



Bid Number/बोली क्रमांक (बिड संख्या):
GEM/2023/B/3366970
Dated/दिनांक : 20-04-2023

Bid Document/ बिड दस्तावेज़

Bid Details/बिड विवरण	
Bid End Date/Time/बिड बंद होने की तारीख/समय	11-05-2023 18:00:00
Bid Opening Date/Time/बिड खुलने की तारीख/समय	11-05-2023 18:30:00
Bid Offer Validity (From End Date)/बिड पेशकश वैधता (बंद होने की तारीख से)	90 (Days)
Ministry/State Name/मंत्रालय/राज्य का नाम	Ministry Of Earth Sciences
Department Name/विभाग का नाम	Na
Organisation Name/संगठन का नाम	National Centre For Antarctic And Ocean Research (ncaor)
Office Name/कार्यालय का नाम	Goa
Total Quantity/कुल मात्रा	1
Item Category/मद केटेगरी	Procurement of New Solar Power Plant 20 KW (Q3)
Minimum Average Annual Turnover of the bidder (For 3 Years)/बिडर का न्यूनतम औसत वार्षिक टर्नओवर (3 वर्षों का)	60 Lakh (s)
OEM Average Turnover (Last 3 Years)/मूल उपकरण निर्माता का औसत टर्नओवर (गत 3 वर्षों का)	60 Lakh (s)
Years of Past Experience Required for same/similar service/उन्हीं/समान सेवाओं के लिए अपेक्षित विगत अनुभव के वर्ष	3 Year (s)
MSE Exemption for Years of Experience and Turnover/ अनुभव के वर्षों से एमएसई छूट	No
Startup Exemption for Years of Experience and Turnover/ अनुभव के वर्षों से स्टार्टअप छूट	No
Document required from seller/विक्रेता से मांगे गए दस्तावेज़	Experience Criteria,Past Performance,Bidder Turnover,OEM Authorization Certificate,OEM Annual Turnover,Additional Doc 1 (Requested in ATC),Compliance of BoQ specification and supporting document *In case any bidder is seeking exemption from Experience / Turnover Criteria, the supporting documents to prove his eligibility for exemption must be uploaded for evaluation by the buyer
Past Performance/विगत प्रदर्शन	10 %
Bid to RA enabled/बिड से रिवर्स नीलामी सक्रिय किया	No

Bid Details/बिड विवरण	
Type of Bid/बिड का प्रकार	Two Packet Bid
Time allowed for Technical Clarifications during technical evaluation/तकनीकी मूल्यांकन के दौरान तकनीकी स्पष्टीकरण हेतु अनुमत समय	3 Days
Evaluation Method/मूल्यांकन पद्धति	Total value wise evaluation

EMD Detail/ईएमडी विवरण

Advisory Bank/एडवाइजरी बैंक	State Bank of India
EMD Amount/ईएमडी राशि	120000

ePBG Detail/ईपीबीजी विवरण

Advisory Bank/एडवाइजरी बैंक	State Bank of India
ePBG Percentage(%) / ईपीबीजी प्रतिशत (%)	10.00
Duration of ePBG required (Months) / ईपीबीजी की अपेक्षित अवधि (महीने).	62

(a). EMD EXEMPTION: The bidder seeking EMD exemption, must submit the valid supporting document for the relevant category as per GeM GTC with the bid. Under MSE category, only manufacturers for goods and Service Providers for Services are eligible for exemption from EMD. Traders are excluded from the purview of this Policy./जेम की शर्तों के अनुसार ईएमडी छूट के इच्छुक बिडर को संबंधित केटेगरी के लिए बिड के साथ वैध समर्थित दस्तावेज प्रस्तुत करने हैं। एमएसई केटेगरी के अंतर्गत केवल वस्तुओं के लिए विनिर्माता तथा सेवाओं के लिए सेवा प्रदाता ईएमडी से छूट के पात्र हैं। व्यापारियों को इस नीति के दायरे से बाहर रखा गया है।

(b). EMD & Performance security should be in favour of Beneficiary, wherever it is applicable./ईएमडी और संपादन जमानत राशि, जहां यह लागू होती है, लाभार्थी के पक्ष में होनी चाहिए।

Beneficiary/लाभार्थी :

Director, NCPOR

If Offline EMD/PBG, the Original document to be delivered to National Centre for Polar and Ocean Research (NCPOR), Ministry of Earth Sciences, Headland Sada, Vasco Da Gama, South-Goa, Goa 403804.
(Director)

Splitting/विभाजन

Bid splitting not applied/बोली विभाजन लागू नहीं किया गया.

