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|  | BHARAT HEAVY ELECTRICALS LIMITED SOLAR BUSINESS DIVISION | EOI Ref: MANPVT0003 |
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BHEL SBD Herewith Publishes

Expression of Interest

(EOI)

and

Invites Prospective vendors to partner with BHEL

for

Entering into TC-MOU (Techno-commercial Memorandum of Understanding) and Pre- bid tie up for Tracker systems for DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING OF TRACKER SYSTEM for various solar PV projects across India

Ref: MANPVT0003 Dated 09.09.2024

Due Date of Receiving duly filled EOI: 19.09.2024 14:00 Hrs

About BHEL

BHEL is India's largest engineering and manufacturing enterprise, operating in the energy, industry and infrastructure sector. Company was established in the year 1964 and since then it has been "Making in India" offering comprehensive products, systems, and services in various areas including power generation (thermal, hydro, gas, nuclear, and solar PV), transmission, transportation, defence, aerospace, oil and gas, and emerging sectors like battery energy storage systems and electric vehicle chargers. BHEL has been instrumental in developing the country's power generation capacity, contributing to core industrial and strategic sectors since the time of its humble beginning. The company's commitment toward its customer is evident through wide range of product portfolio, development and absorption of new technologies, consistent investment of more than 2.5% of its revenue on R&D and innovation, establishment of world-class manufacturing facilities and offering sustainable business solutions. Apart from serving customers, BHEL has been supporting communities through programs like skill development, promoting health, hygiene, education, cleanliness and environmental protection, thus contributing to the society as a whole.

The purpose of publishing this EOI is to provide opportunities to probable vendors who can partner with BHEL for design, manufacturing, supply, installation and commissioning of tracker system for various solar PV projects across India.

Note: BHEL reserves its right to independently verify the documents submitted and visit the vendor works for assessment. Necessary arrangements shall be made by the prospective vendors

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All corrigenda, addenda, amendments, time extensions, clarifications etc. to the Tender will be hosted on <https://bhel.com> only. Bidders should regularly visit this website to keep themselves updated.

Queries:

Bidders to note that any queries related with EOI are to be submitted online only at Email ID provided in Table A with CC to **k.manoj@bhel.in**. Queries/clarifications received in any other form are liable to be unanswered. A reply from the concerned will be given on the same Email ID.

Table A

| Description | Email Id |
|--------------------------------------|--|
| For Technical Queries | punam@bhel.in |
| For General & Commercial Queries | k.manoj@bhel.in |
| For submission of offers against EOI | technicalbid-epd@bhel.in |

Submission of EOI

Offers against EOI to be submitted on Email address to **technicalbid-epd@bhel.in** with subject as Ref: **MANPVT0003 Dated 09.09.2024 “DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING OF TRACKER SYSTEM”** (Mail size should not be more than 20 MB. In case the size is larger, offer can be submitted partwise in multiple mails).

Following documents to be attached while submitting EOI:

1. Annexure I (Duly filled, signed, stamped on official letterhead)
2. Annexure II- Non-Disclosure Agreement (Duly filled, signed, stamped on official letterhead)
3. Documents in support of Pre-Qualification Requirements- Technical
4. Technical offer, comprising of technical specification/Product Catalogues/Datasheets/Drawings/ QAP/ Test report etc
5. Signed SCC, GCC and other formats as mentioned in the tender
6. Documentary evidences for Manufacturing capabilities
7. Any other documents

Note: Bidders may adopt this mode at their own risk. BHEL does not own any responsibility /liability for delays in receipt / loss of secrecy of such offers.

No physical offers for EOI will be accepted.

