INVITATION FOR TENDER

FOR

Design, Supply, Installation (Erection), Testing, Commissioning, including Warranty and Operation & Maintenance for a period of 5 years for

25 KWp Solar Photovoltaic Power Plant Systems

on

Roof Top of the Office Complex of Odisha Electricity Regulatory Commission (OERC)

at

Chandrasekharpur, Bhubaneswar

Dated- 27/06/2015

ODISHA ELECTRICITY REGULATORY COMMISSION
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NOTICE INVITING TENDER

Secretary, Odisha Electricity Regulatory Commission (OERC) invites sealed tenders for Design, Supply, Installation (erection), Testing, Commissioning including Warranty and Operation & Maintenance for 25 KWp Solar Photo Voltaic Power Plant System on roof top of its office complex at Chandrasekharpur, Bhubaneswar. Details of the tender are as under:

a.	Name of the work	25 KWp Solar Photo Voltaic Power Plant System on roof top of its office complex at Chandrasekharpur, Bhubaneswar.
b.	Time allowed for completion	90 days from the date of work order.
c.	Earnest money deposit	Rs.20,000 /-(Rupees Twenty Thousand only)
d.	Security deposit	10% of the ordered value
e.	Cost of Tender Document	Rs. 1,050.00 including VAT (Rupees One Thousand Fifty Only). The tender document may be downloaded from the website and while submitting the complete tender document a separate Demand Draft of Rs.1050/- from a nationalized bank drawn in favour of "OERC FUND" payable at Bhubaneswar as cost of tender document.(Non Refundable) should be enclosed.
f.	Prebid meeting of the venders	Dt– 14/07/2015 at 3:30 P.M. at OERC, Bidyut Niyamak Bhawan, UNIT VIII, BHUBANESWAR
g.	Last date & time of receipt of tender	Dt – 30/07/2015 at 3:00 PM
h.	Address at which the tenders are to be submitted:	Secretary OERC, Bidyut Niyamak Bhawan, Unit-VIII, Bhubaneswar.
i.	Date & time of opening tenders:	Dt- 30/07/2015 at 3:30 PM
j.	Place of opening tenders:	OERC, Bidyut Niyamak Bhawan Unit-VIII, Bhubaneswar
k.	Defect liability period.:-	60(Sixty) months from the date of completion.
l.	Validity of offer.	6 (six) months from the opening of price bid.
m.	Liquidated Damages	0.5% per week to a maximum of 5% of the contract value.

Eligibility of the bidder :- The firm/consortium must have designed, supplied, erected, tested and commissioned at least 2 projects of minimum plant capacity of 10 KWp and above in last two years or cumulative capacity of solar power plant not less than 25 KWp `and are in successful operation on the date of bid opening.

The firm/consortium should have a minimum annual turnover Rs.1.0 Crore in the last financial year and should have valid PAN/ TIN /STCC / VAT clearance certificate, wherever required.

Any technical clarification regarding the tender paper may be clarified from OERC Bhubaneswar.

In case the date of opening of tenders is declared as a holiday , the tenders will be opened on the next working day at the same time.

Odisha Electricity Regulatory Commission has the right to accept/ reject any / all tenders without assigning any reason thereof.

SECRETARY I/c
OERC, Bhubaneswar

List of Abbreviations

AH	Ampere Hour
Asst	Assistant
BG	Bank Guarantee
BIS	Bureau of Indian Standards
BOS	Balance of Systems
CMC	Comprehensive Maintenance Contract
DD	Demand Draft
e.g.	Example
EMD	Earnest Money Deposit
ESI	Employee State Insurance
GOI	Government of India
Govt	Government
GPS	Global Positioning System
HLS	Home lighting Systems
ID	Identity
IEC	International Electro-technical Commission
IS	Indian Standards
JCC	Joint Commissioning Certificate
JNNSM	Jawaharlal Nehru National Solar Mission
KHz	Kilo Hertz
mA	milli Ampere
MNRE	Ministry of New and Renewable Energy
OATC	Other Authorized Test Centers
OREDA	Odisha Renewable Energy Development Agency.
OERC	Odisha Electricity Regulatory Commission
P&C	Planning & Coordination
PCBs	Printed Circuit Boards
PG	Performance Guarantee
PV	Photo Voltaic
QBS	Quality Based Selection
RFID	Radio Frequency Identification
SEC	Solar Energy Centers
SNA	State Nodal Agency
SPV	Solar Photo Voltaic
Sqm	Square Meter
STC	Standard Test Conditions
STCC	Sales Tax Clearance Certificate
TIN	Tax payers' Identification Number
V	Volts
VAT	Value Added Tax
W	Watt
Wp	Watt Peak

DISCLAIMER

Though adequate care has been taken for preparation of this document, the bidder shall satisfy himself that the document is complete in all respect. Intimation of any discrepancy shall be given to this office immediately.

The Odisha Electricity Regulatory Commission (OERC) reserves the right to modify, amend or supplement or cancel this document.

Some company / firm names have been mentioned only to provide a sense of standard and not to show preference and prejudice.

IMPORTANT DATES

1	**Last date & time of receipt of complete offer**	**30.07.2015** **at 3:00 PM**
2	**Date & Time of opening**	**30.07.2015** **at 3:30 PM**

Check List & Index of documents to be submitted

Sl No	Particulars	Submitted Yes/NO	Page No
1	Filled in Bid Document Duly signed on each page by the authorized signatory and stamped as a token of acceptance of the terms and conditions of the BID (Except the Financial Bid Document, which is to be submitted in separate Envelop)		
2	Covering letter		
3	Demand Draft submitted as Earnest Money		
4	Copy of valid PAN/ TIN / STCC /VAT Clearance Certificate (if applicable)		
5	Copy of audited Balance Sheet and Profit and Loss Account for last three years.		
6	Xerox copy of the Income Tax PAN card of the Company		
7	Xerox copy of Service Tax Registration Certificate		
8	Undertaking to unconditionally accept all terms and conditions of the bid document		
9	Power of attorney/authorization to sign the agreement on behalf of bidders & partnership deed articles, if any.		
10	Technical bid in format in Annexure A in sealed cover		
11	Price bid in Annexure B in separate sealed cover		
12	Organizational profile containing the original documents defining the constitution or legal status, place of registration and principle place of business or firm or partnership.		
13	List of deviations if at all with reasons, if any.		
14	Copy of the authorized dealership from the manufacturer		

1. The Scope of works

1.1 The broad scope of the work includes design, supply, installation, testing commissioning, warranty and operation & maintenance for 5 years of one 25 KWp grid interactive Solar PV Power plant including all accessories on the roof top of OERC Office Building at Chandrasekharpur, Bhubaneswar, Odisha.

1.2 A clear understanding of the features of OERC Office Building structure / plan and present control panel for interfacing with Distribution System of the DISCOM is essential.

1.3 Supply of the complete systems, including all necessary components, sub-components, spares, tools & tackles etc. as per technical specifications given in this document including packing, forwarding, safe storage, handling, commissioning, trial and performance testing and handing over, insurance coverage, operation & maintenance for 5 years with warranty.

1.4 Erection and commissioning of the supplied systems on roof of the OERC Building at Chandrasekharpur, Bhubaneswar without any impairment of the existing structure.