MII Purchase Preference/एमआईआई खरीद वरीयता

MII Purchase Preference/एमआईआई खरीद वरीयता	Yes
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MSE Purchase Preference/एमएसई खरीद वरीयता

MSE Purchase Preference/एमएसई खरीद वरीयता	Yes
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1. The minimum average annual financial turnover of the bidder during the last three years, ending on 31st March of the previous financial year, should be as indicated above in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the bidder is less than 3-year-old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.
2. Experience Criteria: In respect of the filter applied for experience criteria, the Bidder or its OEM {themselves or through reseller(s)} should have regularly, manufactured and supplied same or similar Category Products to any Central / State Govt Organization / PSU / Public Listed Company for number of Financial years as indicated above in the bid document before the bid opening date. Copies of relevant contracts to be submitted along with bid in support of having supplied some quantity during each of the Financial year. In case of bunch bids, the category of primary product having highest value should meet this criterion.
3. OEM Turn Over Criteria: The minimum average annual financial turnover of the OEM of the offered product during the last three years, ending on 31st March of the previous financial year, should be as indicated in the bid document. Documentary evidence in the form of certified Audited Balance Sheets of relevant periods or a certificate from the Chartered Accountant / Cost Accountant indicating the turnover details for the relevant period shall be uploaded with the bid. In case the date of constitution / incorporation of the OEM is less than 3 year old, the average turnover in respect of the completed financial years after the date of constitution shall be taken into account for this criteria.
4. Preference to Make In India products (For bids < 200 Crore):Preference shall be given to Class 1 local supplier as defined in public procurement (Preference to Make in India), Order 2017 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products. The minimum local content to qualify as a Class 1 local supplier is denoted in the bid document. If the bidder wants to avail the Purchase preference, the bidder must upload a certificate from the OEM regarding the percentage of the local content and the details of locations at which the local value addition is made along with their bid, failing which no purchase preference shall be granted. In case the bid value is more than Rs 10 Crore, the declaration relating to percentage of local content shall be certified by the statutory auditor or cost auditor, if the OEM is a company and by a practicing cost accountant or a chartered accountant for OEMs other than companies as per the Public Procurement (preference to Make-in -India) order 2017 dated 04.06.2020. Only Class-I and Class-II Local suppliers as per MII order dated 4.6.2020 will be eligible to bid. Non - Local suppliers as per MII order dated 04.06.2020 are not eligible to participate. However, eligible micro and small enterprises will be allowed to participate .In case Buyer has selected Purchase preference to Micro and Small Enterprises clause in the bid, the same will get precedence over this clause.
5. Purchase preference to Micro and Small Enterprises (MSEs): Purchase preference will be given to MSEs as defined in Public Procurement Policy for Micro and Small Enterprises (MSEs) Order, 2012 dated 23.03.2012 issued by Ministry of Micro, Small and Medium Enterprises and its subsequent Orders/Notifications issued by concerned Ministry. If the bidder wants to avail the Purchase preference, the bidder must be the manufacturer of the offered product in case of bid for supply of goods. Traders are excluded from the purview of Public Procurement Policy for Micro and Small Enterprises. In respect of bid for Services, the bidder must be the Service provider of the offered Service. Relevant documentary evidence in this regard shall be uploaded along with the bid in respect of the offered product or service. If L-1 is not an MSE and MSE Seller (s) has/have quoted price within L-1+ 15% (Selected by Buyer)of margin of purchase preference /price band defined in relevant policy, such Seller shall be given opportunity to match L-1 price and contract will be awarded for 25%(selected by Buyer) percentage of total QUANTITY.
6. Past Performance: The Bidder or its OEM {themselves or through re-seller(s)} should have supplied same or similar Category Products for 10% of bid quantity, in at least one of the last three Financial years before the bid opening date to any Central / State Govt Organization / PSU / Public Listed Company. Copies of relevant contracts (proving supply of cumulative order quantity in any one financial year) to be submitted along with bid in support of quantity supplied in the relevant Financial year. In case of bunch bids, the category related to primary product having highest bid value should meet this criterion.

Procurement Of New Solar Power Plant 20 KW (1 set)

(Minimum 50% and 20% Local Content required for qualifying as Class 1 and Class 2 Local Supplier respectively/क्रमशः श्रेणी 1 और श्रेणी 2 के स्थानीय आपूर्तिकर्ता के रूप में अर्हता प्राप्त करने के लिए आवश्यक)

Brand Type/ब्रांड का प्रकार	Unbranded
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Technical Specifications/तकनीकी विशिष्टियाँ

Buyer Specification Document/क्रेता विशिष्टि दस्तावेज़	Download
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Consignees/Reporting Officer/परेषिती/रिपोर्टिंग अधिकारी and/ तथा Quantity/मात्रा

S.No./क्र. सं.	Consignee Reporting/Officer/ परेषिती/रिपोर्टिंग अधिकारी	Address/पता	Quantity/मात्रा	Delivery Days/डिलीवरी के दिन
1	Pradeep Kumar Singh	403804, Director National Centre for Antarctic Ocean Research Headland Sada, Vasco-da-gama,	1	60

Buyer Added Bid Specific Terms and Conditions/क्रेता द्वारा जोड़ी गई बिड की विशेष शर्तें

