**ODISHA RENEWABLE ENERGY DEVELOPMENT AGENCY**

**BHUBANESWAR**

**REVISED BID DOCUMENT POST PRE-BID MEETING**

**TENDER CALL NOTICE No. 433/OREDA DTD-24-01-2020**

**FOR**

Design, Supply, Installation, Commissioning and Maintenance for a period of 5 years of Rooftop Solar PV Power Plants of different capacities

<table>
<thead>
<tr>
<th>Event</th>
<th>Date and Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Hoisting of the bid document on Website</td>
<td>25-01-2020</td>
</tr>
<tr>
<td>Date &amp; time of pre-bid meeting</td>
<td>04-02-2020 at 3.00 PM</td>
</tr>
<tr>
<td>Date &amp; Time of hosting of Revised Bid Document/Corrigendum</td>
<td>07-02-2020</td>
</tr>
<tr>
<td>Date and time for submission of online bids and</td>
<td>26-02-2020 up to 1.00 PM</td>
</tr>
<tr>
<td>Date and time for submission of Hard copy</td>
<td>29-02-2020 up to 1.00 PM</td>
</tr>
<tr>
<td>Date of Opening of Techno-Commercial bids</td>
<td>29-02-2020 at 3.00 PM</td>
</tr>
<tr>
<td>Date of Opening of the price bid</td>
<td>To be intimated to the techno-commercially qualified bidders only.</td>
</tr>
</tbody>
</table>

S-3/59, MANCHESWAR INDUSTRIAL ESTATE, BHUBANESWAR-751010

Phone: (0674) 2588260,2586398,2580554, Fax:2586368

Website: [www.oredaorissa.com](http://www.oredaorissa.com) Email: ceoreda@oredaorissa.com
Disclaimer

Kindly Note:

1. This document is not transferable

2. Though adequate care has been taken for preparation of this document, the bidder shall satisfy himself that the document is complete in all respects. Intimation of any discrepancy shall be given to this office immediately. If no intimation is received from any bidder on the pre bid meeting or within ten days from the date of issue of the bid document, it shall be considered that bid document is complete in all respects and has been received by the bidder.

3. The Odisha Renewable Energy Development Agency (OREDA) reserves the right to modify, amend or supplement this bid document keeping in view the necessity in implementation of the scheme.

4. While the bid document has been prepared in good faith, neither OREDA nor their employees or advisors make any representation, warranty, express or implied or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability and completeness of this bid document, even if any loss or damage is caused by any act or omission on their part.
**DETAILS OF NOTICE INVITING E-TENDER**


<table>
<thead>
<tr>
<th>Package</th>
<th>Project Details</th>
<th>Project Capacity</th>
<th>Estimated Project Cost (in INR)</th>
<th>Earnest Money Deposit (in INR)</th>
<th>Non Refundable Cost of Bid document (in INR)</th>
<th>Tender processing fee Non refundable (in INR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package-1*</td>
<td>Solarization of 20 no. of Fish Firms</td>
<td>20 no. of 3 KW Off Grid RTS systems with 7.2 Vah/Wp Battery Backup</td>
<td>80,00,000/-</td>
<td>40,000/-</td>
<td>5,000/- +GST</td>
<td></td>
</tr>
<tr>
<td>Package-2</td>
<td>Solarization of Bargarh Dyeing Unit</td>
<td>50 kW Grid connected RTS (GCRTS) System with Battery Backup</td>
<td>55,00,000/-</td>
<td>55,000/-</td>
<td>5,000/- +GST</td>
<td></td>
</tr>
<tr>
<td>Package-3</td>
<td>Solarization of Nuapatna, Cuttack Handloom Unit</td>
<td>35 kW (aggregate) Off Grid RTS systems with 7.2 Vah/Wp Battery Backup</td>
<td>46,20,000/-</td>
<td>45,000/-</td>
<td>10,500/- +GST</td>
<td></td>
</tr>
<tr>
<td>Package-4</td>
<td>Solarization of Jhilminda, Bargarh Handloom Unit</td>
<td>6 kW Off Grid RTS with 7.2 Vah/Wp Battery Backup</td>
<td>7,92,000/-</td>
<td>8,000/-</td>
<td>800/- +GST</td>
<td></td>
</tr>
<tr>
<td>Package-5</td>
<td>Solarization of Kotpad, Koraput Handloom Unit</td>
<td>4 kW Off Grid RTS with 7.2 Vah/Wp Battery Backup</td>
<td>5,28,000/-</td>
<td>5,000/-</td>
<td>500/- +GST</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**

*30 KW (10 no. of 3 KW Off Grid RTS systems) of the Package-1, will be allotted to Local MSMEs bidders (Category-B bidder) No work experience and minimum turn over criteria is required for such category of bidder.*
1. **General Scope of Works**

The broad scope of the work includes Design, Supply, Installation, Commissioning and Maintenance of Rooftop Solar PV Power Plants of different capacities.

### 1.1 Design

a. The bidder is required to design the complete system as per technical specification given as well as connectivity needs using the solar PV modules/PCUs and BOS.

b. The Module Mounting Structure (MMS) must be designed to be completely Non-Invasive (without any grouting/chipping) on the roof. (An indicative design is given at Technical Specifications of MMS).

c. Adequate Protection must be provided as per the requirement of the site by taking lightening and other climatic conditions etc.

d. Array Junction Box, Module Junction Box, Separate DCDB & ACDB etc must be provided.

### 1.2 Supply

a. Supply of complete systems, including all necessary components, sub-components, etc. as per BOQ and technical specifications given in this tender document.

b. Supply should also include packing, forwarding, safe storage and handling of all plants and equipment including insurance coverage- all FOR Customer.

### 1.3 Pre-Installation Obligations

a. The indicative drawing and design of module mounting structure that can withstand wind velocities up to **200 KM/hr** has been provided at **Annexure-G**. However, depending on the actual site conditions, the bidders may propose changes in the design of Module Mounting Structure with due certification of a chartered engineer with regards to quality, durability and wind resistance capability and implement the same only after due approval from OREDA.

b. Successful bidder(s) after site visit are required to submit single Line Diagrams for all power plants indicating all wiring details, connectivity details etc. before commencement of installation work.

c. Before submission of the Bid, Bidders in their own interest may visit the sites.

d. The installation process should be documented step by step in the mobile installation app developed by OREDA. The successful bidders before going for installation should collect the app from OREDA Customer Relationship Centre (CRC).

### 1.4 Installation

a. Installation of all plants and equipment has to be done as per the design criteria and approved SLDs.

b. There should not be any invasion/damage what so ever to the roof top due to setting up of the mounting structure of the solar power plant so as to avoid any chances of leakage of rain water, etc. from the roof top on a later date.
c. While cabling the array care must be taken such that no loose cables lie on the rooftops. The roof top should look clean and tidy after installation of the array.
d. Display boards, danger boards etc. as mentioned in the tender should be prominently fixed in appropriate locations.
e. As far as possible PCUs & Control Panels should be wall mounted.
f. Care should be taken such that earthing flats do not touch the roof/walls at any place. Sufficient insulators should be provided for the same.
g. Providing Remote Monitoring Systems in the inverters of the solar PV power plants and sharing the RMS protocol as well as log-in ID and Password of each system with the designated person from the Fire Station as well as concerned division of OREDA.
h. Providing necessary protection devices to protect the power plant from lightening, sudden surges in voltage and current and to ensure safety of the grid to which the plant is connected.
i. The bidder should also ensure protection of life and property likely to be endangered due to the installed solar power plant.
j. For Grid Connected Rooftop Solar Plant (GCRTS), the connectivity of all the systems must be as per Latest Order of OERC on Net Metering vide No. OERC-Engg. 02/2010/(Vol-IV)/1131 Dated :19.08.2016 as amended up to 17.01.2018.

Overview of a basic grid interactive Photo Voltaic system

System side

Solar Panels

SPD

DC isolator Switch

PCU

SM

Battery

Inverter/Charger

CONSUMER LOAD

Grid Side

Distribution Transformer

AC Isolator Switch

Main consumer panel

CM

SM- Solar Generation Meter, CM- Consumer Meter (Net meter or Bi-directional meter)

* A separate/wiring arrangement should be made from inverter/charger to the consumers critical load.
* The actual connectivity diagram may vary depending upon site specification.
Note for GCRTS- (Package-2):

- As indicated in the SLD above, the Critical Load (i.e. to be catered by the Battery) must be separate from the Main Load.
- Consumers are required to apply for Net Metering to the respective Distribution Utility to obtain the Approval/Permission for Net metering. The successful bidder should facilitate the User Agency for submitting the applications and obtaining NOC for Net Metering and getting the project connected to utility end through Net meter. The Application Fees, Cost of Net Meter, Meter Testing Charges etc. shall be borne by the successful bidder/implementing firm.
- The bidder should ensure installation of Net Meter in coordination with Division/Sub Divisional offices of respective Distribution Utility.
- The testing and synchronisation of Net Meter shall be ensured by the bidder in coordination with MRT & Divisional office of respective Distribution Utility before Commissioning of the system. Net-meter if supplied by the Bidder, must be tested & approved by respective Distribution Utility.
- Remote communication facility must be provided in the Generation Meter to monitor Generation/Export Data. The login credentials must be shared with OREDA.

1.5 Commissioning & Testing:

a. After completion of installation work, the plants have to be tested and commissioned in presence of the Asst. Director, OREDA, RE Cell, DRDA of the respective District as well as the designated representative of user.

b. The date & time for testing and commissioning must be decided in consultation with the AD(T) of the concerned district. On the date of such testing & commissioning the commissioning certificate has to be signed by AD(T), OREDA, Head/Authorised person of the institution and representative of select vendor.

c. The process of documentation of installation details & loading of pictures has to be done through “Resolve” Mobile App in consultation with concerned person from OREDA-CRC.

1.6 Maintenance

a. The successful bidder is required to undertake scheduled maintenance as well as corrective maintenance for a period of 5 years starting from the date of commissioning of the project.

b. To ensure proper maintenance of the installed systems the bidder is required to appoint a technically qualified person to look after maintenance and upkeep of the plant. Sufficient spare should also be kept with the service personnel so as to attend to any breakdown forthwith.

c. The bidder must enter in to a Comprehensive Maintenance Contract for a period of 5 years as per the format given in Annexure-A.

d. The date of commencement of CMC shall be reckoned from the date of commissioning of the system in presence of a representative of the user agency and AD(T), RE Cell, OREDA/Representative of OREDA.
e. Scheduled maintenance of each project has to be taken up every quarter as per the Standard maintenance protocol given at **Annexure-B**. The compliance should be reported through mobile app as per the protocol given.

f. The bidder is also required to undertake on-call maintenance as and when required upon receipt of service request from OREDA-CRC.

g. The bidder must adhere to maintenance procedure by OREDA from time to time.

h. The bidder is required to train at least two designated persons from the unit for day to day operation, maintenance and upkeep of the system.

i. The bidder if required should agree to undertake extended maintenance services beyond 5 years on mutually agreed terms and conditions.

j. Following service request intimated by OREDA-CRC, the system must be made functional within 7 days. System downtime beyond 7 days will result in poor performance score of the vendor which might affect their chances of further bidding in the OREDA tenders.

### 2. **Eligibility Criteria for Participating in the Bidding**

In order to be eligible to participate in the tender, the bidder must fulfil the following eligibility criteria. Any discrepancy or deviation from the same shall make the bidder ineligible for participating in the tender

**Status of Bidder:**

a. **Category-A:** The bidder must be registered in the State of Odisha as a company (registered under Indian Companies Act 1956) **or** The bidder must be registered in the State of Odisha as a Partnership Firm (registered under Indian Partnership Act 1932) **or** The bidder must be registered in the State of Odisha as a Sole Proprietorship Firm having GST registration **or** The bidding Companies/firms must be registered anywhere in India must have worked in the State of Odisha in Renewable Energy sector at least for a period of 3 years from the date of issue of this tender.

