Annexure-I

5MW Grid Interactive Solar PV Power Project, Monarchak

Pre Bid Queries of prospective bidder and Clarifications/ replies of NEEPCO

ELECTRICAL

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
1	General technical Information Volume-2, Part-I	4 of 25	4.01 (b)	Transformer-1250 KVA, 415 V/11000V, 3 Phase, 50 Hz with NGR.	The input voltage of transformer plant shall depend on the inverter output which varies from 270V-415V. Request NEEPCO to accept the same	Refer minutes of pre-bid meeting dtd 20-12-12
2	General technical Information Volume-2, Part-I	4 of 25	4.01 (c)	250KVA, 11/.415 V, 3 Phase 50 HZ transformer.	Output voltage of Auxiliary transformer can be decided after calculation of voltage drop. Request NEEPCO to accept the same	Refer minutes of pre-bid meeting dtd 20-12-12
3	General technical Information Volume-2, Part-I	4 of 25	5.0	Supply, erection, testing and commissioning of SCADA system for the remote monitoring and automatically operate and shall be controlled the plant.	Inverter cannot be controlled automatically by SCADA. Inverter automatically goes to sleep mode in case of non availability of AC voltage and wakeup again in case of PV power is available. Request NEEPCO to accept the same	Specification shall prevail. Status of inverter to be made available to SCADA.
4	General technical Information Volume-2, Part-I	4 of 25	6.0	Point b) under Other Works	b) has been left blank Request NEEPCO to clarify regarding the same	Already mentioned in the specification in Cl. No. 6 (ii) as "Supply and erection of galvanized steel ground wire of suitable dia. with hard ware for lightning protection of the SPV Plant and switchyard equipment and grounding as per statutory requirement".
5	General technical Information Volume-2,	10 of	15.01	Crystalline & thin film Solar Module: Relevant IEC Standard	Which type of modules for this system has to consider, Crystalline & thin film	Poly Crystalline PV module.

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
	Part-I	25			Solar Module? Request NEEPCO to clarify the same.	
6	General technical Information Volume-2, Part-I	16 of 25	2.0 & 3.0	SPV Power Plant & Technical details of a SPV Module	Request NEEPCO to permit bidders propose their specific design in order them to meet the Total Guaranteed Energy generation not to be less than 8.322 MU by sizing the required AC & DC Capacities as per bidders design standards..	Refer minutes of pre-bid meeting dtd 20-12-12
7	General technical Information Volume-2, Part-I	2 of 25	1.0	Annual Generation of 8.322 MU(19% CUF)	As per the Meteonorm ,NASA data provided for the proposed site, the GHI is around 1850 kWh/m2. Also the required 8.322 MU guaranteed generation shall not be achievable with 4.5 MW AC & 5 MWp DC capacities . Request NEEPCO to clarify regarding the same.	Refer minutes of pre-bid meeting dtd 20-12-12
		8 of 25	14.02 (d)	"Base Generation" for a year will be the guaranteed generation for a year quoted by the bidder in the Technical formats by taking into account the actual average global solar radiation measured by the calibrated pyranometer for every months at step-1.In our case it will be minimum 8.322 MU (i.e 19 % CUF).		
		11 of 25	17.0 b)	Bidder offering an output of 5 MW, but total energy less than 8.322 MU shall not be considered.		
		13 of 25	21.0	SOLAR INSOLATION LEVEL: The GHI value that is of importance for PV technology is of the order of **1692** kwh/m2 per annum		