1. Scope of Supply

Scope of supply (Bid price to include all cost components) : Supply Installation Testing Commissioning of Goods and Training of operators and providing Statutory Clearances required (if any)

2. Generic

Manufacturer Authorization: Wherever Authorised Distributors/service providers are submitting the bid, Authorisation Form /Certificate with OEM/Original Service Provider details such as name, designation, address, e-mail Id and Phone No. required to be furnished along with the bid

3. Buyer Added Bid Specific ATC

Buyer uploaded ATC document [Click here to view the file.](#)

4. Buyer Added Bid Specific ATC

Buyer Added text based ATC clauses

(i) SCOPE OF INSTALATION & DELIVERY: A proper Installation and Commissioning of the system at site (Himansh station, Sutri Dhaka, Chandra basin, Himachal Pradesh) should be done by vendor.(Transportation of all the items/materials up to the site for establishment of the complete system should be done by the supplier/bidder.)

(ii) The supplier to provide compliance on All Technical Specifications and Scope of Supply & Delivery.

(iii) Bidder Earnest Money Deposit (EMD) - As per GeM General Terms & conditions, scanned copy of EMD (in the name of Buyer) shall be uploaded by Seller in the online bid and original copy of the same will have to

o be submitted directly to the Buyer mentioned delivery address within 5 working days of bid opening, failing which the bid may be treated as incomplete & may lead to rejection of the bid by buyer without making any reference to the seller.

(iv) Performance Bank Guarantee (PBG) - As per GeM General Terms & conditions, the Online PBG or Offline PBG must be submitted by Seller to the Buyer within 15 days of award of contract on GeM. The payments to the seller shall become due only after receipt of Performance Bank Guarantee by the Buyer and verification of its genuineness. No interest shall be payable upon the Performance Bank Guarantee.

(v) If the Seller fails or neglects to observe or perform any of his obligations under the contract it shall be liable for the Buyer to forfeit either in whole or in part, the Performance Bank Guarantee furnished by the Seller.

5. **Warranty**

Warranty period of the supplied products shall be 5 years from the date of final acceptance of goods or after completion of installation, commissioning & testing of goods (if included in the scope of supply), at consignee location. OEM Warranty certificates must be submitted by Successful Bidder at the time of delivery of Goods. The seller should guarantee the rectification of goods in case of any break down during the guarantee period. Seller should have well established Installation, Commissioning, Training, Troubleshooting and Maintenance Service group in INDIA for attending the after sales service. Details of Service Centres near consignee destinations are to be uploaded along with the bid.

6. **Forms of EMD and PBG**

Bidders can also submit the EMD with Payment online through RTGS / internet banking in Beneficiary name

To The Director, National Centre for Polar and Ocean Research
Account No.
10153336180
IFSC Code
SBIN0004116
Bank Name
State Bank of India
Branch address
SBI Commercial Branch, VIDHYA DHIRAJ BHAVANF L GOMES RD, GOA PIN-403802

. Bidder to indicate bid number and name of bidding entity in the transaction details field at the time of on-line transfer. Bidder has to upload scanned copy / proof of the Online Payment Transfer along with bid.

7. **Forms of EMD and PBG**

Successful Bidder can submit the Performance Security in the form of Payment online through RTGS / internet banking also (besides PBG which is allowed as per GeM GTC). On-line payment shall be in Beneficiary name

To The Director, National Centre for Polar and Ocean Research
Account No.
10153336180
IFSC Code
SBIN0004116
Bank Name
State Bank of India
Branch address
SBI Commercial Branch, VIDHYA DHIRAJ BHAVANF L GOMES RD, GOA PIN-403802

. Successful Bidder to indicate Contract number and name of Seller entity in the transaction details field at the time of on-line transfer. Bidder has to upload scanned copy / proof of the Online Payment Transfer in place of PBG within 15 days of award of contract.

8. **Generic**

Installation, Commissioning, Testing, Configuration, Training (if any - which ever is applicable as per scope of supply) is to be carried out by OEM / OEM Certified resource or OEM authorised Reseller.

9. **Generic**

Data Sheet of the product(s) offered in the bid, are to be uploaded along with the bid documents. Buyers can match and verify the Data Sheet with the product specifications offered. In case of any unexplained mismatch of technical parameters, the bid is liable for rejection.

10. **Certificates**

The bidder is required to upload, along with the bid, all relevant certificates such as BIS licence, type test certificate, approval certificates and other certificates as prescribed in the Product Specification given in the bid document.

11. **Certificates**

Bidder's offer is liable to be rejected if they don't upload any of the certificates / documents sought in the Bid document, ATC and Corrigendum if any.

12. **Generic**

Bidders are advised to check applicable GST on their own before quoting. Buyer will not take any responsibility in this regards. GST reimbursement will be as per actuals or as per applicable rates (whichever is lower), subject to the maximum of quoted GST %.

