

BID DOCUMENT
(NIB No. REIL/RE/2019-20/SPV/PP/3.6MWP/14)

FOR

NIB for Design, Engineering, Supply, Construction, Erection, Testing, Commissioning and 10 Years O&M of 3.6 MWp Grid Connected Rooftop Solar PV Projects in Mandideep, Bhopal (Madhya Pradesh)

ISSUED BY



RAJASTHAN ELECTRONICS & INSTRUMENTS LTD.
(A "Mini Ratna" Central Public Sector Enterprise)
2, Kanakpura Industrial Area, Sirsi Road, JAIPUR – 302 034
T. No. 0141-2470531/2470908/2470363, Fax – 0141-2470139
Website: www.reiljp.com

INDEX

PART	CONTENT	PAGE
PART-I		
NIB	BID INVITATION	3
SECTION-I	INSTRUCTION TO BIDDERS	4-5
SECTION-II	ELIGIBILITY AND OTHER CONDITIONS	6-8
SECTION-III	GENERAL CONDITIONS OF CONTRACT	9-17
SECTION-IV	SCOPE OF WORK & TECHNICAL SPECIFICATIONS	18-43
SECTION-V	PAYMENT TERMS & OTHERS CONDITIONS	44-48
SECTION-VI	PROPOSED LOCATION	49
SECTION-VII	SAMPLE FORMAT - EMD	50-54
PART-II		
ANNEXURE (BOQ)	PRICE BID	SEPERATE

RAJASTHAN ELECTRONICS & INSTRUMENTS LTD.
2, Kanakpura Industrial Area, Sirsi Road, JAIPUR – 302 034
T. No. 0141-2470531/2470908/2470363, Fax –0141-2470139
Website: www.reiljp.com

NOTICE INVITING BID
(NIB No. REIL/RE/2019-20/SPV/PP/3.6MWP/14)

Rajasthan Electronics & Instruments Limited (REIL), Jaipur invites sealed bids, from interested bidders for Design, Engineering, Supply, Construction, Erection, Testing, Commissioning and 10 Years O&M of 3.6 MWp Grid Connected Rooftop Solar PV Projects in Mandideep, Bhopal (Madhya Pradesh). The Solar PV modules & Inverters for 3.6 MWp will be supplied by REIL at site.

The bid shall comprise of technical bid and commercial Bid. The detailed scope of work, terms and conditions etc. are available with the Bid documents.

The bids must also be accompanied with Earnest Money of Rs. 13.50 Lacs (Rupees Thirteen Lac Fifty Thousand only) in form of crossed Demand Draft / FDR / Bank Guarantee in favour of “**Rajasthan Electronics & Instruments Limited, Payable at Jaipur**”. The Bank Guarantee should be issued by any scheduled Bank and valid for 180 days.

The details for Bid are as follows.

S. No.	Item	Description
1	Last date for submission of Online Bid	24.03.2020 (15:00 hrs)
2	Earnest Money	Rs. 13,50,000/- only
3	Opening of technical Bid	25.03.2020 (15:00 hrs)
4	Opening of Commercial Bid	To be informed later to successful bidders in the technical bid
5	Last date for submission of Hard copy of tender documents	24.03.2020 (15:00 hrs)
6	Address for Submission of Bid, and Opening of Bids	Dy. General Manager (MM), Rajasthan Electronics & Instruments Limited, 2, Kanakpura Industrial Area, Sirsi Road, JAIPUR – 302 034

REIL reserves the right to reject the whole or part of any or all bids received, without assigning any reason.

Dy. General Manager (MM)

SECTION-I

INSTRUCTION TO BIDDERS

1. The Bid forms containing the Terms and Conditions, the Tender and the Schedule of contract, should be returned in original along with the technical bid document, intact, after filling up the same and duly signing in full with stamp, on each page, failing which the tender shall be liable for rejection. In the event of the space on the Schedule of contract / specifications of items/proforma being insufficient for the required purpose, additional pages may be added. Each such additional page must be numbered consecutively, bearing the Tender Number and be duly signed and stamped by the bidder. In such cases, reference to the additional pages must be made in the Tender Form. If any modification of the schedule is considered necessary, you should communicate the same by means of separate letter sent along with the Tender.

2. PROCEDURE FOR SUBMISSION OF TENDERS / BIDS:

I. The tender should be submitted in 'TWO BID' SYSTEM:-

1) PART-1 TECHNICAL BID:

Technical Bid along with all requisite documents and complete tender documents (duly sign and seal on each page) to be uploaded in the e-tender portal. Technical Bid to be opened by the REIL committee.

2) PART-II FINANCIAL BID:

Price Bid BOQ given with tender is to be uploaded strictly as per the format available with the tender failing which the offer is liable for rejection (renaming or changing format of BOQ sheet will not be accepted by the system).

The EMD, Tender Fee and Power of Attorney to be kept in a sealed envelope super-scribed with **"IFB for Design, Engineering, Supply, Construction, Erection, Testing, Commissioning and 10 Years O&M of 3.6 MWp Grid Connected Rooftop Solar PV Projects in Mandideep, Bhopal (Madhya Pradesh).**

The cover should also be sealed and addressed to following address:

**Dy. General Manager (MM),
Rajasthan Electronics & Instruments Ltd.,
2 Kanakpura Industrial Area, Sirsi Road, Jaipur- 302034.**

Tenders submitted without the 'Two Bid' System procedure will be rejected.

Note: e-Procurement system does not allow submission of documents after due date of tender. Incomplete form or non-submission of required documents may results into rejection of your offer and no Communication shall be done for submission of documents.

3) LATEST HOUR FOR RECEIPT OF THE TENDER:

Your tender must reach this office not later than the date and time notified in the Tender Notice stated In the TENDER DOCUMENT. Any tender received after that shall be rejected. In the event of the stipulated date of opening of the tender being declared a closed holiday for Govt. offices, the date of opening of the tender(s) will be the next working day. Tender sent by hand delivery, should be delivered at this office not later than the due date and time stipulated in the schedule of tender.

4) OPENING OF TENDER:

The **Price/Financial bids** of the bidders whose technical bids are found technically suitable only will be opened later. **The decision of the evaluation committee on technical suitability shall be final.**

5) **PRICES:**

- a. Prices/Financial bid are to be quoted in Indian Rupees and must be meaningful and measurable in the context.
- b. Bidders should clearly specify whether prices quoted are inclusive of GST/duties/ statutory charges or such charges as extra. Where no specific mention GST or other duties quoted shall be deemed to be inclusive of such taxes / charges.
- c. Price must be quoted in original sheet of BOQ failing which the same is liable to be rejected.
- d. Allocation of work may be distributed on L1 price.

- 6) **Security Deposit:** EMD of successful bidders will be adjusted against security deposit and shall be refunded after successful installation-commissioning and O&M of the project.

7) **EARNEST MONEY**

1. The tender must be accompanied by a sum of Rs. 13,50,000/- (Rupee Thirteen Lacs Fifty Thousand only) i.e 2.5% for works estimated to cost up to Rs. 5.40 Crore as Earnest Money in the form of deposit receipts, pay orders, demand drafts or Bank Guarantee failing which the tender shall be summarily rejected. These forms of earnest money could be either of the Punjab National Bank or of any of the Nationalized Banks or by a scheduled bank.
2. Bank Guarantee should be valid for a period 06 month from the date of bid submission.

8) **Performance Bank Guarantee:**

- i. The contractor shall furnish 5% Performance Bank Guarantee (Performance Security) of contract value within Fifteen (15) days from the date of issue of Letter of Award (LOA). This performance security may be accepted in the form of Bank Guarantee and should be valid for a period of 60 days beyond the date of completion of all contractual obligations.
- ii. It may be noted that the Performance Guarantee Test at the time of commissioning and the annual CUF shall be calculated on individual project basis. REIL shall reject the Project where the Performance Guarantee Test / Demonstration Test is failed at the time of commissioning i.e. failure to achieve Day CUF of 15% adjusted to seasonal factor as mentioned in EPC agreement or failure to achieve Performance Ratio of 75% and shall recover the payment already made by encashing the EPC PBG and Annual CUF PBG. If the Project fails to achieve the annual CUF of 15% by upto 1% at the end of 1st operational year, the LD shall be recovered at the rate of Rs. 32.34 per kWh for the shortfall of energy from the energy corresponding to 15% CUF by encashing the EPC PBG and Annual CUF PBG. If the annual CUF of the project at the end of 1st operational year is between 12% to 14% then the LD shall be recovered at the rate of Rs. 40.00 per kWh for the entire shortfall in energy from the energy corresponding to 15% CUF by encashing the EPC PBG and Annual CUF PBG. If the annual CUF of the project at the end of 1st operational year is less than 12%, the project shall be rejected and then the LD shall be recovered by encashing the EPC PBG and Annual CUF PBG.

- 9) **Size of the Projects:** There are around 55 sites having capacity ranging from less than 10 kW to more than 500 kW. Details of the same shall be provided by REIL. The maximum capacity of each RTS project shall be limited to capacity as mentioned in the RTS Policy of Madhya Pradesh. Each RTS Project shall be separately connected with the grid and shall have separate meters at delivery point.

- 10) **Maximum allowable Project Cost (including 10 years O&M) shall not exceed INR One Crore Fifty Lakhs per MW (INR 1,50,00,000/- only per MW) including GST. Any price higher than maximum allowable EPC Cost shall be out rightly rejected and the bid security shall be returned.**

SECTION-II

ELIGIBILITY CONDITIONS:

ELIGIBILITY CRITERIA GENERAL

The Bidder should be a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto, Government owned Enterprises barring Government Department and barring those firms with whom business is banned by the Employer. A copy of certificate of incorporation shall be furnished along with the bid in support of above.

A. TECHNICAL ELIGIBILITY CRITERIA:

The Bidder should have designed, supplied, erected/supervised erection & commissioned/supervised commissioning of grid connected Roof Top Solar Photo Voltaic (RTS PV) Power Project of cumulative installed capacity of 02 MWp or higher, out of which at least one plant should have been of 75 kWp or higher capacity at a single location. The aforesaid installed capacity should have been successfully commissioned within a period of Five years reckoned prior to six months before the date of Bid Opening. The reference plant of 75 kWp or higher capacity must have been in successful operation for at least continuous six (6) months during the period of last 5 years and 6 months prior to the date of Bid Opening.

Notes:

- a) The list of projects commissioned at least 6 months prior to date of Bid Opening, indicating whether the project is grid connected, along with a copy of the Commissioning certificate, Operation Certificate and Work order / Contract Agreement/ Purchase Order from the Client / Owner shall be submitted in support of meeting Technical Eligibility Criteria.
- b) The reference RTS PV Project of 75 KWp or above capacity designed, supplied, erected & commissioned by Bidder can be for itself or any other client.
- c) In case the bidder has executed the project for its own group company/special purpose vehicle, Bidder shall, in addition, obtain a certificate from DISCOM/power procurement agency for commissioning date.

B. FINANCIAL ELIGIBILITY CRITERIA:

- (a) The Minimum Average Annual Turnover (MAAT) of the bidder in the last three financial years (i.e. FY 2016-2017, 2017-2018 and 2018-2019) should be INR 10 Crores. This must be the individual Company's average annual turnover and not that of any group of Companies. A summarized sheet of annual turnover certified by registered CA should be compulsorily enclosed along with corresponding annual accounts.
- (b) The Net worth of the Bidder should be minimum INR One 1 Crore and shall not be less than 100% (hundred percent) of the Bidder's paid up share capital as on the last day of the preceding financial year.

The Bidder shall attach copies of the balance sheets, financial statements and Annual Reports for the preceding 3 (three) completed financial years as on the Technical Bid Opening date. The financial statements shall:

1. reflect the financial situation of the Bidder;
 2. be audited by a statutory auditor;
 3. be complete, including all notes to the financial statements; and
 4. correspond to accounting periods already completed and audited
- (c) No bidding consortium or Joint Venture is allowed to participate in this bidding.

NOTES:

- (i) Net worth shall mean the sum total of the paid up share capital and free reserves. Free reserve means all reserves credited out of the profits and share premium account but does not include reserves credited out of the revaluation of the assets, write back of depreciation provision and amalgamation. Further any debit balance of Profit and Loss account and miscellaneous expenses to the extent not adjusted or written off, if any, shall be reduced from reserves and surplus.
- (ii) Other income shall not be considered for arriving at annual turnover.
- (iii) "Holding Company" and "Subsidiary Company" shall have the meaning ascribed to them as per Companies Act of India.
- (iv) The Bidder shall provide an Auditor's Certificate specifying the net worth of the Bidder and also specifying the methodology adopted for calculating such net worth.