Plant Location details:

BHARAT HEAVY ELECTRICALS LTD
SOLAR BUSINESS DIVISION
Prof. CNR Rao Circle,
Opp. Indian Institute of Science,
Malleswaram Bangalore – 560012 India

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ANNEXURE – I

FORMAT FOR SUBMISSION OF EOI

(to be printed on the official letterhead of the APPLICANT)

To,

Mr. Vinay Kumar
AGM-Materials Management
BHEL SBD Bengaluru-560012
Dear Sir,

Subject: Submission of Expression of Interest Ref: MANPVT0003 Dated 09.09.2024 “DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING OF TRACKER SYSTEM”

With reference to your EOI inviting notice Ref: MANPVT0003 Dated 09.09.2024 and after examining the detailed documents and other details mentioned in the EOI document, I/We hereby offer to submit my /our Expression of Interest.

1. All the annexures and documents necessary in this connection are enclosed hereto. All the documents/ photocopies of the documents have been self-attested by me/us and BHEL is free to reject our offer if any of the documents/photocopies of the documents is/are found to be false or forged.
2. I/we, hereby also declare(s) that I/we have read all terms and conditions in the EOI and all terms and conditions mentioned in the EOI are acceptable. I herewith submit duly signed and accepted Non Disclosure Agreement as per Annexure II.
3. I/we, hereby also declare(s) that my/our organisation/firm is not debarred/ blacklisted by any Central/State Govt. department, agency, PSUs/ Institution/ Agencies/ Autonomous organization.
4. The information sought from me as per the EOI notice is enclosed to this letter.

Yours Faithfully,

(Signature & Stamp of Authorised Signatory)

Name

Designation:

Date:

Place:

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ANNEXURE II

NON-DISCLOSURE AGREEMENT

I, _____, on behalf of the _____ (Name of Company),

acknowledge that the information received or generated, directly or indirectly, while working with BHEL on contract is confidential and that the nature of the business of the BHEL is such that the following conditions are reasonable, and therefore:

I warrant and agree as follows:

I, or any other personnel employed or engaged by our company, agree not to disclose, directly or indirectly, any information related to the BHEL Without restricting the generality of the foregoing, it is agreed that we will not disclose such information consisting but not necessarily limited to:

- Technical information: Methods, drawings, processes, formulae, compositions, systems, techniques, inventions, computer programs/data/configuration and research projects.
- Business information: Customer lists, project schedules, pricing data, estimates, financial or marketing data,

On conclusion of contract, I, or any other personnel employed or engaged by our company shall return to BHEL all documents and property of BHEL including: drawings, blueprints, reports, manuals, computer programs/data/configuration, and all other materials and all copies thereof relating in any way to BHEL, EPD's business, or in any way obtained by me during the course of contract. I further agree that I, or any others employed or engaged by our company shall not retain copies, notes or abstracts of the foregoing.

This obligation of confidence shall continue after the conclusion of the contract also.

I acknowledge that the aforesaid restrictions are necessary and fundamental to the business of the BHEL and are reasonable given the nature of the business carried on by the BHEL. I agree that this agreement shall be governed by and construed in accordance with the laws of country.


I enter into this agreement totally voluntarily, with full knowledge of its meaning, and without duress.

Place: - _____ Date: - _____

Name

Company


Signature

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|  | SOLAR BUSINESS DIVISION (SBD) | SPECIAL CONDITIONS OF CONTRACT (SCC) | ITEM: DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING OF TRACKER SYSTEM Ref No: MANPVT0003 |
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These Conditions shall be read in conjunction with General Condition of Contract (GCC Rev R0) enclosed along with the tender enquiry. In case of any conflict or inconsistency, the requirement of SCC shall prevail over the GCC.