**Category-B:** Local MSMEs who are not able to meet the given work experience and financial eligibility criteria must have been registered under MSME Development Act 2006 in Odisha under Section D, Division 35, Group 351 having NIC 5 digit code - 35105 (Electric power generation using solar energy). The bidder applying in this category will be exempted from "**Work experience**" and "**Financial Eligibility criteria**", but they have to comply with "**Other Eligibility Criteria**" as mentioned below. Such category of bidder can apply for Package-1 only except price bid. Interested bidders will have to submit the willingness to accept the L1 price developed in the tender as per the format (Annexure-P). These category bidders can also apply for other packages if they fulfil the eligibility criteria under the said package. In that case, these category bidders will be considered as Category-A bidder.
**Work experience:**

b. The bidder must have working experience in last 3 years from the date of issue of this tender in Rooftop solar projects in Govt / PSUs/ Govt Agency/ Bodies, Health Institutions, Medical Colleges & Hospital, Universities, Educational Institutions, Community Centers, Welfare Homes, Old age Homes, Orphanages, Common Service Centers, Trust/NGO/Voluntary Organizations/Training Institutions and any other establishment registered under the Society Registration Act 1860 or The Indian Trust Act 1882). **However, experience in private or any other sector can be considered if the same is done under any Central/State Govt programme and is certified by the concerned State Nodal Agency responsible for implementing RTS project.** The minimum cumulative capacity required for each package is as follows:

<table>
<thead>
<tr>
<th>Package</th>
<th>Minimum Cumulative Experience (kW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package-1</td>
<td>30</td>
</tr>
<tr>
<td>Package-2</td>
<td>50</td>
</tr>
<tr>
<td>Package-3</td>
<td>35</td>
</tr>
<tr>
<td>Package-4</td>
<td>6</td>
</tr>
<tr>
<td>Package-5</td>
<td>4</td>
</tr>
</tbody>
</table>

As a proof of installation, the bidder must submit the work completion certificates issued in the name of the bidder **mentioning the date of commissioning** against the experience, signed/authorised by Designated Public Officer and submit the details in the below format.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of the Organization/ Beneficiary</th>
<th>Capacity Commissioned (kW)</th>
<th>Date of Commissioning</th>
<th>Certificates attached</th>
</tr>
</thead>
</table>

**Financial Eligibility:**

c. Net Worth of the bidder in the last Financial Year (2018-19) should be **Positive.** “Net Worth” as per section 2 (57) of the Companies Act, 2013 means the aggregate value of the paid up share capital and all reserves created out of the profits and securities premium account, after deducting the aggregate value of the accumulated losses, deferred expenditure and miscellaneous expenditure not written off, as per the audited balance sheet, but does not include reserves created out of revaluation of assets, write-back of depreciation and amalgamation.

d. Minimum Average Annual Turnover (MAAT) on solar business for last three financial years (2016-19) of the bidder should as follows:

<table>
<thead>
<tr>
<th>Package</th>
<th>Minimum Average Annual Turnover (MAAT) in INR in solar business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Package-1</td>
<td>40,00,000/-</td>
</tr>
</tbody>
</table>
### Instructions to Bidders:

#### 3.1 General Instructions

- Interested bidders are advised to view the detailed tender documents on [www.oredaorissa.com](http://www.oredaorissa.com) or [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA).

- Bidders desirous of participating in the tender shall have to pay the tender costs mentioned in TENDER SCHEDULE. The tender cost is required to be paid in shape of Demand draft only, drawn in favour of Chief Executive, OREDA payable at Bhubaneswar. The tender cost is inclusive of GST and is not refundable.

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| Package-2 | 55,00,000/- |
| Package-3 | 50,00,000/- |
| Package-4 | 10,00,000/- |
| Package-5 | 6,00,000/- |

As proof of the same, a certificate by a registered chartered accountant in the letter head with seal of the CA’s firm must be submitted. The certificate of CA should clearly indicate turnover exclusively on solar business. The audited balance sheets of the last three financial years (2016-19) must be submitted.

**Other Eligibility Criteria:**

e. The bidder must be in possession of the valid test certificates of Solar PV module and Power Conditioning Unit/Inverter from MNRE authorized test laboratory.

Successful bidder after receipt of LOI, must submit the test reports and data sheets of the all the components along with the authorisation letter from Original Equipment Manufacturer (OEM).

The datasheets & test Reports for particular equipment must be submitted in the name of a **single OEM** only.

The component wise requirement of test certificates has been given in Annexure-C.

f. The bidder’s company/firm must have established quality assurance systems and organization in line with the requirements under ISO 9001:2015. The relevant certificate in this regard to be submitted.

g. The bidder’s company/firm must not have been debarred / blacklisted by any Govt. Dept., agency, PSUs / institution / agencies / autonomous organisations. The bidder shall submit a self-certification by an authorized person duly notarized to this effect.
• All participating bidders shall have to pay the non-refundable tender processing fee as mentioned in TENDER SCHEDULE to K.S.E.D.C. Ltd. Bangalore through Tender Wizard Portal on e-payment modes only such as credit/debit cards, Net banking etc.

• Earnest money as specified in bid should be deposited in shape of Demand Draft drawn in favour of the Chief Executive, OREDA payable at Bhubaneswar from any nationalized bank. Alternatively, the EMD can also be submitted in shape of Bank Guarantee from any nationalized bank in the format given at Annexure-D having validity of 45 days.

• The bidders shall submit copies of documents defining their respective constitutional or legal status, place of registration and principle place of business of company or firm or partnership.

• Only bidding companies are required to submit Board Resolutions in prescribed format given at Annexure-E.

• Bidding firms are required to submit documents related to assignment of Power of attorney to sign the agreement on behalf of bidders.

• Bidding Partnership firms are required to submit complete partnership deeds along with the bid documents.

• The bidder shall submit reports on their financial standing such as audited profit and loss statements, balance sheets, auditor’s report for the past three years. All accounting statements must be duly audited and submitted along with auditor’s note on accounts and accounting standards.

• The bidders shall submit information on their performance during last 3 years in format given at Annexure-F.

• The bidders shall have to indicate their capacity to manufacture/integrate the different solar PV systems asked for in this tender within the specified time after meeting all their other similar commitments.

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

• Certificate to the effect that the systems to be supplied are indigenous & not fully imported must be furnished.

• Since timely execution of works is of paramount importance, requests for extension of time shall not be ordinarily entertained.
• Notice inviting tender, bid documents, prescribed Technical bid, price bid, terms & conditions will form the part of the tender.

• Bidders may in their own interest visit the sites before submitting bids.

• All Taxes applicable at the time of supply will be admissible.

• 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, OREDA will have the right to suitably dispose off the same and forfeit the expenses towards such dispute either from the amount payable to the vendor or adjust from the performance BG.

• OREDA will not be responsible for any incidental or consequential losses of the firms during the contract period or after.

• During the warranty period, MNRE/ State Agencies/ Users reserve the right to cross check the performance of the systems with the minimum performance levels indicated in the MNRE specifications.

• Deviations in terms and conditions, Specification of material, Inspection clause etc. will not be accepted under any condition.

• The Electronic Form/Template of the Techno –Commercial bid, as available on the portal, shall be duly filled in and scanned copies of documents in support of meeting the minimum qualifying requirement of the tender shall be given as attachments

• Prices quoted must be firm and fixed. No price variation / escalation shall be allowed during project execution period.

• Any condition in regards to financial aspects, payments, terms of rebate etc. beyond the prescribed financial terms of OREDA will make the bid invalid.

• Therefore, it is in the interest of the bidders not to write anything extra in the Price Bid except price.

• Canvassing in any manner shall not be entertained and will be viewed seriously leading to rejection of the bid.

• All subsequent addendum/Corrigendum to the tender shall be hoisted in OREDA’s official web site www.oredaorissa.com and www.tenderwizard.com/OREDA only.

3.2 SUBMISSION OF BIDS:
• **THE BIDS MUST BE SUBMITTED ONLY ONLINE ON** www.tenderwizard.com/OREDA portal.

• The bidder must ensure that the bids are received in the specified website as per the date and time indicated in the Tender notice.

• The bidders are advised to register their user ID, Password, company ID on website www.tenderwizard.com/OREDA by clicking on hyper link “Register Me”.

### 3.2.1 PROCEDURE FOR SUBMISSION OF ONLINE BIDS

**A. ACQUISITION OF DIGITAL SIGNATURE CERTIFICATE**

For participating in the bid, it is mandatory to procure the Digital Signatures of Class III only.

**B. REGISTRATION IN TENDER WIZARD PORTAL**

- Log in www.tenderwizard.com/OREDA Click “Register”, fill in the online registration Form.

- Un-registered bidders are required to pay registration fee as applicable to M/s KSEDCL, Bangalore in tender wizard e-payment mode only.

- All bidders are required to pay the tender processing fees as applicable to M/s KSEDCL, Bangalore in tender wizard portal in e-payment mode only.

- As soon as the verification is done the e-tender user ID will be enabled/ provided.

**C. ON-LINE REQUEST FOR e-TENDER DOCUMENTS**

After viewing Tender Notification in www.tenderwizard.com/OREDA if bidder intends to participate in tender, it has to use its e-tendering User ID and Password which has been received after registration and acquisition of DSCs (Digital signature certificate) and to follow the step by step instructions given below.

- Insert the PKI (which consists of your Digital Signature Certificate) in your System.

  *(Note: Make sure that necessary software of PKI has been installed in your system)*

- Click / Double Click to open the Microsoft Internet Explorer

  (This icon will be located on the Desktop of the computer)

- Go to Start > Programs > Internet Explorer. Type www.tenderwizard.com/OREDA in the address bar, to access the Login Screen.

- Enter e-tender User Id and Password, click on “Go”.

- Click on “Click here to login” for selecting the Digital Signature Certificate. Select the Certificate and enter DSC Password. Re-enter the e-Procurement User Id Password.
• Click “Un Applied” to view / apply for new tenders.

• Click on Request icon for online request. After making the request, bidder has to pay the requisite tender processing fee (as indicated in tender notice) through e-payment facility only available in the portal. Bidders will receive the Tender Documents which can be checked and downloaded by following the below steps.

  ▪ Click on the “Show form” icon.
  ▪ Tender documents will appear on the screen.
  ▪ Click “Click here to download” to download the documents.

D. SUBMISSION OF SECURITIES FEE:

• The bidders shall have to scan the Demand Draft towards EMD and Tender Cost and upload the same in .pdf or .jpg format.

• EMD of the unsuccessful bidders will be returned to them at the earliest after expiry of the final bid validity and latest on or before the 30th day after the award of the contract.

• The bidding company/firm registered in Odisha having valid exemption certificate can claim the exemption from depositing the EMD and Tender Cost.

• To ensure due performance of the contract, Performance Security is to be obtained from the successful bidder awarded the contract.

• To ensure proper maintenance of the systems 10% of cost of the systems have to be submitted by select vendor as performance bank guarantees equivalent to 10% cost of the system.

  • Additional Performance Security shall be obtained from the bidder when the bid amount is less than the estimated cost of the package. In such an event the bidders who have quoted less bid price/rates than the estimated cost of the respective package shall have to prepare bank draft/bank guarantee/term deposit pledged in favour of Chief Executive, OREDA with validity of 6 months equal to the exact amount of differential cost i.e. estimated cost minus the quoted amount and submit the scanned copy of the same along with the online price bid as Attachment.

Note: Additional Performance Security in Original has to be submitted before placement of Work order along with Submission of Acceptance to LOI. Submission of Additional Performance Security in original along with Tender Cost & EMD shall lead to rejection of the bid.

The bids of the Technically qualified bidders will be opened for evaluation of price bid. In case of the bidders quoting less bid price/rate than the estimated cost and have not furnished the exact amount of differential cost as Additional Performance Security, their price bid will not be taken into consideration for evaluation even if they have qualified in the technical bid evaluation.
The details of the above securities fees are listed below:

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Type of Securities</th>
<th>Amount in INR</th>
<th>Submission mode</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tender Cost</td>
<td>As mentioned in the schedule</td>
<td>Demand Draft</td>
<td>Non-refundable</td>
</tr>
<tr>
<td>2</td>
<td>Earnest Money Deposit (EMD) or Bid Security</td>
<td>As mentioned in the schedule</td>
<td>Demand Draft/ Bank Guarantee with validity 45 days from the date of bid submission.</td>
<td>EMD to be refunded to the successful bidder on receipt of Performance Security.</td>
</tr>
<tr>
<td>3</td>
<td>Performance-cum-Maintenance Security: 10% value of the contract: 5 Nos of Bank Guarantees each equivalent to 2% of the cost of the systems with validities of 1.5, 2.5, 3.5, 4.5 &amp; 5.5 years respectively. To be submitted by the successful bidder at time of submission of acceptance to LOI. If the successful bidder will not execute and maintain the project as per the tender conditions, then all the five nos of BG will be encashed.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E. SUBMISSION OF TECHNO-COMMERCIAL BIDS:

- The techno-commercial bid sheets in .xls format are to filled up and up-load without changing the file name. Submission of incomplete techno commercial bid sheets will be liable for rejection of the bid.

- Scanned copies of all related documents as per the checklist shall be uploaded in .pdf or .jpg format prior to last date and time of receipt of bids as specified in tender Notice.

F. SUBMISSION OF PRICE BIDS

- The bidder should fill up price schedule in the given bid sheets in .xls format and up-load the same without changing the file name. The bid will be rejected if the schedule of price is submitted in incomplete form.

After completing all the formalities, Bidders will have to submit the tender as specified in NIT and must take care of all instructions. Prior to submission, verify whether all the required documents have been attached and uploaded to the particular tender or not.

Note:

- The bid sheets (.xls file) shall be uploaded in www.tenderwizard.com/OREDA portal, prior to online closing of the tender. By no other means (except online) price bid shall be accepted for evaluation of tender.

- Please note down or take a print of bid control number once it is displayed on the screen.

G. SUBMISSION OF HARD COPIES

- Along with the e-tender, bidders shall also submit hard copies of only the following documents:
  1. Demand draft or Bank Guarantee against the EMD
  2. Demand draft against the Tender Cost
  3. Tender processing fee acknowledgement
- The above documents must be submitted in OREDA office at S-57, Mancheswar
Industrial Estate, Bhubaneswar 751010 on or before the stated date in the manner prescribed elsewhere in the document.

- The bidder should not submit the hard copy of any documents other than the above documents. Filled in Price bids/Copies of the uploaded price bids should not be submitted in hard form. Submission of hard copy of such documents will liable the tender for rejection.