Bidder should submit following documents along with Technical bid:-

1. Certificate of Incorporation.
2. Bankers Report.
3. Audited Balance sheet for last three years (i.e. 2016-17, 2017-18, 2018-19).
4. Turnover and net worth value duly certified by CA.
5. Photocopy of the last Three years Income Tax Return.
6. Experience in Installation, Commissioning and maintenance of SPV Power Plant Systems as per requirement in tender. (attached verified documents such as I&C and maintenance certificate)
7. Photocopy of GST/service tax registration No., TIN no., PAN no.
8. EMD.
9. Declaration that firm is not blacklisted by any government department/ PSU.
10. Any other relevant documents

C) OTHER CONDITIONS:

- a) **Responsibility for executing Contract:** The contractor is to be entirely responsible for the Execution of the contract in all respects in accordance with the terms and conditions as specified in the acceptance of tender.
- b) The contractor shall not sublet transfer or assign the contract to any part thereof without the written permission of the General Manager (RE). In the event of the contractor contravening this condition, General Manager(RE) be entitled to place the contract elsewhere on the contractors account at his risk and the contractor shall be liable for any loss or damage, which the General Manager(RE), may sustain in consequence or arising out of such replacing of the contract.
- c) **Document:** The bidder should have a valid **PAN / TAN /GST No. & other statutory document as applicable** and produce attested copies of such certificates along with the tender papers in Technical Bid, failing which the tender is liable to be rejected.
- d) **Right to accept / reject:** REIL reserves the right to reject any or all tender without assigning any reason whatsoever. Also, the REIL authority reserves the right to **award** any or part or full contract to any successful agency at its discretion and this will be binding on the bidder.
- e) The capacity of the SPV Power Plants shown in the tender can be increased or decreased to any extent depending upon the actual requirement.
- f) **Assistance to contractor:** The contractor shall not be entitled for assistance either, in the procurement of raw materials required for the fulfillment of the contract or in the securing of transport facilities.

D. Electrical Contractor License:

- The work shall be carried out by the contractor, having valid Electrical Contractor License for carrying out installation work under the direct supervision of the persons holding valid certificates of competency issued by the Central / State Government.
- The successful BIDDER shall furnish the names and particulars of the certificate of competency of supervisor and workmen to be engaged for carrying out this work.

SECTION-III

GENERAL CONDITIONS OF CONTRACT

1. PROJECT COST:

- 1.1. The Project cost shall include all the costs related to above Scope of Work including but not limited to contingent and incidental expenses and escalations. Bidder shall quote the price bid in Schedule 1,2,3 and 4 that covers all the obligations mentioned in the Bidding Documents in respect of but not limited to Feasibility, Assessment, Design, Supply, Erection, Testing and Commissioning including Warranty, goods and services including spares required if any during O&M period. The bidder shall arrange construction power, water and all related required during installation, commissioning and O&M of the plant. The Bidder has to take all permits, approvals and licenses, Insurance till the completion of 10 years of O&M etc., provide training and such other items and services required to complete the scope of work mentioned above. Bidder shall quote the price bid in Schedule 5 that covers Operation and Maintenance Charges.
- 1.2. The Project cost quoted for CAPEX projects is on lump sum turnkey basis and the bidder is responsible for the total Scope of work.
- 1.3. The Project Cost shall remain firm and fixed and shall be binding on the Successful Bidder till completion of work irrespective of his actual cost of execution of the project. No escalation will be granted on any reason whatsoever. The bidder shall not be entitled to claim any additional charges, even though it may be necessary to extend the completion period for any reasons whatsoever.
- 1.4. The Project Cost shall be inclusive of all duties and taxes, insurance etc. The prices quoted by the firm shall be complete in all respect and no price variation /adjustment shall be payable by REIL.
- 1.5. The Operation & Maintenance of Solar Photovoltaic Power Plant would include wear, tear, overhauling, machine breakdown, insurance, and replacement of defective modules, invertors / Power Conditioning Unit (PCU), spares, consumables & other parts for a period of 10 (Ten) years.

2. INSURANCE

- 2.1 The Bidder shall be responsible and take an all comprehensive risk covered Insurance Policy for transit-cum-storage-cum- erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The Bidder shall also take appropriate insurance including watch and ward during O&M period.
- 2.2 Project damage from natural disasters like earthquake, fire, wind storms as well as theft shall be mitigated through purchase of comprehensive insurance policy by the Bidder.
- 2.3 The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/material/equipment/properties during execution of the Contract till the completion of O&M Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of Bidder.
- 2.4 The insurance to be taken by the Bidder shall gave due stipulations providing for the assignment of the benefits under the Policies to REIL/NVVN or any person designated by REIL/NVVN.

3. WARRANTIES AND GUARANTEES

The Bidder shall warrant that the goods supplied under this contract are new, unused, of the most recent or latest technology and incorporate all recent improvements in design and materials. The bidder shall provide warranty covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of 10 years from the date of commissioning of the projects. The successful bidder has to transfer all the Guarantees/ Warrantees of the different components to the owner of the project. The responsibility of operation of Warrantee and Guarantee clauses and Claims/ Settlement of issues arising out of said clauses shall be responsibility of the Successful bidder and REIL/NVVN will not be responsible in any way for any claims whatsoever on account of the above.

4. TYPE AND QUALITY OF MATERIALS AND WORKMANSHIP

- 4.1 The design, engineering, manufacture, supply, installation, testing and performance of the equipment shall be in accordance with latest appropriate IEC/ Indian Standards as detailed in the (Technical specifications) of the bid document. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE shall be used.
- 4.2 The specifications of the components should meet the technical specifications mentioned in bid document.
- 4.3 Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant.

5. OPERATION & MAINTENANCE (O & M) GUIDELINES TO BE MANDATORILY FOLLOWED BY BIDDERS

- 5.1 The bidder shall be responsible for all the required activities for successful operation and maintenance of the Rooftop Solar PV system for a period of 10 years from the date of commissioning of the plant for projects under CAPEX Model.
- 5.2 The bidder shall follow below mentioned guidelines. In addition, O & M practices shall be strictly followed as per requirement.
 - a. O&M of Solar Power Plant shall be compliant with grid requirements to achieve committed energy generation.
 - b. Deputation of qualified and experienced engineer/ technicians till the O&M period at project site.
 - c. Periodic cleaning of solar modules. The modules shall be cleaned with a periodic interval of 15 days or as and when required as per actual site conditions. It's the responsibility of the bidder to get the modules cleaned during O & M Period. Roof Top Owner is responsible for such obligation of bidder so as to achieve guaranteed CUF.
 - d. Periodic checks of the Modules, PCUs and BoS shall be carried out as a part of routine preventive and breakdown maintenance.
 - e. Immediate replacement of defective equipment as and when required.
 - f. Supply of all spares, consumables and fixtures as required. Such stock shall be maintained for all associated equipments and materials as per manufacturer's / supplier's recommendations.
 - g. All the testing instruments required for Testing, Commissioning and O&M for the healthy operation of the Plant shall be maintained by the Bidder. The testing equipments must be calibrated once in a year from NABL accredited labs and the certificate of calibration must be kept for reference as required.

- h. If negligence/ mal-operation on part of the Bidder's operator results in failure of equipment, such equipment should be repaired/ replaced by the Bidder free of cost.
- i. Co-ordination with Power Procurer for realization of bills. Remote monitoring of the generation of Solar Power shall be done through appropriate apps which shall be provided by Bidder. Provision for mobile app based display shall be made for all the data display with a provision to interact with the REIL / NVVN and Nodal Agency and other state holders to raise requests / issues and sending emergency messages. Billing and reconciliation software shall be provided by the bidder with integration with Project data for easy preparation and sending of bills and subsequent record of payment receipts. The invoice shall be based on the automated generated meter reading recorded on metering date. Metering date shall mean the first business day of every month and reading shall be taken at 1200 Hrs. In parallel to remote monitoring, the daily meter reading to be taken at 1200 Hrs. In case of failure of automated system the person in charge present at site from Bidder's side shall take a Joint Meter Reading in presence of Power Procurer on daily basis and submit the JMR on 1st business day of month.
- j. Online Performance Monitoring, controlling, troubleshooting, maintaining of logs & records. A maintenance record register is to be maintained by the operator with effect from Commissioning to record the daily generation, regular maintenance work carried out as well as any preventive and breakdown maintenance along with the date of maintenance, reasons for the breakdown, duration of the breakdown, steps taken to attend the breakdown, etc.
- k. For any issues related to operation & maintenance, a telephone number shall be made available to the rooftop owner/ plant owner to resolve within 72 hours. If not attended within such stipulated time, a complaint may be raised to REIL/NVVN by Power Procurer, pursuant to which, a penalty of Rs.10,000 shall be imposed, which shall be recovered from bidder.
- l. If any jobs covered in O&M Scope as per IFB are not carried out by the Bidder/ Bidders during the O&M period, the Engineer-In-Charge shall take appropriate action as deemed fit. REIL/NVVN reserves the right to make surprise checks/ inspection visits at its own or through authorized representative to verify the O&M activities being carried out by the Bidder. Failure to adhere to above guidelines will result in penal action including debarring from participation in next tender.

6. METERING AND GRID CONNECTIVITY:

Metering and grid connectivity of the roof top solar PV system would be the responsibility of the Bidder in accordance with the prevailing guidelines of the concerned DISCOM and / or CEA (if available by the time of implementation). REIL / NVVN could facilitate connectivity; however, the entire responsibility lies with bidder only. Metering shall be done at inverter output.

7. PLANT PERFORMANCE EVALUATION

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the commissioning and O&M period. PR should be shown minimum of 75% at the time of inspection for initial commissioning acceptance. If the PR is less than 75%, the project shall not be accepted by REIL and REIL may extend an option to bidder(s) for re demonstration of Performance Parameters after due rectification at its sole discretion. Rectification has to be done by the bidder to achieve PR 75%, within the stipulated

timeline, failing which the project shall be rejected and the recovery of payment already made shall be done by encashing EPC PBG and Annual CUF PBG.

8. PROGRESS REPORT

The bidder shall submit the progress report monthly to REIL. REIL will have the right to depute it's representatives to ascertain the progress of contract at the premises of works of the bidder.

9. Submission of Project Completion Report (PCR)

The bidder shall submit the Project Completion Report (both in editable soft copy and signed hard copy) after commissioning of the project as per the Scope of IFB to REIL as per the Format to be provided by REIL/NVVN. Non-submission of the report shall be considered as "Breach of Contract" and shall attract punitive actions as per the relevant provisions of the Contract including non-release of Incentive. However, the decision of Engineer - in - charge shall be final in this regard.

10. Submission of O & M Report (OMR)

The bidder shall submit the Monthly O&M Report mandatorily to REIL as per the Format enclosed to be provided by REIL/NVVN. Non-submission of the report shall be considered as "Breach of Contract" and shall attract punitive actions as per the relevant provisions of the Contract including non-release of Incentive. However, the decision of Engineer - in - charge shall be final in this regard.

11. PROJECT INSPECTION

The project progress will be monitored by REIL/NVVN and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from Nodal Agency, Discoms, NVVN, REIL or any agency/ experts designated / authorised by REIL/NVVN from time to time. Third party verification, monitoring of system installed to oversee, the implementation as per required standards and also to visit the manufacturer's facilities to check the quality of products as well as to visit the system integrators to assess their technical capabilities as and when required may be done by NVVN or any agency/ experts designated / authorised by NVVN . The cost of Inspection shall be borne by NVVN. The projects shall be inspected at any time during commissioning or after the completion of the project(s) as follows:

Inspection shall be carried out by Inspecting officer(s) nominated by NVVN, NVVN officials, or from the officials of following listed agencies/bodies

- d) Govt./NABL accredited agencies/Labs,
- e) NISE,
- f) CPRI,
- g) DNV Climate Change Services AS (DNV)
- h) TUV SUD South Asia Private Limited (TUV SUD)
- i) Bureau Veritas Certification Holding SAS (BVCH)
- j) TUV Rheinland (China) Ltd. (TUV Rheinland)
- k) TUV NORD CERT GmbH (TUV NORD)
- l) Any other agencies/bodies to be notified by NVVN on time to time.

12. APPLICABLE LAW

The Contract shall be interpreted in accordance with the laws of the Union of India and the competent courts at Jaipur, Rajasthan.

13. SETTLEMENT OF DISPUTE

If any dispute of any kind whatsoever arises between REIL and Bidder in connection with or arising out of the contract including without prejudice to the generality of the foregoing, any question regarding the existence, validity or termination, the parties shall seek to resolve any such dispute or difference by mutual consent. .

If the parties fail to resolve, such a dispute or difference by mutual consent, within 30 days of its arising, then the dispute shall be referred by either party by giving notice to the other party in writing of its intention to refer to arbitration as hereafter provided regarding matter under dispute. No arbitration proceedings will commence unless such notice is given. Any dispute in respect of which a notice of intention to commence arbitration has been given in accordance with Sub Clause either 13.1 or 13.2, shall be finally settled by arbitration.

13.1 In case the Bidder is a Public Sector Enterprise or a government department:

In case the Bidder is a Public Sector Enterprise or a Government Department, the dispute shall be referred for resolution in Permanent Machinery for Arbitration (PMA) of the Department of Public Enterprise, Government of India. Such dispute or difference shall be referred by either party for Arbitration to the sole Arbitrator in the Department of Public Enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law & Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary / Additional Secretary, when so authorized by the Law Secretary, whose decision shall bind the Parties finally and conclusive. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.

