoring systems including EMS/SCADA in order to meet the plant facility operating requirement in consonance with the grid operations and in compliance with the grid codes as applicable during the operation.

xxiv) Duly and timely provide the Employer (or parties designated by the Employer) with all notifications required under the Contract including in particular such notifications set forth in Certain Notifications by Contractor;

xxv) Contractor shall provide access to the Employer to all data for the Plant Facility from the EMS including the SCADA system.

xxvi) Contractor shall at all times allow and provide Employer all necessary information for the operation of EMS including the SCADA system (with no notification or approval of access being required unless specifically and otherwise agreed to by the Parties) full, free, unconditional, safe and complete access to the EMS including the SCADA system. Contractor shall monitor and operate the Plant in accordance with the contract and shall ensure smooth operation of the plant.

xxvii) Provide the training to the Employer's personnel in relation to the operation of the



complete plant facility. Training shall be provided to the employer within 190 days before end the contract.

xxviii) Contractor shall provide the insurances prescribed in insurance. The Contractor shall, with [prior intimation of 5 Business Days] at regular business hours, allow persons duly authorized by the Employer including but not limited to the officials of the insurance company of the Employer, to inspect the Project and provide to such personnel, access to all information which is necessary for their inspection, and is reasonably requested by the Employer. All representatives of the Employer shall strictly adhere to the Applicable Laws and the Health, Safety and Environmental (HSE) practices of the Contractor as provided in the Reference Documents;

xxix) Contractor shall provide for the watch and ward of the Plant at all times during the Term. The watch and ward deployment plan shall take care of comprehensive Project level security and the Contractor shall take necessary steps to prevent sabotage, theft, vandalism and malicious damage of the assets comprising the Plant, and shall also coordinate and liaison with law enforcement authorities. The Contractor shall take all possible measures to keep the plant operational and secure.

xxx) Contractor shall Coordinate with SLDC/RLDC and other related entities/departments/local Panchayats as required for proper operation of the Plant Facilities. The Contractor shall also coordinate with relevant agencies for monthly Joint Meter Readings, meter testing, and any other requirements such as any audit or inspection by the government agencies or authorities, financiers, any designated third-party agency etc. for the Project operations.

xxxi) Contractor shall be responsible for appointing a Qualified Coordinating Agency at the Pooling Substation Level and shall be responsible for carrying out the forecasting and scheduling of the energy generation from the plant facility (In accordance with the Deviation Settlement Mechanism Regulations, as applicable). Scheduling given by the Contractor is such that no penalty is levied on the Employer due to any deviation of actual generation from scheduling beyond the allowed limit. If any penalty is imposed on the Employer due to such deviations beyond allowed limit the same shall be passed on to the Contractor and the recovery of the same will be done from the O&M Price payable to the Contractor.

xxxii) Water requirement for module cleaning arrangement and the cost for the same shall be



borne by Contractor. The Contractor shall arrange for water on it's own, by ensuring ESIA norms.

xxxiii) Contractor shall be responsible to comply with all applicable National and International Standards as well as local statutory provisions related to Environmental Protection Regulations, Health and Safety requirement.

xxxiv) Contractor will be responsible for coordinating with the OEMs for securing warrantee conditions and services from OEMs as per the warrantee of each equipment, as well also for the Project insurance claims.

xxxv) Contractor shall carry out the performance monitoring for the Plant Facility on continuous basis and in case of any deviation, the Contractor shall perform the due diligence appropriately to find out the actual root cause of such deviation. Any test or inspection required such as thermal imaging, IV characteristics test etc. to analyse such deviation will be the responsibility of the Contractor. Thereafter the corrective action required to mitigate such deviation shall be undertaken by the Contractor without any additional cost.

xxxvi) Contractor shall be responsible for maintenance of all each and every civil infrastructure parts like Building, cable trench, fencing, drain, plumbing system fire-fighting system, CCTV system, security arrangement, road, earthing, any foundations, anti-weeding, clearing bushes in the solar field etc., as per the direction of employer

xxxvii) In the last quarter of the O&M Contract Period, the Contractor shall handover the Plant Facilities to the Employer along with inventory of spare parts, tools, equipment, consumables and supplies for the facility's operation along-with required details of recommended spares list with all associated information regarding replacement records, supplier details, tentative cost, storage details, specifications for the basis of replacement frequency and mean time between failures and mean time to restore.