- At the time of evaluation of the bid, OREDA may ask the bidder for the hard copy of uploaded documents for any clarification if needed.

4. **DEAD LINE FOR SUBMISSION OF BIDS**

- Soft copy of the bid shall be uploaded through the portal [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) on or before the last date and time specified for online submission of the bids.

- DD towards Tender cost, DD towards EMD and tender processing fee acknowledgement must be received by OREDA at the address specified not later than the time and date stated in the tender notification.

- In the event of the specified date for the submission of bids being declared a holiday for OREDA, the bids will be received on the next working day as per the time indicated in tender notification.

- OREDA may, at its discretion, extend this deadline for submission of bids.

5. **LATE BIDS**

- Soft copy of the bid can’t be uploaded on the portal after expiry of submission time and the bidder shall not be permitted to submit the same by any other mode. In such case, even if the bidder has submitted the specific documents in hard copy in original within the stipulated deadline, its bid shall be considered as late bid. The hard copy submitted [specific documents (viz., EMD, tender cost.)] shall be returned unopened to the bidder.

- Hard copy of the EMD in shape of DD if received by OREDA after the last date for submission of the hardcopy bid the same will be considered as late bid even if the bidder has uploaded the soft copy of the bid within the stipulated deadline.

- In such a case, the soft part of the bid uploaded on the portal shall be sent unopened to “Archive” and shall not be considered at all any further.

6. **MODIFICATION AND WITHDRAWAL OF BIDS**

- Bidder may modify or withdraw their bids through the relevant provisions on the portal [www.tenderwizard.com/OREDA](http://www.tenderwizard.com/OREDA) up to the due date and time of submission of bid indicated in tender notification

- The Bidders may modify and resubmit their bids as per the provisions given in the portal.

- Bidders may withdraw their bids through the relevant provisions as mentioned in the portal.
7. **PROCEDURE FOR OPENING THE BIDS:**

- The Technical bid shall be opened at the time & date mentioned in the NIT by OREDA in the presence of bidders, who choose to be present. If necessary, the firms may be called for Technical Presentation the schedule for which will be intimated by OREDA.
- The Price bid shall be opened after evaluation of technical suitability of the offers. The date for opening of Price bid shall be communicated subsequently. The Price Bid of only those bidders shall be opened who qualify in the technical bid.
- 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.
- Tender Opening event can be viewed online.
- The bid sheets of participants can be viewed by other participants.

8. **ALLOCATION OF WORK:**

- The work in each package shall be allotted in the following manner:

<table>
<thead>
<tr>
<th>Package</th>
<th>Work Allocation</th>
</tr>
</thead>
</table>
| Package-1 | 30 KW (10 no. of 3 KW) to L1 Category-A Bidder.  
15 KW (5 no. of 3 KW) to A1 Category-B Bidder.  
15 KW (5 no. of 3 kW) to A2 Category-B Bidder  
(A1 and A2 will be arranged on the basis of their position in the draw of lots) |
| Package-2 | 50 KW to L1 Category-A Bidder |
| Package-3 | 35 KW to L1 Category-A Bidder |
| Package-4 | 6 KW to L1 Category-A Bidder |
| Package-5 | 4KW to L1 Category-A Bidder |

*For the purpose of allocation of work to Local MSMEs of Category-B, they will be arranged on the basis of their position in the draw of lots. Work will be allotted equally to such MSMEs maximum to 2 bidders in the Package-1. If the A- 1 & A-2 bidders fail to execute the programme then the work will be allotted to subsequent winners in the lottery.

All supply / installation orders shall be placed with the state local registered office of the qualified vendors only.

- The allotment of the area / districts will be the discretion of OREDA.

**DEPENDING UPON THE PERFORMANCE OF THE VENDORS, CHIEF EXECUTIVE, OREDA WILL BE AT LIBERTY TO CANCEL/MODIFY/REVISE THE WORK ORDERS OF ANY OF THE SELECTED VENDORS.**

9. **ISSUE OF LETTER OF INTENTS (LOI)**

- Allocation of work will be done through specific work orders issued in the name of the select bidders.
- Prior to issue of work orders a Letter of Intent will be issued to the selected bidders detailing out the quantity and scope of the works, locations of works, Bank
Guarantees and documents to be submitted before issue of work orders, other deliverables, etc.

- Upon receiving the same the bidder is required to visit the project sites along with AD(T)/Technician of the concerned districts, discuss details of the project with the concerned customers, finalize the exact sites of installation, loads to be separated for connecting to the solar power plants, convenient dates of installation etc. as well as all logistics details. Following this the bidder has to submit a letter of acceptance of the LoI along with the required bank guarantees, work execution schedule etc. and after of the same by Chief Executive, OREDA formal work orders will be issued.

10. **ACCEPTANCE/REJECTION:**
OREDA reserves the right to accept / reject any or all Tenders without assigning any reason thereof and alter the quantity of materials mentioned in the Tender documents at the time of placing purchase orders. Tender will be summarily rejected if:
  i) EMD is not deposited either in shape of Bank Draft in favor of OREDA payable at Bhubaneswar or in Bank Guarantee (BG).
  
  **Note:** EMD against previous Tenders, if any, will not be adjusted towards EMD against this Tender.
  
  ii) Submission of incomplete technical and /or financial bid sheets.
  
  iii) Non submission of any of the documents (both soft and hard) as asked for in the tender document.
  
  iv) Submission of Late bids.

11. **VALIDITY OF OFFER:**

- The offer must be kept valid for a period of one year from the date of opening of the technical 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.

12. **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.
- PV modules used in solar power plants must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 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 OREDA.
- The warranty provided by the OEM for a particular product shall only be applicable to the tendered project even if the warranty period exceeds the period of CMC.
• As a testimony, the successful bidder must submit the warranty certificate and service agreement with the OEM for the tendered work.

13. **Penalty and Termination of Contract:**

- The systems shall be supplied, installed and commissioned within the scheduled time. If the bidder fails to adhere to the schedule, OREDA shall without prejudice to its other remedies under the contract deduct from the contract price as liquidated damages a sum equivalent to 1% 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 5 weeks of delay) OREDA may consider termination of the contract and forfeit the security deposit without prejudice to the other remedies of the contract.
- However, Chief Executive, OREDA may at 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 can be allowed with imposition of penalty. If the delay is considered to be genuine time extension can be allowed without imposition of penalty.

14. **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.

15. **Inspection:**

- All tests and inspections shall be made at the place of delivery. Officers authorized by OREDA 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 of their obligation in the contract.
- OREDA shall have the right to have the tests carried out at its own cost by an independent agency at any point of time.

16. **Payment:**

- 90% of the cost of system and installation charge along with all applicable tax shall be released upon commissioning of the systems at the location specified in the purchase order upon due verification by authorised officers and submission of following documents
  - Performance report signed by the Assistant Director, OREDA
  - Warranty certificates of SPV module, PCU & Battery (if applicable)
from the Manufacturer

- Web enabled generation report
- Operation manual
- Proof of conducting training programme
- Login credentials of the Remote Monitoring System
- Project Completion Report & Joint Commissioning Report
- GPS based plant photographs of each installation
- I-V Curves of Solar modules
- Dos & Don'ts in the form of a booklet
- Filled in CMC Agreement
- Balance 10% cost of the supplied materials, Installation & Commissioning charges will be released after 3 months successful performance following submission of the following
  1. Submission of monthly/ hourly power consumption reports supported by the reading of inverter given with the power plant in the format given.

**17. 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 Authorized OREDA Officer. The general schedule of execution will be as follows

- Under normal circumstances all ordered systems must be installed and commissioned in all respects within 90 days of receipt of firm work order from OREDA.

- Under exceptional circumstances Chief Executive, OREDA may consider to extend the execution period by a maximum of 60 days upon written application of the vendor stating justified reasons for delay which should be supported by the concerned customer and recommended by the concerned AD(T) of OREDA.

- Upon intimation about commissioning of the systems by the executing firm a joint inspection will be carried out by the representatives of the executing firm, OREDA and User organization.

- The issuance of a JCC shall, in no way relieve the executing firm of it’s responsibility for satisfactory operation of the power plant.

**Installation App:** It is mandatory to report the details of materials and the progress of execution in the mobile app developed for the purpose.

- To ensure due performance of the contract, Performance Security is to be obtained from the successful bidder awarded the contract. In case the firms fails to execute the work as per the schedule the performance security @ 10% of the order value will be forfeited.
• Bid security should be refunded to the successful bidder on receipt of Performance Security.

18. **COMPREHENSIVE MAINTENANCE CONTRACT (CMC):**
Upon selection, the bidder must enter into a Comprehensive Maintenance Contract with OREDA for a period of 5 years from the date of commissioning of each project in the format given. Willingness to execute such CMC will have to be submitted along with the tender. The broad scope of CMC shall cover

i. All systems will be mandatorily maintained for a period of 5 years from the date of commissioning.
ii. It is mandatory to undertake scheduled maintenance every three months and report details on the mobile App developed for the same.
iii. It is mandatory to undertake all on-call maintenance within 7 days from the date of receipt of the call and report details on the mobile App developed for the same.
iv. The period of maintenance will be extended by the No. of days of delay in attending to on-call maintenance and making the system functional. The delay will be the difference of no. of days of delay from the actual date of completion and target date of completion.
v. The delay is calculated from the day a ticket is raised against a vendor to the day the ticket is closed.

**Maintenance security:**
To ensure proper maintenance of the systems 10% of cost of the systems have to be submitted by select vendor as performance bank guarantees equivalent to 10% cost of the system. For the purpose 5 Nos of Bank Guarantees each equivalent to 2% of the cost of the systems with validities of 1,2,3,4& 5 years respectively to be submitted. Following successful maintenance of the systems and submission of bills thereon, the bank guarantees may be deposited.

Annual Maintenance Charges (AMC) will be paid annually upon successful maintenance of the systems and submission all necessary reports thereon.

**Note:**
Execution of CMC and submission of Performance Bank Guarantees are pre conditions for release of 1st payment of 90%.

19. **LIMITATION OF LIABILITY:**
OREDA, 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.
20. **DISPUTE:**
For adjudication of any dispute between OREDA and the bidders arising in this case, reference can be made to any Law courts under the jurisdiction of Odisha High court only. The Chief Executive, OREDA reserves the right to accept or reject any or all bids without assigning any reason thereof.

Sd/-

Chief Executive

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

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**For any assistant, Contact:**
E-Tendering help desk number: 080- 40482000/121/133/140(Bangalore)
OREDA Help Desk- 09776823641/09937140591
<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Particulars</th>
<th>Name of the file uploaded on e-tender portal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cost of Tender document for Rs.10,500/- (Copy of Bank Draft to be uploaded &amp; enclosed).</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Acknowledgement for tender processing fee.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cost of EMD in shape of Bank Draft/ Bank Guarantee (Copy of DD/BG to be uploaded &amp; enclosed)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Forwarding letter duly signed and stamped by the bidder</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Undertaking duly signed and stamped by the bidder.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Certificate of Unconditional Acceptance of all terms and conditions of the tender</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Confirmation to Technical Specification</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Copy of Board Resolution in the prescribed format (Applicable to Companies only)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Declaration duly signed and stamped by bidder.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Letter of Authorization</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Undertaking to supply Indigenous items as per relevant guidelines of MNRE, GoI</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Willingness to open service centre in the state of Odisha and local registered office for execution of the works</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Power of attorney to sign the agreement on behalf of applicant &amp; partnership deed articles, if any</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Valid document registering the status of the applicant as manufacturer /systems integrator</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Organizational Profile containing the original documents defining the constitution or legal status, place of registration / branches, annual off-grid and on-grid wise capacity of solar power plants installed for last 3 years.</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Willingness to open service centre in the state of Odisha and local registered office for execution of the works</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Undertaking to supply Indigenous items as per relevant guidelines of MNRE, GoI</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Copy of GST registration certificate in the name of bidder</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Copy of the PAN card in the name of bidder.</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Copy of the TIN No. in the name of bidder.</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Copy of Tax return of the bidding company/firm</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Turnover certificate over best of last three years (2016-19) exclusively in the business of solar PV duly certified by Chartered Accountant.</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Audited Balance Sheet in exclusively solar business for last three FY 2016-19</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Proof of cumulative capacity for installation of Solar PV Power plant with Work Completion Report as given format</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Proof of production capacity of SPV power plant</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Proof of Quality assurance systems certification</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Performance Report of last 3 years as given format</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Acceptance to L1 price for category-B bidder only as per the format Annexure-P</td>
<td></td>
</tr>
</tbody>
</table>

Signature of bidder with seal
GENERAL TECHNICAL SPECIFICATIONS (FOR ALL PACKAGES)

The general scope under this contract includes to design, manufacture, 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 to all the equipment of SPV Power plant on the respective sites / as per instruction from time to time. The illustrative Schedule of requirements is in accordance with the specifications contained in this document.

1. **Solar PV Modules:**
The modules having capacity above 200Wp should only be provided in the array to obtain the required array power output. Indigenously produced PV module (s) containing mono/multi crystalline silicon solar cells should only be used.