1.5 Suitable modifications as per requirements may be made to the available Control Room provided in the Building.

1.6 Providing pedestals if required for mounting of the PCU'S and control panels

1.7 RCC structures (matrix of stay / leg / beams) to support the structure, steel frame work depending on design approval should be provided by the bidder.

1.8 All structural drawings to be got approved from OERC.

1.9 Adequate training has to be provided to the persons to be designated by OERC in day-to-day maintenance and upkeep of the installed system. The bidder must also provide a detailed operation and maintenance manual specific to the installed systems.

1.10 Items essential for completion of the above works but not included herein shall also form a part of this offer and included in bid price.

Signature of Bidder with Seal

2. Eligibility Criteria

The bidding concern shall fulfill the following for qualification of the bid.

2.1 The firm /Consortium must have valid PAN/ TIN/ STCC/ VAT Clearance Certificate where ever required.

2.2 The firm/ Consortium must have a minimum annual turnover of Rs.1.0 crore in the last financial year.

2.3 The firm / Consortium must have designed, supplied, erected, tested & commissioned at least 2 projects of minimum plant capacity of 10 KWp and above or cumulative capacity of solar power plant not less than 25 KWp in the last two years and which is /are in successful operation on the date of bid opening.

2.4 The firm / Consortium must have adequate capacity to design, test, supply, erect, commission & maintain the power plant within the given time schedule.

2.5 The products must conform to technical requirements / standards for off-grid/ standalone solar PV power plants /systems to be deployed under the National Jawaharlal Nehru Solar Mission (JNNSM).

2.6 The firm / Consortium must have established quality assurance systems and organization in line with the requirements under JNNSM.

2.7 The firm / Consortium must not have been debarred / blacklisted by any Govt. Deptt, Agency, PSUs / Institution / Agencies / Autonomous Organisations. The bidder shall submit a self certification by an authorized person duly notarized to this effect.

3. Instructions TO BIDDERS

3.1 A Bidder can submit a single bid only.

3.2 Bidders must submit their bids for all items as stated in this bid document in a **single hardbound** properly page numbered and Indexed. No loose separate paper or spiral bound documents will be accepted. Demand Drafts towards cost of document and EMD to be provided in a separate envelop placed inside the first envelop.

3.3 Bids must be submitted in English language only.

3.4 Incomplete, telegraphic or conditional bids shall not be accepted.

3.5 Prices quoted must be firm and fixed. No price variation / escalation shall be allowed during process of completion of the project.

3.6 The bidders must sign at the bottom of each page of the bid documents at the time of submission in token of unconditional acceptance of the departmental terms and conditions, technical specifications etc**.**

3.7 Deviations in terms and conditions, Specification of material, Inspection clause etc. may not be accepted.

3.8 The bidders should furnish the information on all past supplies and satisfactory performance.

3.9 The bidders shall submit audited profit and loss statements and balance sheets.

3.10 Earnest money as specified in bid may be deposited in shape of Demand Draft drawn in favour of the "OERC Fund" payable at Bhubaneswar from any Nationalized Bank**. Bids without E.M.D will not be accepted.**

3.11 Bids received late due to postal delay or otherwise **will not be considered**.

3.12 The bidders are required to furnish their offers in the price bid both in words & figures. In case of corrections, if any, the original text/numerical must be clearly crossed out and re-written legibly above, below or on the side of the crossed out characters as per availability of space and the authorized person must put his dated initial under such corrections. In case of any conflict between figures and words, the latter shall prevail.

3.13 Extension of time for execution of work shall be decided by the Commission.

3.14 The bidders must have a local support system for maintenance of the SPV installations at OERC.

3.15 All pages of the bid documents must be signed & sealed by the authorized person on behalf of the bidders.

3.16 Bids will be accepted & will be opened as per information mentioned in this document and receipt against submission of bid shall be issued by OERC.

3.17 The last date of receipt of the bid is 30.07.2015 to 3:00 P.M. Sealed bids may be delivered in OERC during office hours on working days. Bids received after due date & time will not be considered. If due to any reason the due date is declared as a holiday the bid will be opened on next working day at the same time.

3.18 The technical bid shall be opened on 30.07.15 at 3:30 P.M in the OERC office, Bhubaneswar in presence of such bidders or their authorized representatives, who may like to be present at the time of opening.

3.19 The bidder shall submit the requisite documents as detailed in the Check list and Index of documents.

3.20 The bid document should be submitted in two parts as detailed below:

3.20.1 Bids should be submitted in two separate sealed envelope as mentioned below & addressed to the Secretary, OERC, Bhubaneswar -12, inside a sealed envelope super-scribed "Bid for Solar PV systems against tender Notice dated "27th June, 2015". First sealed envelope should contain Technical Bid as per Annexure-A, alongwith documents as defined in "Check list and Index of documents". It should be super-scribed as Part-1 Technical Bid. All the papers of bid documents except the price bid duly signed should be submitted in the first envelope. Required earnest money deposit in the form of Demand draft in favour of "OERC Fund" payable at Bhubaneswar should be attached. The entire technical bid documents except the EMD to be hard bounded indexed and all the pages properly numbered.

3.20.2 Second sealed envelope (Part-II) should contain Price bid as per Annexure-B in a separate sealed envelope. It should be super-scribed with "PART- II PRICE BID". Any condition in regard to financial aspects, payments, terms of rebate etc beyond the prescribed financial terms of OERC will make the bid invalid.

3.21 The procedure of opening of the bid shall be as under

3.21.1 First envelope "PART-1 TECHNICAL BID" and second envelope "PART- II PRICE BID" "shall be opened at the time & date mentioned in the bid Notice by OERC representative in the presence of bidders, who choose to be present.

3.22 All Taxes applicable at the time of supply (from the date of consignment) will be extra and admissible.

3.23 In case of supply of any defective material or substandard material, the materials will be rejected & it will be the responsibility of the supplier for taking back & replacing the rejected materials at their own cost. In case of non-lifting of such rejected materials within a reasonable time offered by the office it will have the right to suitably dispose off the same and forfeit the amount.

3.24 The supplied materials should strictly comply with the specifications as mentioned in the bid; otherwise the material would be liable for rejection.

3.25 Any clarification on the technical specification and commercial terms and conditions may be clarified from OERC.

3.26 Deviation of any commercial terms and condition and technical specification shall not be entertained under no circumstances.

3.27 Bidders may in their own interest visit the sites and undertake site visit before submitting bids. OERC will not be responsible for any incidental or consequential losses of the firms while execution and till expiry of the period of maintenance.

3.28 All the bidders shall essentially indicate the break-up of prices as shown in Price bid.

3.29 During the warranty period OERC reserves the right to cross check the performance of the systems with the minimum performance levels specified in the MNRE specifications.

3.30 The Secretary, OERC shall award the contract to the successful bidder whose bid shall get the highest score in the approved evaluation system which is on the basis of score on technical, financial and experience parameters.

3.31 On award of contract the qualified bidder shall be termed as contractor / supplier / executor /turnkey operator.

4. Acceptance/ Rejection of the bid documents:

OERC reserves the right to reject or accept any bid or annul the bidding process at any time prior to award of contract without assigning any reason thereof, without having prejudice of incurring any liability to the affected bidders or any obligation to inform the bidders.

Secretary

I/we have carefully read & understood the above terms & conditions of the bid & agree to abide by them.