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
8	General technical Information (Volume-2, Part-I)	12 of 25	19.0	**ARRANGING WATER AND POWER SUPPLY** Water and electricity required during construction and O&M period shall be arranged by the contractor.	Both these clauses are contradictory. Request NEEPCO for provision of power & water supply during construction and O & M period as NEEPCO has already established facilities at the proposed site	Refer minutes of pre-bid meeting dtd 20-12-12
	Instructions to bidder	4 of 41	1.4 & 1.5	**1.4 Water Source:** For construction purposes, construction water shall be drawn by the Contractor from the existing ground water sources. The Contractor shall also make his own arrangement to draw Potable water requirement and service water requirements from existing facilities. **1.5 Construction Power:** i) The Contractor shall also be provided with electricity at 415 V free of cost for the execution of the Contract, at 01 (one) convenient point to be mutually decided in the Construction site.		Refer minutes of pre-bid meeting dtd 20-12-12
9	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	3	5.00 & 5.04	ii) Power evacuation through 33KV line which is approximately 1000 meters from the proposed 33 KV switchyard. 5.04) Power generated will be evacuated at 33 kV level by two double circuit lines to the nearest substation at Rabindranagar which is 6 km away.	What is the distance of nearest substation from 33kV switchyard as in point 5.00 it is 1000 meters and 5.04 it is 6000 meters? Request NEEPCO to clarify the same	33kV line shall be 1 km (approx).
10	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	4 of 14	5.05	The inverters shall automatically turn on and off successively as the available solar irradiation varies over the day. The inverters shall have all necessary synchronization equipment installed as necessary. The voltage range shall be -20% to +15%.	As per Inverter manufacturer ±10 % is allowed. Request NEEPCO to accept the same	Refer minutes of pre-bid meeting dtd 20-12-12

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
11	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	4 of 14	6.01.1	SPV modules to be supplied should have minimum declared output of around 300 watt peak capacity per module under standard test conditions.	Please relax the condition as most of the module manufacturers are offering in the range of 230Wp to 250 Wp. Request NEEPCO to accept the same. Further transportation & handling of higher wattage modules like 300 Wp modules is difficult.	Refer minutes of pre-bid meeting dtd 20-12-12
12	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	4 of 14	6.02.2	The frames and leg assembles of the array structures shall be made MS hot dip galvanized of suitable sections of Angle, Channel, Tubes or any other sections as may deemed fit conforming to IS for steel structure to meet the design criteria. Minimum thickness of galvanization should be at least 90 microns.	ASTM- A123 standard specifies maximum 100 microns galvanization. However, for cold formed light gauge sections used in PV supporting structures, the 70 micron galvanization Is used. Request NEEPCO to accept the same	As per specification.
13	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	5 of 14	6.05.1	The SMU shall be dust, vermin, and waterproof and made of metal or thermoplastic	We recommend that SMU shall be of polycarbonate/polyester material with UV protection as per TUV. Request NEEPCO to accept the same	As per specification.
14	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	5 of 14	6.05.2	Each SMU will have Suitable Reverse Blocking Diodes of maximum DC blocking voltage of 1000 V with suitable arrangement for its connecting.	In modern practice fuses are provided in each positive and negative circuit which equals serve the purpose of protection as offered by diodes. Diodes provision also will increase the power losses and heating in the combiner box. Request NEEPCO to accept the same.	As per specification.
15	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	6 of 14	6.05.7	The PCU shall have provision for galvanic isolation. Each solid state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter	Present advance age of Inverter, inverter is not available with inbuilt galvanic isolation as offered by leading inverter suppliers. They are offering Transformer Less (TL) inverter and galvanic isolation is to be achieved through Grid transformer.	Refer minutes of pre-bid meeting dtd 20-12-12

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
					In this way, we avoid galvanic isolation transformer winding losses and can achieve more system efficiency & yield generation. Request NEEPCO to accept the same.	
16	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	6 of 14	6.05.8	Continuous output power rating - 500KW	Please relax the each inverter rating between 500KW to 1000KW for more flexibility. Request NEEPCO to accept the same.	Refer minutes of pre-bid meeting dtd 20-12-12
17	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	6 of 14	6.05.8	PCU- MPPT Range 475 V to 900 V DC	MMPT voltage range can be different from this one because MPPT range shall be depending on the PCU manufacturer and will be decided after finalization of PCU. Request NEEPCO to accept the same.	As per specification.
18	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	8 of 14	7.00 (xiv)	Degree of protection- IP31	Degree of protection shall be IP20 as per clause no. 6.05.8. Request NEEPCO to clarify the same.	Refer minutes of pre-bid meeting dtd 20-12-12
19	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	8 of 14	9.00	LT Power Interfacing Panel	LT Interfacing panel is not required as three winding transformer shall be used to combine 2 X 500KW inverters. ACB shall be the part of inverter AC compartment. Request NEEPCO to accept the same.	Refer minutes of pre-bid meeting dtd 20-12-12
20	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	10 of 14	11.01,11.02 & 11.03	Cables and wires for array	As per the international standards PV wires shall be as per TUV 2PFG2008 EBXL/XLPO double insulated, class-5 UV protected which shall not require any conduits for laying. Request NEEPCO to accept the same.	As per specification.
21	SPV, PCU and electrical	10	11.05	Only copper conductor wires of	Wires up-to 16Sqmm. Shall be provided	As per specification.