All modules must comply with to IEC 61215, 61730 part 1 & 2 (Certificates from MNRE test centres in support of such compliance must be submitted along with the tender document. The other criteria are as follows:

- Crystalline Silicon Solar Cell Modules IEC 61215 Edition (II)
- PV modules must have quality to IEC 61730 Part I & II, for safety qualification testing and to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701.
- PV modules used in solar power plants must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.
- Each PV module used in solar power project under this tender must use a RF identification tag (RFID), which must contain the following information. The RFID should be laminated inside the module and but must be able to withstand harsh environmental conditions.
  - Name of the manufacturer of PV Module.
  - Name of the manufacturer of Solar cells.
  - Month and year of the manufacture (separately for solar cells and module).
  - Country of origin (separately for solar cells and module).
  - I-V curve for the module.
  - Peak Wattage, Im, Vm and FF for the module.
  - Unique serial No and Model No of the module.
  - Date and year of obtaining IEC PV module qualification certificate.
  - Name of the test lab issuing IEC certificate.

2. **Module Mounting Structure:**
i. Hot dip galvanized MS/Aluminum mounting structures shall be used for mounting the modules/panels/arrays. Each structure will have angle of inclination as per the site conditions to take maximum insolation.
ii. The Mounting structure must be Non-invasive Ballast Type and any sort of penetration of roof to be avoided. The design details are as follows:
   a. The inclination of module should be within 10-15 degrees.
   b. The upper edge of the module must be covered with wind shield so as to avoid bulk air ingress below the module. Slight clearance must be provided on both edges (upper & lower) to allow air for cooling.
   c. An indicative drawing is shown at Annexure S

iii. The mounting structure should be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.

iv. The fasteners should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels.

v. The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m². The load shall be well distributed so that point loads are well within the limits.

vi. The minimum clearance of the structure from the roof level should be in between 70-150 mm.

vii. The structures should be laid on the rooftop on weather resistant FRP mountings which should be non-penetrating type and proper drainage of rain water over terrace through the installation area should be maintained.

viii. The structures should be suitably loaded with reinforced concrete blocks of appropriate weight made out of M25 concrete mixture.

ix. Special care should be taken while designing all structures for modules to cater to heavy rainfall.

x. The array shall be located sufficiently inside the boundary wall of the terrace (parapet wall) and should not be projecting out. PV array shall be installed in the terrace space free from any obstruction and/or shadow. PV array shall be installed utilizing optimum terrace space to minimize effects of shadows due to adjacent PV panel rows.

xi. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance.

xii. Additional waterproofing shall be provided in the areas where RCC blocks are placed on the terrace.

xiii. The minimum clearance between lower edge of PV panel and terrace ground level shall be 150 mm to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace.

xiv. The PV array structure design shall be appropriate with a factor of safety of min. 1.5.

xv. Each array may be provided with two bird repellents spikes at a level higher than the upper edge of the array. The location of the spike should be selected for minimum shadow effect.

xvi. The support structure shall be free from corrosion when installed.

xvii. PV modules shall be secured to support structure using screw fasteners and/or metal
clamps. Screw fasteners shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames. Module fasteners/clamps shall be adequately treated to resist corrosion.

xviii. Adequate spacing shall be provided between any two modules secured on PV array for improved wind resistance.

xix. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years.

xx. The structure should be appropriately designed to withstand high wind velocities up to 180-200 km per hour. (The bidder is required to submit a certificate from an authorized chartered engineer with regards to the strength and durability of the structure)

3. **JUNCTION BOXES (JBS):**

The junction boxes shall be dust and waterproof and made of thermo-plastic. The terminals will be connected to copper lugs or bus bar of proper sizes. The junction boxes will have suitable cable entry points fitted with cables glands. Suitable markings shall be provided on the legs or bus bar for easy identification and cable ferrules will be fitted the cable termination points for identification. Each main junction box shall be fitted with appropriate rating blocking diode. The junction boxes shall be of reputed make.

- Array Junction Box should be IP 65 as per IEC 60529 and should be provided with fuses and isolators of suitable ratings.
- DC Distribution board should comply with IP 21 as per IEC 60529. It should be equipped with suitable rating of DC isolators for solar input from array junction box and fuse of suitable rating between PCU and battery.
- AC distribution board should comply with comply with IP 21 as per IEC 529 and should be equipped with suitable rating of MCB between PCU and load.
- All switch, circuit breakers and connectors should comply with IEC 60947 (part – i, ii, iii) / is 60947 (Part-i , ii , iii).

4. **BATTERY BANK:**

For Package-1,3,4,5, there will be one battery bank comprising of appropriate capacity for respective SPV Power Plant. The batteries should be T-Gel/VRLA Type and shall have long service life. The cells should confirm IS 15549/ IEC 61427 and as per specification given below shall be provided.

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Capacity of Plant</th>
<th>Minimum Battery Bank Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 KW</td>
<td>7200Wh</td>
</tr>
<tr>
<td>2</td>
<td>2 KW</td>
<td>14400Wh</td>
</tr>
<tr>
<td>3</td>
<td>3 KW</td>
<td>21600Wh</td>
</tr>
<tr>
<td>4</td>
<td>5 KW</td>
<td>28800Wh</td>
</tr>
</tbody>
</table>

**Note:** Individual battery voltage should be 12 V for 1KW Solar plant and for above 1 KW power plant only 2 V battery is allowed.
<table>
<thead>
<tr>
<th>Terminals</th>
<th>Made of lead alloy suitable for bolted connection. The terminals should be greased with petroleum gel.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrolyte</td>
<td>Battery grade Sulphuric acid</td>
</tr>
<tr>
<td>Self Discharge</td>
<td>Less than 3% per month at 30 degree C</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>1500 cycle duty at 27degree C at 80% depth of discharge 3000 cycle duty at 50% discharge.</td>
</tr>
<tr>
<td>Battery Voltage</td>
<td>12 V for 1KW Solar plant and for above 1 KW power plant only 2 V battery is allowed.</td>
</tr>
<tr>
<td>Service Life</td>
<td>Should perform satisfactory for a minimum period of 5 year under operating conditions as mentioned.</td>
</tr>
</tbody>
</table>

5. **AC Distribution Panel Board:**
The AC Distribution Board shall consist of the components as per designed PCU.

6. **Cables & Wirings:**
The Cable & Wires should comply to IEC60227 or IS694 & IEC60502 or IS1554 BSEL50618(for DC cables for PV systems). The details are as follows:

- Cables running between solar panels and array junction box should be 4 Sqmm copper flexible.
- Cables running between AJB and DCDB should be of 16 Sqmm copper flexible cable for Solar Plant capacity of 1 KW to 5 KW. Cables running between AJB and DCDB should be of 25Sqmm copper flexible cable for Solar Plant capacity of 6 KW and above
  
  a. Cable running between PCU and battery should be 25Sqmm coppers flexible cable.
  b. Cable running between PCU and ACDB should be 6 Sqmm Copper cables.
  c. All copper flexible cables should comply to IS651 and make should be Polycab, Havells or equivalent.
  d. Colour code should be followed for over all wiring i.e, red for positive, black for negative, green for earth.
  e. All cable should run in suitable PVC Conduits .No cable should be directly exposed to sunlight.

7. **Danger Plates:**
The bidder have to provide at least 8 Danger Notice Plates of 200 mm X 150 mm made of mild steel sheet, minimum 2 mm thick and vitreous enamelled white on both sides and with inscription in signal red colour on front side as required. The inscription shall be in English and local language. Out of eight, four danger notice shall have to be provided at PV Power plant & Four-danger notice at Control Room & Battery room.

8. **Lightening & Over Voltage Protection System:**

- The SPV power plant should be provided with Lightning and over voltage protection, connected with proper earth pits. The main aim of over voltage protection is to reduce the over voltage to a tolerable level before it
reaches the PV or other sub-system components. The source of over voltage can be lightning or other atmospheric disturbance.

- The lightning Conductors shall be made of 25 mm diameter 4000 mm long GI spike as per provisions of IS 2309-1969. Necessary concrete foundation for holding the lightning conductor in position to be made after giving due consideration to maximum wind speed and maintenance requirement at site in future. The lightning conductor shall be earthed through 20 mm X 3 mm thick GI flat earth pits/earth bus made with 25 mm X 5 mm GI flats.
- Most areas of the State being prone to lightening, Type-II SPDs shall be included as a mandatory requirement.
- Similarly Type I+II SPD should also be provided on the grid side in ACDB or PCU to protect the PCU from damage

9. **EARTHING SYSTEMS:**
Chemical Earthing (Maintenance Free) system including Lightning & Surge Protection arrangement to be provided. Earthing system design should be as per the standard practices and should confirm to the latest edition of IS 3043.

10. **DISPLAY BOARD:**
You shall provide the display board of size 3 ft x 3 ft that gives detailed circuit diagram of the system with its description.

11. **COMPREHENSIVE MAINTENANCE CONTRACT (CMC):**
- The PV module(s), battery bank, Inverter and other sub - components will be warranted as per the given clause. The manufacturers can also provide additional information about the system and conditions of warranty as necessary.
- Scope of Operation & Maintenance of SPV Power Plant for a period of 5 years from date of commissioning
- Regular maintenance of the SPV Power Plant for a period of 5 years after commissioning along with supply of consumable items.
- The breakdown maintenance of the entire system including supply of necessary spare parts if any shall be for a period of 5 years from the date of commissioning of power plant
- 5 years maintenance period shall begin on the date actual commissioning of the power plant.
- Normal and preventive maintenance of the power plant shall be covered under CMC.
- During maintenance period of the power plant, if there is any loss or damage of any component of the power plant due to miss management/miss handling or due to any other reasons pertaining to the vender’s deputed personnel, what-so-ever, the vender shall be responsible for immediate replacement/rectification. The damaged component may be repaired or replaced by new component. It is understood after examination the performance of the component or the system shall not degrade.
12. **Drawings & Manuals:**
2 copies of Engineering, electrical drawings and Installation and O&M manuals 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 and power evacuation, synchronization and distribution for street lighting system 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 OREDA before progressing with the installation work.

13. **Remote Monitoring System:**
The Solar PV Power plant must be provided with remote monitoring system embedded to the DC Generation Meter. The RMS must be capable of providing ONLINE Generation data (daily, monthly, yearly & total). The features of the RMS along with operational details must be submitted along with the Bid. These systems should work using GSM/GPRS data communication service (GSM/GPRS service shall be provided by the Vendor for 5 years including data charges) or SMS (Short Message Service). They must provide data on power generation every 15 minutes indicating all spikes, dips etc.

   *Important features:
   a. Cloud based Communication
   b. Dashboard display either on PC, Laptop, Tab, smart phone
   c. Internal communication protocols.

   *Monthly Report has to be submitted to OREDA.

14. **Hybrid Power Conditioning Unit (PCU):**
As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels before powering equipment designed for nominal mains AC supply. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the “Power Conditioning Unit” OR simply PCU. In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array & the Inverter, to maximize Solar PV array energy input into the System. PCU should conform IEC 61683, IEC 60068 as per specifications.

PCU refers to combination of charge controller, inverter and AC charger and shall be supplied as integrated unit or separate units.

*Inverter:

The inverter will be highly efficient. The inverter should confirm IEC 61683 /IS 61683, IEC 60068 and should be based on MPPT design. Inverters would display its own parameters and the parameters of battery bank connected to the inverter. Beyond the maximum load the inverters will trip. The inverters should be designed to be completely compatible with the charge controllers and distribution panels and are of integrated design.

Salient features of the Inverters shall be as follows:

a. The PCU should be designed to be completely compatible with the SPV array voltage.

b. A Central inverter with MPPT shall be used with the power plant for maximum efficiency and shall be efficient based on PWM with IGBT/ reliable power based
design.
c. The sine wave output of the inverter shall be 230V, Single phase, 50 HZ AC.
d. **There should be provision to charge the battery using Grid power as long as grid voltage is between 170V-265V. In case Grid voltage falls below 170V up to 130V, Grid charging shall stop but load shall continue to run using Grid supply not by Solar.**
e. The peak inverter efficiency inclusive of built in isolation transformer shall exceed 85% at full load
f. There should be provision to export excess PV power to grid in case the load consumption is less than the actual generation. **This is futuristic feature and provision should be there to enable or disable this export feature.**
g. Inverter shall provide display of PV array DC voltage & current, Battery Voltage & Current, Inverter Voltage & Current, Grid voltage & Current, Battery charging status and required parameters when fault occurs. Remote monitoring of inverter parameters should be possible.
h. Operating temperature Range shall be 0 to 55 deg C
i. Maximum Power Point Tracker (MPPT) shall be integrated in the power conditioner unit to maximize energy drawn from the Solar PV array.
j. The charge controller/ MPPT units should qualify to IEC standards.
k. Online microprocessor based Data Acquisition Systems and Remote Monitoring facility for 365 days with data Recovery from remote location should equip.