13. **Past Project Experience**

Proof for Past Experience and Project Experience clause: For fulfilling the experience criteria any one of the following documents may be considered as valid proof for meeting the experience criteria:a. Contract copy along with Invoice(s) with self-certification by the bidder that service/supplies against the invoices have been executed.b. Execution certificate by client with contract value.c. Any other document in support of contract execution like Third Party Inspection release note, etc.**Proof for Past Experience and Project Experience clause:** For fulfilling the experience criteria any one of the following documents may be considered as valid proof for meeting the experience criteria:a. Contract copy along with Invoice(s) with self-certification by the bidder that service/supplies against the invoices have been executed.b. Execution certificate by client with contract value.c. Any other document in support of contract execution like Third Party Inspection release note, etc.

14. **Generic**

1. The Seller shall not assign the Contract in whole or part without obtaining the prior written consent of buyer.
2. The Seller shall not sub-contract the Contract in whole or part to any entity without obtaining the prior written consent of buyer.
3. The Seller shall, notwithstanding the consent and assignment/sub-contract, remain jointly and severally liable and responsible to buyer together with the assignee/ sub-contractor, for and in respect of the due performance of the Contract and the Sellers obligations there under.

Disclaimer/अस्वीकरण

The additional terms and conditions have been incorporated by the Buyer after approval of the Competent Authority in Buyer Organization, whereby Buyer organization is solely responsible for the impact of these clauses on the bidding process, its outcome, and consequences thereof including any eccentricity / restriction arising in the bidding process due to these ATCs and due to modification of technical specifications and / or terms and conditions governing the bid. Any clause(s) incorporated by the Buyer regarding following shall be treated as null and void and would not be considered as part of bid:-

1. Definition of Class I and Class II suppliers in the bid not in line with the extant Order / Office Memorandum issued by DPIIT in this regard.
2. Seeking EMD submission from bidder(s), including via Additional Terms & Conditions, in contravention to

exemption provided to such sellers under GeM GTC.

3. Publishing Custom / BOQ bids for items for which regular GeM categories are available without any Category item bunched with it.
4. Creating BoQ bid for single item.
5. Mentioning specific Brand or Make or Model or Manufacturer or Dealer name.
6. Mandating submission of documents in physical form as a pre-requisite to qualify bidders.
7. Floating / creation of work contracts as Custom Bids in Services.
8. Seeking sample with bid or approval of samples during bid evaluation process.
9. Mandating foreign / international certifications even in case of existence of Indian Standards without specifying equivalent Indian Certification / standards.
10. Seeking experience from specific organization / department / institute only or from foreign / export experience.
11. Creating bid for items from irrelevant categories.
12. Incorporating any clause against the MSME policy and Preference to Make in India Policy.
13. Reference of conditions published on any external site or reference to external documents/clauses.
14. Asking for any Tender fee / Bid Participation fee / Auction fee in case of Bids / Forward Auction, as the case may be.

Further, if any seller has any objection/grievance against these additional clauses or otherwise on any aspect of this bid, they can raise their representation against the same by using the Representation window provided in the bid details field in Seller dashboard after logging in as a seller within 4 days of bid publication on GeM. Buyer is duty bound to reply to all such representations and would not be allowed to open bids if he fails to reply to such representations.

[This Bid is also governed by the General Terms and Conditions/ यह बिड सामान्य शर्तों के अंतर्गत भी शासित है](#)

In terms of GeM GTC clause 26 regarding Restrictions on procurement from a bidder of a country which shares a land border with India, any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. While participating in bid, Bidder has to undertake compliance of this and any false declaration and non-compliance of this would be a ground for immediate termination of the contract and further legal action in accordance with the laws./जेम की सामान्य शर्तों के खंड 26 के संदर्भ में भारत के साथ भूमि सीमा साझा करने वाले देश के बिडर से खरीद पर प्रतिबंध के संबंध में भारत के साथ भूमि सीमा साझा करने वाले देश का कोई भी बिडर इस निविदा में बिड देने के लिए तभी पात्र होगा जब वह बिड देने वाला सक्षम प्राधिकारी के पास पंजीकृत हो। बिड में भाग लेते समय बिडर को इसका अनुपालन करना होगा और कोई भी गलत घोषणा किए जाने व इसका अनुपालन न करने पर अनुबंध को तत्काल समाप्त करने और कानून के अनुसार आगे की कानूनी कार्रवाई का आधार होगा।

---Thank You/धन्यवाद---

Sr No.	<u>ITEM SPECIFICATIONS</u>
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A	New Solar Power Plant 20 KW - QTY 1 No.
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1

Specifications

Turnkey project of fabrication, supply, transportation, installation and commissioning of 20KW off grid system of Solar Power Plant at Himalayan field station Himansh, Chandra basin, Lahul –Spiti district, Himachal Pradesh

National Center for Polar and Ocean Research (NCPOR), Ministry of Earth Sciences, Govt. of India propose to setup a 20 KW(provision to extend in future) solar power plant dedicated for field station" Himansh" in Chandra basin, near Batal (~125km from Manali by road). The field station Himansh is located at 4080m altitude and experienced heavy snow (10 feet) in winter.