## ANNEXURE-2

### Generation Guarantee for Solar Plant

#### 1. Annual Generation Guarantee

- A. In consideration for the payment of the O&M Price, from the Commencement Date until the end of the Term, the Contractor grants to the Employer Performance Ratio Guarantee on the terms and conditions set forth in the contract.
- B. The Contractor shall guarantee the Target Generation (post-OTGT) for each year during the O&M Period ("Annual PR Guarantee") from the date of Operational Acceptance. In the event that the Actual Generation is less than the Guaranteed Target Generation (G<sub>TN</sub>), the Contractor shall, upon demand, indemnify the Employer by paying liquidated damages - not as a penalty - equivalent to the estimated energy loss. This indemnity shall be subject to a maximum of **five percent (5%)** of the revenue from the Target Generation (G<sub>TN</sub>), calculated at the ceiling tariff specified below.

- **Ceiling tariff - Rs. 3.56 per unit**

- C. **Generation Guarantee During O&M:** The bidder shall guarantee the Target Generation (G<sub>TN</sub>) as per PVSyst document finalized during detailed engineering and modified as per O&M Target Generation Test (OTGT) at plant end ABT meter, (i.e., at 220kV near to 33/220 kV pooling substation) after successful O&M Target Generation Test.

The annual target generation during O&M shall be calculated as follows-

$$G_{TN} = G_{TS\_ref} \times RCF \times [1 - (N - 1) \times DF]$$

Where-

- G<sub>TN</sub> - Target generation during N<sup>th</sup> O&M year (in kWh)
- G<sub>T\_ref</sub> - Generation finalized (evaluated) during detailed Engineering (in kWh)
- N – Year of operation
- RCF - Radiation Correction Factor;  $RCF = \frac{GHI_{meas}}{GHI_{ref}}$

(Note: Kindly refer to GA-J: O&M Target Generation Test Procedure)



- $GHI_{meas}$  - Measured Global Horizontal Insolation during the O&M period (in kWh/m<sup>2</sup>)
- $GHI_{ref}$  - Reference Global Horizontal Insolation (as per relevant clause of SA-B: Project-Specific Technical Details of Tender Document)
- OTF - O&M Target Generation Factor: Ratio of achieved generation during OTGT Period to Radiation Corrected Target generation for OTGT period
- DF – Module degradation factor (in %)

(**Note:** DF shall be provided to Successful bidder based on the module supplied by the Employer.

- $G_N$  - Measured Generation during N<sup>th</sup> the O&M period (in kWh) (Actual Generation)

**A. Liquidated Damages for Shortfall in Annual Generation for Solar PV Plant:**

If the Contractor fails to achieve annual guaranteed generation (i.e., Target Generation ( $G_{TN}$ )) at the end of a Year, (i.e.,  $G_N < G_{TN}$ ) the Contractor shall be liable for liquidated damages to the Employer as per below:

$$LD_N = \Delta G_N \times \text{Ceiling Tariff}$$

Where,

$\Delta G_N$ : Shortfall in energy generation during N<sup>th</sup> O&M period calculated as -

$$\Delta G_N = G_{TN} - G_N$$

**Recovery of LD during O&M:** In case of shortfall in generation, recovery of LD shall be first deducted from payment towards O&M contract value up to limiting level of 25% of the Annual Contract Value. In case the LD recovery amount exceeds above limiting value, balance amount shall be recovered through Bank Guarantee submitted by EPC Contractor.

**Note:**

- (i) The value of amount encashed from above BG shall have to be replenished by EPC contractor within three months.



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- (ii) The Invoices raised by the O&M Contractor during the year (when Target Generation has not been calculated), shall be paid by the Employer after deducting LD, if applicable, as per above formula, on the basis of Measured Generation for the invoice period.
- (iii) In case Annual Generation Guarantee is demonstrated by the O&M Contractor (i.e.,  $G_N \geq G_{TN}$ ), any amount deducted as LD towards shortfall in Generation during the year shall be reversed.
- B. In case the Project fails to generate any power continuously for 1 month any time during the O&M period, apart from the force majeure and grid outages as certified by competent authority from STU/ CTU, it shall be considered as “an event of default”. In the case of default, the entire Contract Performance Security will be forfeited.
- C. Penalty during O&M period against breakdown of other Infrastructure of Plant Facilities that don't affect the generation of power directly, such as but not limited to, civil infrastructure, water supply system/network, other Infrastructure developed by the Contractor as per Scope of Work for the Project (Section-VII: Scope of Works & Technical Specifications) and/or non-compliance with scheduled preventive maintenance activities shall be penalised @ Rs.1000/day, for non-compliance with PM Schedule (Initiation/Completion of Scheduled maintenance Activity as agreed under this Contract) beyond 48 hours. Cumulative value of such penalty shall be limited to 50% of Annual O&M Contract Value.