The name of our Plant/ Unit may please be read as SOLAR BUSINESS DIVISION (SBD) as it was changed from ELECTRIC & PHOTOVOLTAIC DIVISION (EPD)


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| 1. | Type of Contract | Tender invitation- Expression of Interest for Entering into TC-MOU (Techno-commercial Memorandum of Understanding) and Pre- bid tie up for Tracker systems for DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING OF TRACKER SYSTEM for various solar PV projects across India |
| 2. | Item Details | DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING OF TRACKER SYSTEM as per following documents : 1. Technical Specifications DOC NO: PS-439-1426 Rev: 01 2. PRE-QUALIFICATION REQUIREMENTS- TPQR Rev: 00 |
| 3. | Consignee address | Shall be informed at the time of floating of NIT (Purchase Inquiry). Consignee address in LR should be strictly as per above. |
| 4. | Buyer and Paying Authority | BHARAT HEAVY ELECTRICALS LIMITED - SOLAR BUSINESS DIVISION (SBD), (Formerly known as ELECTRIC & PHOTOVOLTAIC DIVISION) PROF. CNR RAO CIRCLE, SCIENCE INSTITUTE POST, MALLESWARAM, BANGALORE-560012. |
| 5. | Buyer IEC CODE/ GST No. | IEC CODE: 0588138690 / GST No: 29AAACB4146P1ZB |
| 6. | Buyer Email ID | For Commercial Clarifications: k.manoj@bhel.in ; For Technical Clarifications: punam@bhel.in ; |
| 7. | Mode of Dispatch | By Road/Rail. Note: It is Vendor's responsibility to ensure availability of Trucks/Train/Flights/Ships schedule etc. well in advance for dispatch of material to meet contractual delivery requirement. <ul style="list-style-type: none"> Part shipment is allowed. Transshipment is not allowed. It is also the vendor's responsibility to ensure material is dispatched through shortest possible route. By ROAD/RAIL/AIR/SHIP |
| 8. | Price basis | BHEL will finalize TC MOU with qualified and registered bidders. |

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| | | <p>Subsequently, based on BHEL requirement, NIT (purchase enquiries) shall be floated for obtaining offer including price bids. (Note: price Bid is not to be submitted along with TC MOU offer)</p> <p>Price Basis for such enquiries floated against TC MOU shall be as follows: Indigenous purchase – Ex-WORKS, inclusive of packing & forwarding charges. Taxes and duties to be paid in line with GCC. Material to be dispatched on freight pre-paid basis to the consignee address as per clause no. 3 above as mentioned in the enquiry. Insurance is in the scope of BHEL. All the other applicable taxes including Income Taxes (TDS) as per Indian law shall be deducted from the payables & paid to Government by BHEL.</p> |
| 9. | Evaluation of Offer | Shall be specified later during floating the NIT (Purchase Inquiry) |
| 10. | Change of Scope | <p>The same will be communicated only to the bidders who have participated in the tender.</p> <p>The techno-commercially qualified bidders shall be asked to submit Impact Price bid, if applicable.</p> |
| 11. | Quantity Splitting | Shall be specified later during floating the NIT (Purchase Inquiry) |
| 12. | Reverse Auction | Shall be specified later during floating the NIT (Purchase Inquiry) |
| 13. | Delivery Period | Shall be specified later during floating the NIT (Purchase Inquiry) |
| 14 | Transit Insurance | <p>In BHEL Scope.</p> <p>Insurance details shall be informed along with the NIT / Purchase Order.</p> <p>Prior Dispatch, intimation shall be issued to Insurance agency by the supplier about the value of consignment, dispatch details, along with one set of documents consisting of LR copy, Packing List, Challan indicating the items dispatched (with their weights).</p> |
| 15 | Unloading at SBD/project site and transportation from Indian port to consignee address in case of imports | In the scope of BHEL. |
| 16 | Payment terms | Shall be specified later during floating the NIT (Purchase Inquiry) |