A. Design conditions:

The site being in higher Himalaya are subjected to extreme weather conditions , the structure and fabrication should be able to sustain in following weather condition:

Temp: minimum of -30oC in winter and maximum of 40oC in summer

Snowfall: Maximum of 3m (10ft approx) accumulation during winter (from October to March)

Rainfall: Maximum during monsoon (average 255mm)

Wind: Maximum of 41 m/s

B. Approaches:

Up to Manali, Himachal Pradesh) – By road

Manali - Batal (Manali-Kaza route) - By road (120 km approx.)

Batal - Sutri Dhaka base (proposes site for installation) - By foot (1.5 km approx. from roadhead)

Figure1. Approaches to Himansh station

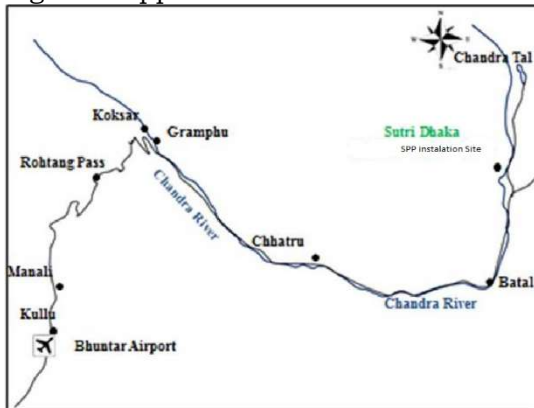


Figure.2 Himansh station (Summer-May to October)



Figure.3 Himansh station (Winter – November to April)



Figure.4 Himansh station (Aerial view in winter)



C. Technical specifications:

The Solar Power plant should have capacity to generate 20kWp power and also has provision to extend the facilities to produce further up to 50KW. All materials involve in plants should be high standard and known company make of national/ international level. The plant should be modular in nature and the individual panels should be light enough to be carried by one porter to remote areas in a short time, ensuring immediate re-use at a new site with minimum delay.

The detailed specifications are given below:

The proposed projects should be commissioned as per the technical specifications given below. Any shortcomings will lead to cancellation of order. A off Grid Solar Photovoltaic (SPV) power plant consists of SPV Modules, Module Mounting Structure including elevated truss framed support, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Controls & Protections, Interconnect cables, Junction boxes, Distribution boxes and switches. PV Array should be mounted on a suitable structure. Off-grid SPV system should be designed with necessary features to Power the Battery Bank in efficient manner during day time. Components and parts used in the SPV power plant 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.

Solar PV system should consist of following equipment's/components:

1. Solar PV modules
2. Module mounting structure including elevated truss framed support
3. Power Conditioning Unit (PCU)/Inverter
4. Battery Bank
5. Junction Boxes.
6. DC Distribution Board
7. AC Distribution Board
8. Cables
9. Remote Monitoring System
10. Metering
11. Protection
12. Drawings & Manuals
13. Planning & Designing
14. The make of various items
15. Tools & Tackles And Spares
16. Danger Boards And Signages
17. Fire Extinguishers
18. Warranty and Maintenance
19. Installation and Commissioning

1. SOLAR PV (PHOTOVOLTAIC) MODULES :-

- a. 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.
- b. For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701.
- c. The total solar PV array capacity should not be less than 20kWp and should comprise of Solar PV Panels of Mono Crystalline Module of minimum 335Wp and above Wattage. Module capacity less than minimum 335 Watts should not be accepted.
- d. Adequate 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 centres.
- f. The module frame shall be made of corrosion resistant materials, preferably having anodized aluminium.
- g. The Bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his Bid.
- h. I-V curves at STC should be provided by Bidder
- i. Other general requirement for the PV modules and subsystems shall be the Following:
 1. The rated output power of any supplied module shall have tolerance within +/- 3%.
 2. 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.
 3. 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.
 4. The SPV module should have 25 years self-life.

j. Modules deployed must use a RF identification tag. The following information must be mentioned in the RFID used on each module. This should be inside the laminate only.

- a. Name of the manufacture of the PV module
- b. Name of the manufacture of Solar Cells.
- c. Month & year of the manufacture (separate for solar cells and modules)
- d. Country of origin (separately for solar cells and module)
- e. I-V curve for the module Wattage, Im, Vm 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

k. Warranty:

I). Material Warranty:

- a. Material Warranty is defined as:
- b. The project developer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five (05) years from the date of sale to the original customer ("Customer")
- c. Defects and/or failures due to manufacturing
- d. Defects and/or failures due to quality of materials
- e. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the project developer will repair or replace the solar module(s), at the Owners sole option.

II. Performance Warranty:

- a. The predicted electrical degradation of power generated not exceeding 20% of the minimum rated power over the 25 year period and not more than 10% after ten years period of the full rated original output.