Signature of Bidder with Seal

5. COMMERCIAL TERMS & CONDITIONS:

5.1 Rate

The offer should indicate the unit cost of the system, Installation & Commissioning charges, O & M Charges and taxes & duties separately. The unit cost must be inclusive of packing, forwarding, loading & unloading charges, cost of insurance and transportation FOR destination where the system will be installed as per the work order.

5.2 Sales Tax & Duties etc.:

All Taxes and duties as prescribed both under Central and State Government sales tax rules would be applicable.

5.3 Earnest Money Deposit:

5.3.1 Earnest money deposit of Rs.20,000/- is required to be deposited along with the bid without which the bid will not be accepted. No interest will be payable for the EMD amount under any circumstances. The validity of BG for the EMD amount may be extendable in case of necessity.

5.3.2 Earnest money can be deposited in shape of a Demand Draft in favour of 'OERC Fund' from any Nationalised Bank Payable at Bhubaneswar and the proof of deposits should be attached to the bid. EMD can also

be deposited in shape of irrevocable 'Bank Guarantee' from a Nationalised Bank with validity up to six months from the date of opening of the bid.

5.3.3 E.M.D would be refunded to the unsuccessful Bidders after finalization of the bid without any interest.

5.3.4 E. M. D would be adjusted against security deposit in case of successful bidders.

5.3.5 E. M. D would be forfeited in case of non- compliance of the purchase order by the successful bidder.

5.3.6 In case of claim for exemption from deposit of Earnest money sufficient proof in support of claim for exemption of EMD as prescribed in Govt. of India Notification is to be attached with the bid.

5.4 Security Deposit/ Performance Guarantee Fees :

The successful bidder must deposit the Security amount / Performance Guarantee fees @ 10% of the ordered value with the OERC, Bhubaneswar-12 at the time of acceptance of the work order in shape of irrevocable Bank Guarantee. The said deposit would be forfeited, if the supplies are not made as per the Terms & Conditions of the purchase order. 50% of the security deposit amount will be refunded after three months of commissioning of the SPV Plant, subject to satisfactory execution / performance of the systems. Balance 50% of the Security deposit shall be released after expiry O & M period of 5 years subject to the successful performance.

5.5 Programme Execution Schedule :

5.5.1	Delivery of systems at sites	2 months from the date of handing over the roof top to the vendor for the purpose of erection of the PV power plant.
5.5.2	Installation & commissioning	1 month from the date of preliminary inspection, physical verification. And handing over of systems for installation.
5.5.3	Upon intimation about commissioning of the systems by the executing firm/Consortium a joint inspection will be carried out by the representatives of the executing firm/ Consortium and OERC.	
5.5.4	The issuance of a JCC shall, in no way relieve the executing firm / Consortium of its responsibility for satisfactory operation of the power plant.	

5.6 Validity of Offer

The offer must be kept valid for a period of 180 days from the date of opening of the technical and commercial bid or till the completion of the project whichever is later. No escalation clause except the admissible tax component under the period of consideration would be accepted.

5.7 STCC

The bidders must submit attested copy of valid up to date sales Tax / VAT Clearance Certificate along with the bid wherever required.

The original certificate would be produced at the time of opening of the bid, or, before placement of purchase order, if required.

5.8 Warranty

The complete system should be warranted against any manufacturing defect or bad workmanship at least for a period of 5 (five) years from the date of commissioning of the systems.

Major system subcomponent SPV modules must be warranted against any manufacturing defect of bad workmanship for a period of 10 years.

Warranty Certificate to the above effect must be furnished along with the Commissioning Reports. Any defect noticed during warranty period should be rectified/replaced by the supplier free of cost upon due intimation by OERC.

5.9 Penalty and termination of contract

The systems shall be designed, supplied, installed, tested and commissioned within the scheduled time. If the supplier fails to adhere to the schedule, OERC shall without prejudice to its other remedies under the contract deduct from the contract price as liquidated damages a sum equivalent to 0.5% of the delivery price of the delayed goods or unperformed services for each week of delay until actual delivery or installation/commissioning up to a maximum deduction of 5% of the contract price for delayed goods or installation and commissioning. Once the maximum is reached (i.e 10 weeks of delay) OERC may consider termination of the contract and forfeit the security deposit without prejudice to the other remedies of the contract.

However, OERC may at its own discretion allow reasonable time extension upon written application of the supplying firm. If the delay is considered intentional or due to the negligence of the vendor, no extension will be allowed with imposition of penalty. If the delay is considered to be genuine, time extension can be allowed without imposition of penalty.

5.10 Force Majeure

The supplier of the SPV system shall not be charged with liquidated damages nor shall his security for performance be forfeited when failure of the supplier in making delivery is due to any event beyond the control of the supplier and could not have been foreseen, prevented or avoided by a prudent person. These include, but are not restricted to acts of nature, acts of public enemy, acts of Government, fires, floods, epidemics, strikes, freights, embargoes and unusually severe weather.

5.11 Inspection

5.11.1 Inspection of Solar PV Modules and other major components will be carried out by officials of OERC at the place of delivery/site.

5.11.2 Officers authorized by OERC shall be entitled at all reasonable time to inspect and supervise and test during erection and commissioning. Such inspection will not relieve the executing firm / Consortium of their obligation in the contract.

5.11.3 OERC shall have the right to have the tests carried out at its own cost by an independent agency at any point of time.

5.12 Payment

(a) 60% on receipt of materials and verification thereof of officers of OERC in presence of supplier.

(b) 40% after completion of erection testing of installation and furnishing a bank guarantee of 10% of the ordered value (BG valid for 5 year) towards performance. All payments due shall be released approximately within 15 days of presenting the bill, if without any dispute.

5.13 Execution

Execution of work shall be carried out in an approved manner as outlined in the technical specification or where not outlined, in accordance with relevant Indian Standard Specification, to the reasonable satisfaction of the Officers of OERC authorized for the purpose.

5.14 Limitation of Liability

OERC, will, in no case be responsible for any accident fatal or non-fatal, caused to any worker or outsider in course of transport or execution of work. All the expenditure including treatment or compensation will be entirely borne by the Executants. The Executants shall also be responsible for any claims of the workers including PF, Gratuity, ESI & other legal obligations.

5.15 Dispute

For adjudication of any dispute between OERC and the bidders arising in this case, reference can be made to any Law courts under the jurisdiction of Odisha High court only. OERC reserves the right to accept or reject any or all bids without assigning any reason thereof.

SECRETARY

I/We have carefully read and understood the above terms and conditions of the bid and agree to abide by them.