13.2 In all other cases

- a) In all other cases, any dispute submitted by a party to arbitration shall be heard by an arbitration panel comprising of three arbitrators, in accordance with the provisions set forth below:
- b) REIL and the Bidder shall each appoint one arbitrator, and these two arbitrators shall jointly appoint a third arbitrator, who shall chair the arbitration panel. If the two arbitrators do not succeed in appointing a third arbitrator within Thirty (30) days after the later of the two arbitrators has been appointed, the third arbitrator shall, at the request of either party, be appointed by the Appointing Authority for third arbitrator which shall be the President, Institution of Engineers.
- c) If one party fails to appoint its arbitrator within thirty (30) days after the other party has named its arbitrator, the party which has named an arbitrator may request the Appointing Authority to appoint the second arbitrator.
- d) If for any reason an arbitrator is unable to perform its function for a period of 45 days or more, the mandate of the Arbitrator shall terminate in accordance with the provisions of applicable laws as mentioned in Clause 18 (Governing Law) and a substitute shall be appointed in the same manner as the original arbitrator.
- e) Arbitration proceedings shall be conducted with The Arbitration and Conciliation Act, 1996. The venue or arbitration shall be Jaipur, Rajasthan.

- f) The decision of a majority of the arbitrators (or of the third arbitrator chairing the arbitration panel, if there is no such majority) shall be final and binding and shall be enforceable in any court of competent jurisdiction as decree of the court. The parties thereby waive any objections to or claims of immunity from such enforcement.
- g) The arbitrator(s) shall give reasoned award. Notwithstanding any reference to the arbitration herein, the parties shall continue to perform their respective obligations under the Agreement unless they otherwise agree.
- h) Cost of arbitration shall be equally shared between the Bidder and REIL.

14. FORCE MAJEURE

For purpose of this clause, "Force Majeure" means an event beyond the control of the Bidder and not involving the Bidder's fault or negligence and not foreseeable, either in its sovereign or contractual capacity. Such events may include but are not restricted to Acts of God, wars or revolutions, fires, floods, epidemics, quarantine restrictions and fright embargoes etc. Whether a "Force majeure" situation exists or not, shall be decided by REIL and its decision shall be final and binding on the Bidder and all other concerned.

- a). "Force Majeure" shall mean any event beyond the reasonable control of the REIL or of the Bidder, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:
 - I. Act of God, including, but not limited to lightning, drought, fire and explosion (to the extent originating from a source external to the site), earthquake, volcanic eruption, landslide, flood, cyclone, typhoon or tornado, act of war, terrorist attack, public disorders, civil disturbances, riots, insurrection, sabotage, rebellion, blockade, embargo ;
 - II. A Force Majeure Event shall not be based on the Economic hardship of either Party. In case of any damage because of force majeure event, the Project shall be repaired / commissioned at its own cost by the Bidder.
 - III. the unlawful, unreasonable or discriminatory revocation of, or refusal to renew, any Consent required by the Bidder for the development/ operation of the Project, provided that an appropriate court of law declares the revocation or refusal to be unlawful, unreasonable and discriminatory and strikes the same down.
 - IV. Industry wide strikes and labour disturbances having a nationwide impact in India.
 - V. Radioactive contamination or ionising radiation originating from a source in India or resulting from another Force Majeure Event mentioned above excluding circumstances where the source or cause of contamination or radiation is brought or has been brought into or near the Power Project by the EPC Bidder or those employed or engaged by the EPC bidder
- b. Force Majeure shall not include (i) any event or circumstance which is within the reasonable control of the Parties and (ii) the following conditions, except to the extent that they are consequences of an event of Force Majeure:
 - i. Unavailability, late delivery, or changes in cost of the plant, machinery, equipment, materials, spare parts or consumables for the Power Project;
 - ii. Not getting timely approvals from the concerned authorities involved for any activity related to execution of the Project. Inability to obtain permission from discom. Inability to obtain commissioning certificate from discom.
 - iii. Delay in the performance of any sub-Bidder or their agents

- iv. Non-performance resulting from normal wear and tear typically experienced in power generation materials and equipment;
- v. Strikes at the facilities of the Affected Party;
- vi. Insufficiency of finances or funds or the Agreement becoming onerous to perform; and Non-performance caused by, or connected with, the Affected Party's:
 - i. Negligent or intentional acts, errors or omissions;
 - ii. Failure to comply with an Indian Law; or
 - iii. Breach of, or default under this IFB document.

c. Notification of Force Majeure Event

- i. The Affected Party shall give notice to the other Party of any event of Force Majeure as soon as reasonably practicable, but not later than seven (7) Days after the date on which such Party knew or should reasonably have known of the commencement of the event of Force Majeure. If an event of Force Majeure results in a breakdown of communications rendering it unreasonable to give notice within the applicable time limit specified herein, then the Party claiming Force Majeure shall give such notice as soon as reasonably practicable after reinstatement of communications, but not later than three (3) Days after such reinstatement.
- ii. Provided that such notice of Force Majeure shall be a pre-condition to the Affected Party's entitlement to claim relief under this IFB. Such notice shall include full particulars of the event of Force Majeure, its effects on the Party claiming relief and the remedial measures proposed. The Affected Party shall give the other Party regular (weekly or monthly basis, as communicated and agreed upon between the Parties in writing) reports on the existence Force Majeure and/ or progress of those remedial measures and such other information as the other Party may reasonably request about the Force Majeure Event.
- iii. The Affected Party shall give notice to the other Party of (i) the cessation of the relevant event of Force Majeure; and (ii) the cessation of the effects of such event of Force Majeure on the performance of its rights or obligations under this IFB, as soon as practicable, but not later than seven (7) Days after becoming aware of each of these cessations.
- iv. In case of delay in Payment due to Force Majeure, Affected Party shall have inform the other Party and make payment as soon as effect of Force Majeure shall be ended on Affected Party payment obligation.
- v. To the extent not prevented by a Force Majeure Event, the Affected Party shall continue to perform its obligations pursuant to this IFB. The Affected Party shall use its reasonable efforts to mitigate the effect of any Force Majeure Event as soon as practicable.

d. Available Relief for a Force Majeure Event

- i. No Party shall be in breach of its obligations pursuant to this IFB except to the extent that the performance of its obligations was prevented, hindered or delayed due to a Force Majeure Event;
- ii. Every Party shall be entitled to claim relief in relation to a Force Majeure Event in regard to its obligations;
- iii. For avoidance of doubt, none of either Party's obligation to make payments of money due and payable prior to occurrence of Force Majeure events under this IFB shall be suspended or excused due to the occurrence of a Force Majeure Event in respect of such Party.
- iv. Provided that no payments shall be made by either Party affected by a Force Majeure Event for the period of such event on account of its inability to perform its obligations due to such Force Majeure Event.

15. LANGUAGE

All documents, drawings, instructions, design data, calculations, operation, maintenance and safety manuals, reports, labels and any other data shall be in English Language. The contract agreement and all correspondence between the REIL and the bidder shall be in English language.

16. OTHER CONDITIONS

- 16.1 The Successful bidder shall not transfer, assign or sublet the work under this contract or any substantial part thereof to any other party without the prior consent of REIL in writing.
- 16.2 The Successful bidder or its sub Bidders shall not display the photographs of the work and not take advantage through publicity of the work without written permission of REIL.
- 16.3 The Successful bidder or its sub Bidders shall not make any other use of any of the documents or information of this contract, except for the purposes of performing the contract.
- 16.4 REIL will not be bound by any Power of Attorney granted/ issued by the Successful bidder or its sub Bidders or by any change in the composition of the firm made during or subsequent to the execution of the contract. However, recognition to such Power of Attorney and change (if any) may be given by REIL after obtaining proper legal advice, the cost of which will be chargeable to the Successful bidder concerned.

16.5 SUCCESSORS AND ASSIGNEES:

In case REIL or Successful bidder may undergo any merger or amalgamation or a scheme of arrangement or similar re-organization & this contract is assigned to any entity (ies) partly or wholly, the contract shall be binding mutatis mutandis upon the successor entities & shall continue to remain valid with respect to obligation of the successor entities.

16.6 SEVERABILITY:

It is stated that each paragraph, clause, sub-clause, schedule or annexure of this contract shall be deemed severable & in the event of the unenforceability of any paragraph, clause sub clause, schedule or the remaining part of the paragraph, clause, sub-clause, schedule annexure & rest of the contract shall continue to be in full force & effect.

16.7 COUNTERPARTS:

This contract may be executed in one or more counterparts, each of which shall be deemed an original & all of which collectively shall be deemed one of the same instrument

16.8 RIGHTS & REMEDIES UNDER THE CONTRACT ONLY FOR THE PARTIES:

This contract is not intended & shall not be construed to confer on any person other than the REIL & Successful bidder hereto, any rights and / or remedies herein.

17. CORRESPONDENCE

Bidder requiring any Techno-Commercial clarification of the bid documents may contact in writing or by Fax /E Mail.

Name	Contact Number	Email id
Sh. Amitabh Sharma	+91-7727011721	amitabh.sharma@reil.co.in
Sh. Kuldeep Singh Rathore	+91-7727007749	kuldeep.rathore@reil.co.in

Verbal clarifications and information given by the REIL or its employees or its Representatives shall not be in any way entertained.

SECTION-IV

SCOPE OF WORK

A. SCOPE OF WORK:

The scope of work would essentially cover, but not limited to the following:

- (i.) Successful bidder(s) is (are) required to get in touch with the customers as per the list to be provided by REIL. However, they can also identify more customers in the nearby area who are ready to get the RTS installed in their premises at the same terms & conditions.
- (ii.) Site visit and check the feasibility of space including installation capacity in consultation with respective Target Customer and submit site feasibility assessment report to REIL / NVVN as per the Format to be provided later. Submission of project proposals after incorporating Net metering as per MP state policies.
- (iii.) Obtaining No Objection Certificate (NOC) from Distribution Company (DISCOM) for grid connectivity or any other approvals prevalent as per the statutory policy/guidelines in the state,
- (iv.) Design, Engineering, Manufacture, Supply, Storage, Civil work, Erection, Testing & Commissioning and comprehensive O&M FOR 10 Years., quality control of the grid connected rooftop Solar PV Project.
- (v.) Any additional modification work of the roof tops in order to implement the RTS system/project shall be in the scope of successful bidder/developer.
- (vi.) Monthly Joint Meter Reading with Consumer and Coordination with Consumer during O&M period for realisation of the bills.
- (vii) SPV Modules and Inverters shall be supplied by the REIL.**

B. DETAILED SCOPE OF WORK:

1. Details of work

- 1.1. Designing, engineering, supply, installation, testing and Commissioning of various capacities of Project as per standard design and specifications and connecting up to existing Mains / ACDB and interfacing internal electrical loads of Project's License's network/electrical loads with Comprehensive O&M for period of Ten (10) Operational Years for Sale of Solar Power. The bidder would have to take approval for the interfacing the Project with Grid/Electrical Loads of every location from distribution licensee/ CEIG, applicable. Comprehensive O&M for Ten (10) Operational Years shall be required for each of the Project.
- 1.2. Bidder shall be responsible for all the works related to Commissioning and operation for Ten (10) Operational Years of Project. In no case, Procurer or Nodal Agency shall be responsible to pay or increase in tariff for any work related to Project.
- 1.3. It is clarified that the projects awarded would not include energy storage with rooftop solar project. However, if Procurer desires to have such arrangement, it would need to pay separately for the battery storage, and associated change in design and civil and electrical works. Such arrangement would not affect the tariff discovered for sale of power.

2. The scope of work shall also include the following:

- 2.1. A layout plan of the site should be submitted to the Inspecting Authority clearly indicating the identified location for installation of SPV modules & control room, where control panels shall be installed. The Bidder shall also submit the mode in which the system will operate in accordance with the provisions of Clauses 5.1, 5.2, 5.3 and 5.4 of Madhya Pradesh Policy for Decentralized Renewable Energy Systems, 2016 as amended from time to time;
- 2.2. Detailed planning of time bound smooth execution of Project;
- 2.3. Performance testing of the Completion and Successful Commissioning of the Project;
- 2.4. Comprehensive O &M of the Project for Ten (10) Operational Year to assure faultless operation, and inventory maintenance; Supply of Power from Commissioning to Termination or for twenty five (25) Operational Years;
- 2.5. Coverage of risk liability of all personnel associated with implementation and realization of the Project;
- 2.6. The Bidder shall maintain sufficient inventory of the spare parts to ensure that the Project is functional during the first Ten (10) years of operation;
- 2.7. The Bidder is responsible for the waterproofing of the roof disturbed/ pierced for installation of Project for the Comprehensive O&M period of first Ten (10) Operational Years. The Bidder should immediately take necessary action to repair any damage to the water proofing. However, in such situations, Bidder shall bear any loss or damage to Project and rectify the same within reasonable timeframe but any generation loss in such eventualities shall not be passed on to Developer/Procurer. If Bidder fails to do required water proofing within 7 days from the day of identification of issue, Developer/Procurer may get the same done at prevailing market rate and Bidder shall reimburse the same to Developer/Procurer. If the Bidder fails to reimburse the expenses to the Procurer then such expenses shall be adjusted by the Developer/ from the Performance Deposit or any other Security as may be available with the Developer.
- 2.8. Bidder shall be responsible for O&M of the Project from the first Part Commissioning or SCOD, whichever is earlier, to the completion of Ten (10) Operational Years.
- 2.9. In case the bidder desires to do ground mount for part/full capacity for any site then bidder should consider the associated civil costs for such sites while bidding.