2. MODULE MOUNTING STRUCTURE INCLUDING ELEVATED TRUSS FRAMED SUPPORT :-

- i. Modules shall be mounted on a non-corrosive support structures (anodized aluminum or equivalent) towards due south and at a suitable inclination to maximize annual energy output.
- ii. Hot dip galvanized MS pipe, angle, channel etc may be used for installing ground mounted elevated truss structure and GI sheets to be placed on the elevated truss. Minimum thickness of galvanization should be at least 120 microns. The SPV module shall be installed on the mounting structure riveted on the GI sheets.
- iii. The structure should have compatible angle of inclinations as per the site condition for maximizing the power output.
- iv. The solar PV panels should be mounted at a height of 3mt from the ground level and accordingly the bidders should design the support structure.
- v. The Mounting structure shall be so designed to withstand the speed for the wind zone of the location given above (wind speed of 41m/s). The design details along with load calculation sheet to be shared with NCPOR.
- vi. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed.
- vii. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts.
- viii. 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.

- ix. The above structure should have a room not less than 16m² (4mx4m) and made of insulated 150 mm thick puff panels, with flooring, to be used as power room for installing power bank, inverter, meter, distribution board etc. Flooring frame to be made of a minimum of 100 mm ISMB Sections- on top of frame structure of floor, 150 mm thick PUF panel and ~12.5 mm wooden flooring.
- x. All the structural members should be properly enamel painted with one coat of primer and two coats of paint. All the end openings of the sections should be properly sealed.
- xi. GI sections ladders should be fabricated and installed at suitable locations along the structure to access the mounted solar panels for cleaning and maintenance.

3. PCU / INVERTER :-

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 to be achieved using an electronic Inverter and the associated control and protection devices. All these components of the system are termed the "Power Conditioning Unit (PCU)". In addition, the PCU should also house Solar Charge Controller with MPPT (Maximum Power Point Tracker) for charging the battery bank, Inverter and AC Charger. Technical features of the inverter shall be as follows

Switching devices IGBT/MOSFET

Type MPPT based Charge Controller

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

Ambient temperature considered -30o C to 50o C

Humidity 95 % Non-condensing

Protection of Enclosure IP-54(Minimum) for indoor. IP-65(Minimum) for outdoor.

Cooling Solar Natural and Forced Air cooling with temperature sensitive fan operation

Efficiency 90% at rated load and normal operating conditions

THD < 3%

PF > 0.9

- a) The capacity of the PCU/Inverter should be 20kW.
- b) Inverters should be of very high quality having high efficiency and shall be completely compatible with the charge controller and distribution panel.
- c) Inverter should conform IEC 61683, IEC 60068 as per specifications.
- d) Inverter to be supply should be tested in MNRE approved test centre like NISE.
- e) An Inverter should have an inbuilt charger for charging the batteries through Diesel Generator in the event of cloudy atmosphere.
- f) The inverter shall be designed for continuous, reliable power supply as per specifications. The inverter shall have high conversion efficiency from 25 percent load to the full rated load. The efficiency of the inverter shall be more than 90% at full load and more than 88% at partial load (50%-75%).
- g) The inverter shall be designed for extreme temperatures i.e. -30°C to 50°C.
- h) The Inverter shall have internal protection arrangement against any sustained fault in the feeder.
- i) The dimension, weight, foundation details etc. of the inverter shall be clearly indicated in the detailed technical specification.
- j) Each solid-state electronic device shall have to be protected to ensure long life of the inverter as well as smooth functioning of the inverter.
- k) Supplier shall indicate tripping voltage & start up voltage for the inverters & this should be perfectly matched with the recommendation of battery manufacturers.

- l) The PCU shall be placed on a 'floor mounted metallic frame' inside power room not susceptible to inundation by water. All cable entry to and from the PCU shall be fully sheathed to prevent access of rodents, termites or other insects into the PCU from bottom/top of the PCU in form of a detachable gland plate.
- m) For the monitoring of unit generated provision of Ah meters at input side shall be accomplished with Energy meter and voltmeters at suitable place in the power room.
- n) The bidder shall furnish details of proper operation, maintenance and troubleshooting details to NCPOR.
- o) PCU shall be capable of complete automatic operation
- p) Built-in meter and data logger to monitor plant performance through external computer shall be provided.

4. BATTERY BANK:-

- a) Storage batteries should conform IEC 61427 / IS 1651 / IS 133369 as per specifications.
- b) Batteries to be supply should be tested in MNRE approved test centre like National Test House, NISE, etc.
- c) Battery terminal to be provided with covers.
- d) Charging instructions to be provided along with the batteries.
- e) Suitable carrying handle to be provided.
- f) A suitable battery rack with interconnections & end connector to be provided to suitably house the batteries in the bank. The features and dimensions of the battery rack to be provided along with the bid document.
- g) The batteries should be tubular maintenance free and suitable for recharging by means of solar modules and also have minimum manufacturer warranty of 5 years.
- h) The batteries to be designed for operating in ambient temperature of site in the state of Himachal Pradesh.
- i) The Battery Bank to be designed to provide 2 days ("1 No Sun" day) autonomy (power back up). Considering an average generation of 80kWh from 20kWp solar power system, the Battery bank should be capable of storing the power of 160kWh for 2 days autonomy. After the installation of system, a discharge test will be carried out once the batteries are fully charged through solar at the site. Bidder to provide battery sizing, number, calculation sheet and specification details along with the offer.
- j) The design of battery bank should be based on minimum power consumption requirement of the station per day i.e not less than 70% of the total capacity (20kW) of the Power Plant.