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
	system Particular Technical specification Electrical Volume-2,Part-II, Section-II	of 14		reputed make shall be used.	with copper. Above 16Sq.mm class-2 aluminum conductor shall be used. Request NEEPCO to accept the same.	
22	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	11 of 14	11.11	Cables and wires for array	Module interconnection & string connection to junction box shall be with 4Sq.mm UV protected Cu Solar cables. For junction box to inverter 1Cx95Sq.mm copper or 185Sqmm./240Sq.mm Aluminum (FR PVC insulated) cables shall be used. Request NEEPCO to accept the same.	As per specification.
23	SPV, PCU and electrical system Particular Technical specification Electrical Volume-2,Part-II, Section-II	11 of 14	11.12	Brief technical specifications of DC Cables and Connectors:- Standard:- IS 7098-Part II & Grade 1.1 kV Working Voltage:- Up to 1100V Temperature Range:- -15°C to +70°C Specification:- IS 7098-Part II for XLPE cables and IS1554 for PVC cables & Applicable International standards	For the 5MW Solar Power Plant, we recommend to provide the specifications as mentioned below : Standard: TUV 2PFG Working Voltage:-Up to 1800V DC Temperature Range:- -05°C to +90°C Specification:-XLPO/EBXL Thermosetting rubber Applicable International standards:- we request to add TUV,2PFG standard in same. Request NEEPCO accept and do the necessary changes.	As per specification.
24	Transformers Particular Technical specification Electrical Volume-2,Part-II Section-III	2 of 29	1.00.00 a)	5 Nos, 1250 KVA, */11kV, 3 phase, 50 Hz, ONAN, outdoor type transformers and accessories. (*: The LV shall be suitable for the Rated output of the inverter with a minimum of 390V)	There are very less inverter manufacturers to provide the output of >390 volts on AC side for 500KW inverter. We request to consider the output of >300 volts on AC side for 500KW inverter. Request NEEPCO to accept the same.	Refer minutes of pre-bid meeting dtd 20-12-12
25	Transformers Particular Technical specification Electrical Volume-2,Part-II	4 of 25	1.2	SPECIFIC TECHNICAL REQUIREMENTS FOR TRANSFORMER-1250KVA transformer	We provide a scheme where in the output of inverter directly stepped up to 33kV using 0.3/33kV transformers and evacuation at 33kV level with 8 pole	Refer minutes of pre-bid meeting dtd 20-12-12