3. Internal electrification:

- 3.1. Inspection of the existing electrical network of each of the Project site.
- 3.2. Inspection of the Project in respect of its interfacing with licensee network/identified electrical load.
- 3.3. Preparation and submission of electrical drawing for the site with quantity of material required.
- 3.4. Obtaining prior approval of the work and drawing from Inspecting Authority;
- 3.5. Execution of the work in accordance with the norms and regulation directives for testing and completion of the Project to the satisfaction of the Nodal Agency;

4. Grid connection:

- 4.1 The Bidder shall be responsible for synchronization of the Project with licensee's network under Madhya Pradesh Policy for Decentralized Renewable Energy Systems, 2016 as amended from time to time. The Bidder shall also suggest the Project Group of operation of the system mentioned in above policy and intimate the Nodal Agency;
- 4.2 Connectivity of Project with the licensee's network
- 4.3 Commissioning of the project as applicable.

5. Metering and grid connectivity:

- 5.1. Metering and grid connectivity of the Projects would be the responsibility of the Bidder in accordance with the prevailing guidelines of the concerned distribution licensee and / or CEA and net metering provisions in the state of MP. Nodal Agency and Procurer may facilitate in the process; however, the entire responsibility lies only with the Bidder. The cost of required meters shall be borne by Bidder. This includes purchase of net meters in case of supply through Category I under Madhya Pradesh Policy for Decentralized Renewable Energy System, 2016
- 5.2. In case of Category I and Category III systems, the Bidder shall install the Generation Meter separately near the output of Inverter of both the Category systems and for Category-I, Net-Meter shall be located in place of present discom's ,metering system.

6. Metering and grid connectivity:

- 6.1. Metering and grid connectivity of the Projects would be the responsibility of the Bidder in accordance with the prevailing guidelines of the concerned distribution licensee and / or CEA and net metering provisions in the state of MP. Nodal Agency and Procurer may facilitate in the process; however, the entire responsibility lies only with the Bidder. The cost of required meters shall be borne by Bidder. This includes purchase of net meters in case of supply through Category I under Madhya Pradesh Policy for Decentralized Renewable Energy System, 2016.
- 6.2. In case of Category I and Category III systems, the Bidder shall install the Generation Meter separately near the output of Inverter of both the Category systems and for Category-I, Net-Meter shall be located in place of present Discom's metering system.
- 6.3. Meters and metering equipment shall be tested as per provision of MPERC and as per IS 14697 at CPRI or at any NABL accredited lab before installation at site on the cost of power producer and should be properly sealed in the presence of designated authority from Nodal Agency at the time of installation.
- 6.4. The accuracy class, current rating and certifications of the net meter and generation meter shall confirm with the standards for net meter and standards for generation meter as provided Madhya Pradesh Policy for Decentralized Renewable Energy System, 2016 and any subsequent amendment.

7. Insurance:

The Bidder shall also take insurance for third party liability covering loss of human life, engineers and workmen and also covering the risks of damage, theft of material/ equipment/ properties after completion of the work(s). Before commencement of the work, the Bidder shall ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work. Liquidation, Death, Bankruptcy etc., shall be the responsibility of Bidder.

8. Warranty and guarantees:

- 8.1. The Bidder shall warrant that the goods supplied under this RFB are new, unused, of the most recent or latest technology and incorporate all recent improvements in design and materials as per standards specified in the technical specifications of this RFB. The Bidder shall provide warranty covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of initial Ten (10) Operational Years.
- 8.2. The responsibility of operation of warranty and guarantee clauses and claims/ settlement of issues arising out of said clauses shall be responsibility of the Bidder and REIL will not be responsible in any way for any claims whatsoever on account of the above for the period of the contract.

9. Type and quality of materials and workmanship:

- 9.1. The design, engineering, manufacture, supply, installation, testing, commissioning and performance of the equipment shall be in accordance with latest/ appropriate IEC/Indian Standards as detailed in the technical specifications of this RFB or its subsequent amendments. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE/ CEA/ electricity regulators/ Nodal Agency shall be used. All the relevant test certifications must be kept valid up to one (1) Year from the COD of the Project.
- 9.2. The specifications of the components should meet the technical specifications mentioned in the EPC Agreement.
- 9.3. Any supplies which have not been specifically mentioned in the EPC Agreement but which are necessary during construction or Comprehensive O&M period of the Project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth construction and Comprehensive O &M of the Project.

10. Construction of control room etc.

Construction of control room or any other relative civil work essential for Commissioning of Project.

11. Additional works

- 11.1. Additional civil, structural or electrical works which are so required/desired to be undertaken by the Procurer for the Project and which are not covered in the scope of work, shall be done by the Bidder after obtaining concurrence of the Procurer on its design, drawing and estimate cost of such additional works, Cost of such additional works shall be borne by the Procurer. The costs shall be computed on the basis of SOR of PWD (Civil) and of DISCOM (Electrical). Cost of additional works shall be decided mutually between Bidder and Procurer, but, in any case, it should not exceed the SOR rates or the actual rates, whichever is lower. A copy of actual cost and the SOR rates assessed for additional work shall be submitted to Nodal Agency for approval. Additional works may include but not limited to;
- 11.2. Laying of additional length of cable and accessories if the complete space/rooftop provided is more than 500 meters away from the utility/DISCOM metering point.
- 11.3. Requirement of additional/specific design of structure, as desired by Procurer in deviation with the design provided by the Bidder, to accommodate solar panels on rooftop, ground or on any existing structure/ construction/body.
- 11.4. Construction of approach to the rooftop/place of installation.

11.5. Unless otherwise agreed between the Parties, the Bidder shall not do (a) chipping of rooftop; or (b) disturb water proofing of roof (c) carry out any other modification of the Premises without the written consent of the Procurer. One time cost for strengthening of Premise to the extent required for setting up Solar PV Project during construction shall be borne by Bidder. Any delay due to strengthening of Premise shall not be considered to extend the SCOD unless it is approved by Procurer in written. Cost of repair or maintenance of Premise to the extent required for the Solar PV Project, during the Comprehensive O&M of Project, shall be the responsibility of Bidder, other than cost required for water proofing. The cost for water proofing will be the responsibility of Bidder for a period of first Ten (10) Operational Years.

11.6. In case of any ambiguity over any specific works, Bidder and Procurer shall involve Nodal Agency to get the clarity on the additional works.

12. Provision of sign board

The bidder shall have to provide sign board of dimension 8'x4' (M.S. sheet size 4'x3' of 16 gauge, M.S. angle 40x40x5 mm with essential bracing & adequate grouting with PCC 1:3:6 i/c painting & writing) at each site with complete specification & matter will be provided to the Bidder with EPC Agreement.

13. Completion and Commissioning:

13.1 Completion: When the Bidder fulfils his obligation under the EPC Agreement, it shall obtain completion certificate from Nodal Agency for the EPC Agreement Capacity and part thereof. Nodal Agency shall issue separate Completion Certificate for the capacity of Project under Category III. This Completion certificate received from the Nodal Agency by the Bidder shall be treated as COD for Category-III Projects.

13.2 Procurer may purchase power produced after the Initial Part Commissioning or Completion and before commissioning from the Developer at Quoted Tariff, on the condition that Bidder shall follow all laws and regulation while providing solar power.

13.3 For the purpose of obtaining Completion certificate following documents shall be required:

- a) Inspection Report of the Work(s) as per prescribed format provided by Nodal Agency.
- b) CEIG Approval for the EPC Agreement Capacity or part thereof, if applicable;
- c) Project satisfaction certificate from DREO for the EPC Agreement Capacity or part thereof. If EPC Agreement Capacity divided under Category I and III, Bidder shall submit separate satisfaction certificate from Procurer for EPC Agreement Capacity or part thereof under Category I and III.
- d) Document in support of performance of the Project and achievement of CUF of 15.0% subject to seasonality as mentioned in agreement, as certified by the Nodal Agency and NVVN, REIL. Separate performance report for the capacity under Category I and III shall be submitted by Power Producer. At the time of commissioning of the Project, the Performance Ratio shall be greater than 75% for acceptance of the project by REIL / NVVN.

13.4. In case of part Completion, Bidder shall be required to submit all the above mentioned requisites with request for every part capacity Completion.

13.5. **Commissioning:** Part Commissioning is allowed for all the Projects.

13.6. Bidder, in coordination with the Discom, shall submit Commissioning certificate, for the capacity of the Project received Completion certificate under Category I, issued by the concerned Discom, in accordance with all applicable regulations/policies.

13.7 Further, Nodal Agency shall issue the Commissioning Certificate for the capacity of the Project Completed under Category III on issuance of Completion Certificate for capacity under Category III.

13.8. In case of Part Commissioning, Bidder shall be required to submit all the above mentioned requisites with submission of every Part Commissioning of capacity.

Tentative BOQ (for tender purpose) for the work IFB for Design, Engineering, supply, Construction, Erection, Testing, Commissioning and 10 year O&M of around 3.6 MWp Grid Connected Rooftop Solar PV based power projects in Mandideep (Bhopal), MP.

S. No.	Item Description	Qty.	Supply	E&C	O&M	Remark
1.	Solar PV module of capacity not less than 300 Wp as per technical specifications	For 3.6 MWp	By REIL	Bidder	Bidder	
2.	High grade MS structures/Aluminum Structures (as per Site requirement) of required sizes and shapes for fixing Solar panels and other works (as per Specification)	For 3.6 MWp	Bidder	Bidder	Bidder	Design to be submitted for approval
3.	String Inverter, as per technical specifications.	For 3.6 MWp	By REIL	Bidder	Bidder	
4.	D.C. cables and LT cables: Supply, laying (underground/surface), testing and commissioning of copper conductor, XLPE insulated armored cables (as per IS spec and specification given in para. No. 17 of "TECHNICAL SPECIFICATION") of various sizes required to complete the work.	As per site requirement as per design for each site	Bidder	Bidder	Bidder	Size of the cable to be decided based on voltage drop & approval by REIL
5.	Control Cables: Supply, laying, termination, testing and commissioning of 1.1 KV XLPE insulated, GS wire armored cables as per relevant IS standard required to complete the work.	As per site requirement for each site	Bidder	Bidder	Bidder	
6.	Earthing- Supply, Erection, Testing and Commissioning of all earthing equipments as per relevant IS standard and applicable IE rules to complete the work.	As per site requirement for each site	Bidder	Bidder	Bidder	Calculation ,Design & Drawing to be submitted for approval
7.	Safety Equipment- Supply and fixing of CO2 based fire fighting equipments of reputed make, ISI marked as per the actual site requirement.	As per site requirement for each site	Bidder	Bidder	Bidder	
8.	Civil Works - All the associated Civil works complete in all respects, required to complete the work such a module structure foundation and trench work etc. will be in the scope of this work.	As per site requirement for each site	Bidder	Bidder	Bidder	
9.	Metering System- The bidirectional electronic energy meter (0.5 S Class) for measuring Export –Import energy meter conforming to relevant IS/IEC standard and as per regulation of respective states for 11 KV/33 KV outgoing feeder suitable for interfacing with GPS time synchronisation equipment.	As per site requirement for each site	Bidder	Bidder	Bidder	Specification shall be as per respective State's Discom guideline
10.	Solar Energy Meters as per requirement of connection points as per guidelines of MNRE/DISCOM/SEB	As required as per design	Bidder	Bidder	Bidder	Specification shall be as per respective

						State's Discom guideline
11.	Tool kit for Installation- commissioning	2 sets for each site	Bidder	Bidder	Bidder	
12.	Misc works: Any other work required to complete & commission the work.	As required as per design & site requirement	Bidder	Bidder	Bidder	

Notes: The above BOQ is only for guidance purpose so that bidder gets an overview of the work to be executed. Bidders are requested to visit site before quoting the tender. Detailed BOQ, complete in all respects needs to be submitted by the bidder after the award of work to him and after the approval of detailed drawings of the project from REIL. The bidder will get detailed BOQ & drawings approved from the Railways.

1. The system shall consist of (but not limited to) following equipment:

- (a) Module Mounting structures (MMS)
- (b) Cables and hardware
- (c) LT Panel (if reqd.), or conventional switchyard (indoor LT panel (if reqd.))
- (d) Transformers (if reqd.)
- (e) Metering cubicle with ABT energy meters (main and check meters) at 11 kV switch yard in the PV plant
- (f) AC Distribution boxes and DC distribution boxes
- (g) Earthing kits & Earth mat
- (h) Lightning arrestors in solar array
- (i) Tool Kits for maintenance along with personal protective equipment
- (j) Weather monitoring equipment (for measuring Solar Radiation, Temperature etc.)
- (k) Mandatory spares
- (l) Illumination system for the plant including control room & switchyard
- (m) Consumable for Modules washing and Office stationary during O & M

2. Grid interfacing, including all equipment required for the same such as isolators, lightning arrestor, panels, protection equipment, cables, conductors, earthing and SPV Panel yard etc. as per statutory requirements and comply to CERC Grid code and State Electricity Board .