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| 17 | Documents to be Submitted by Seller / Contractor for Claiming Payment | Shall be specified later during floating the NIT (Purchase Inquiry) |
| 18 | Guarantee period | As per technical specification |
| 19 | Submission of Performance Bank Guarantee (PBG) or Security Deposit (SD), hereafter referred as Performance Security (PS) | <p>Applicable</p> <p>PERFORMANCE SECURITY (PS) shall be submitted by the bidder for an amount equivalent to 5% of the contract value including Taxes & Duties on FOR Destination price. Performance security shall be valid for Product Warranty period i.e. 10 years from the date of Supply.</p> <p>Performance Bank Guarantee (PBG) or Security Deposit (SD), hereafter referred as performance security shall be submitted by the successful bidder after the award of contract.</p> <p>Modes of deposit: Performance security may be furnished in the following forms:</p> <ol style="list-style-type: none"> Local cheques of Scheduled Banks (subject to realization)/ Pay Order/Demand Draft/ Electronic Fund Transfer in favour of BHEL. Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The Bank Guarantee format should have the approval of BHEL. Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act (FDR should be in the name of the Contractor, a/c BHEL). Securities available from Indian Post offices such as National Savings Certificates, Kisan Vikas Patras etc. (held in the name of Contractor furnishing the security and duly endorsed/ hypothecated/ pledged, as applicable, in favour of BHEL). Insurance Surety Bond. <p>(Note: BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith)</p> <p>Performance security is to be submitted within 10 days from the date of Letter of Intent (LOI)/ Purchase Order (PO) and it should remain valid for a period of 60 (sixty) days beyond the date of completion of all contractual obligations of the supplier, including warranty obligations</p> <p>Forfeiture of Performance Security:</p> <p>The performance security will be forfeited and credited to BHEL's account in the event of a breach of contract by the supplier.</p> |

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| | | <p>PS should be refunded to the contractor without interest, after he duly performs and completes the contract in all respects but not later than 60(sixty) days of completion of all such obligations including the warranty under the contract. The Performance Security shall not carry any interest.</p> <p>In case of delay in submission of Performance security, enhanced Performance security which would include interest (SBI MCLR rate+6%) for the delayed period, shall be submitted by the bidder. Further, Performance security is not submitted till such time the first bill becomes due, the amount of Performance security due shall be recovered as per terms defined in Tender/contract, from the bills along with due interest</p> |
| 20 | Integrity Pact | APPLICABLE – Shall be specified later during floating the NIT (Purchase Inquiry) |
| 21 | Organization Chart | The bidder shall submit the overall organization chart along with contact details/mobile no. of officials dealing with this contract package for engineering, supply, Quality, etc. along with TC-MOU offer. |
| 22 | Delivery Failure and Termination/ Liquidated Damages | <p>Applicable as per Cl. No. 16 (Page 17 of 28) of GCC R0.</p> <p>Clause No. 16.2.1 of GCC to be read as: Purchaser reserves the right to recover from the Seller/Contractor, as agreed, liquidated damages and not by way of penalty, a sum equivalent to half (½) percent of undelivered portion per week or part thereof, subject to a maximum of ten (10) percent of the total contract price (including elements of taxes, duties and freight) if the Seller/ Contractor fails to deliver any part of the ordered stores within the period stipulated in the Order/Contract.</p> <p>NOTE:</p> <ol style="list-style-type: none"> 1. LR/RR date for indigenous supplies shall be treated as the date of delivery for levying LD as per Clause 16. 2. In case of any amendment/revision, LD shall be linked to the amended/revised contract value and delivery date(s). 3. If Order/ Contract involves two or more Units/ Sets/ Lots, then Liquidated Damages shall be for order/ contract value of the delayed Unit/ Set/ Lot, provided delivery stipulated in the Order/ Contract is Unit/ Set/ Lot wise, however total LD amount shall be limited to 10% of total order value. (including taxes, duties and freight) |