SIGNATURE OF BIDDER WITH SEAL

TECHNICAL SPECIFICATION

The general scope under this contract for installation of 25 KWp rooftop SPV Power plant includes to design, testing, inspection, packing and forwarding, transportation up to project site, loading & unloading, storage in safe custody, erection, carrying out preliminary tests at site, commissioning, performance testing, operation and maintenance for 5 years *&* handing over of SPV Power plant with all the associated equipments at the site as per the contract. The illustrative Schedule of requirements is in accordance with the specifications contained in this document as mentioned hereunder:

System Detail

Sl. No.	Brief Description	Units
1	SPV modules for a 25 KWp (as per specifications) plant	Complete Set as per requirement
2	SPV module mounting structure made of GI/Aluminum suitable for accommodating 25 KWp capacity SPV modules including foundation as per specifications on rooftop of OERC Building	-do-
3	PCUs as per specifications	-do-
4	Array Junction Boxes and Main Junction Boxes	-do-
5	Data Logging system with remote monitoring as per specification	-do-
6	DC Distribution units as per specifications	-do-
7	AC Distribution units as per specifications	-do-
8.	3 Phase 415 Volt Bi-directional Meter with Import & Export Readings interfacing with Distribution Supply; Compliant with OERC's Net Metering Order dt.26.11.14.	-do-
9	Cables as per standard design & specification	As required at site for full plant commissioning including O & M
10	Fire extinguisher in accordance with BIS codes for electrical short circuit fires along with sand buckets	Complete Set as per requirement
11	Lightning Arrester complete set as per specification	-do-
12	Protection & Earthing of the entire installation as per specification	-do-
13	Spares, tools and plant for 5 years operation and maintenance	-do-
14	Fuses, Transfer switches, Printed Circuit boards required for power plant	-do-
15	Providing training to Engineers and site Staff for o perating Maintenance and trouble shooting skills	
16	Operation and maintenance of the SPV Power Plant for a period of 5 years from date of commissioning of the power plant.	
17	Engineering and electrical drawings alongwith Installations and O&M manuals	Two Complete Sets
18	Any other equipment required to complete the installation	

All the items against which no make has been mentioned must confirm to ISI standards.

1. Solar Photovoltaic Modules

1.1 The total solar PV array capacity should not be less than 25 KWp and comprise of crystalline silicon modules with minimum capacity of 240 Wp and above wattage. The module type must be qualified as per IEC 61215 or any other latest edition for crystalline silicon. SPV module conversion efficiency should be equal to or greater than 15% under STC. Modules must qualify to IEC 61730 Part I and II for safety qualification testing.

1.2 The PV module shall perform satisfactorily in humidity up to 100% with temperature between – 10°C to + 60°C.

1.3 The predicted electrical degradation at the end of the period of 10 years shall not be more than ten (10) per cent of the full rated original output.

1.4 Other general requirement for the PV modules and subsystems shall be the following:

a) A strip containing the details such as Name of the supplier or distinctive logo, Model or Type No., Serial No., Year of make, Open Circuit Voltage, Operating voltage, Operating current, Maximum System voltage for which module is suitable, Short circuit current should be laminated on the module so as to be clearly visible from front side.

b) The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary more than 3 (three) per cen*t* from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

c) Except where specified, the front module surface shall consist of impact resistant, low-iron and high-transmission toughened glass of international standards quality.

d) The module frame, if any, shall be made of GI or aluminum which shall be electrolytically compatible with the structural material used for mounting the modules.The structure should be so designed and durable to withstand for atleast 10 years without corrosion and damage.

e) The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP65 rated.

f) Necessary I-V curves at 25c, 45c, 60c and at NOC are required to be furnished. PV modules should have maximum 10% degradation in performance/output over 10 years.

g) The PV module must have 10 years free replacement guarantee against material defect or craftsmanship.

h) The weight of each panel should be minimal.

i) Each PV module to be used is desired to have RFID. The following information must be mentioned in RFID to be used on each module:-

Name of the manufacturer of PV module; name and manufacturer of the solar cell; month and year of manufacture; I-V curve, wattage, Im,Vm,FF for the module; unique serial no & model no; date & year of obtaining IEC PV module qualification certificate.

2. Array Structure

2.1 Wherever required, suitable number of PV panel structures shall be provided. Structures shall be of flat-plate design either I or L sections.

2.2 Structural material of GI or Aluminum (to be quoted separately, if quoting for both GI & Aluminum) shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Galvanizing should meet ASTM A-123 hot dipped galvanizing or equivalent which provides at least spraying thickness of 70 microns on steel as per IS5905, if steel fasteners and nuts and bolts are used. Structures shall be supplied complete with all members to be compatible for allowing easy installation at the rooftop site.

2.3 The structures should be of suitable size to hold modules and properly designed to allow easy replacement of any module.

2.4 Each structure shall have a provision to adjust its angle of inclination to the horizontal as per the site conditions.

2.5 Each panel frame structure shall be so fabricated as to be fixed on the rooftop column/wall structures. The structure should be capable of withstanding a minimum wind load of 160 km/hr after grouting & installation or better. Grouting material for SPV structure shall be as per M15(1:2:4) concrete specification

2.6 The structures shall be designed for simple mechanical and electrical installation. There shall be no requirement of welding or complex machinery at the installation site. If prior civil work or support platform is absolutely essential to install the structures, the supplier shall clearly and unambiguously communicate such requirements along with their specifications in the bid. Detailed engineering drawings and instructions for such prior civil work shall be carried out prior to the supply of Goods. It may be mentioned that the roof should not have any damage because of installation.

2.7 The supplier shall specify installation details of the PV modules and the support structures with appropriate diagrams and drawings. Such details shall include, but not limited to, the following;

a) Determination of true south at the site;
b) Array tilt angle to the horizontal, with permitted tolerance;
c) Details with drawings for fixing the modules;
d) Details with drawings of fixing the junction/terminal boxes;
e) Interconnection details inside the junction/terminal boxes;
f) Structure installation details and drawings;
g) Electrical grounding (earthing);
h) Inter-panel/Inter-row distances with allowed tolerances; and
i) Safety precautions to be taken.

The array structure shall support SPV modules at a given orientation and absorb and transfer the mechanical loads to the rooftop columns properly. All nuts and bolts shall be of very good quality stainless steel.

3. Power Conditioning Unit (PCU)

The PCUs required shall be of 25 KVA, should convert DC power produced by SPV modules in to AC power and adjust the voltage & frequency levels to suit the local grid conditions. The 25 KVA PCU with grid interactive shall feed power to the A.C. load of OERC Building at Chandrasekharpur, Bhubaneswar. The make of PCU may

be of KACO/Delta/Refusol/ABB/Schneider etc. If any better technical solution of PCU is suggested, it should be quoted separately with justification.

Common Technical Specification:

Control Type : Voltage source, microprocessor assisted, output regulation

Output voltage : 3 phase, 415 V ac

Frequency : 50 Hz (±5%)

Continuous rating : 25 KVA with net metering /off Import/Export meters (Bi-directional meters)

DC link voltage range : 0 to 1000 V

Nominal Power : 25 KVA

Total Harmonic Distortion : less than 3%

Operating temperature Range : (-)10 to 60 deg C

Housing cabinet : PCU to be housed in suitable switch cabinet, With degree of ingress protection of International Standard.

PCU efficiency : 97 % and above at full load,

Power Control : MPPT

Display of Parameters : LCD

Communication Port : As per standard Design.

Warranty : Minimum 5 years.

Other important Features/Protections of PCU :

- Mains (Grid) over-under voltage and frequency protection
- Fool proof protection against Islanding.
- Included authentic tracking of the solar array's maximum power operation voltage (MPPT).
- Array ground fault detection.
- LCD and piezoelectric keypad operator interface Menu driven
- Automatic fault conditions reset for all parameters like voltage, frequency and/or black out.
- MOV type surge arresters on AC and DC terminals for over voltage protection from lightning-induced surges.
- All parameters should be accessible through an industrial standard communication link.
- Over load capacity (for 10 sec) should be 200% of continuous rating.

3.1 The PCU shall be self commuted and shall utilize a circuit topology and components suitable for meeting the specifications listed above at high conversion efficiency and with high reliability.