5. JUNCTION BOXES (JBs) :-

- a) The junction boxes 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 / double compression cable glands. Provision of earthings. It should be placed at 4 to 5 feet height or above 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 should have suitable arrangement monitoring and disconnection for each of the groups.
- d) Suitable markings to be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification.
- e) All fuses should have DIN rail mountable fuse holders and to be housed in thermoplastic IP 65 enclosures with transparent covers.

6. DC DISTRIBUTION BOARD :-

- a) DC Distribution panel to receive the DC output from the array field.
- b) DC DBs should 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 to be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

7. AC DISTRIBUTION BOARD :-

- a) AC Distribution Board (DBs) should control the AC power from PCU/ inverter, and should have necessary surge arrestors.
- b) All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS 60947 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 Panel's to 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) The panels to be designed for minimum expected ambient temperature of -30 degree Celsius to 40 degree Celsius, 90 percent humidity and dusty weather.
- f) All indoor panels should have protection of IP54 or better. All outdoor panels should have protection of IP65 or better.
- g) All the 415 AC or 230 volts devices / equipment like bus support insulators, circuit breakers, SPDs, VTs etc., mounted inside the switchgear to be suitable for continuous operation and satisfactory performance under the following supply conditions
Variation in supply voltage +/- 10 %
Variation in supply frequency +/- 3 Hz

8. CABLES :-

Cables of appropriate size to be used in the system should have the following characteristics:

- a) Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards
- b) Temp. Range: -30oC to +40oC.
- c) Excellent resistance to heat, cold, water, oil, abrasion, UV radiation and flexible
- d) 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 solar system to the minimum (2%).
- e) For the DC cabling, XLPE or, XLPO insulated and sheathed, UV stabilized single core multi-stranded flexible copper cables to be used; Multi-core cables to not be used.
- f) For the AC cabling, PVC or, XLPE insulated and PVC sheathed single or, multi-core multi-stranded flexible copper cables to be used; Outdoor AC cables should have a UV-stabilized outer sheath.
- g) The cables (as per IS) should be insulated with a special grade PVC compound formulated for outdoor use. Outer sheath of cables to be electron beam cross-linked XLPO type and black in colour.
- h) The DC cables from the SPV module array should run through a UV stabilized PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm.
- i) Cables and wires used for the interconnection of solar PV modules to be provided with solar PV connectors (MC4) and couplers.
- j) All cables and conduit pipes should be clamped with thermo-plastic clamps at intervals not exceeding 50 cm; the minimum DC cable size should 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 should be equal to the size of the phase wires.
- k) 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. In addition, cable drum no. / Batch no. to be embossed/ printed at every one meter.

l) All cables and connectors for use in installation of solar plant must be of solar grade which can withstand harsh environment conditions including low and high temperature (-30o to +40o), 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.

9. REMOTE MONITORING FACILITIES:-

The Power Plants should have suitable inbuilt instrumentation for web based remote monitoring of its Status. Power Plants shall be capable of transmitting its monitorable parameters over GSM/CDMA/GPRS/TCP IP Network and conform to respective standard protocols. The Power Plants shall also have suitable Data Logging & Storage capacity for at least 7 days event logs. The systems should also be able to be monitored in the internet at any time. Internet connection for the same will be provided to the bidder.

10. METERING:-

Uni-directional Energy Meter to be provided having Class-0.5S or better with LT AC 3-Phase 4-Wire and should be installed between O/P of the Inverter and LT panel to measure the Energy utilized from the solar power plant. The said meter are required to be tested and calibrated by the concerned Electricity Department and the expenditure on testing and calibrating of Energy Meter to be borne by Tenderer.

11. PROTECTION:-

I. EARTHING PROTECTION :-

a) 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. Earth Resistance to be tested in presence of the representative of NCPOR. PCU, ACDB and DCDB should also be earthed properly.

b) Earth resistance should not be more than 5 ohms. It to be ensured that all the earthing points are bonded together to make them at the same potential.