<table>
<thead>
<tr>
<th>Inverter Capacity</th>
<th>Equal/ Higher than the Capacity of Rooftop Solar Power Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverter Voltage</td>
<td>230 V (for 1 phase); 415 V (for 3 phase)</td>
</tr>
<tr>
<td>Nominal Battery Voltage</td>
<td>Capacity as mentioned earlier</td>
</tr>
<tr>
<td>Output frequency</td>
<td>50 Hz +/- 0.5 Hz</td>
</tr>
<tr>
<td>Overload Capacity</td>
<td>150% for 10 Second</td>
</tr>
<tr>
<td>Efficiency</td>
<td>80% at 50% of load and More than 90% at full load 0.8 PF</td>
</tr>
<tr>
<td>Short Circuit Protection</td>
<td>Circuit Breaker and Electronics protection against sustained fault.</td>
</tr>
<tr>
<td>Low Battery Voltage</td>
<td>Automatic Shut Down</td>
</tr>
<tr>
<td>Total Harmonic Distortion</td>
<td>Less than 3%</td>
</tr>
<tr>
<td>Over Voltage</td>
<td>Automatic Shut Down</td>
</tr>
<tr>
<td>AC over Current/Load</td>
<td>Automatic Shut Down</td>
</tr>
<tr>
<td>Protection</td>
<td>Over Voltage both at Input &amp; Output</td>
</tr>
<tr>
<td></td>
<td>Over Current both at Input &amp; Output</td>
</tr>
<tr>
<td></td>
<td>Over Frequency</td>
</tr>
<tr>
<td></td>
<td>Surge voltage inducted at output due to external source.</td>
</tr>
<tr>
<td>Protection Degree</td>
<td>IP20/IP21</td>
</tr>
<tr>
<td>Instrumentation &amp; Indication</td>
<td>Input &amp; Output voltage, Input &amp; Output Current, Frequency, Power output, different status of inverter, kind of fault by audio signal.</td>
</tr>
</tbody>
</table>

**Charge Controller Unit:**
The Charge Controller shall be dual input type, where under normal condition the input is fed from a SPV panel and in the absence of SPV power or low SPV power conditions an external single phase AC source can be used for battery charging. A selector switch shall be provided for choosing between those modes. When the batteries are charged from external AC sources, the charging current should be set manually depending on the capacity of the source and the charging requirement of the batteries. The charge controller shall be of MPPT type / PWM type employing IGBT switching elements. Charge controller should confirm IEC 62093 / IEC 60068 as per specification.

The charging sequence from SPV array or external AC source shall be as follows:

*From SPV Array:*

The battery shall be charged at the maximum rate depending on the solar radiation until the battery terminal voltage reaches 2.25 volts per cell. The battery charging should be automatically terminated when the rate of increase of battery voltage is steady (dv/dt sensing). The charger shall switch on the „trickle charge after this.

*From AC Source:*

The battery shall be charged at the rate manually set depending on the battery condition or capacity of AC source. The maximum rate shall be internally pre-set. The battery charging should be automatically terminated when the rate of increase of battery voltage is steady (dv / dt sensing) or when the battery terminal voltage reaches 2.75 volts per cell.

Salient features of the Charge Controller shall be as follows:

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching elements</td>
<td>IGBT/MOSFET</td>
</tr>
<tr>
<td>Type of Charger</td>
<td>PWM</td>
</tr>
<tr>
<td>Input</td>
<td>From Solar PV array</td>
</tr>
<tr>
<td>Output Voltage:</td>
<td>Suitable for charging nominal battery bank from respective capacity of SPV array.</td>
</tr>
<tr>
<td>Protections</td>
<td>Short Circuit, Deep Discharge, Input Surge Voltage, Over Current (load), Battery Reverse Polarity, Solar array reverse polarity.</td>
</tr>
<tr>
<td>Indication</td>
<td>String „ON“, Main „ON“, Charging „ON“, 80% Charged, 100% Charged, Charger Overload, Battery On Trickle Battery disconnected / Fault Battery Reverse Polarity, Low Solar Power, System Fault and Charger over Temperature and Input Over / Under Voltage (for AC).</td>
</tr>
<tr>
<td>MIMIC Diagram:</td>
<td>To indicate power flow and operation of the charge controller/ battery charger; shall have provision for visual indications of existing power input/output through MIMIC diagram.</td>
</tr>
</tbody>
</table>

You may design Power Conditioning Unit (PCU), which consist of a solar charge controller & inverter as per design mentioned above. In addition, it should have a Grid Charger. It provides the facility to charge the battery bank either through Solar or Grid set. The PCU continuously monitors the state of Battery Voltage, Solar Power output and the loads. Due to sustained usage of power, when the Battery Voltage falls below a preset level, the PCU will automatically transfer the load to the grid power and also charge the Batteries through the in-built Grid Charger. Once the batteries are charged to the present level, the PCU cuts
off the Grid power from the system and will restore to feeding the loads from the battery bank & continue to charge the battery bank from the available solar power. The PCU always gives preference to the solar power and will use Grid power only when the solar power / battery charge is insufficient to meet the load requirement.

**Salient Features:**
- Priority of charging is from Solar panels.
- Over heating Protection.
- Dual Display Showing PV & Inverter output.
- Short circuit & Over load Protection.
- Inbuilt Heavy Duly Solar Charge Controller.
- No Load Shut Down for load = 5% 9not applicable for > 1 kVA systems) Fully equipped with powerful Grid Charger.
- User friendly client and Web based Software.

**ADDITIONAL TECHNICAL SPECIFICATIONS FOR PACKAGE-2**

In addition to the technical specification mentioned in the above section-1,2,3,5,6,7,8,9,10,11,12,13, these are following technical specification for 50 KW Grid connected RTS (GCRTS) System with Battery Backup

1. **GRID TIED POWER CONDITIONING UNIT/INVERTER:**
   i. As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels before powering equipment designed for nominal mains AC supply. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the “Power Conditioning Unit” OR simply PCU. PCU refers to combination of charge controller, inverter and AC charger and shall be supplied as integrated unit or separate units.
   
   ii. The inverter should be highly efficient. The inverter should confirm IEC 61683, IEC 60068 & IEC 62116 (Anti Islanding Protection) i.e. it should island the Solar PV System in case the Grid shuts down. It should be based on MPPT design. Beyond the maximum load the inverters should trip. The inverters should be designed to be completely compatible with the distribution panels and are of integrated design.
   
   iii. Salient features of the Inverters shall be as follows:
       a. The PCU should be designed to be completely compatible with the SPV array voltage.
       b. Grid tied Inverter with inbuilt MPPT should be used.
       c. The sine wave output of the inverter shall be 415 V, 3 phase, 50 HZ AC.
       d. The peak inverter efficiency inclusive of built in isolation transformer shall exceed 85% at full load
       e. Inverter shall provide display of PV array DC voltage & current, Inverter Voltage &
Current, Grid voltage, Current and required parameters when fault occurs. Remote monitoring of inverter parameters must be facilitated.

f. Operating temperature Range shall be 0 to 55 deg C
g. Maximum Power Point Tracker (MPPT) shall be integrated in the power conditioner unit to maximize energy drawn from the Solar PV array.
h. The charge controller/ MPPT units should qualify to IEC standards.
i. It should be equipped with Online microprocessor based Data Acquisition Systems and Remote Monitoring facility for 365 days with data Recovery from remote location.

- **Detailed Specifications are:**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total output power (AC)</td>
<td>Total Inverter capacity should be greater than or equal to the 50 KW (Rooftop Power Plant Capacity)</td>
</tr>
<tr>
<td>Input DC voltage range DC input</td>
<td>As required for the solar grid inverter</td>
</tr>
<tr>
<td>Maximum power point Tracking (MPPT)</td>
<td>Inbuilt</td>
</tr>
<tr>
<td>Number of independent MPPT Inputs</td>
<td>1 or more</td>
</tr>
<tr>
<td>Output AC voltage</td>
<td>Three phase 415 (+12.5%, -20%)</td>
</tr>
<tr>
<td>Operating Frequency range</td>
<td>47.5 – 52.5 Hz</td>
</tr>
<tr>
<td>Nominal frequency</td>
<td>50 Hz</td>
</tr>
<tr>
<td>Power factor of the inverter</td>
<td>&gt;0.98 at nominal power</td>
</tr>
<tr>
<td>Total harmonic distortion</td>
<td>Less than 3%</td>
</tr>
<tr>
<td>Built-in Protection</td>
<td>AC high / low voltage; AC high /low Frequency</td>
</tr>
<tr>
<td>Anti-islanding protection</td>
<td>As per VDE 0126-1-1 or IEC 60255.5 or IEC 62116 or equivalent standards</td>
</tr>
<tr>
<td>Operating ambient temperature range</td>
<td>-10 degC - +60 degC</td>
</tr>
<tr>
<td>Humidity</td>
<td>0 – 95% Rh</td>
</tr>
<tr>
<td>Inverter efficiency</td>
<td>&gt;=85%</td>
</tr>
<tr>
<td>weighted efficiency</td>
<td>94%</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP 65 for outdoor mounting, IP 54 for indoor mounting</td>
</tr>
<tr>
<td>Communication interface RS 485 / RS 232 and RJ45 Safety compliance</td>
<td>IEC 62103, IEC 62109-1, IEC 62109-2 Galvanic Isolation</td>
</tr>
<tr>
<td>Cooling Convection Display type</td>
<td>LCD for data display. LCD / LED for status display</td>
</tr>
<tr>
<td>Display parameters to include</td>
<td>Output power (W), cumulative energy (Wh), DC voltage (V), DC current(A), AC voltage(V), AC frequency(Hz), AC current(A); cumulative hours of operation,</td>
</tr>
<tr>
<td>Compliance with standards and codes</td>
<td>IEC6163/ IS 61683, IEC 60068- 2 (1,2,14,30)</td>
</tr>
</tbody>
</table>

2. **UPS with Battery back-up**

For powering the emergency load, this 50 KW Grid connected RTS (GCRTS) System will be supported an UPS system with battery back-up as per the OERC approved single line diagram as mentioned above. The emergency load to be separated before connecting to the UPS system. The indicative specification is as follows:

<table>
<thead>
<tr>
<th>Specification</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPS capacity</td>
<td>25 KW</td>
</tr>
<tr>
<td>Rated Power</td>
<td>&gt; 80% of rated capacity</td>
</tr>
<tr>
<td>Output</td>
<td>3-Phase</td>
</tr>
<tr>
<td>Protections</td>
<td>Current Sensor Fail, DC Low Voltage / Over Voltage, Feedback Fail, High Temperature, Input Phase Reversal,</td>
</tr>
</tbody>
</table>
### Battery Specifications

<table>
<thead>
<tr>
<th></th>
<th>Mains Low / High Cut, Overload, Reverse Polarity, Short circuit etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Battery Type</strong></td>
<td>T-Gel/ VRLA Lead Acid type</td>
</tr>
<tr>
<td><strong>Individual Battery Voltage</strong></td>
<td>12V</td>
</tr>
<tr>
<td><strong>Battery Bank capacity (VAh)</strong></td>
<td>Minimum 90,000 VAh</td>
</tr>
</tbody>
</table>

#### 3. **NET METER**

The On-grid Solar power plant will be connected to the grid through a net meter as per the single line diagram indicated in this document. The indicative specification of the Net-meter is as follows:

**Three Phase Meter:**
- Three Phase Four wire, 3x240VAC, 20-100Amps ISI marked Direct current operated bidirectional Energy Meter, DLMS CatB having calibration LED, Battery back up, AMR compliance & front sealing facility to be used as NET meter for less than 20KW LT consumer with Accuracy : 1.0.
- Transparent Box of Engineering Plastic to house above meter with all accessories.

#### 4. **GENERATION METER**

**Three Phase Meter:**
- Three Phase Four wire, 3 x 240VAC, 20-100Amps ISI marked Direct current operated Energy Meter, DLMS CatC having calibration LED, Battery back up, AMR compliance & front sealing facility to be used as generation meter up to 20KW with Accuracy : 1.0.
- GPRS/GSM Modem with connecting cable & antenna for running smoothly up to 5 year for AMR facility.
ANNEXURES

Annexure-A

SAMPLE FORMAT FOR C.M.C

Comprehensive Maintenance Contract (CMC) for maintenance of SPV power plant supplied and installed by M/s ........................................ for five years.

This Comprehensive Maintenance Contract (CMC) is executed between the Orissa Renewable Energy Development Agency (OREDA), S-3-59, Mancheswar Industrial Estate, Bhubaneswar - 751010, herein after called as 1st party and M/s ........................................ herein after called as 2nd party, for maintenance of ...... kWp Rooftop Solar PV Plant at ........................................ for a period of five years with effect from ......................... AD, supplied, installed and commissioned vide Letter No: ......................... Date: .........................

The 2nd party will maintain ....... kWp Rooftop Solar PV Plant at ........................................ as per the terms and conditions mentioned here under.

1. It has been envisaged in the Letter No: ......................... Date: ......................... under clause No ...... that this 1 No of ......kWp Grid Connected Rooftop Solar PV Plant shall be warranted against any manufacturing defect and bad workmanship at least for a period of 5 years for the system and 10 years for the PV modules from the date of commissioning. As these systems have been commissioned and handed over to the 1st party through its Assistant Director (Tech) at DRDA, as such are covered under warranty period up to ......................... Hence, the 2nd party is fully responsible for their trouble free maintenance and the 2nd party is liable to rectify / remove any defect noticed within the aforesaid period free of cost.

2. The 2nd party will impart training to 2designated persons from the organization be able to provide first aid repair service for the SPV systems.