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| 23 | Preference to Make in India | <p>This Tender is governed by Circular No. P-45021/2/2017-B.E.-II dated 15.06.2017, 28.05.2018, 29.05.2019 & 04.06.2020 issued by Govt. of India (copy enclosed).</p> <p>"For this procurement, Public Procurement (Preference to Make in India), Order 2017 dated 15.06.2017, 28.05.2018, 29.05.2019, 04.06.2020, 16.09.2020 and subsequent Orders issued by the respective Nodal Ministry shall be applicable even if issued after issue of this NIT but before finalization of contract/ POI WO against this NIT. In the event of any Nodal Ministry prescribing higher or lower percentage of purchase preference and/ or local content in respect of this procurement, same shall be applicable."</p> <p>Preference to Make in India including counter offering will be as per the Public Procurement (Preference to Make in India), Order 2017 available in the following links:</p> <p>https://dipp.gov.in/sites/default/files/publicProcurement_MakeinIndia_15June2017.pdf https://dipp.gov.in/sites/default/files/Revised-PPP-MII-Order-2017_28052018.pdf https://dipp.gov.in/sites/default/files/PPP-MII%20Order%20dt%2029th%20May%2019_0.pdf https://dipp.gov.in/sites/default/files/PPP%20MII%20Order%20dated%204th%20June%202020.pdf https://dipp.gov.in/sites/default/files/PPP%20MII%20Order%20dated%2016%2009%2020_20.pdf</p> <p>Certification (as applicable) giving the percentage of local content, in line with PPP-MII order, to be submitted as per attached Annexure-1(A) for procurement value from Rs. 5.00 Lac to Rs. 10.00 Crore or Annexure-1(B) for procurement value more than Rs. 10.00 Crore.</p> <p>Amendments/addendums/circulars/Revisions thereto if any from Government or Statutory bodies or agencies shall be applicable if not explicitly stated above from time to time. It is the responsibility of the bidders to keep updated themselves of the same. The bidders shall submit their offers in compliance.</p> |
| 24 | Purchase from SEZ in India | <p>Purchase from SEZ in India shall be considered as Indigenous purchase for the purpose of Purchase Preference to Make in India Policy, Price Basis, Payment term & delivery terms. However, additional taxes, duties including Safe Guard Duty if any shall be considered while evaluating the bid.</p> |
| 25 | Inspection Agency | <p>As Applicable by BHEL/BHEL's Customer/BHEL Nominated Agency</p> |
| 26 | TAXES AND DUTIES (Clause No. 4.1, 4.2 & 4.3) | <p>Clause No. 4.1, 4.2 & 4.3 of GCC to be read as: 4.1 CGST/SGST/UTGST/IGST</p> |

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| | (Applicable only for Indian Bidders) | <p>4.1.1 Seller/ Contractor is required to ensure that CGST/SGST/UTGST/IGST (whichever is applicable) is quoted as per the existing tariff on the date of the offer and all benefits as per existing laws have been considered.</p> <p>4.1.2 It is the responsibility of the seller/contractor to issue the Tax Invoice strictly as per the format prescribed under the relevant applicable GST law (CGST Act/SGST Act/UTGST Act/IGST Act). Vendor to indicate the proper GSTN Registration/ HSN code in their tax invoice.</p> <p>4.1.3 The purchaser is registered in the State of Karnataka vide following GST registration number: 29AAACB4146P1ZB.</p> <p>4.1.4 Seller/contractor is required to mention the above registration number in their tax invoice unless stated otherwise in NIT/SCC.</p> <p>4.1.5 CGST/SGST/UTGST/IGST shall be paid at actuals against Tax Invoice but restricted to the amount and percentage in the order/contract.</p> |
| 27 | OTHER TAXES & LEVIES (Clause No. 4.4) (Applicable only for Indian Bidders) | <p>Clause No. 4.4 of GCC to be read as:</p> <p>4.2 OTHER TAXES & LEVIES 4.2.1 All taxes/duties/Cess other than CGST/SGST/UTGST/IGST shall be deemed to be included in the Ex-Works prices unless specified otherwise by the bidder in the price bid. No variation in other taxes and duties shall be payable by Purchaser.</p> |
| 28 | CUSTOMS DUTY (Clause No. 4.5 of GCC) (Applicable only for Indian Bidders) | <p>Clause No. 4.5 of GCC to be read as:</p> <p>4.3 CUSTOMS DUTY</p> <p>4.3.1 Customs Duty/IGST/Goods and Services compensation cess under Goods and Services Tax (Compensation to States) Act, 2017 element for imported items as per Special Conditions of Contract shall be included in the Ex-Works prices.</p> <p>4.3.2 Seller/ Contractor shall arrange for his own import license, if required, since Purchaser will not provide any import license. Therefore, Seller/ Contractor alone shall be responsible for any delay in getting import license or non-availability of the same or completion of other related formalities. Purchaser shall not be responsible for any financial liability, whatsoever, on this account.</p> <p>4.3.3 Essentiality Certificate or Project Authority Certificate (PAC) as per Import Policy, if required to avail concessional customs duty, shall be clearly specified in the offer. Import content (CIF value in rupees) with list of items, quantity, foreign currency, Country of origin etc., shall be submitted by the bidder as part of Price bid.</p> |