3. Routing, planning and Construction etc. of towers or cable trenches as required for facilitating evacuation of Power from SPV plant through LT transmission lines/underground cable. Cable laying, Overhead line drawal as per relevant IS norms shall be in contractor's scope. **Other works not specified above but required as per site for evacuation shall be under the scope of the successful contractor.** "Right of Way" shall be in PGCIL's scope.

4. The connecting voltage for solar system shall be 415 V, three Phase distributed but Export & Import meter shall at 11 KV/33 KV systems as per site requirement. Metering of outgoing energy at the 11 KV/33 KV system outgoing feeder of transformer is in the scope of contractor.

Technical Specification

The proposed Projects shall be completed as per the technical specifications given below.

The Bidder are hereby advised to take a note of the draft guidelines issued by MNRE dated 09-08-2016 or any amendments thereof in respect of minimum technical requirements, quality standards, best practices and specifications for grid connected roof top PV systems in addition to technical parameters mentioned in the EPC Agreement and comply accordingly.

1. Parameters

A Project consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), charge controller (if required), Inverter, Controls & Protections, interconnect cables and switches. PV Array should be mounted on a suitable structure. Project should be designed with necessary features to synchronize with the grid power. Components and parts used in the Project including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

PROJECT SHALL CONSIST OF FOLLOWING EQUIPMENT/ COMPONENTS:

- 1.1. MNRE has specified that the cells and modules used in such projects shall be from the models and manufacturers included in Approved List of Models and Manufacturers (ALMM).
- 1.2. Solar Photovoltaic Modules
 - a) The developer can use indigenous/ imported mono/ polycrystalline Solar PV modules as per the specifications prescribed by MNRE.
 - b) The PV modules used must qualify to the latest edition of IEC PV module qualification test or equivalent BIS standards Crystalline Silicon Solar Cell Modules IEC 61215/IS14286. In addition, the modules must conform to IEC 61730 Part-1-requirements for construction & Part 2 requirements for testing, for safety qualification or equivalent IS.
 - c) For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701. The total solar PV array capacity should not be less than allocated capacity (kWp) and should comprise of solar crystalline modules of minimum 300 Wp and above wattage. Module capacity less than minimum 300 Wp should not be accepted.
 - d) Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.
 - e) PV modules must be tested and approved by one of the IEC authorized test centers. The module frame shall be made of corrosion resistant materials, having Pre-galvanized/ anodized Aluminium or superior material (as approved from MNRE/NVVN)
 - f) The Bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his Bid.
 - g) Other general requirement for the PV modules and subsystems shall be the following:
 - i. The rated output power of any supplied module shall have tolerance of +/- 3%.
 - ii. The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

- iii. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.
 - iv. I-V curves at STC should be provided by Bidder.
 - v. The glass used for making module shall be 3.2 mm for 60 cell and 4.0 mm for 72 cell. Each string shall have identical Wp rating Solar PV modules.
- 1.3. Modules deployed must use a RF identification tag. The following information must be mentioned in the RFID used on each modules (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions).
- a) Name of the manufacturer of the PV module
 - b) Name of the manufacturer of Solar Cells.
 - c) Month & year of the manufacture (separate for solar cells and modules)
 - d) Country of origin (for solar cells)
 - e) I-V curve for the module Wattage, I_m , V_m and FF for the module
 - f) Unique Serial No and Model No of the module
 - g) Date and year of obtaining IEC PV module qualification certificate.
 - h) Name of the test lab issuing IEC certificate.
 - i) Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001

1.4. Warranties:

a. Material Warranty

Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a Period as specified in MNRE guidelines from the date of Completion.

- Defects and/or failures due to manufacturing
- Defects and/or failures due to quality of materials
- Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will replace the solar module(s)

b. Performance Warranty

The predicted electrical degradation of power generated not exceeding 20% of the minimum rated power over the twenty five (25) Year period and not more than 10% at the end of tenth (10th) Year of the full rated original output.

1.5. Array Structure

- a) Hot dip galvanized MS/ Pre-galvanized/ Anodized Aluminium or superior material (as approved by MNRE) mounting structures may be used for mounting the modules/ panels/arrays. Each structure should have angle of inclination as per the site conditions to take maximum insulation. However to accommodate more capacity the angle inclination may be reduced until the Project meets the specified performance ratio and CUF requirements.
- b) Module Mounting Structures shall be designed to withstand the extreme weather conditions in the area. The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a Project is proposed to be installed (for minimum wind speed of 150 km/hour). It may be ensured that the design has been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to REIL. Suitable fastening arrangement that do not require drilling in rooftops should be adopted to secure the installation against the specific wind speed.
- c) The Module Mounting Structure support and fixation arrangement shall be designed in such a way that it does not damage or deteriorate the strength, durability and performance of the roof including water proofing carried out on the roof.

- d) The mounting structure steel shall be as per latest IS 2062: 1992 and galvanization of the mounting structure shall be in compliance of latest IS 4759.
- e) Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Aluminium structures also can be used, that can withstand the wind speed of respective wind zone. Necessary protection towards rusting need to be provided either by coating or anodization.
- f) The fasteners used 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
- g) Regarding civil structures the Bidder need to take care of the load bearing capacity of the roof and need arrange suitable structures based on the quality of roof. The total load of the structure (when installed with PV modules) on the terrace should be less than 60 kg/m².
- h) The minimum clearance of the structure from the roof level should be 300 mm.

1.6. Junction Boxes (JBS) Based on System Design Requirements

- a) The junction boxes are to be provided in the PV array for termination of connecting cables. The J. Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminium/cast aluminium alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable cable glands.
- b) Copper bus bars/terminal blocks housed in the junction box with suitable termination threads conforming to IP65 standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry. Single / compression cable glands with provision of earthings. It should be placed at 5 feet or suitable height for ease of accessibility.
- c) Each Junction Box shall have High quality Suitable capacity Metal Oxide Varistors (MOVs) / SPDs, suitable Reverse Blocking Diodes. The Junction Boxes shall have suitable arrangement monitoring and disconnection for each of the groups
- d) Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification

1.7. DC Distribution Board Based on System Design Requirements

- a) DC Distribution panel to receive the DC output from the array field.
- b) DC DPBs shall have sheet from enclosure of dust & vermin proof conform to IP 65 protection. The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

1.8. AC Distribution Panel Board

- a) AC Distribution Panel Board (DPB) shall control the AC power from PCU/ inverter, and should have necessary surge arrestors. Interconnection from ACDB to mains at LT Bus bar while in grid tied mode.
- b) All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.

- c) The changeover switches, cabling work should be undertaken by the Bidder as part of the project.
- d) All the Panels shall be metal clad, totally enclosed, rigid, floor, mounted, air - insulated, cubical type suitable for operation on three phase / single phase, 415 or 230 volts, 50 Hz.
- e)
- f) The panels shall be designed for minimum expected ambient temperature of 45 degree Celsius, 80 percent humidity and dusty weather.
- g) All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better.
- h) Should conform to Indian Electricity Act and rules (till last amendment).
- i) All the 415 AC or 230 volts devices / equipment like bus support insulators, circuit breakers, SPDs, VTs etc., mounted inside the switchgear shall be suitable for continuous operation and satisfactory performance under the following supply conditions:-

Variation in supply voltage	+/- 10%
-----------------------------	---------

Variation in supply frequency	+/- 3 Hz
-------------------------------	----------

1.9. PCU/Array Size Ratio

- a) The combined DC wattage of all inverters should not be less than rated capacity of Project under STC.
- b) Maximum power point tracker shall be integrated in the PCU/inverter to maximize energy drawn from the array.

1.10. PCU/ Inverter

- a) As SPV array produce direct current electricity, it is necessary to convert this direct current into alternating current and adjust the voltage levels to match the grid voltage. Conversion shall be achieved using an electronic Inverter and the associated control and protection devices. All these components of the Project are termed the "Power Conditioning Unit (PCU)". In addition, the PCU shall also house MPPT (Maximum Power Point Tracker), an interface between Solar PV array & the Inverter, to the PCU/inverter should also be DG set interactive. The PCU should also have provision of charge controller in case of systems. If necessary. Inverter output should be compatible with the grid frequency. Typical technical features of the inverter shall be as follows:
- Switching devices: IGBT/MOSFET
 - Control Microprocessor /DSP
 - Nominal AC output voltage and frequency: 415V, 3 Phase, 50 Hz (In case single phase inverters are offered, suitable arrangement for balancing the phases must be made.)
 - Output frequency: 50 Hz
 - Grid Frequency Synchronization range: + 3 Hz or more
 - Ambient temperature considered: -20 °C to 50 °C
 - Humidity: 95 % Non-condensing
 - Protection of Enclosure: IP-20(Minimum) for indoor: IP-65(Minimum) for outdoor.
 - b) Grid Frequency Tolerance range: + 3 or more
 - Grid Voltage tolerance: - 20% & + 15 %
 - No-load losses: Less than 1% of rated power
 - Inverter efficiency(minimum): >93% (In case of 10kWp or above)
 - Inverter efficiency (minimum): > 90% (In case of less than 10 kWp)
 - THD: < 3%
 - PF: > 0.9
- b) Three phase PCU/ inverter shall be used as required.
- c) PCU/inverter shall be capable of complete automatic operation including wake-up, synchronization & shutdown.
- d) The output of power factor of PCU inverter is suitable for all voltage ranges or sink of reactive power; inverter should have internal protection arrangement against any sustainable fault in feeder line and against the lightning on feeder.
- e) Built-in meter and data logger to monitor Project performance retrievable through external computer shall be provided.
- f) The power conditioning units/inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests as per standard codes IEC 61683/IS 61683 and IEC 60068-2(1,2,14,30, 64)/Equivalent BIS Std.
- g) Anti-islanding (Protection against Islanding of grid): The PCU shall have anti islanding protection in conformity to IEEE 1547/UL 1741/ IEC 62116 or equivalent BIS standard.
- h) The PCU/ inverter generated harmonics, flicker, DC injection limits, Voltage Range, Frequency Range and Anti-Islanding measures at the point of connection to the utility services should follow the latest CEA (Technical Standards for Connectivity Distribution Generation Resources) Guidelines.

- i) The charge controller (if any) / MPPT units environmental testing should qualify IEC 60068-2(1, 2, 14, 30,64)/Equivalent BIS standard. The junction boxes/ enclosures should be IP 65(for outdoor)/ IP 54 (indoor) and as per IEC 529 specifications.
- j) The PCU/ inverters should be tested from the MNRE approved test centres/NABL/BIS/IEC accredited testing-calibration laboratories. In case of imported power conditioning units, these should be approved by international test houses.

1.11. Integration Of PV Power With Grid

For better grid interaction and functioning of Project, the following arrangement shall be ensured by Bidder:

- i. Project should have appropriate instruments installed at solar panel output, inverter and load to facilitate minute-wise recording and storage of monthly data (voltage, current, generation, consumption and grid injection) for twelve (12) Months of energy flow at various nodes.
- ii. ~~Synchronization of inverter operation with voltage. Project shall go under the islanding mode but not the load of~~
- iii. In case of network failure, or low or high voltage, Project shall go under islanding mode but not be out of synchronization so far as its operation with connected load is concerned. The supply from Project to the load points would be resumed, once the DG set comes into service, Project shall again be synchronised with DG supply and load requirement would be met to the extent of availability of power. 4 pole isolation of inverter output with respect to the grid/ DG power connection need to be provided.
- iii. The Project commissioned under the Madhya Pradesh Policy for Decentralised Renewable Energy Systems, 2016 as amended from time to time, shall be provided with reverse protection relays in order to prevent reverse flow of active power into the Grid. The relay and devices used for such arrangement shall be of relevant standards.

1.12. Data Acquisition System / Project Monitoring:

- a) Data Acquisition System shall be provided for each of the solar PV Project.
- b) Data Logging Provision for Project control and monitoring, time and date stamped system data logs for analysis computer for data monitoring, metering and instrumentation for display of systems parameters and status indication to be provided. The time integration period of data will be maximum of 15 minutes
- c) The following parameters should be accessible via the operating interface display in real time separately for Project:
 - i. AC Voltage
 - ii. AC Output current.
 - iii. Output Power
 - iv. Power factor
 - v. DC Input Voltage
 - vi. DC Input Current
 - vii. Time Active
 - viii. Time disabled
 - ix. Time Idle
 - x. Power produced
 - xi. Protective function limits (Viz-AC Over voltage, AC Under voltage, Over frequency, Under frequency ground fault, PV starting voltage, PV stopping voltage).
- d) All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and read on the digital front panel at any time) and logging facility (the current values, previous

values for up to a Year and the average values) should be made available for energy auditing through the internal microprocessor and should be read on the digital front panel.