3. Five numbers of bank guarantees (BG) each of value equal to 2 % of Total Project Cost shall be kept as fees towards Performance guarantee with the Chief Executive, OREDA having validity of 1, 2, 3, 4 and 5 years respectively from the date of commissioning of the systems which remains valid up to ........................., ........................., ........................., ......................... and ......................... respectively for each year, the PGF shall be returned to the 2nd party thereafter only.

4. The CMC includes repair/ replacement of all spares and consumable & PV module during the maintenance period.

5. The 2nd party will setup a state level office in Odisha duly headed by a Service Engineer.

6. The 2nd party shall undertake corrective maintenance upon registration of complaint by consumer at CRC-OREDA. After attending to the defect 2nd party has to upload the required documents at RE-solve M-App for successful closure of the complaint. The 2nd party shall ensure rectification of defects and restore functionality within seven days of lodging the complaints.
7. The 2nd party shall undertake scheduled maintenance work as per the prescribed format attached herewith (Annexure-B) and upload the required details and documents in the M-appstrictly according to the given schedule.

8. The 2nd party shall apprise the 1st party about the requirements and supply of spares during warranty as well as CMC period.

9. Annual Report from CRC-OREDA shall be considered as token of verification of maintenance done and release of Payment of Annual Maintenance Cost.

10. It will be the liberty of the 1st party to cross check the systems maintained by the 2nd party. Random verification of the maintenance may be carried out by the 1st party wherever necessary.

11. The 2nd party may continue to maintain the gadgets after expiry of the maintenance period of 5 years, provided the beneficiaries/ 1st party desires.

12. For adjudication of any dispute between the two parties arising on execution of this CMC, the matter shall first be brought to the notice of Chief Executive, OREDA.

13. In case, there will be no amicable settlement of the issues, the matter can be referred to the court of law having jurisdiction at Bhubaneswar only.

The Annual Maintenance contract is signed jointly between the two parties today i.e on dated ................. and shall come into force from the date of its signature(s).

For and on behalf of Odisha Renewable Energy Development Agency, Bhubaneswar

( 1st Party) ............................

For and on behalf of M/s .................................................................

( 2nd party) ............................with Seal
## Periodic Maintenance Protocol for Solar power plants/packs

<table>
<thead>
<tr>
<th>SL No</th>
<th>Task</th>
<th>Quarterly</th>
<th>Semi-annual</th>
<th>Annual</th>
<th>Bi-annual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PV Array</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Inspect each PV modules for damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Observe PV array shading and take corrective measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Clean array with water and remove debris around array</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Inspect array mounting structure, check for loose fasteners, corrosion, broken/ damaged concrete footings etc. and take corrective measures, if necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Check array junction box, all wires and cables and take corrective measures if necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Adjust tilt angle , if necessary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>Check array current &amp; voltage. If required each module current, voltage &amp; bypass diode condition.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Check for any loose contacts in the string connection(+ve/-ve MC4 connectors)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PCU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Check inverter and/or charge controller for correct settings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Check Inverter capacity and max allowable load using dummy load.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Ventilation fan condition/filter cleaning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Check all the parameters (I/P &amp; O/P) as per Manufacturer datasheet for any Malfunctioning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Protection devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Check for continuity of lightening arrestor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Check system earthing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Check all SPDs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Check all bypass/ blocking diodes and take corrective measures if necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Home inverter/UPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Check Inverter capacity and max allowable load using dummy load, Fuses and Ventilation condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Check Battery capacity and backup time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Component wise Test Reports

<table>
<thead>
<tr>
<th>S/N</th>
<th>Major Component</th>
<th>Test Certificates Required</th>
<th>Test description</th>
<th>*Designated Test Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Crystalline Silicon Terrestrial PV Modules</td>
<td>IEC 61215</td>
<td>Design qualification</td>
<td>UL India (up to 400 Wp), TUV Rheinland (up to 400 Wp), NISE (up to 100 Wp), ETDC, EAST</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IEC 61730</td>
<td>Safety Qualification</td>
<td>UL India (up to 400 Wp), TUV Rheinland (up to 400 Wp), EAST</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IEC 61701</td>
<td>Salt Mist Corrosion Test</td>
<td>UL India (up to 400 Wp), TUV Rheinland (up to 350 Wp), ETDC (up to 100 Wp), EAST</td>
</tr>
<tr>
<td>2</td>
<td>Power Conditioning Units (PCU)/Inverter*</td>
<td>IEC 61683</td>
<td>Efficiency Test</td>
<td>UL India, TUV Rheinland, NISE, ERTL, ETDC, CPRI, EAST</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IEC 60068</td>
<td>Environmental Test</td>
<td>UL India (up to 250 KVA), TUV Rheinland, NISE, ERTL, ETDC, CPRI, ERTL, EAST</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IP 20/21</td>
<td>Ingress Protection</td>
<td>TUV Rheinland, NISE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IEC 62116</td>
<td>Anti Islanding Protection</td>
<td>UL India, TUV Rheinland, NISE, ERTL, ETDC, CPRI, EAST</td>
</tr>
<tr>
<td>3</td>
<td>Battery</td>
<td>IS 61427/1651/13369/15549</td>
<td>As per IS 15549-2005</td>
<td>NTH, NISE, ERTL EAST (up to 1000 Wp), ETDC (up to 100 AH), CPRI (up to 1000 AH)</td>
</tr>
</tbody>
</table>

*Self certified Test reports of PCU may be submitted for capacities above 10 kW*
Annexure-D

Model Bank Guarantee Format for Performance Security

Annexure-II of Finance Department Office Memorandum 4939 dtd 13.2.12, Govt of Odisha
[Ref Para 22(i1)]

To
WHEREAS----------------------------------------------- (name and address of the supplier) (hereinafter called "the supplier") has undertaken, in pursuance of contract no----------------- dated--------------- to supply --------------------------------- (description of goods and services) (herein after called "the contract") AND WHEREAS it has been stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognized by you for the sum specified therein, as security for compliance with its obligations in accordance with the contract;
AND WHEREAS we have agreed to give the supplier such a bank guarantee; NOW THEREFORE we hereby affirm that we, are guarantors and responsible to you on behalf of the supplier, upto a total of ------------ .(Amount of the guarantee in words and figures).and we undertake to pay you. Upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid. Without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.
We hereby waive the necessity of your- demanding the said debt from the supplier before Presenting us with the demand.
We further agree that no change or addition to or other 'modification of the terms of the contract to be performed there under or of any of the contract documents --which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.
This guarantee shall be valid until the day of--------20------ Our branch at * (Name & Address of the _____ * branch) is liable to pay the guaranteed amount depending on the filing of claim and any part thereof under this Bank Guarantee only and only if you serve upon us at our-------- * branch a written claim or demand and received by us at our ____ * branch on or before Dt. --------otherwise bank shall be discharged of all liabilities under this guarantee thereafter.

(Signature of the authorized officer of the Bank)
Name and designation of the officer
Seal.name & address of the Bank and address of the Branch
Annexure-E

BOARD RESOLUTION

(To be submitted on pre-printed Corporate Letter Head)

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED IN THE MEETING OF THE BOARD OF DIRECTORS OF M/S……………………………………………………………………………………………………………………

HAVING ITS REGISTERED OFFICE AT……………………………………………. HELD ON DD/MM/YY AT…. HRS

Resolved that the company/firm do agree to participate in the tender invited by OREDA vide Notice No .............................. Dtd....................... for Design, supply, installation, commissioning and maintenance for a period of 5 years of 222 No. of 10 KW Solar PV Power Plants (with battery backup), 2220 No. of Solar Street Lighting Systems (SLS), 222 No. of 1 HP AC Submersible Pump with overhead tank as per the technical specification and description given in the tender document in Residential Schools located in 11 district of Odisha.

RESOLVED FURTHER THAT, the company/firm does agree to unconditionally accept all terms and conditions mentioned in the aforementioned tender document.

RESOLVED FURTHER THAT, subject to eligibility, the company/firm agree to open an effective service center in the state of Odisha, preferably in the vicinity of projects so as to cater regular maintenance services to the customers of the company/firm.

RESOLVED FURTHER THAT, Ms/Mr ______________________________ Director and/or Ms/Mr____________________________ authorized signatory of the company be and hereby authorized to sign, execute and submit such applications, undertakings, agreements and other requisite documents writings and deeds as may be deemed necessary or expedient to implement the above assignment

AND RESOLVED FURTHER THAT, the common seal of the company is affixed, wherever necessary, in the presence of any Director of the company who shall sign the same as token of the presence.

For .................................................................

Chairman/Company Secretary

Name of the Authorized person

Specimen Signature of Authorized person

The above signature to be attested by the person signing the resolution
## Annexure-F

### Format of Performance for last 3 years
*(To be submitted on letter head of company)*

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Particulars</th>
<th>Details to be filled up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of the bidder and contact details</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Status of bidder (Manufacturer/System integrator)</td>
<td><em>In support of this the bidder may submit valid certificate from MNRE/Other state agency/Rating agency</em></td>
</tr>
<tr>
<td>3</td>
<td>Production/Integrating capacity per annum</td>
<td><em>In support of this the bidder may submit valid Production/integrating certificate from NSIC/DIC/OSIC</em></td>
</tr>
<tr>
<td>4</td>
<td>Total amount of solar system (On/Off-grid Power plant, Street light, Solar Pump, Home lighting system) installed in kWp in 3 years (16-17, 17-18 &amp; 18-19)</td>
<td><em>Please submit year wise installed data along with roofs thereof such as work completion reports by the concerned customer.</em></td>
</tr>
<tr>
<td>5</td>
<td>Annual Turnover over last 3 years (16-17, 17-18 &amp; 18-19)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>No. of employee currently working</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Awards/Honours received during 3 year</td>
<td></td>
</tr>
</tbody>
</table>

Date:....................

(Signature)...............................................................................

Place:....................

(Printed Name)...........................................................................

(Designation)............................................................................

(Common Seal)...........................................................................
Annexure-G

Indicative Diagram of Module Mounting Structure
UNDERTAKING BY THE BIDDER

I/we here by undertake that

1. We have thoroughly read and examined the notice inviting tender and the tender document along with all its schedules, annexure etc.
2. The rates quoted by us are firm and final and are meant for execution of the allotted supply / installation within the time frame stipulated in the tender/supply / installation order.
3. All terms and conditions of the tender including the rates quoted by us shall remain valid for a period of min one year from the date of opening of the technical bids.
4. In case our tender is incomplete in any respect or we violate any of the prescriptions given in the tender for submission of the same OREDA shall, without prejudice to any other right or remedy, be at liberty to forfeit the earnest money deposited by us.
5. In case of award of supply / installation in our favour OREDA shall have the right to convert the EMD deposited by us in to full or part (as the case may be) of the security deposit to be deposited by us against award of the supply / installation.
6. In case we fail to commence or complete the supply / installation as per the time schedules or fail to fulfill any of the terms and conditions given in the tender OREDA shall, without prejudice to any other right or remedy, be at liberty to forfeit the security deposit made by us against the award of the supply / installation.
7. I/We hereby declare that I/We shall treat the tender documents, specifications and other records connected with the supply / installation as secret/confidential and shall not communicate information derived there-from to any person other than a person to whom I/We have authorized to communicate the same or use the information in any manner prejudiced to the safety of OREDA/the State Govt.
8. I/We shall abide by all the laws prevailing at the time of the execution of the supply / installation and shall be responsible for making payments of all the taxes, duties, levies and other Govt. dues etc. to the appropriate Govt. departments.
9. The entire tender document has been discussed in the Board meeting and a resolution has been concurred for participation in the tender (copy enclosed)
10. We are not blacklisted / debarred / defaulted in any manner by any Central / State Government / Public Sector Undertaking in India.
11. In case any false documents submitted and found any time in future the firms shall be liable to be proceeded against as per prevailing laws.
12. Our state commercial tax / TIN registration no. is ________________________________ and CST registration No. ________________________________
   The PAN No. under the Income Tax Act is ________________________________ and GST Registration No. is ________________________________
13. I/We shall be responsible for the payment of the respective taxes to the appropriate authorities and should I/we fail to do so, I/we hereby authorize OREDA to recover the taxes due from us and deposit the same with the appropriate authorities on their demand.

Signature of bidder with stamp & date
**Letter of Authorization**

(to be submitted in the letter head of the bidder)

To,

Chief Executive
Odisha Renewable Energy Development Agency
S-59, MIE, Bhubaneswar-751010
Odisha

Sub: Design, Supply, Installation, Commissioning and Maintenance for a period of 5 years of Rooftop Solar PV Power Plants of different capacities

Ref: Tender Call Notice No. 433/OREDA, dt. 24-01-2020.

Sir,

I/we hereby authorise Ms. /Mr. ___________________ , Designation.....................................of our company to sign all relevant documents on behalf of the company/firm in dealing with the above tender. She / He is also authorized to attend all meetings and submit technical and commercial information as may be required by OREDA in the course of processing of the tender.

We further authorise Ms. /Mr. _______________ designation.................................. of our company to make technical presentation on behalf of the company.