The PCU shall give the preference to feed the Loads from Solar Energy being produced and shall draw the additional power from mains to meet the load requirements in the case load is more than solar energy being produced. Conversely it should feed the solar power to the Grid if the load is less than the solar energy generated.

3.2 Since the PCU is to be used in solar photo voltaic energy system, it should have high operational efficiency. The DC to AC conversion efficiency shall at least be 98 percent for output ranging from 20 percent of full load to full load. The idling current in no load must not exceed 2 percent of the full-load current.

3.3 In PCU there shall be a direct current isolation provided at the output by means of a suitable isolating transformer.

3.4 The PCU output shall be 415 VAC, 50 Hz 3 phase,

3.5 The PCU shall be capable of operating in parallel with the grid utility service and shall be capable of interrupting line-to-line fault currents and line-to-ground fault currents.

3.6 The PCU shall include appropriate self protective and self diagnostic features to protect itself and the PV array from damage in the event of PCU component failure or from parameters beyond the PCU'S safe operating range due to internal or external causes. The self-protective features shall not allow signals from the PCU front panel to cause the PCU to be operated in a manner which may be unsafe or damaging. Faults due to malfunctioning within the PCU, including commutation failure, shall be cleared by the PCU protective devices and not by the existing site utility grid service circuit breaker.

3.7 The PCU shall go to the shut down/ standby mode with its contacts open under the following conditions before attempting and automatic restart after an appropriate time delay in insufficient solar power output.

(a) Utility-Grid Over or Under Voltage

The PCU shall restart after an over or under voltage shutdown when the utility grid voltage has returned to within limits for a minimum of two minutes.

(b) Utility-Grid Over or Under Frequency

The PCU shall restart after an over or under frequency shutdown when the utility grid voltage has returned to the within limits for minimum of two minutes. The permissible level of under/over voltage and under/over grid frequency is to be specified by the bidder.

3.8 The PCU Power factor at the point of utility service connection shall be 0.95 lagging or leading when operating at above 25 percent of the rated output, but may be less than 0.95 lagging below 25 percent of the rated output.

3.9 The high voltage and power circuits of the PCU shall be separated from the low-voltage and control circuits. The internal copper wiring of the PCU shall have flame resistant insulation. Use of PVC is not acceptable. All conductors shall be made of standard copper.

3.10 The PCU shall withstand a high voltage test of 2000 V rms, between either the input or the output terminals and the cabinet (chassis).

3.11 Full protection against accidental open circuit and reverse polarity at the input shall be provided.

3.12 The PCU shall not produce Electromagnetic interference (EMI) which may cause malfunctioning of electronic and electrical instruments including communication equipment, which are located within the facility in which the PCU is housed.

3.13 The PCU shall have an appropriate display on the front panel to display the instantaneous AC power output and the DC voltage, current and power input. Each of these measurement displays shall have an accuracy of 1 percent of full

scale or better. The display shall be visible from outside the PCU enclosure. Operational status of the PCU, alarms, trouble indicators and AC and DC disconnect switch positions shall also be communicated by appropriate messages or indicator lights on the front of the PCU enclosure.

3.14 It shall have data communication facility with LAN/WAN options along with remote access facility and SCADA package with latest monitoring systems

3.15 Electrical safety, earthing and protection

a. Installations shall abide by CEA Regualtions on Safety, 2010.

b. Internal Faults: Inbuilt protection for internal faults including excess temperature, commutation failure, overload and cooling fan failure (if fitted) is obligatory.

c. Galvanic Isolation: Galvanic Isolation is required to avoid any DC component being injected into the grid and the potential for AC components appearing at the array.

d. Over Voltage Protection: Over Voltage Protection against atmospheric lightning discharge to the PV array is required to be provided. Protection is to be provided against voltage fluctuations in the grid itself and internal faults in the power conditioner, operational errors and switching transients.

e. Earth fault supervision: An integrated earth fault device shall have to be provided to detect eventual earth fault on DC side and shall send message to the supervisory system.

f. Cabling practice: Cable connections must be made using PVC Cu cables, as per BIS standards. All cable connections must be made using suitable terminations for effective contact. The PVC Cu cables must be run in GL trays with covers for protection.

g. Fast acting semiconductor type current limiting fuses at the main bus-bar to protect from the grid short circuit contribution.

3.16 The PCU shall include an easily accessible emergency OFF button located at an appropriate position on the unit.

3.17 The PCU shall include ground lugs for equipment and PV array grounding.

3.18 All exposed surfaces of ferrous parts shall be thoroughly cleaned, primed, and painted or otherwise suitably protected to survive a nominal 30 years design life of the unit.

3.19 The PCU enclosure shall be weatherproof and capable of surviving climatic changes and should keep the PCU intact under all conditions in the room where it will be housed. The INVERTER shall be located indoor and should be either wall / pad mounted. Moisture condensation and entry of rodents and insects shall be prevented in the PCU enclosure.

3.20 Components and circuit boards mounted inside the enclosures shall be clearly identified with appropriate permanent designations, which shall also serve to identify the items on the supplied drawings.

3.21 All doors, covers, panels and cable exits shall be gasketed or otherwise designed to limit the entry of dust and moisture. All doors shall be equipped with locks. All openings shall be provided with grills or screens with openings not larger than 0.95 cm.

3.22 In the design and fabrication of the PCU the site temperature (5° to 55°C), incident sunlight and the effect of ambient temperature on component life shall be considered carefully. Similar consideration shall be given to the heat sinking and thermal for blocking diodes and similar components.

3.23 Factory Testing:

The PCU shall be tested at Factory as per the normal practice. A Factory Test Report (FTR) shall be supplied with the unit after all required tests. The FTR shall include detailed description of all parameters tested qualified and warranted.'

3.24 Plant Metering / Data Logging

(a) PV array energy production: Digital Meters to log the actual value of AC/DC Voltage, Current & Energy generated by the PV system shall have to be provided. Two way LT 415V energy meter (Import - Export metering) shall be incorporated in the system on the main LT AC Grid supply confirming to the stipulations as mentioned in the order dated 26.11.2014 of OERC and amendments, if any, thereto on net metering.

(b) Solar Irradiance An integrating pyranometer (Class II or better) should be provided with the sensor mounted in the plane of the array. Readout should be integrated with data logging system.

(c) Temperature Sensor: Integrated temp, sensors for measuring the module surface temp., invertor inside enclosure temp, and ambient temp to be provided complete with readouts integrated with the data logging system.

(d) A data logging system (Hardware and software) for plant control and monitoring shall be provided with the following features:

(e) A suitable Computer: i3/i5 with 500 GB HDD, 4 GB RAM, 2 Parallel & 2 Serial Port, Wi-Fi Lan Card, DVD RW Drive, 20" LCD, USB Scroll Mouse, along with 1 KVA ups.

(f) GSM Modem / Wi Fi modem in case GSM connectivity is used or Wireless Router + modem in case Ethernet connection is being used for remote access must be provided.

(g) Provision for Remote Supervisory Control and data acquisition through SCADA software at the purchasers location with latest software/hardware configuration and service connectivity for online / real time data monitoring/control. The operation and maintenance/ control to be ensured by the supplier after installation.

All major parameters should be available on the digital bus and logging facility for energy auditing through the internal microprocessor and can be read on the digital front panel at any time the current values, previous values for up to a month and the average values. The following parameters should be accessible via the operating interface display.