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
	Section-III				structure. Request NEEPCO to accept the same.	
26	Transformers Particular Technical specification Electrical Volume-2,Part-II Section-III	4 of 25	1.2 , Point no-10	Vector Group – Dyn11	Vector group shall be as per inverter manufacturer recommendation. Normally Dy5y5 three winding (IT grid) transformer is recommended. Request NEEPCO to accept the same.	As per System Requirement.
27	Transformers Particular Technical specification Electrical Volume-2,Part-II Section-III	4 of 25	1.2 , Point no-12	Neutral Earthing - LV neutral shall be solidly earthed	LV neutral Earthing shall be depending on inverter manufacturer. Request NEEPCO to accept the same.	As per System Requirement.
28	Transformers Particular Technical specification Electrical Volume-2,Part-II Section-III	5 of 25	1.2 , Point no-19	Neutral Current Transformer	In case of IT grid system, Neutral Current Transformer is not required. Request NEEPCO to accept the same.	As per System Requirement.
29	Transformers Particular Technical specification Electrical Volume-2,Part-II Section-III	5 of 25	1.2 , Point no-21	Bushings:- b) Impulse withstand test voltage (peak) – 95 c) One minute power frequency test voltage kV (rms)- 38	These specifications should be as per mentioned below:- b) Impulse withstand test voltage (peak) – 75 c) One minute power frequency test voltage kV (rms)- 28 Request NEEPCO to clarify the same.	Refer minutes of pre-bid meeting dtd 20-12-12
30	Transformers Particular Technical specification Electrical Volume-2,Part-II Section-III	6 of 25	1.2	Neutral Grounding Resistor for Transformers.	In case of IT grid system, Neutral Grounding Resistor is not required. Request NEEPCO to accept the same.	Refer minutes of pre-bid meeting dtd 20-12-12
31	Transformers Particular Technical specification Electrical Volume-2,Part-II Section-III	9 of 25	1.2 , 250kVA Auxiliary Transformer Point-18	Neutral Current Transformer	In case of such small auxiliary transformers, Neutral Current Transformer is not required. Request NEEPCO to accept the same.	As per System Requirement.

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
32	Transformers Particular Technical specification Electrical Volume-2,Part-II Section-III	9 of 25	1.2 , 250kVA Auxiliary Transformer Point-18	Bushings:- b) Impulse withstand test voltage (peak) – 95 c) One minute power frequency test voltage kV (rms)- 38	These specifications should be as per mentioned below:- b) Impulse withstand test voltage (peak) – 75 c) One minute power frequency test voltage kV (rms)- 28 Request NEEPCO to clarify the same.	Refer minutes of pre-bid meeting dtd 20-12-12
33	33 KV Outdoor Switchyard particular Technical specification Electrical Volume-2, Part II , Section-V	1 of 40	Technical Specification	33kV Outdoor switchyard	We propose the 33kV indoor switchgear. Request NEEPCO to accept the same.	Refer minutes of pre-bid meeting dtd 20-12-12
34	33 KV Outdoor Switchyard particular Technical specification Electrical Volume-2, Part II , Section-V	3 of 40	3.00 point no- vi)	Short Circuit Current:- 12.5kA for 3sec	12.5kA breaker is not available with reputed vendor makes and most widely available is 16kA/25kA breaker. Request NEEPCO to accept and do necessary changes.	For 33kV Indoor Switchgear Short Circuit Current shall be considered as 40kA for 1 sec.
35	33 KV Outdoor Switchyard particular Technical specification Electrical Volume-2, Part II , Section-V	37 of 40	Data sheet-33kV Isolator	Rated short time with-stand current(KA rms):- a) For 1sec- 16kA rms b) For 3sec – 16kA rms	IS it 16kA rms or 12.5kA rms. Request NEEPCO to clarify the same.	Refer minutes of pre-bid meeting dtd 20-12-12

CIVIL & STRUCTURES

Sl NO	Section	Pg. NO	Cl. No	RFQ Specifications	Lanco Query	NEEPCO's Reply
1	General technical Information Volume-2, Part-I	3 of 25	2.0 (f)	Cutting and clearing of trees, plants etc., in about 30 acres of land to ensure shadow free area.		Refer minutes of pre-bid meeting dtd 20-12-12
2	Particular Technical Specification (Civil Works) Volume-2, Part-III, Section-I	Page 6 of 25	7.01.00	RCC foundation made with cement concrete as per design based on site soil condition		As per specification.
3	Particular Technical Specification (Civil Works) Volume-2, Part-III, Section-I	Page 8	12.01.00	All buildings shall be reinforced concrete framed structure on concrete foundations with infill masonary wall and RCC roof slabs		As per specification.
4	-	-	-	Fencing of the SPV Plant		Refer minutes of pre-bid meeting dtd 20-12-12