- e) String and array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
- f) The data shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
- g) All instantaneous data should be available through Remote Monitoring System (RMS).
- h) Software shall be provided for USB download and analysis of DC and AC parametric data for individual Project.
- i) Provision for Internet monitoring and download of data shall be necessarily incorporated for projects.
- j) Remote monitoring of the generation of Solar Power shall be done through appropriate apps which shall be provided by contractor. Provision for mobile app based display shall be made for all the data display with a provision to interact with the REIL and Nodal Agency and other state holders to raise requests / issues and sending emergency messages. Billing and reconciliation software shall be provided by the bidder with integration with Project data for easy preparation and sending of bills and subsequent record of payment receipts.
- k) Remote Monitoring and data acquisition through Remote Monitoring System software with latest software/hardware configuration and service connectivity for online / real time data monitoring/control complete to be supplied and Comprehensive O&M/control to be ensured by the supplier. Provision for interfacing these data on Nodal Agency server and portal in future shall be kept.

1.13. Transformers “if required” & Metering

- a) Dry/oil type appropriate kVA, of transformer Step up along with all protections, switchgears, Vacuum circuit breakers, cables etc. along with required civil work.
 - i. Dry Type Transformer windings shall be of class F insulation or better.
 - ii. The core shall be constructed from non-ageing, cold rolled, grain oriented silicon steel laminations.
 - iii. The maximum losses for dry type transformer shall not be more than the values specified in latest energy conservation building code (ECBC) of BEE.
 - iv. The fittings/accessories including protection/monitoring device generally required for satisfactory operation of the transformer, are to be provided.
 - v. Suitable rain shed arrangement shall be provided to keep transformer under that arrangement.
 - vi. Painting shall be as per employers requirement(will be finalized during detailed engineering)
 - vii. Type and routine test shall be conducted as per IS11171

In case the bidder/contractor has conducted such specified type test(s) within last ten years as on the date of bid opening, he may submit the type test reports to the owner for waiver of conductance of such type test(s). These reports should be for the test conducted on the equipment similar to those proposed to be supplied under this contract and test(s) should have been either conducted at an independent laboratory or should have been witnessed by client.

In case the bidder is not able to submit report of the type test(s) conducted within last ten years from the date of bid opening, or in case the type test report(s) are not found to be meeting the specification requirements the bidder shall conduct all such tests under this contract at no additional cost to the employer and submit the test reports.

- b) The energy meter shall be as per standard and requirement of Discoms, Nodal Agency.
- c) The Bidder must take approval/NOC from the concerned distribution licensee for the connectivity, technical feasibility, and synchronization of Project with distribution network and submit the same to Nodal Agency before Commissioning Project.
- d) Reverse power relay shall be provided by Bidder (if necessary), as per the local distribution licensee's requirement.

1.14. Power Consumption:

- a) Regarding the generated power consumption, priority needs to be given for internal consumption first and thereafter any excess power can be exported to the distribution licensee network.

1.15. Protections:

- a) The Project should be provided with all necessary protections like earthing, Lightning, and grid islanding as follows:
- b) **Lightning Protection:**

The SPV power Project shall be provided with lightning & overvoltage protection of appropriate size. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IEC 62305 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

- c) **Surge Protection:**

Internal surge protection shall consist of three MOV type surge-arrestors connected from +ve and ve terminals to earth (via Y arrangement).

- d) **Earthing Protection**

- i. Each array structure of the PV yard should be grounded/ earthed properly as per IS: 3043-1987. In addition the lightning arrester/masts should also be earthed inside the array field.
- ii. Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make them at the same potential.

1.16. Grid Islanding

- a) In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "island". Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The Project shall be equipped with islanding protection. In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.
- b) A manual disconnect 4pole isolation switch, besides automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel.

1.17. Cables

Cables of appropriate size to be used in the Project shall have the following characteristics:

- i. Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards
- ii. Temp. Range: 10 °C to +80 °C.
- iii. Voltage rating 660/1000V
- iv. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
- v. Flexible
- vi. Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire Project to the minimum.(2%). The cables (as per IS) should be insulated with a special grade PVC compound formulated for outdoor use.
- vii. The cables used in the system should be ISI marked PVC type 'A' pressure extruded insulation or XLPE insulated FRNC Copper/aluminum conductor. Overall PVC/XLPE insulation for UV protection Armored cable for underground laying. All cable trays including covers to be provided. All cables conform to latest edition of IEC/ equivalent BIS Standards as specified below: BOS item / component Standard Description Standard Number Cables General Test and Measuring Methods, PVC/XLPE insulated cables for working Voltage up to and including 1100 V ,UV resistant for outdoor installation IS /IEC 69947.
- viii. Cables of various sizes as per load requirement for connecting all the modules / arrays to Junction Boxes and from Junction Boxes to DC distribution box and from DC distribution box to inverter. Cables shall be armoured type if laid in switchyard area or directly buried.
- ix. Cables for use at the DC-side of PV system shall meet the requirements of TUV standard 2 PFG 1190/5.18 or EN-50618 or other equivalent standard.

- x. All connections should be properly terminated, soldered and/or sealed from outdoor and indoor elements. Relevant codes and operating manuals must be followed.
- xi. Cable Routing/ Marking: All cable/wires are to be routed in a GI cable tray and suitably tagged and marked with proper manner by good quality ferule or by other means so that the cable easily identified.
- xii. The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. twenty five (25) Operational Years.
- xiii. The ratings given are approximately, Bidder to indicate size and length as per system design requirement. All the cables required for the Project provided by the Bidder. All cable schedules/layout drawings approved prior to installation.
- xiv. The size of each type of AC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 2 %.
- xv. All such external electrical works shall be required to be done as per DISCOMs SOR.
- xvi. All cables upto main ACDB panel should be of Copper and beyond which can be of Copper/Aluminium cables.
- xvii. The DC cables from the SPV module array shall run through a UV-stabilized PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm.
- xviii. Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers
- xix. All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermo-plastic clamps at intervals not exceeding 50 cm; the minimum DC cable size shall be 4.0 mm² copper; the minimum AC cable size shall be 4.0 mm² copper. In three phase systems, the size of the neutral wire size shall be equal to the size of the phase wires.
- xx. The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 2.0%.The total voltage drop on the cable segments from the solar grid inverter to the building distribution board shall not exceed 2.0%.
- xxi. All cables and connectors for use for installation of solar field must be of solar grade which can withstand harsh environment conditions including High temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. DC cables used from solar modules to array junction box shall be solar grade copper (Cu) with XLPO insulation and rated for 1.1kV as per relevant standards only.

1.18. QUALITY REQUIREMENTS FOR ROOFTOP SOLAR PV

This is indicative List of tests/ checks. The manufacturer is to furnish a detailed quality Plan indicating the practice & procedure along-with the relevant supporting documents.

I. PCU

- A) Incoming Quality Checks on bought out items
- B) In-process quality checks,
- C) Routine tests as per following on the assembled PCU:
 - 1) Test to demonstrate automatic / manual synchronization and connection to utility service
 - 2) Functional check on all protections
 - 3) Check on accuracy of all parameters measured by PCU
 - 4) Test to demonstrate operation of start-up, stable operation of the PCU, disconnection and shutdown controls and response to other control signals
- D) Following sample tests on one sample of PCU:
 - 1) Heat run test including measurement of phase currents, efficiencies, harmonic content and power factor at four points preferably 25, 50, 75 and 100% of the rated nominal power.

II. SPV module

SPV modules quality plan should include the following:

- A) Incoming Quality Checks on bought out items (listed in third party test reports of relevant standard)
- B) In-process quality checks
- C) Sample tests as per following:
 - 1) SPV modules to be checked visually for following defects: (sampling as per General Inspection Level II and AQL 1.5% as per IS 2500 Part 1)
 - a) Scratches on the frame and/or glass
 - b) Excessive or uneven glue marks on glass or frame
 - c) Inconsistent cell colors
 - c) Completeness of module in all respects
 - 2) Performance of SPV module at STC (sampling as per General Inspection Level II and AQL 1.5% as per IS 2500 Part 1)
 - 3) IR-HV-IR test (sampling as per Special Inspection Level S-3 and AQL 1.5% as per IS 2500 Part 1)
 - 4) Robustness of terminations on 1 sample per offered lot.

III. Mechanical load test on 1 sample per offered lot

IV. DC Cable

Routine and Acceptance Test as per the TUV Specification -2 Pfg 1190/08.2007 or equivalent Standard

IV. Array Junction Box / String Monitoring Box

Array Junction quality plan should include the following:

- A) Checks on bought out items as per internal standards of the manufacturer
- B) In-process checks, as per internal standards of the manufacturer
- C) Sample tests as per following:
 - 1) IR-HV-IR test (sampling as per General Inspection Level-II and AQL 1.5% as per IS 2500 Part 1)
 - 2) String Monitoring Card/ Power Supply card/ DC-DC Converter function check on one sample of SMB (In case of String Monitoring Box only)
 - 3) Communication Function Test on one sample (In case of String Monitoring Box only)
 - 4) Degree of protection visual checks like gasket profile, sealing arrangement, paper pull check

V. LT Power Cable

Routine and Acceptance Test as per IS 1554 Part-I/IS 7098 Part-I.

VI. HT Power Cable

Routine and Acceptance Test as per IS 7098 Part-II.

VII. LT Switchgear

Routine Test as per IS 8623.

VIII. Roof Top Module Mounting Structure

Galvanizing Checks as per relevant IS4759 in case of hot dip galvanized MS structure. Anodic coating checks as per IS 1868 for Aluminum structure

IX. Module Cleaning System:

Pipes, Valves, Pumps etc shall be tested as per requirements of relevant standard.

X. Auxiliary and LT Transformer (Dry Type) As per table in Appendix-I

1.19. Connectivity

The maximum capacity for interconnection with the grid at a specific voltage level shall be as specified in the Distribution Code/Supply Code of the State and amended from time to time. The work should be done in compliance with respective regulations and policy.

1.20. Tools & Tackles and Spares

- a) The requirement of maintaining tools, tackles and spares at site or at service center is left to the discretion of the bidder with a condition that the same would be made available immediately as and when required.

- b) The bidders are advised to ensure a response time of 24 hours and maximum expected turnaround time of 72 hours (under special circumstances, additional time limit may be considered).
- c) Minimum requisite spares to be maintained by the Bidder, in case of PCU/inverter comprising of a set of control logic cards, IGBT driver cards etc. PCU/Inverter, Junction Boxes, fuses, MOVs / arrestors, MCCBs etc. along with spare set of PV modules be indicated, shall be maintained at site or at nearest service centre for the entire period of Comprehensive O&M.

1.21. Danger Boards and Signage

Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date.

1.22. Fire Extinguishers

The firefighting system for the proposed Project for fire protection shall consist of portable fire extinguishers in the control room for fire caused by electrical short circuits. The installation of Fire Extinguishers should conform to TAC regulations and BIS standards. The fire extinguishers shall be provided in the control room housing PCUs as well as on the site where the PV arrays have been installed. Sand buckets in the control room should be in place.

1.23. Drawings and Manuals

- a) Two sets of Engineering, electrical drawings and Installation and Comprehensive O&M manuals are to be supplied. Bidder shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid with basic design of the Project and power evacuation, synchronization as also protection equipment.
- b) Approved ISI and reputed makes for equipment be used.
- c) For complete electro-mechanical works, Bidder shall supply complete design, details and drawings to REIL and Nodal Agency for approval.

1.24. Planning and Designing

- a) The Bidder should carry out Shadow Analysis at the site and accordingly design strings & arrays layout considering optimal usage of space, material and labour. The Bidder should submit the array layout drawings along with Shadow Analysis Report to the designated authority of Nodal Agency and REIL/NVVN.
- b) Nodal Agency/NVVN/REIL reserves the right to modify the landscaping design, Layout and specification of sub-systems and components at any stage as per local site conditions/requirements.
- c) The Bidder shall submit preliminary drawing for approval & based on any modification or recommendation, if any. The Bidder shall submit one set and soft copy in CD of final drawing for formal approval to proceed with construction work.

- d) The mounting structure shall be installed without disturbing the roof and its water proofing layer.

1.25. Safety Measures

The Contractor shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc.

1.26 Display Board

The bidder has to display a board at the project site mentioning the following:

- a. Plant Name, Capacity, Location, date of commissioning, estimated Power generation.
Bidder will have to provide sign board of dimension 8'x4' (M.S. sheet size 4'x3' of 16 gauge, M.S. angle 40x40x5 mm with essential bracing & adequate grouting with PCC 1:3:6 i/c painting & writing) at each site with complete specification. Further NVVN/REIL logo stickers shall be in placed at different locations in site as decided by NVVN/REIL during detailed Engineering and the matter shall be provided separately.

1.27. PLANT PERFORMANCE EVALUATION

REIL shall reject the Project where the Performance Guarantee Test / Demonstration Test is failed at the time of commissioning i.e. failure to achieve Day CUF of 15% adjusted to seasonal factor as mentioned in EPC agreement or failure to achieve Performance Ratio of 75% and shall recover the payment already made by encashing the EPC PBG and Annual CUF PBG. If the Project fails to achieve the annual CUF of 15% by upto 1% at the end of 1st operational year, the LD shall be recovered at the rate of Rs. 32.34 per kWh for the shortfall of energy from the energy corresponding to 15% CUF by encashing the EPC PBG and Annual CUF PBG. If the annual CUF of the project at the end of 1st operational year is between 12% to 14% then the LD shall be recovered at the rate of Rs. 40.00 per kWh for the entire shortfall in energy from the energy corresponding to 15% CUF by encashing the EPC PBG and Annual CUF PBG. If the annual CUF of the project at the end of 1st operational year is less than 12%, the project shall be rejected and then the LD shall be recovered by encashing the EPC PBG and Annual CUF PBG.