AC Voltage

AC Output current

Output Power

DC Input Voltage

DC Input Current

Time Active

Time disabled

Time Idle

Temperatures (C)

Invertor Status

Protective function limits (Viz – AC overload voltage, AC under voltage, Over frequency. Under frequency, ground fault. PV starting voltage, PV stopping voltage, Over voltage delay, Under voltage delay, over frequency, Ground fault delay, PV starting delay, PV stopping delay).

3.25 Maximum Power Point Tracker (MPPT)

Maximum power point tracker shall be integrated in the PCU to maximize energy drawn from the array. The MPPT should be micro processor based to minimize power losses. The details of working mechanism of MPPT shall be mentioned. The MPPT must have provision (manual setting) for constant voltage operation.

3.26 Disconnection and Islanding

Disconnection of the PV generator in the event of loss of the main grid supply is to be achieved by in-built protection within the power conditioner. This may be achieved through rate of change of current, phase angle, unbalanced voltage or reactive load variants.

Operation outside the limits of power quality as described in the technical data sheet should cause the power conditioner to disconnect the grid. Additional parameters requiring automatic disconnection are: Neutral voltage displacement Over current Earth fault and reverse power. In case of the above, cases, tripping time should be less than 15 seconds. Response time in case of grid failure due to switch off or failure based shut down should be well within 5 seconds. In case of use of more than one PCU, suitable equipments for synchronising the AC out put of all the PCUs to the ACDB/Grid should be provided.

3.27 Automatic reconnection after the grid failure is restored

PCU shall have the facility to reconnect the PCU automatically to the grid following restoration of grid subsequent to grid failure condition.

4. Array Junction Box, Main Junction Boxes :

The junction boxes are to be provided in the PV yard for termination of connecting cables. The J. Boxes shall be made of FRP/Powder Coated Aluminum with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The J.Bs shall be such that input & output termination can be made through suitable cable glands.

Provision of Copper bus bars/terminal blocks housed in the junction box with suitable termination threads.

Provision of Hinged door with EPDM rubber gasket to prevent water entry.

Single compression cable glands and Provision of earthing.

Suitable capacity MOVs should be provided within the box to protect against lighting

5. Plant Control, data logger & plant monitoring unit

Basically, this unit should perform the following:

- Measurement and/or recording of energy parameters.
- Simple data logger or energy meter to record the energy data on a pre▼ determined interval basis.
- Measurement & continuous acquisition of ambient air temperature, solar radiation, PV module temperature, PCU output voltage and current, output frequency
- Operating state monitoring and failure indication.
- Representation of monitored data in graphics mode or in tabulation mode.
- Controlling & monitoring the entire power system through remote terminal.
- Necessary hardwares & softwares shall have to be supplied by the Supplier. Both the softwares and hardwares required for interfacing the plant with office including CPUs, modems UPS are to be supplied and installed by the Supplier.

6. DC Distribution Board

DC Distribution panel to receive the DC output from the array field with analog measurement meter for voltage, current and power from different MJBs so as to check any failure in the array field.

DC DPBs shall have sheet from enclosure of dust & vermin proof. The bus bars are to made of copper of desired size. Suitable capacity MCBs be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

7. AC Distribution Panel Board

AC Distribution Panel Board (DPB) shall control the AC power from PCU, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar to be carried out and complete equipment along with metering to be installed in the ACDB. Requirement/specifications of DCDB and ACDB may be changed as per site conditions. An ACDB to be provided at the cable terminating point emanating from 25KVA PCU for interconnection control of dedicated electrical loads.
All switches at the, circuit breakers, connectors should confirm to IEC
60947, part I, II and III and all electrical components shall be as per relevant IS and IS marked wherever available.

8. <u>METERING SCHEME</u>

Metering arrangement and LT Connectivity should be in conformity with the CEA (Installation and Operation of meters) Regulations 2006 and OERC order dated 26.11.2014 on "Metering/Bi-directional Metering and their connectivity with respect to roof top solar PV projects" and subsequent amendmets.

9. Cable & Wires

9.1 Cabling in the yard and control room: Cabling in the yard shall be carried out as per IE Rules. All other cabling above ground should be suitably mounted on cable trays with proper covers.

9.2 Wires: Only FRLS copper wires of appropriate size and of reputed make with IS mark shall have to be used.

9.3 Cables Ends: All connections are to be made through suitable cable/lug/terminals; crimped properly & with use of Cable Glands.

9.4 Cable Marking: All cable/wires are to be marked in proper manner by good quality ferule or by other means so that the cable can be easily identified.

9.5 Any change in cabling schedule/sizes if desired by the bidder/supplier be got approved after citing appropriate reasons. All cable schedules/layout drawings have to be got approved prior to installation. All cable tests and measurement methods should confirm to IEC 60189.

9.6 Cable Specifications:

- Multi strand, annealed high conductivity copper conductor
- PVC type 'A' pressure extruded insulation
- Overall PVC insulation for UV protection and confirm to IEC 69947
- Armoured cable for underground laying
- All cables shall conform to BIS standards (IS 694) and (IS 1554)
- The size of each type of cable selected shall be based on minimum voltage drop, however, the maximum drop shall be limited to 2%
- Selected cable should carry a current density of minimu m 1.2Amp/Sq.mm

9.7 Laying of Cables

- All electrical cables / wires inside the building to be fixed in accordance with specifications for electrical works.
- Proper laying of cables have to be ensured in appropriate cable trays, pipes / trenches as per site requirement.
- A.C. supply cables to be terminated at the DB / LT bus bar.
- For laying / termination of cables, latest BIS / lEC codes / standards be followed.

10. Fire Extinguishers :

The fire fighting system for the proposed power plant for fire protection shall be consisting of:

- Portable fire extinguishers in the control room for fire caused by electrical short circuits etc.
- Sand buckets in the control room.

The installation of Fire Extinguishers should conform to TAC Regulations and BIS standards. The fire extinguishers shall be provided in the control room housing the batteries and PCUs as well as on the roof top where the PV arrays have been installed.

11. Lightning and Over Voltage Protection:

The SPV Power Plant should be provided with Lightening and over voltage protection. The aim is to reduce the over voltage to a tolerable value before it reaches the PV or other subsystem component. There shall be the required number of suitable Lightning Arrestors (LAs) installed in the array field. Lightning protection shall be provided by the use of metal oxide varistors and suitable earthing such that induced transients find an alternate route to earth. Protection shall meet the safety rules as per Indian Electricity Act / CEA(Measures relating to Safety and Electric Supply) Regulations 2010. Necessary foundation for holding the LAs is to be arranged keeping in view the

wind speed of the site and flexibility in maintenance in future. Each LA shall have to be earthed.

12. Protection

12.1 The system will have fail-safe interlocking arrangement, in the event of failure of 3 phase, 415 volt distribution power supply. The 25 KWp Solar Plant shall be disconnected from the grid and the Solar Plant will be taken on house load. If the house load is not sufficient, then the Solar Plant will go to sleep mode.

12.2 Each array structure of the PV yard should be grounded properly. In addition the lighting arrester/masts should also be provided inside the array field. Provision should be kept for shorting and grounding of the PV array at the time of maintenance work. All metal casing/shielding of the plant should be thoroughly grounded in accordance with Indian electricity Act./ CEA(Measures relating to Safety and Electric Supply) Regulations 2010. Earth resistance should be tested in presence of the representatives of OERC after earthing by calibrated Earth Tester. PCU; ACDB & DCDB should be earthed properly.