For the purpose of this Clause, the PM shall be inclusive of, but not limited to the following PM activities:

Item	Scope of Maintenance Activity	Periodicity
PV Arrays	Cleaning of PV Modules	A least 2 cycles per month
PV Arrays	Thermal Imaging of PV Modules	Once every year
220kV Transmission Line	Thermal Imaging & Drone Survey of 220kV Transmission Line	Once every year



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Environmental/Corrosive Protective Coatings	White-washing/Application/Re-application of Distemper, Epoxy coatings	Once in every 2 years under the O&M Contract period, in consultation with the Owner
Roads and Access paths	Repair and maintenance of all roads – Access, Internal and Periphery roads, walkways as well as fences, gates, cable-trenches and outdoor equipment platforms.	Once every year prior to Monsoon season, in Consultation with the Owner
Water Supply Network	Repair and Maintenance of Water Supply Network including piping network, valves, pumps etc.	Once Every Year in Consultation with the Owner.
Periphery Lighting	Repair and maintenance of Peripheral Lighting including replacement of non-functional lighting fixtures, Junction Boxes, Conduits etc.	Once every Six Months
Rodent Entry Points	Application/re-application of Anti-rodent protection measures like PUF filling, sealant etc. at Checker/Gland Plates, Cable Entry Points (in PCU/SMU, Switchgear Panels, Buildings, Enclosures)	Once every Six Months
All bolted/tightened structures	Tightening/fastening of bolts that are exposed to winds/vibrations like MMS members/foundation bolts	Once every Year before onset of Windy season, in consultation with the Owner.



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Enclosures of Equipment requiring Temperature and Dust Controlled environment for Normal Operation	Application/re-application of insulation/Dust-Filters/Temperature-control equipment at Enclosures/Buildings housing PCU, Switchgear	Once every Year, consultation with the Owner.
Weather Monitoring System	Calibration of Sensors/Measuring Instruments	As per the requirement to maintain valid calibration certificate
Entire Plant Facility	Oversight management of the hazardous/toxic materials including its handling and disposal as per Government of India Rules and environmental and safety assessments by a qualified Specialist	Once every Year, in consultation with the Owner.

**Note :** *The Contractor shall ensure intimation and submission of requisite Reports to the owner at least 15 days prior to initiation of maintenance action for the activity.*

- D. Void
- E. The Penalty specified on account of delays, and Liquidated Damages and on account of deviations in Functional Guarantees as above shall be assessed independent of each other.
- F. **Limitation of Contractor's Liability under O&M Contract:** Except for the Contractor's indemnity obligations under this Contract, and except for actions or claims arising from gross negligence or intentional or wilful misconduct, Contractor's total liability to Employer for a given year shall not exceed the corresponding year's Value of O&M Contract.

**Scheduling and Forecasting:**

1. The Contractor shall be responsible for appointing a Qualified Coordinating Agency if



required by concerned authorities at the Pooling Substation Level for scheduling and forecasting activity. Also, the contractor shall be responsible for carrying out the forecasting and scheduling of the energy generation from the plant facility (In accordance with the Deviation Settlement Mechanism Regulations, as applicable). Scheduling given by the Contractors is such that no penalty is levied on the Employer due to any deviation of actual generation from scheduling beyond the allowed limit. If any penalty arises due to DSM after adjusting the payable and receivable imposed on the Employer due to such deviations beyond allowed limit, the same has to be paid by the contractor separately. If the contractor fails to pay such penalty, then it shall be recovered from the contractor's payment to be done by Employer.

2. The deviation charges, as per applicable regulations, for the difference in units between scheduled and actual generation shall be recovered from the contractor on following basis.

2.1 In case of any deviation due to forecasting and scheduling error, Contractor shall bear the cost/Penalty.

2.2 In case of localized thunderstorm/sand storm, the Employer shall bear the deviation charges till the time period before which the revision of scheduling is not allowed, as per applicable regulation.

2.3 In case if there is a component/Machine/Inverter failure, the Employer shall bear the deviation charges on account of such failure till the time period block before which the revision of scheduling is not allowed, affected as per applicable regulation. The contractor shall bear the deviation charges due to such failure beyond such time period.