Signature of the authorise persons

1. ______________________________Yours faithfully

   Head of the organization

   Name and designation of the attesting officer with stamp.
Annexure-J

DECLARATION

(To be submitted on the letter head of the company)

To,

The Chief Executive,
Odisha Renewable Energy Development Agency,
S-59, MIE, Bhubaneswar 751 010,
Odisha.

Sub:- Design, Supply, Installation, Commissioning and Maintenance for a period of 5 years of Rooftop Solar PV Power Plants of different capacities

Ref:- Tender call Notice No. 433 /OREDA, dt. 24-01-2020

Sir,

I/we hereby declare the following in the context of the aforementioned tender that:

a) The entire tender document has been discussed in the Board meeting and a resolution has been passed for participation in the tender (copy enclosed)

b) We are not involved in any litigation that may have an impact of affecting or compromising the delivery of services as required under this tender

c) We are not blacklisted / defaulted in any manner by any Central / State Government / Public Sector Undertaking in India.

d) In case any false documents submitted and found in future the firms shall be liable to be proceeded against as per prevailing laws.

Yours faithfully,

Authorised signatory

(Stamp).
Annexure-K

Certificate of Unconditional Acceptance of the tender

(to be submitted on the letter head of the company by Board Resolution)

We_____________________________________________________________
__ a prospective bidder for the work of “Design, Supply, Installation, Commissioning and Maintenance for a period of 5 years of Rooftop Solar PV Power Plants of different capacities” here by certify that we have carefully studied and understood the contents of the entire bid document hoisted on the website of OREDA as well as tenderwizard.com/OREDA on ____________ and hereby confirm our unconditional acceptance to each and every line of the said bid document.

Date:....................

(Signature)...................................................………………..

Place:.....................

(Printed Name)..........................................………………

(Designation)............................................

(Common Seal)................................................................
Annexure-L

Confirmation to Technical Specifications

(to be submitted on the letter head of the company)

Certified that we have carefully read and understood the technical specifications of the products and services to be provided under this tender and we hereby confirm our total adherence to the given technical specifications. The test certificates provided by us also base on the same technical specifications/parameters.

Date:....................

(Signature)...............................................................

Place:....................

(Printed Name)..........................................................

(Designation)..........................................................

(Common Seal)........................................................
Forwarding Letter
(To be submitted in the letter head of the applicant)

To,

The Chief Executive
Odisha Renewable Energy Development Agency (OREDA)
S.59. MIE, Bhubaneswar -751010
Odisha.

Sub:- Design, Supply, Installation, Commissioning and Maintenance for a period of 5 years of Rooftop Solar PV Power Plants of different capacities.

Sir,

Having studied the bid document carefully I/we, the undersigned, offer to submit our bid for Design, Supply, Installation, Commissioning and Maintenance for a period of 5 years of Grid connected Rooftop Solar Projects at various Government Buildings

I/We have also read the various provisions therein and confirm that the same are acceptable to us. We further declare that any additional conditions, variations, deviations, if any, shall not be given effect to. We further understand that any deficiency / illegibility in documents shall make our application liable for rejection.

I/we submit our application understanding fully well that
(a) The documents submitted along with our application are subject to verification by appropriate authorities.
(b) OREDA reserves the right to accept or reject any application without assigning any reasons thereof and shall not be held liable for any such action.
(c) Any genuine changes made by OREDA in the interest of the work with respect to the technical requirement during the course of project implementation will be acceptable.
(d) All acts, rules, regulations, norms and conditions of Govt of India and Govt of Odisha shall be applicable during the period of execution of project.

We hereby declare that all the information and statements made in this proposal are complete, true and correct and also accept that any misinterpretation contained in it may lead to our disqualification.

We hereby declare that our application has been submitted in good faith and the information contained is true and correct to the best of our knowledge and belief.

Yours faithfully,

Signature of bidder with seal
Annexure-N

General Guidelines for Installation and Maintenance of RE Systems under OREDA

Disclaimer

These guidelines meant for internal use of OREDA only. These guidelines are prescribed for installation and maintenance of RE systems installed by/under OREDA only. OREDA does neither recommend nor insist other organizations to follow these guidelines for installation or maintenance of RE systems installed by either by themselves or through any other organization other than OREDA. The Odisha Renewable Energy Development Agency (OREDA) reserves the right to modify, amend or supplement these guidelines whenever such necessity arises.

Though adequate care has been taken for preparation of these guidelines the installation and maintenance details prescribed in this document are not the only and absolute prescriptions. Depending upon the on-site conditions, the installation/maintenance technician shall take his/her own well judged decision while installing or maintaining a given RE system.

Though safety features have not been covered under these guidelines, Indian standard safety guidelines for construction work and electrical works must be followed by all involved in with installation and maintenance of RE systems under these guidelines.

Declaration

These guidelines will hereinafter be known as “General Guidelines for Installation and Maintenance of RE Systems under OREDA”

These guidelines shall be applicable to all distributed RE systems installed under the aegis of OREDA.

These guidelines shall be strictly followed by all vendors of OREDA.

These guidelines will also be strictly adhered to by all technicians and supervisory level officers of OREDA.

These guidelines will also constitute an integral part of all tenders of OREDA.

The scoring system prescribed in these guidelines shall be applicable to all vendors of OREDA executing projects on behalf of OREDA

Intent behind framing these guidelines
These guidelines have been framed solely with the intention of improving the installation standards of RE systems and to extend quality and timely maintenance services so as to minimize system downtime and guarantee customers’ satisfaction.

Context

Last few years have witnessed tremendous rise in the number of RE installation particularly in remote, un-served and underserved parts of the state. In view of absolute need of these installations to meet the basic requirements such as lighting, supply of drinking water, irrigating farm lands etc. it is imperative on the part of OREDA to ensure proper performance of the systems which largely depends on the quality of materials, standards of installation and the certainty and frequency of maintenance.

Ministry of New and Renewable Energy, GOI normally determines the quality and standards of the materials which are elaborately reiterated in the respective tenders documents.

Project specific installation procedures are often elaborated in the respective tender documents which the vendors are expected to follow meticulously. However, it has been observed that the vendors often do not adhere to these procedures which results in poor performance of the systems. To enable the vendors to follow the procedures meticulously a specific installation App has been developed by OREDA which will be shared with the vendors on their registered mobiles meant to be used by their designated Technicians. The App has been made in such a way that as a technician proceeds for installation of a certain system/device it opens up the step by step installation procedure for the given system/device which the technicians simply has to follow and upload pictures wherever camera buttons have been provided. As a technician completes installation the entire installation report along with pictures will be ready on his mobile for submission to OREDA.

Renewable Energy systems are known for their low maintenance needs. Often this is misconceived as “no-maintenance” which results in non-performance of such high value and efficient systems. Thus all RE systems must be maintained well. When it comes to RE systems particularly solar PV systems with battery storage, maintenance assumes paramount importance because non-charging or less charging of the batteries fast degrade the batteries rendering them totally unserviceable in a matter of few days. For example when the PV panel of a streetlight accumulates dust, moisture, moss etc. its power generating capacity reduces substantially resulting in low charging of the battery. On the other hand the consumption of power from the battery increases substantially under such circumstances as the panel senses early dusk and late dawn. This results in shortening the battery cycles and ultimately the life span of the battery which constitutes almost 40% of the cost of the system. Thus effective maintenance must focus on certainty and regularity.

Though the primary responsibility of maintenance of the systems has been vested in the concerned vendor the rising number unresolved service requests at the CRC calls for some serious organizational oversight. Moreover it is presumed that many customers are also not able to register their requests due to poor or no mobile connectivity, ignorance about CRC and its toll free number etc.
Keeping the above in view, OREDA during September 2018 introduced a Scheduled Maintenance Regime through its Customer Relationship Centre so as to introduce periodicity and certainty in the maintenance services being extended by the vendors. Like installation the scheduled maintenance has also been made mobile application based where the technician responsible for maintenance of the system can step by step follow the prescribed procedure for scheduled maintenance and upload pictures wherever camera buttons have been provided. At the end of the maintenance procedure a maintenance report can also be generated by the technicians.

This initiative is not only expected to increase the performance level of the installations but also greatly reduce service requests by customers.

**Objectives:**

The primary objectives of this new initiative are

1. Increase economic life span of installations.
2. Ensuring better performance of RE systems.
3. Higher returns on investments.
4. Higher customer satisfaction
5. Better acceptance of decentralised RE based power systems
6. Increased response to climate change mitigation.

**Stakeholders:**

Ensuring proper performance of RE installations calls for combined effort of all stakeholders such as Customers, Sponsors, PRIs, Vendors, Independent Service Organizations, OEMs and OREDA.

- **Customers:**
  Customers are the ultimate users and custodians of RE systems/devices. They are required to own the systems irrespective of the systems being privately owned by them or a public property installed inside their premises. They should be responsible for safety and security of the systems as well as day to day maintenance of the systems as prescribed in the users’ manual.

- **Sponsors**
  Sponsors are the Government Departments/Organizations sponsoring the schemes/programme under which the RE systems/devices are installed. Sponsors are responsible for availing and extending maintenance contracts and organizing funds for the same. Sponsors are to be kept informed about the
maintenance activities as well as emergent situations that call for material and financial resources.

c. **Panchayati Raj Institutions (PRIs)**

PRIs are supposed to be the ultimate owners of community assets such as drinking water supply systems, street lights etc. They are expected to properly register the community assets in their asset registers as well as apportion funds from their grants/income for repair and maintenance of the assets beyond the scheduled maintenance period.

d. **Vendors**

Vendors are primarily responsible for supply, installation and commissioning of the RE systems/devices. They are also responsible for effective maintenance of the systems for the first five years or as may be mentioned in the concerned tender. Vendors are required to extend scheduled maintenance services as well as on-call maintenance services to all systems installed by them. For extending such services smoothly they may establish their own service network or avail services of Independent Service Organizations. Vendors are also required to have back-to-back agreements with their OEMs for extending guarantee, warranty, supply of spares etc. Vendors shall work in close coordination with the customers, custodians, field units, respective technical divisions and CRC of OREDA in order to deliver effective maintenance services.

e. **Original Equipment Manufacturers (OEMs)**

The Manufacturers of original equipments used in RE systems/devices are important stakeholders as far as delivery of effective maintenance services are concerned. Without proper inventory of spares at their end for the entire period of maintenance and quick response to the need of spares at the project site it is almost impossible to deliver effective maintenance services on the part of the vendors. Hence OEMs must enter into tripartite agreements with vendors as well as OREDA with regards to adequacy and timely supply of spares. OREDA may also consider empanelling OEMs of important items such as pumps, invertors, CPUs etc.

f. **OREDA**

OREDA represented by its Technical Divisions, Field Units, CRC is the most important stakeholders in respects of

I. Managing processes and providing oversight
II. Establishing principles and parameters for extending maintenance services
III. Setting up performance parameters
IV. Monitoring, measuring and analysing stakeholders’ performance.
V. Working for performance improvement
VI. Identifying time bound and appropriate actions as well as working on the same

VII. Developing internal preparedness to repair, re-installing systems beyond the scope of the vendors.

VIII. Developing contingency resources and plans in force majeure situations.

IX. Recognizing and encouraging good performance

Process Flow:
The overall process of is hinged on three distinct sub processes. They are

1) On boarding the project
2) Installation & Commissioning of the systems
3) Creation of system IDs and linking to CRM
4) Managing the R&M.

The efficiency of maintenance is largely dependent on the quality and regularity of step 1,2&3.

The processes are as follows:

ONBOARDING:
On-boarding refers to creation of the project specific data base comprising of the following details. On boarding of each project is to be done by the concerned Division Head of OREDA.

a. Name of the scheme (Generic-Specific)
b. Name of the sponsors.
c. Details of sanction order indicating quantity, cost, locations etc.
d. Date of floating of tender
e. Date of finalization of tenders.
f. Vendor details (name, quantity of work awarded, total cost of the work, locations assigned)
g. Date of Issue of LOI
h. Details of survey report submitted by vendor in response to LOI
i. Details of project execution schedule submitted by vendor in response to LOI
j. Date of issue of firm work order vendor wise
k. Final date of completion of the project.

This would get populated onto the database in phases as the scheme progresses from conception to inception.

Once a scheme is on-boarded the details are to be intimated to CRC for creation of a new account.

PROJECT EXECUTION:

The vendor to whom a particular work has been assigned is responsible for execution of the project. As soon as a project is on-boarded with the above details the same
will appear on the dashboard of the concerned vendor(s). The vendor then has to assign the project to specific technician(s) having registered mobile phones on which the installation apps have been loaded.

The technician will then be able to see his/her assigned projects on the app provided having details such as name of the project, name of the customer, location details including GPS coordinates, capacity of the project etc. As the technician starts executing the project he/she has to upload the following details as and when it happens

a. Date of commencement
b. Details of all hardwares
c. Exact location of installation
d. Complete step by step installation details including picture as per the installation app.
e. Date of commissioning the project

This would get populated onto the database in phases as the scheme progresses from conception to inception.

SUPERVISION:

District Level:

As soon as the on-boarding is complete the Officer-in-charge of the District RE Cell can see the details on his dashboard. Similarly he can see the subsequent processes carried out at the vendor and technician levels. At any point of time as may be required the Officer-in-charge of the District RE Cell can undertake field visits and supervise the progress of the work, quality of work execution etc.