13. Tools, Tackles & Spares :

After completion of installation & commissioning of the power plant, necessary tools & tackles are to be provided free of cost by the Supplier for maintenance purpose. A list of tools and tackles supplied by the Supplier should be handed over to the representatives of OERC.

A list of requisite spares in case of PCU comprising of a set of control logic cards, IGBT driver cards etc. Junction Boxes. Fuses, MCCBs etc along with spare set of PV modules and batteries (if required) be indicated, which shall be supplied along with the equipment. A minimum set of spares shall be maintained in the plant itself for the entire period of warranty and Operation & Maintenance which upon its use shall be replenished.

14. Danger Boards :

Danger boards should be provided as and where necessary as per IE Rule/ CEA(Measures relating to Safety and Electric Supply) Regulations 2010 as amended up to date.

15. Provision of Training :

Necessary trainings may be provided for day to day trouble shooting of the SPV power plant.

16. O&M for a period of 5 years:

Operation & Maintenance of SPV power plant for five years should be provided.

17. Drawings & Manuals

Copies of Engineering, electrical drawings and Installation and O&M manuals in two complete sets are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant, power evacuation, synchronization along with protection equipment. Approved ISI and reputed makes for equipment be used.

For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to OERC before progressing with the installation work.

However, at tendering stage, the supplier may furnish only preliminary design & drawing for evaluation purposes.

18. Any other equipment required to complete the installation:

Any other equipments as required to complete the installation and make the SPV power plant run efficiently shall be provided even if not included herein and at no extra cost.

ANNEXURE -A

TECHNICAL BID

Supply, installation, commissioning and maintenance of 25 KWp grid interactive Solar PV Power Plant with 5 years comprehensive maintenance contract.

We confirm the following technical specification.

Sl. No.	Brief Description	Units
1	SPV modules for a 25 KWp (as per specifications)	Complete Set as per requirement
2	SPV module mounting structure made of Aluminum suitable for accommodating 25 KWp capacity SPV modules including foundation as per specifications on rooftop of OERC Building	-do-
3	PCUs as per specifications	-do-
4	Array Junction Boxes and Main Junction Boxes	-do-
5	Data Logging system with remote monitoring as per specification	-do-
6	DC Distribution units as per specifications	-do-
7	AC Distribution units as per specifications	-do-
8.	3 Phase 415 Volt Bi-directional Meter with Import & Export Readings interfacing with Distribution Supply; Compliant with OERC's Net Metering Order dt.26.11.14.	-do-
9	Cables as per standard design & specification	As required at site for full plant commissioning including O & M
10	Fire extinguisher in accordance with BIS codes for electrical short circuit fires along with sand buckets	Complete Set as per requirement
11	Lightning Arrester complete set as per specification	-do-
12	Protection & Earthing of the entire installation as per specification	-do-
13	Spares, tools and plant for 5 years operation and maintenance	-do-
14	Fuses, Transfer switches, Printed Circuit boards required for power plant	-do-
15	Providing training to Engineers and site Staff for o perating Maintenance and trouble shooting skills	
16	Operation and maintenance of the SPV Power Plant for a period of 5 years from date of commissioning of the power plant.	
17	Engineering and electrical drawings alongwith Installations and O&M manuals	Two Complete Sets
18	Any other equipment required to complete the installation (a) (b) ----------	

Signature of the Bidder with seal

ANNEXURE-B

PRICE BID

Sl. No.	Item	Lump Sum amount
A.	**Supply, Errection, Testing and Commission of the System**	
1	SPV modules for a total capacity of 25KWp as per specifications.	
2	SPV module roof top mounting structure suitable for accommodating 25 Kwp SPV modules including foundation as per specifications on rooftop	
3	PCU as per specifications for 25 Kwp complete with all features grid interactive having net metering features	
4	Array Junction Boxes	
5	Main Junction Boxes	
6	Data Logging system with remote monitoring as per specification	
7	DC Distribution units as per specifications	
8	AC Distribution units as} per specifications	
9	Cables requirement as per design	
10	Fire extinguisher in accordance with BIS codes for electrical short circuit fires along with sand buckets	
11	Lightning arrester complete set as per specification	
12	Earthing complete set as per specification	
13	Fuses, Transfer switches, Printed Circuit boards required for power plant	
B.	Taxes and Duties	Lump Sum amount or actual whichever is lower.
C.	Engineering and Electrical Drawings, O & M Manuals and training of OERC personnel for operation, maintenance and trouble shooting skills	Lump sum amount
	TOTAL A + B + C	Lump sum amount
D.	Yearly charges for maintenance and operation of SPV Power Plant (i) 1st Year covered in Guarantee/Warranty in complete shape. (ii) Subsequent 4 year	Amount in Rs.

ANNEXURE-C

Scope of operation & maintenance of SPV power plant for a period of 5 years

All materials, components of the power plant during the period of maintenance shall be the property OERC.

Regular operation & maintenance of the SPV Power Plant for a period of 5 years of warranty after commissioning along with supply of consumable items as and when necessary and submission of daily performance datas of power plant shall come, under the operation & maintenance contract.

The break down maintenance of the entire system including supply of necessary spare parts, if any are already under the coverage of warranty clause of the General Terms & Condition and special terms & condition for a period of 12 months from date of commissioning of power plant. The operation and maintenance schedule of the SPV power plant during the 5 years contract period shall be as detailed below.

1. 5 years operation and maintenance period shall begin on the date actual commissioning for the power plant.
2. The maintenance personnel shall be qualified and well trained so that they can handle any type of operation hazard quickly and timely.
3. The maintenance personnel shall be in a position to check and test all the equipment frequently, so that preventive actions, if any, could be taken well in advance to save any equipment from damage. Any abnormal behavior of any equipment shall be brought to the notice of OERC immediately for appropriate action.
4. The maintenance personnel shall keep clean the power plant at regular intervals. Other activities in the control room will not be allowed under any circumstances.
5. Normal and preventive maintenance of the power plant such as cleaning of module surface, all electrical connection, changing of tilt angle of module mounting structure, cleaning & greasing of battery terminals etc.
6. During operation & maintenance period of 5 years of the power plant, if there is any loss or damage of any component of the power plant due to mis-management / mis-handling of the maintenance staff, the supplier shall be responsible for immediate replacement / rectification. The damaged component may be repaired, if it is understood after examination that after repairing performance of the component shall not be degraded, otherwise the defective component shall have to be replaced by new one without any extra cost.
7. List of spare parts & measuring instruments are to be supplied along with the systems may be specified in the bid.
8. Operation & Maintenance Instructions:
   8.1 The successful bidder shall furnish 2 copies of operating and maintenance instruction manuals in English at the time of inspection and taking over of the equipment. These manuals shall properly bound in book form and contain all information, description of equipment, diagram etc. necessary to enable the customer to operate and maintain the whole scheme.

8.2 Proper Operation & Maintenance of the plant shall be carried out by the supplier during O & M period of 60 months with 3 monthly / annual review check up of plant and equipment in detail with OERC.