II. LIGHTNING PROTECTION :-

The SPV power plants to be provided with lightning & overvoltage protection. The main aim in this protection is 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 to 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 to be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

III. SURGE PROTECTION :-

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

12. DRAWINGS & MANUALS :-

a) Two sets of Engineering, electrical drawings and Installation and O&M manuals are to be supplied. Tenderer should provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization along with protection equipment.

b) Approved ISI and reputed makes for equipment be used.

c) For complete electro-mechanical works, Tenderer should supply complete design, details and drawings for approval to NCPOR before progressing with the installation work

13. PLANNING & DESIGNING :

- a) The tenderer should carry out Shadow Analysis at the site and accordingly design strings & arrays layout considering optimal usage of space, material and labor. The tenderer should submit the array layout drawings along with Shadow Analysis Report to NCPOR for approval.
- b) NCPOR reserves the right to modify the design, layout and specification of sub-systems and components at any stage as per site conditions/requirements.
- c) The tenderer should submit preliminary drawing for approval & based on any modification or recommendation, if any. The tenderer should submit three sets and soft copy in CD of final drawing for formal approval to proceed with construction work.
- d) Drawings to be furnished by Tenderer after Award of Contract. The contractor should furnish the following drawings after the award of contract
 - i. General arrangement and dimensioned layout.
 - ii. Schematic drawing showing the requirement of SPV panel, Power conditioning Unit(s)/inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
 - iii. Structural drawing along with foundation details for the structure.
 - iv. Layout of solar Power Array

14. THE MAKE OF VARIOUS ITEMS SHOULD BE AS UNDER:

Sr. No. Disruption Make

1. SPV Modules To be quoted by the firm. The Photovoltaic modules must be manufactured under MNRE standards and tested & approved by one of the IEC authorized test centers. Test Certificates can be from any of the NABL / BIS accredited testing / calibration lab. The SPV modules to be supplied should be approved from MNRE.
 2. Power Conditioning Unit (Invertors) Luminous/Havells-Solar/OPS/Sukam-Solar/Neowatt-Consol/Statcom/Exide-Solar/Delta or equivalent make. Minimum IP 65 standard for outdoor & IP 54 for indoor applications. Option of minimum three brands to be quoted by bidder.
 3. Switchgear for AC Distribution Panel ABB/ SIEMENS / Schneider Electric/L&T/C&S/ HENSEL as per ISI standards
 4. Cables Finolex / Havells / Polycab and should be ISI/TUV approved.
 5. Batteries Exide/Luminous/Amaron Quanta/Rocket/ Southern
 5. Housing cabinets The field array junction boxes will comply with IP65 standard. The electronics including inverters, CPU, charge controllers, MPPTs, AC & DC distribution boxes should comply IP54 for indoor and IP 65 for outdoor applications.
 6. Surge Protection Devices CITEL/ PHOENIX/DEHN/ OBO/ SCHNEIDER ELECTRIC/ ABB/HAGER
 7. Energy Meter L&T/Secure
 8. All Structural Hollow section TATA,JINDAL,APPOLO
 9. GI corrugated sheets TATA, JINDAL APPOLO
- Note: Any make/brand, if not available in the market, can be substituted by equivalent make/brand in consultation with NCPOR.

15. TOOLS & TACKLES AND SPARES:-

After completion of installation & commissioning of the power plant, necessary tools & tackles are to be provided free of cost by the vendor for maintenance purpose.

A list of requisite spares (three sets) in case of PCU/inverter comprising of control logic cards, IGBT driver cards etc. Also three sets of spares comprising Junction Boxes, Fuses, MOVs / arrestors, MCCBs etc along with PV modules, which should be supplied along with the equipment. A minimum set of spares should be maintained in the plant itself for the entire period of warranty.

16. DANGER BOARDS AND SIGNAGES :-

Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date. Three signage should be provided one each at battery –cum- control room, solar array area and station premises. Text of the signage may be finalized in consultation with NCPOR.

17. FIRE EXTINGUISHERS :-

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

- a. Requisite portable fire extinguishers in the control room for fire caused by electrical short circuits.
- b. Sand buckets in the control room.
- c. The installation of Fire Extinguishers should conform to TAC regulations and BIS standards. The fire extinguishers should be provided in the control room housing PCUs.

18. WARRANTIES :-

- a. The bidder should provide warrantee covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of 5 years from the date of commissioning of the plant. The equipment's or components, or any part thereof, so found defective during guarantee period to be forthwith replaced free of cost by the successful tenderer to the satisfaction of indentor, NCPOR. The successful Tenderer has to transfer all the Guarantees /Warrantees of the different components of the plant to NCPOR. All warranties from the manufacturer have to be fully endorsed by the bidder. Warranty certificate to the above effect must be furnished along with the commissioning reports to NCPOR.
- b. The performance profile for solar power production for the first 10 years and then at every year onwards till 25 years should be submitted.
- c. In case of Inverter if the spares are not available or the Inverter cannot be repaired the tenderer should replaced the faulty inverter with new one at his own cost. The Tenderer shall attend the complaints and undertake the repairs within one week from the receipt of the complaint telephonically or in writing from the NCPOR.

19. INSTALLATION AND COMMISSIONING:-

A proper Installation and Commissioning of the system at site (Himansh station, Sutri Dhaka, Chandra basin, Himachal Pradesh) should be done by vendor.

(Transportation of all the items/materials up to the site for establishment of the complete system should be done by the vendor.)