1.28. SUBMISSION OF PROJECT COMPLETION REPORT (PCR)

The bidder shall submit the Project Completion Report (both in editable soft copy and signed hard copy) after commissioning of the project as per the Scope of IFB to REIL as per the Format to be provided. Non-submission of the report shall be considered as "Breach of Contract" and shall attract punitive actions as per the relevant provisions of the Contract including non-release of Incentive. However, the decision of Engineer - in - charge shall be final in this regard.

1.29. SUBMISSION OF O&M REPORT (OMR)

The bidder shall submit the Monthly O&M Report mandatorily to REIL as per the Format to be provided. Non-submission of the report shall be considered as "Breach of Contract" and shall attract punitive actions as per the relevant provisions of the Contract including non-release of Incentive. However, the decision of Engineer - in - charge shall be final in this regard.

1.30. PROJECT INSPECTION

The project progress will be monitored by REIL/NVVN and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from Nodal Agency, Discoms, NVVN, REIL or any agency/ experts designated / authorised by NVVN/REIL from time to time. Third party verification, monitoring of system installed to oversee, the implementation as per required standards and also to visit the manufacturer's facilities to check the quality of products as well as to visit the system integrators to assess their technical capabilities as and when required may be done by NVVN/REIL or any agency/ experts designated / authorised by NVVN/REIL. The cost of Inspection shall be borne by REIL/NVVN. The projects shall be inspected at any time during commissioning or after the completion of the project(s) as follows:

Inspection shall be carried out by Inspecting officer(s) nominated by REIL/NVVN, REIL/NVVN officials, or from the officials of following listed agencies/bodies

- a) Govt./NABL accredited agencies/Labs,
- b) NISE,
- c) CPRI,
- d) DNV Climate Change Services AS (DNV)
- e) TUV SUD South Asia Private Limited (TUV SUD)
- f) Bureau Veritas Certification Holding SAS (BVCH)
- g) TUV Rheinland (China) Ltd. (TUV Rheinland)
- h) TUV NORD CERT GmbH (TUV NORD)
- i) Any other agencies/bodies to be notified by REIL on time to time.

2. DOCUMENTS TO BE FURNISHED AFTER RECEIPT OF LOA FOR APPROVAL WITHIN 90 DAYS

Bidder shall furnish the following documents, in phased manner, after receipt of purchase order for approval.

- (a) Catalogues, datasheets and manuals of items supplied by bidder.
- (b) Drawings of structure, layout structure, General arrangement etc. in solar array field and switchyards.
- (c) Drawings of cable trenches in solar array field and switchyards.
- (d) Drawings of earthing arrangement for solar field array and control room panels.
- (e) Drawings of foundation pedestals to mount equipment such as inverter, etc.
- (f) General arrangement and layout drawings of all systems.
- (g) Drawings of earth mat and earthing arrangements in 11kV switchyard.
- (h) Any other drawings required by REIL

The drawings for the works can be seen in the office of PGCIL. It should be noted by contractor that these drawings are meant for general guidance only and the PGCIL/REIL officials may suitably modify them during the execution of the work according to the circumstances without making the beneficiary liable for any claims on account of such changes.

The contractor are advised to visit the site of work and investigate actual conditions regarding nature and conditions of site, difficulties involved due to inadequate stacking space, due to built up area around the site, availability of materials water and labour probable sites for labour camps, stores, godowns, etc. They should also satisfy themselves as to the sources of supply and adequacy for their respective purpose of different materials referred in the specifications and indicated in the drawings. The extent of lead and lift involved in the execution of works and any difficulties involved in the execution of work should also be examined before formulating the rates for complete items of work described in the schedule.

3. Availability of breakdown / maintenance staff

During the period of warranty the Contractor shall keep available an experienced engineer and necessary equipment to attend any defective installations resulting from defective erection and/or defects in the equipment supplied by the Contractor. The contractor shall bear the cost of all modification additions or substitutions that may be considered necessary due to faulty materials, design or workmanship for the satisfactory working of the equipment. The final decision regarding defective material / poor workmanship shall rest with REIL, which shall be binding on the bidder.

4. Failure to attend the defects

All defects and deficiencies advised to the bidder shall be attended to by him promptly. If contractor fails to respond and arrange repair / rectification within reasonable time, the purchaser shall be free to get the repairs done through departmental labour or through any other sources at contractor's expenses without prejudice to the other remedies available under the contract.

For any issues related to operation & maintenance, number shall be made available to the rooftop owner/ plant owner to resolve within 72 hours. If not attended within such stipulated time, a complaint may be raised to REIL, pursuant to which, a penalty of Rs. 10,000 for full month or part there of shall be imposed. Repetition of such instances for more than 2 times a year may lead to stop the next Scheduled payment as per T&C. Further, If the outage of the plant is more than 30 days continuously, then the 50% PBG amount shall be encashed by REIL and If the outage is exceeding more than 60 days then complete PBG amount shall be encashed by REIL. This will be applicable till 10 years of O&M as per the Scope of the RFS.

5. Maintenance period:

The contractor will have to attend the defect and deficiencies of the work for a period of 10(Ten) years from the date of completion of work as certified by Plant in-charge of the work under warranty period (i.e. Defect Liability Period). AMC shall be operative for 10 years from the date of commissioning and issue of provisional acceptance certificate.

6. COMPLETION PERIOD: Installation and commissioning of the SPV system should commence immediately after release of LOI and Installation & commissioning should be completed within 09 Month from the date of LOI& may be extended depends upon the field situation.

The contractor will submit a detailed BAR/PERT chart indicating all the activities, mobilization of material and man power and other resources required to complete the work in stipulated time. Non completion of work within stipulated time period will attract the penalty as per the contract.

7. Quality Certification, Standards and Testing for Grid-connected Rooftop Solar PV Systems/Power Plants

Quality certification and standards for grid-connected rooftop solar PV systems are essential for the successful mass-scale implementation of this technology. It is also imperative to put in place an efficient and rigorous monitoring mechanism, adherence to these standards. Hence, all components of grid-connected rooftop solar PV system/ plant must conform to the relevant standards and certifications given below:

Solar PV Modules/Panels	
IEC 61215/ IS 14286	Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
IEC 61701	Salt Mist Corrosion Testing of Photovoltaic (PV) Modules
IEC 61853- Part 1/ IS 16170: Part 1	Photovoltaic (PV) module performance testing and energy rating -: Irradiance and temperature performance measurements, and power rating
IEC 62716	Photovoltaic (PV) Modules - Ammonia (NH ₃) Corrosion Testing (As per the site condition like dairies, toilets)
IEC 61730-1,2	Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction, Part 2: Requirements for Testing
Solar PV Inverters	
IEC 62109-1, IEC 62109-2	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements, and Safety of power converters for use in photovoltaic power systems Part 2: Particular requirements for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting)
IEC/IS 61683 (as applicable)	Photovoltaic Systems - Power conditioners: Procedure for Measuring Efficiency (10%, 25%, 50%, 75% & 90-100% Loading Conditions)
IEC 62116/ UL 1741/ IEEE 1547 (as applicable)	Utility-interconnected Photovoltaic Inverters - Test Procedure of Islanding Prevention Measures
IEC 60364-5-53/ IS 15086-5 (SPD)	Measuring relays and protection equipment - Part 27: Product safety requirements
IEC 60068-2 / IEC 62093 (as applicable)	Environmental Testing of PV System - Power Conditioners and Inverters
Fuses	
IS/IEC 60947 (Part 1, 2 & 3), EN 50521	General safety requirements for connectors, s a) Low-voltage Switchgear and Control-gear, Part 1: General rules b) Low-Voltage Switchgear and Control-gear, Part 2: Circuit Breakers c) Low-voltage switchgear and Control-gear, Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units EN 50521: Connectors for photovoltaic systems - Safety requirements and tests
IEC 60269-6	Low-voltage fuses - Part 6: Supplementary

	requirements for fuse- links for the protection of solar photovoltaic energy systems
Surge Arrestors	
BFC 17-102:2011	Lightening Protection Standard
IEC 60364-5-53/ IS 15086-5 (SPD)	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control
IEC 6164311:2011	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods
Cables	
IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1 & 2)/ IEC69947 (as applicable)	General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltages up to and including 1100 V, and UV resistant for outdoor installation)
BS EN 50618	Electric cables for photovoltaic systems (BT(DE/NOT)258), mainly for DC Cables
Earthing /Lightning	
IEC 62561 Series (Chemical earthing) (as applicable)	IEC 62561-1 Lightning protection system components (LPSC) - Part 1: Requirements for connection components IEC 62561-2 Lightning protection system components (LPSC) - Part 2: Requirements for conductors and earth electrodes IEC 62561-7 Lightning protection system components (LPSC) - Part 7: Requirements for earthing enhancing compounds
Junction Boxes	
IEC 60529	Junction boxes and solar panel terminal boxes shall be of the thermo- plastic type with IP 65 protection for outdoor use, and IP 54 protection for indoor use
Energy Meter	
IS 16444 or as specified by the DISCOM	A.C. Static direct connected watt-hour Smart Meter Class 1 and 2 — Specification (with Import & Export/Net energy measurements)
Solar PV Roof Mounting Structure	
(IS 2062/IS 4759)	Material for the Structure Mounting

Note- Equivalent standards may be used for different system components of the plants. In case of clarification following person/agencies may be contacted.

- Ministry of New and Renewable Energy (Govt. of India)
- National Institute of Solar Energy
- The Energy & Resources Institute
- TUV Rheinland
- UL

5. SCOPE OF WORK FOR OPERATION AND MAINTENANCE DURING 10YEARS:

The supplier will have to quote the rates for Compressive Annual Operation and Maintenance Contract separately for 10 years. Cleaning of panels and tightening of connections shall be carried out every fortnightly. For maintenance of PCU/String Inverter, adequate set of essential spares shall be kept ready/ aside in coordination with PCU/String Inverter supplier.

Under Comprehensive annual maintenance contract, contractor shall provide the following services:-

- Attending Breakdown calls as and when required.
- Routine checking, repair and cleaning of Devices during service visit as per maintenance schedule and as per stipulation of original equipment manufacturer.
- Periodic monitoring of performance of the equipment.
- Quarterly Review visit will be provided by contractor's engineer to check the health of system.
- Immediate replacement of defective Modules, Invertors/PCUs and other equipment as and when required.
- Supply of all spares, consumables and fixtures as required. Such stock shall be maintained for all associated equipment and materials as per manufacture/supplier's recommendations.
- If negligence/ mal-operation on part of the Bidder's operator result in failure of equipment, such equipment should be repaired/replaced by the Bidder free of cost.
- CAMC shall cover replacement of spare parts due to wear & tear, overhauling, machine breakdown, insurance and replacement of defective modules, inverters/Power Conditioning Unit (PCU) spares, consumables & other parts and man power required for its operation for 5 years.

6. HSN Code: Bidder shall clear mention in the HSN Code in the technical bid and shall be submitted HSN code with items wise details bid the bid.

.....

7. Milestones:

Table of milestone (s)

S. No.	Description of milestone	Time allowed in days (All are from date of LOI)
1	Submission of data sheet & drawing for approval	
2	Manufacturing of structures, cables, & other items required to complete the project, pre dispatch inspection of material	
3	Installation of complete system	
4	Commissioning of the system	
5	Handover the system	
6.	Performance Guarantee test of the systems	

SECTION-V

Payment Term

The terms of payment has been summarized below.

i. Schedule I - Plant and Equipment (including Spares and Type test):

For Price Components of Plant and Equipments: Payment shall be 75 % (on receipt of equipment at site on pro-rata basis and physical Verification and its acceptance and certification by Engineer In Charge (EIC)) + 5% (on completion of facilities including all associated auxiliaries and its verification from Engineer In Charge) + 20% (on completion of Guarantee Tests / Demonstration Test and issuance of Commissioning / Completion Certificate by the Nodal Agency / Discom).

ii. Schedule II - Local transportation and inland transit insurance and other local costs incidental to delivery of plant & equipment:

Payment shall be 100% (pro-rata to the value of the equipment/spares received at site and on production of invoices by the contractor as certified by EIC)

iii. Schedule III - Installation Services and Civil Works:

80%(on pro-rata basis on progressive erection of the identified equipment on certification by the Engineer In Charge)+5%(on completion of facilities including all associated auxiliaries and its verification from Engineer In Charge) +15% (on completion of Guarantee Tests/Demonstration Test and issuance of Commissioning/Completion Certificate by the Nodal Agency/Discom).

iv. Schedule IV - Taxes & Duties: Payment shall be 100 % on receipt of equipment/spares/services and on production of satisfactory documentary evidence by contractor.

v. Schedule V- Operation and Maintenance Charges: 100% of monthly Operation and Maintenance Payment shall be on monthly basis at end of each month after the submission of monthly O&M Reports and its acceptance by EIC.

Release of payment shall be done within Ten (10) Business days from the date of receipt of invoice with all supporting documents and its acceptance by EIC.