8.3 Proper repainting, re-coating of exposed surfaces to prevent rusting & replacement of worn out parts shall be carried out along with the maintenance of the PCU and battery back (if any).

- Supplier shall be fully responsible for the complete O&M and optimum operation of the plant. The name and contract nos. of this personnel shall be notified to the OERC for the purpose of contract, responsibility and correspondence with regard to all trouble shooting.
- Replacement & repair of damaged parts shall be carried out immediately during the O&M period so as to ensure at least 95% uptime.
- Plant operation reports shall be made available in the system regular basis.
- Plant shall be operated as per the standard IER practices to ensure proper safety measures.
- The supplier shall ensure replacement of worn out parts and component during the operation & maintenance period for which purpose the supplier shall carry and maintain minimum inventory levels of spares at the plant and its works.
- In case of delay in repair & maintenance and non observance of purchasers O&M schedule, the purchaser shall have the right to impose any penalties including forfeiture of performance security.
- Regular maintenance (routine preventive breakdown and capital maintenance) of complete plant and equipments including SPV Array, PCU, SCADA system with dedicated telephone lines shall be carried out by the supplier in accordance with manufactuer's instructions, manufactuer's procedures, relevant safety codes, Indian Electricity Act, Indian Electricity Rules, CEA Safety Regulations, purchaser's instructions, prudent utility practices etc.
- In case of any fault, the fault must be removed within 24 hours failing which a penalty of Rs.1,000/- per day shall be charged. In case of any part to be imported the maximum period for repair should not be more than 15 days. However, under Force Majure circumstances penalty can be waived off.

9. Routine, preventive, breakdown& Capital Maintenance:

- Routine and Preventive maintenance shall include such checks and maintenance activities which are required to be carried out on all the components of the power plant to minimize breakdown and to ensure smooth and trouble free running of the plant. The supplier shall be responsible to carry out routine and preventive maintenance and replacement of each and every component/ equipment of the power plant and he shall provide all labour, materials, consumables etc. for routine and preventive maintenance of his own cost. A register may be maintained specifying the date and the type of maintenance activities undertaken.
- Breakdown maintenance shall mean the maintenance activity including repairs and replacement of any component or equipment of the plant

which is not covered by routine and preventive maintenance and which is required to be carried out as a result of sudden failure / breakdown of that particular component or equipment while the plant is running. The supplier shall be responsible to carry out breakdown maintenance of each and every component of the power plant and he shall provide the required manpower, materials, consumables, components or equipment etc. for breakdown maintenance at his own cost irrespective of the reasons of the breakdown/ failure.

- Capital maintenance shall mean the major overhaul of any component or equipment of the power plant which is not covered by routine, preventive and breakdown maintenance which may become necessary on account of excessive wear & tear, aging which needs repair / replacement. The capital maintenance of power plant and all civil structures shall normally be planned to be carried out on an annual basis. For this purpose a joint inspection by the supplier and OERC shall be carried out of all the major components of the power plant, about two months in advance of the annual maintenance period in order to ascertain as to which components of the power plant require capital maintenance. In this regard the decision of the purchaser will be final and binding. However, if the condition of any plant and component warrants its capital maintenance at any other time, a joint inspection of the purchaser and supplier shall be carried out immediately on occurrence of such situation and capital maintenance shall be carried out by arranging the shutdown of the plant / part of the plant, if required, in consultation with concerned authorities. The decision of the purchaser shall be final and binding.

10. A separate agreement shall be made with the successful bidder for operation & maintenance of SPV power plant for a period of 5 years.

ANNEXURE-D

FORMAT FOR BANK GUARANTEE

On stamp paper of requisite amount

B.G. No:…….
This Deed of Guarantee made this …. day of (…. month) of 2015 (Year Two thousand fifteen) we, …(name and address of the bank)…., (herein after referred to as 'The Bank') which expression shall unless the counterpart otherwise admit include its legal representative, successors and the Odisha Electricity Regulatory Commission, Bhubaneswar referred to as the 'OERC') which expression shall include its legal representative, successors and assignees.

Whereas 'OERC' has invited bid for the work of Design, supply, installation, commissioning and maintenance of SPV Systems vide 'Invitation for Offer' dated --------/OERC AND WHEREAS M/S. (Name and address of the firm), who having submitted their Bid hereinafter referred to as the 'Bidder' and have agreed to deposit to the 'OERC' an amount of Rs…… (Rupees ……) as per the terms and conditions of the Bid Document AND WHEREAS the 'OERC' also willing to accept a Bank guarantee in lieu of payment by demand draft of any amount equivalent to the amount of earnest money required to be deposited by the Bidder to the 'OERC i.e. an amount equal to Rs…….. which as guarantee will be kept valid up to ----------.

In consideration of the 'OERC' having agreed to consider the Bid proposals submitted by the Bidder without depositing the amount of earnest money and against this Bank guarantee, we ……. (name and address of the bank) hereby undertake and guarantee to make payment to the 'OERC' the amount of Bid earnest money deposit at any time (time being the essence of the contract) when the 'OERC' asks for the same as per the terms and conditions of the bid Document.

The bank further undertakes not to revoke this guarantee during its currency except with the previous consent of the 'OERC' in writing and the guarantee shall be continuous and irrevocable guarantee up to a sum of Rs…….. (Rupees……..)only provided always that any indulgence or relation on the part of the 'OERC' to the said bidder with or without the consent of the bank shall not prejudice or restrict remedies against the bank nor shall the same in any event be a ground of defence by the Bank against the 'OERC'.

In case the 'OERC' puts forth a demand in writing on the Bank for the payment of amount full or in part against this bank guarantee, the bank will consider that such demand by itself is a conclusive evidence and proof that the bidder has failed in complying with the terms and conditions stipulated by the 'OERC' in its bids and payment will be made to the 'OERC' without raising any disputes regarding the reasons for such failure on the part of the bidder.

The bank shall not be discharged for release from this guarantee by any arrangement between the bidder and the 'OERC' with or without the consent of the bank or any alterations in the obligations of the parties or by an indulgence, forbearance shown by the 'OERC' to the bidder.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the 'OERC' may have or hereafter possess against the bidder and the 'OERC' shall be under no obligations to marshal in favour of the bank any such securities or fund or asset that the 'OERC' at its absolute discretion may vary, exchange, renew, modify or refuse to complete or enforce or assign any security or instrument.

The Bank agrees that the amount hereby guaranteed shall be due and payable to the 'OERC' on 'OERC' serving a notice requiring the payment of the amount and such notice shall be served on the bank either by actual delivery thereof to the Bank or by dispatching thereof to the bank by Registered post at the address of the said Bank. Any notice sent to the Bank at its address by Registered Post shall be deemed to have been duly served on the Bank notwithstanding that the notice may not in fact have been delivered to the Bank.

In order to give full effect to the provisions of this guarantee the bank thereby waives all rights inconsistent with the above provisions and which the bank might otherwise as a guaranter by entitled to claim and enforce.

We,…….(name and address of the bank), lastly undertake not to revoke this guarantee during its currency except with the previous consent of the 'OERC' in writing.

'"Notwithstanding anything contained herein",

(i) Our liability under this guarantee shall not exceed Rs…… (Rupees ……. only).

(ii) This Bank Guarantee shall be valid up to ----------

(iii) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if we receive from you a written claim or demand on or before ---------- (date of expiry of Guarantee)".

Dated:-…. day of ….. 2015.