Once a project is commissioned the Officer-in-charge of District RE Cell can make necessary checks and upload the commissioning certificate on the App provided to him within a stipulated timeline.

HQR. Level

After getting the commissioning reports and necessary checks thereon the concerned division of OREDA will create the project/system ID after which the project/system will automatically get linked to the CRC which will mark the beginning of the processes at CRC such as Scheduled Maintenance and Corrective Maintenance.
R&M Management:

The R&M regime involves two types of efforts. The first is the **Scheduled Maintenance Activities**, which is done as a preventive action. It is expected that these periodic maintenances will drastically reduce the incidents of breakdowns. This should be done at some periodicity and in each case, a list of activities must be done. The second is the **Unscheduled Maintenance Activities** which are of corrective nature. This means when any breakdown/ malfunction is detected, the appropriate corrective action needed can be initiated.

Scheduled (Preventive) Maintenance:

- A **master maintenance schedule** is to be drawn up for the organization covering each installation.
• This will be done by stratifying the districts into District Clusters based on logistical convenience.

• Each Cluster will be broken down into three geographical patches (comprising of Blocks/ GPs) called as Maintenance Cluster to evenly distribute the ticket load across each month within that Maintenance Cluster.

• The CRMS, well before the schedule, will fire a flurry of emails and SMS to the Vendors notifying about the list of installations they must cover in each of the Clusters within that Month. A ticket for each installation in the list will be automatically generated. It may be noted that though the list is sent in one list, separate emails will be sent for each ticket on which communication/ transactions have to be made by the Vendor.

• It’s the responsibility of the Vendors to track each case through their authorised technicians and report compliance throughout the month as soon as they cover the installations.

• The technicians/ SPOC of the vendor must share the documents/ evidences required for the acceptance of resolution over e-mail in the same thread the ticket was raised. No resolution mail other than that thread will be accepted. The protocol of communication may get subsequently changed to improve operational efficiency.

• The CRC as soon as it receives the resolution mail, will cross verify the claim of resolution by the technicians and may close the ticket or return for rework.

• The CRMS at the end of the month will compute the performance of the ticket/ Vendor/ Scheme and release a score card.
Unscheduled (Corrective) Maintenance:

- Breakdown occurs at one of the installations.
- Customer calls the CRC to submit a service request.
- The agent at the CRC using the CRMS identifies the customer and registers a request called as a ticket.
- Automatically a set of e-mails are fired to the Vendor, its Technician, Administering Dept. of the Scheme and OREDA.
- The CRMS tracks each ticket and follows up each case over e-mail and voice calls.
- After the lapse of certain days, the CRMS auto escalates it to the Nodal Officer/ Scheme Officer for action.
- Vendor/ Technician resolves the ticket at the field and intimates the CRC about it through the designated communication channel as per the protocol.
- CRC cross-verifies it with the community/ customer and closes the ticket.
- CRMS measures the performance.
Repair and Maintenance Regime:

Scheduled Maintenance:
The schedule maintenance regime will focus on the vendor’s certainty and regularity of visit to the installations under him as his performance parameter. He is expected to comply with minimum of 90% visit against the Scheduled Tickets within that Service Month.

Activities under each category of Tickets:

The vendor is warranted to visit the installations and undertake a list of activities linked to that category of ticket. The ticket category can be of Quarterly, Half Yearly and Annual. To know the installation Class specific and ticket Category specific list of activities, kindly refer to Annexure – XXXX.

Time Limit:
- It’s expected that the vendor must complete the activities over the list of installations designated for that maintenance month within that calendar month itself.
- It may be noted that they can work on any day without any bias to the day being notified as holiday or otherwise.

Route/ Sequence:
- Each installation must be visited once in every quarter, half yearly and yearly for different categories of activities.
- To maintain a uniform gap between the visits every time, the vendor is expected to stick to an optimal sequence in a route.
- The number of routes that the vendor identifies depends on how big his list and how many technicians is to be deployed. [An example may be inserted]
- Care must be taken so that all installations not only are resolved within a month, but also are closed.

Score:
On successful completion of one ticket as per the service standard, the vendor will earn certain points, and for each default he will earn a negative score which is designed to be a deterrent. The scores are:

<table>
<thead>
<tr>
<th>Visits</th>
<th>Activity Types</th>
<th>Earnings</th>
<th>Penalties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit - 1</td>
<td>Q1</td>
<td>3</td>
<td>-9</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>3</td>
<td>-9</td>
</tr>
<tr>
<td>Visit - 2</td>
<td>H1</td>
<td>1</td>
<td>-3</td>
</tr>
<tr>
<td>Visit - 3</td>
<td>Q3</td>
<td>3</td>
<td>-9</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>3</td>
<td>-9</td>
</tr>
<tr>
<td></td>
<td>H2</td>
<td>1</td>
<td>-3</td>
</tr>
<tr>
<td>Visit - 4</td>
<td>A1</td>
<td>1</td>
<td>-3</td>
</tr>
</tbody>
</table>
Corrective Maintenance:

Service Standards:

While the Schedule Maintenance regime focuses on the vendor’s certainty and regularity of visit to the installation as his performance parameter, Corrective Maintenance Regime focuses on the Timeliness of the vendor to respond to a breakdown situation.

The vendor upon being notified of a breakdown situation shall have to complete his assessment within 2 days and complete the repair work within next 5 days. All (100%) tickets must be resolved within the time limit given above. If the scope of repair/replacement is found to be beyond the scope of Maintenance Contract (MC), then the vendor immediately after the field reconnaissance must report the same to the CRC.

- It is expected that at any point of time, none of the vendors would be having cases older than 7 days pending in their list.
- And, no vendor’s installations under a scheme should show ‘Non-Working’ status of more than 2% of the installations.

Methodology:

Corrective maintenance requires a different approach as against the scheduled maintenance methodology. While the scheduled maintenance is predictable, corrective maintenance requires case specific approach. The following are recommendations for most efficient methodology. But the vendors are free to adopt their own if they are complying to the time limit.

Reconnaissance:

Within 2 days of ticket date.

- When a request of service is registered, the vendor as the first response must organize collection of field level information about the nature of problem.
- Based on that feedback from the field, the vendor must decide the following;
  - The genuinity of the request,
  - If the requirement of repair is beyond the scope of his MC,
  - If it is within his scope, then, he must arrange labor, spares, materials needed for the repair and mobilize them to attend the breakdown at the spot.

This will help the vendor to resolve the request in one visit. This is more necessary as at times the villagers without ascertaining the owner of the installation, registers a request in the CRC, and, as there is the possibility of multiple installations in one village and the data matches, the ticket is raised against a working installation.

Repair:

Within 7 days of ticket date.
• The authorized technicians of the vendor must move to the location with the resources to undertake the repair.
• Upon completion of the repair the installations must be tested in the presence of the customer/ custodian.
• Requisite evidence and documentation must be completed by the technicians and immediate intimation need to be sent to the CRC.

How to handle repair beyond the scope of MC

• At the reconnaissance stage, when the vendor realises that the requirement is beyond the scope of MC, he must request for closure giving appropriate reasons.
• He must use the same communication channel as he would have used for resolution,
• The CRC then would take it off the Vendor list and transfer to the OREDA list.
• OREDA will take this matter up with their principals for resolution.

Score:

• Each vendor at the start will be given a Credit account of 8760 hrs (365 Days x 24 hrs) for each of the installation he is responsible for maintenance. That will be known as the ‘Total Achievable Uptime’.
• When a request for service gets registered at the CRC the clock is started from the next day. The day the Vendor responds to a ticket informing successful resolution, the Clock stops at that day.
• At the end of a period the time taken for each ticket for resolution, which is converted into hours get deducted from the ‘Total Attainable Uptime’ of that Ticket.
• And if the resolution time exceeds the set time of ‘7 Days’, the system will treat those additional days with twice the score.
• The system is so designed that the lesser the time taken to resolve, higher will be his Net Score. More he takes time to resolve; higher will be his penalty score which may erode his other good works.

Implementation:

Training and Orientation:
OREDA will conduct orientation and training sessions for the Vendors and their technicians

Helpdesk:
OREDA CRC will provide support to the field personnel of the vendors to acquaint themselves with various communication and process protocol.

Performance Evaluation:

The following paragraphs explain the way OREDA will evaluate both the performances and how it will turn it into a composite score of performance. The Scheduled Maintenance activities have been given primacy over the Corrective Maintenance activities. While the
Scheduled Maintenance is given 80% weightage in the composite score, Corrective Maintenance is given 20%.

**Computation of performance**
Examples from the shared Excel sheets may be incorporated.

**Rewards and Recognitions**

OREDA will do everything under its might to support good performance of the vendors as achieving very high uptime of its installation and good customer relationship is its prime organizational focus. It also will weed out non-performing vendors by penalising them for their bad performance and blacklisting them for good.

OREDA will:

- Give preference to the high performing vendors in the upcoming tenders.
- Institute Awards and Recognition during important days of OREDA
- Recover Liquidated Damages in shape of penalties
- Blacklist vendors whose past performances are not at all good
**Sample Price Bid Format (Package-1,2,3,4,5)**

This is a sample price bid format.

Maintenance cost will be calculated @ 10% of the Supply and Installation cost.

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Particulars*</th>
<th>Price in INR per KW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Design &amp; Supply of equipment for Package-___ as per the technical specification and scope given in the tender.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Cost of Installation and commissioning of the system</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Cost</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Quoted Price should be exclusive of Taxes. GST shall be levied based on Applicable rates*
## Annexure-Q

### Details of Project Location

#### Project Location (Package-1)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the District</th>
<th>Name of the block</th>
<th>Name of the Fish Farm</th>
<th>Capacity of Plant (KW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Balasore</td>
<td>Sadar Balasore</td>
<td>Dighirahania</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Baragarh</td>
<td>Bhatli</td>
<td>Pipalmunda</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Boudh</td>
<td>Sadar Boudh</td>
<td>Boudha</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Gajapati</td>
<td>Gosani</td>
<td>Parlakhemundi</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Ganjam</td>
<td>Digapahandi</td>
<td>Digapahandi</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Jajpur</td>
<td>Barchana</td>
<td>Kalkala</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Kalahandi</td>
<td>M. Rampur</td>
<td>M.Rampur</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Kalahandi</td>
<td>Golamunda</td>
<td>Golamunda</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Keonjhar</td>
<td>Sadar Keonjhar</td>
<td>Digdan</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Keonjhar</td>
<td>Patana</td>
<td>Musakhor</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>Koraput</td>
<td>Jeypore</td>
<td>Jeypore</td>
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</tr>
<tr>
<td>12</td>
<td>Malkangiri</td>
<td>Sadar Malkangiri</td>
<td>Malkangiri</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>Mayurbhanj</td>
<td>Baripada</td>
<td>Kathapala</td>
<td>3</td>
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<tr>
<td>14</td>
<td>Mayurbhanj</td>
<td>Baripada</td>
<td>Bajor</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>Nawarangpur</td>
<td>Nabarangpur</td>
<td>Nabarangpur</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>Puri</td>
<td>Pipili</td>
<td>Kausalayaganga</td>
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</tr>
<tr>
<td>17</td>
<td>Sambalpur</td>
<td>Kunchinda</td>
<td>Kuchinda</td>
<td>3</td>
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<tr>
<td>18</td>
<td>Sambalpur</td>
<td>Rengali</td>
<td>Bamaloi</td>
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<tr>
<td>19</td>
<td>Subarnapur</td>
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<td>Subarnapur</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
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<td>Sundargarh</td>
<td>3</td>
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<td></td>
<td></td>
<td></td>
<td><strong>Total</strong></td>
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</tbody>
</table>

#### Project Location (Package-2)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the District</th>
<th>Name of the Handloom Cluster</th>
<th>Capacity of Plant (KW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bargarh</td>
<td>Bargarh dyeing unit</td>
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</table>
### Project Location (Package-3)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the District</th>
<th>Name of the Handloom Cluster</th>
<th>Capacity of Plant (KW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nuapatna, Cuttack</td>
<td>Rakshaya SHG, Tigiria</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Khandua Handloom Complex</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Nuapatna Tie &amp; Dye WCS</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Satyabhama ECP WCS</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Sri Durga Mahila WCS</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Utkal ECP WCS</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Maa Tarini Mahila ECP WCS</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Madanmohan WCS, Tigiria</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Shree Jagannath WCS</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Kalyanimayee WCS, Tigiria</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Maa Dakhineswari WCS, Badasahi</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>Nuapatna No. 1 WCS</td>
<td>5</td>
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<tr>
<td>13</td>
<td></td>
<td>Nuapatna No. 2 WCS</td>
<td>5</td>
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<tr>
<td></td>
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</table>

### Project Location (Package-4)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the District</th>
<th>Name of the Handloom Cluster</th>
<th>Capacity of Plant (KW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jhilminda, Bargarh</td>
<td>Sambalpuri Bastralaya</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Traditional Weavers SHG</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
</tr>
</tbody>
</table>

### Project Location (Package-5)

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Name of the District</th>
<th>Name of the Handloom Cluster</th>
<th>Capacity of Plant (KW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kotpad, Koraput</td>
<td>Kotpad WCS, Mirgam Street, Kotpad</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Dongriguda WCS, Kotpad</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
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