1. Penalty :

- Delay beyond ten (10) Days to achieve any milestone mentioned in COD Schedule shall attract penalty of 0.5% of EPC-PBG per week of delay or part thereof except for final milestone..

2. Force Majored

For purpose of this clause, "Force Majeure" means an event beyond the control of the Bidder and not involving the Bidder's fault or negligence and not foreseeable, either in its sovereign or contractual capacity. Such events may include but are not restricted to Acts of God, wars or revolutions, fires, floods, epidemics, quarantine restrictions and fright embargoes etc. Whether a "Force majeure" situation exists or not, shall be decided by REIL/ NVVN and its decision shall be final and binding on the Bidder and all other concerned.

- a. "Force Majeure" shall mean any event beyond the reasonable control of the REIL/NVVN or of the Bidder, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following:
- I. Act of God, including, but not limited to lightning, drought, fire and explosion (to the extent originating from a source external to the site), earthquake, volcanic eruption, landslide, flood, cyclone, typhoon or tornado, act of war, terrorist attack, public disorders, civil disturbances, riots, insurrection, sabotage, rebellion, blockade, embargo ;
 - II. A Force Majeure Event shall not be based on the Economic hardship of either Party. In case of any damage because of force majeure event, the Project shall be repaired / commissioned at its own cost by the Bidder.
 - III. the unlawful, unreasonable or discriminatory revocation of, or refusal to renew, any Consent required by the Bidder for the development/ operation of the Project, provided that an appropriate court of law declares the revocation or refusal to be unlawful, unreasonable and discriminatory and strikes the same down.
 - IV. Industry wide strikes and labour disturbances having a nationwide impact in India.
 - V. Radioactive contamination or ionising radiation originating from a source in India or resulting from another Force Majeure Event mentioned above excluding circumstances where the source or cause of contamination or radiation is brought or has been brought into or near the Power Project by the EPC Bidder or those employed or engaged by the EPC
- b. Force Majeure shall not include (i) any event or circumstance which is within the reasonable control of the Parties and (ii) the following conditions, except to the extent that they are consequences of an event of Force Majeure:
- I. Unavailability, late delivery, or changes in cost of the plant, machinery, equipment, materials, spare parts or consumables for the Power Project;
 - II. Not getting timely approvals from the concerned authorities involved for any activity related to execution of the Project. Inability to obtain permission from discom. Inability to obtain commissioning certificate from discom.
 - III. Delay in the performance of any sub-Bidder or their agents
 - IV. Non-performance resulting from normal wear and tear typically experienced in power generation materials and equipment;
 - V. Strikes at the facilities of the Affected Party;
 - VI. Insufficiency of finances or funds or the Agreement becoming onerous to perform; and

Non-performance caused by, or connected with, the Affected Party's:

- Negligent or intentional acts, errors or omissions;
- Failure to comply with an Indian Law; or
- Breach of, or default under this IFB document.

c. Notification of Force Majeure Event

- vi. The Affected Party shall give notice to the other Party of any event of Force Majeure as soon as reasonably practicable, but not later than seven (7) Days after the date on which such Party knew or should reasonably have known of the commencement of the event of Force Majeure. If an event of Force Majeure results in a breakdown of communications rendering it unreasonable to give notice within the applicable time limit specified herein, then the Party claiming Force Majeure shall give such notice as soon as reasonably practicable after reinstatement of communications, but not later than three (3) Days after such reinstatement.
- vii. Provided that such notice of Force Majeure shall be a pre-condition to the Affected Party's entitlement to claim relief under this IFB. Such notice shall include full particulars of the event of Force Majeure, its effects on the Party claiming relief and the remedial measures proposed. The Affected Party shall give the other Party regular (weekly or monthly basis, as communicated and agreed upon between the Parties in writing) reports on the existence Force Majeure and/or progress of those remedial measures and such other information as the other Party may reasonably request about the Force Majeure Event.
- viii. The Affected Party shall give notice to the other Party of (i) the cessation of the relevant event of Force Majeure; and (ii) the cessation of the effects of such event of Force Majeure on the performance of its rights or obligations under this IFB, as soon as practicable, but not later than seven (7) Days after becoming aware of each of these cessations.
- ix. In case of delay in Payment due to Force Majeure, Affected Party shall have inform the other Party and make payment as soon as effect of Force Majeure shall be ended on Affected Party payment obligation.
- x. To the extent not prevented by a Force Majeure Event, the Affected Party shall continue to perform its obligations pursuant to this IFB. The Affected Party shall use its reasonable efforts to mitigate the effect of any Force Majeure Event as soon as practicable.

VI. Available Relief for a Force Majeure Event

- a. no Party shall be in breach of its obligations pursuant to this IFB except to the extent that the performance of its obligations was prevented, hindered or delayed due to a Force Majeure Event;
- b. every Party shall be entitled to claim relief in relation to a Force Majeure Event in regard to its obligations;

- c. For avoidance of doubt, none of either Party's obligation to make payments of money due and payable prior to occurrence of Force Majeure events under this IFB shall be suspended or excused due to the occurrence of a Force Majeure Event in respect of such Party.
- d. Provided that no payments shall be made by either Party affected by a Force Majeure Event for the period of such event on account of its inability to perform its obligations due to such Force Majeure Event.

3. Other Terms & Conditions:-

Compliance with Regulations and Indian Standard:-

All works shall be carried out in accordance with relevant regulations, both statutory & those specified by the Indian standard related to the works covered by this specification. In particular the equipment and installation will comply with the following:-

Work man's compensation act.
 Minimum wages Act.
 Payment wages Act.
 Contact Labour regulation & abolition Act.
 ESI, PF & Bonus Act.
 Regulation under Indian Electricity Rules,
 I.S. Standard as applicable& other statutory requirement.

5. GENERAL TERMS AND CONDITIONS

- (a) The above scope of work is indicative. However, if there is any other work the supplier shall carry out the same without any extra cost.
- (b) Responsibility, right and liabilities of the bidder, under this contract, will commence from the date of acceptance of the purchase order.
- (c) The work will have to be carried out in such a manner that will not cause any inconvenience to other agencies working in the site.
- (d) Prior to handing over of site, the entire site will be cleaned off debris etc.
- (e) All the materials brought to site shall accompany with appropriate paper work like challan, Invoice etc. duly verified & signed by Customer, to be submitted to REIL for payment.
- (f) Any damage to the buildings / structures / area made by bidder's workmen or by bidder's agent will be made good by bidder at their cost.
- (g) Safety of bidder's workmen or bidder's agent is responsibility of the bidder. Accordingly, risk and necessary insurance and safety cover shall be addressed by bidder.
- (h) No child labour should be employed for executing the present contract.
- (i) Bidder is required to meet all the statutory obligation with regard to work deployed by bidder for the contract such as ESI, PF, Minimum wage act Work man compensation act, Income Tax act, Employees Insurance act etc.
- (j) All tools and tackles required for installation, wiring, assembly, digging of cable trenches, earth pits etc have to be organized by the bidder. All the accessories such as power drilling machine, cutting machine, digging tools & complete set of crimping tools etc shall be organized by bidder.
- (k) All the works shall be executed strictly as per the direction of engineer in-charge at site.

(l) **Pre-dispatch inspection of items supplied by bidders:**

- Manufacture test certificates must be furnished in advance to enable clearance to dispatch to the site.
- On completion of inspection, the test certificates must be furnished to REIL in advance to enable clearance for dispatch to the site.
- Material shall be inspected at manufacturing work.

(m) **Delivery Schedule: 30** days from placement date of LOI.

(n) **Delivery of material:** The material shall be delivered freight and loading unloading at respective site.

(o) The complete job for supply of items and installation- commissioning shall be carried out by contractor.

(p) Five year on site guarantee and maintenance at site including spares of all the supplied items. A Service Level Agreement shall be signed with the supplier for 10 year free maintenance from the date of commissioning of systems.

(q) All necessary co-ordination activities for metering to the 11/33 kV grid shall be carried out by bidder. This includes liaisoning with the Govt. Departments/ agencies.

(r) 10 years guarantee and onsite warranty maintenance of the equipments supplied the bidder from the date of commissioning of the project.

6. LABOUR CAMPS

Land for setting up a workshop by the contractor or for his labour camp or

for any other purpose, shall have to be arranged by the contractor at his own cost and under his own arrangements. The contractor, however, will be permitted to make use of the railway land to the extent that can be made available to him free of cost, by the railway in the vicinity of the site of works. The contractor/s shall at all times be responsible for any damage or trespass committed by his agent and workmen for carrying out the work.

SECTION-VI

Location of proposed SPV Power Plant(s) are as under

S.NO	Zone	Name of Region	State/City	Location	Tentative Capacity(in kWp)	Category of States
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						

NOTE:

1. Usable area has to be worked out by the bidder after survey & studying the site, before quoting the rates in the tender, for feasibility of providing the proposed capacity of plants.

PERFORMA (EMD)

BANK GUARANTEE TOWARDS EARNEST MONEY DEPOSIT

Bank Guarantee No.

Date

To,

Rajasthan Electronics & Instruments Limited, (REIL)
2, Kanakpura Industrial Area Sirsi Road,
Jaipur-302034 (Rajasthan)

Dear Sir,

In accordance with Invitation for Bids under your Bid Document No. **REIL/RE/2019-20/SPVPP/3.6MWp/14**) M/s.(**Bidder Name**) having its registered office at (hereinafter called the bidder) wish to participate in the said Bid for design, engineering, supply, transportation, unloading, storage, installation and commissioning of 3.6 MWp Solar PV based power project with AMC period of 10 years (the required solar PV modules & inverters will be supplied by REIL to site) at Mandiddep, Bhopal.

As an irrevocable bank guarantee against Bid Security for an amount of Rs. Four Lac only (Rs. 4,00,000/- only) valid up to, required to be submitted by the Bidder as a condition precedent for participation in the said Bid which amount is liable to be forfeited on the happening of any contingencies mentioned in the Bidding Documents.

We, the(**Bank Name& address**) guarantee and undertake to pay immediately on demand by Rajasthan Electronics & Instruments Limited the amount of Rs. 13,50,000/- only without any reservation, protest, demand and recourse. Any such demand made by the 'REIL' shall be conclusive and binding on us irrespective of any dispute or difference raised by the Bidder.

This Guarantee shall be irrevocable and shall remain valid up to(date of expiry of Guarantee).. If any further extension of this guarantee is required, the same shall be extended to such required period (not exceeding one year) on receiving instructions from **M/s.**(**Bidder Name**) on whose behalf this guarantee is issued.

This guarantee will remain in force up to and including(date of expiry of Guarantee). , and any demand in respect thereof must reach the Bank not later than the above date.

Notwithstanding anything contained herein above:

- i) Our liability under this guarantee shall not exceed Rs. 13,50,000/- only)
- ii) This bank guarantee shall be valid up to(date of expiry of Guarantee).
- iii) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee only and only if we receive from you a written claim or demand on or before (date of expiry of Guarantee).

The said letter of guarantee has been transmitted through SFMS gateway to your bank. It is advised that in your own interest, you may verify the genuineness of above letter of guarantee from your bank / branch.

Dated the date of 2020.

Bank Name
(sealed& signed)

Tender ref.: NIB No. REIL/RE/2019-20/SPV/PP/3.6MWP/14

Authorization Certificate

To
Deputy General Manager (MM),
Rajasthan Electronics & Instruments Limited,
2, Kanakpura Industrial Area,
Jaipur-302034
Rajasthan

Date

Dear Sir,

Mr. is hereby authorized to sign and submit tender document in reference to your tender no **REIL/RE/2019-20/SPV/PP/3.6MWP/14** dated **09.03.2020** on behalf of M/s for **Design, Engineering, Supply, Construction, Erection, Testing, Commissioning and 10 Years O&M of 3.6 MWp Grid Connected Rooftop Solar PV Projects in Mandideep, Bhopal (Madhya Pradesh).**

On behalf of company

Name and Designation

Signed and sealed (who has signed the tender)

UNDERTAKING OF NO NEAR RELATIVE

Date

To

Deputy General Manager (MM),
Rajasthan Electronics & Instruments Limited,
2, Kanakpura Industrial Area,
Jaipur-302034
Rajasthan

Dear Sir,

I.....S/o..... R/o..... hereby certify that none of my relatives) as defined in the tender document is/are employed in REIL unit as per details given in tender document. In case at any stage, it is found that the information given by me is false / incorrect, REIL shall have the absolute right to take any action as deemed fit/without any prior intimation to me.

On behalf of company

Name and Designation

Tender ref.: NIB No. REIL/RE/2019-20/SPV/PP/3.6MWP/14

CERTIFICATE FOR NON BLACK LISTING

Date

To

Deputy General Manager (MM),
Rajasthan Electronics & Instruments Limited,
2, Kanakpura Industrial Area,
Jaipur-302034
Rajasthan.

Dear Sir,

We, M/s.confirm that we are not blacklisted in any PSUs/Government/Semi Government / Quasi Government department in India, as on date of submission of bid. This undertaking is submitted to the best of my knowledge. If at any stage it is found wrong, then REIL may take necessary action against us.

On behalf of company

Name and Designation