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| 29 | DIRECT TAXES (Clause No. 4.6 of GCC) (Applicable only for Indian Bidders) | <p>Clause No. 4.6 of GCC to be read as:</p> <p>4.4 DIRECT TAXES 4.4.1 Purchaser shall not be liable towards income tax of whatever nature including variations thereof, arising out of this Order/ Contract, as well as tax liability of the Seller/ Contractor and his personnel.</p> <p>4.4.2 Deductions of Tax at source at the prevailing rates shall be effected by the Purchaser before release of payment, as a statutory obligation, if applicable. TDS certificate will be issued by the Purchaser as per statutory provisions.</p> |
| 30 | STATUTORY VARIATION (Clause No. 5.0 of GCC) (Applicable only for Indian Bidders) | <p>Clause No. 5.0 of GCC to be read as:</p> <p>5.0 STATUTORY VARIATION</p> <p>5.1 If any rates of Tax or duty are increased or decreased, a new Tax or duty is Introduced, an existing Tax or duty is abolished, or any change in interpretation or application of any Tax or duty occurs in the course of the execution of Contract including Delivery period extensions (if any), which was or will be assessed on the bidder in connection with performance of the Contract, an equitable adjustment of the Contract Price shall be made to fully take into account any such change by addition to the Contract Price or deduction there from, as the case may be. However, these adjustments would be restricted to direct transactions between BHEL and the bidder/ agent of foreign bidder (if applicable). These adjustments shall not be applicable on procurement of raw materials, intermediary components etc. by the bidder /agent.</p> <p>5.2 For variation after the agreed completion periods, the seller/contractor alone shall bear the impact for the upwards revisions and adjust the price in their basic price in such a manner that total price with tax or duties matches with the ex- works with taxes of Purchase Order/Contract. For downward revisions, purchaser shall be given the benefit of reduction in CGST/SGST/UGST/IGST. This will be without prejudice to the levy of penalty for delay in delivery/completion schedule.</p> |
| 31 | New Clause of GCC (Applicable only for Indian Bidders) | <p>Vendor/Supplier will intimate & upload the Tax invoice along with LR/RR (as applicable) on web portal & intimate BHEL immediately on removal of goods from vendor/supplier works. In case of Services, Vendor is required to upload the Tax invoice on Web Portal immediately after raising the invoice. BHEL will issue the delivery order/instruction to dispatch the material to the customer as indicated in SCC.</p> <p>All payments against Tax Invoice to vendors/contractors shall be released only after:</p> <p>Vendor/contractor declaring such invoice in GSTR-1 within the prescribed timeline as per the relevant Act.</p> <p>The tax component charged by the vendor in the invoice should be matched with the details uploaded by vendor in GSTR-1.</p> <p>Confirmation of payment of GST thereon by vendor on GSTN portal</p> |

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| | | <p>In case, any GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry to timeline prescribed in the relevant Act for availing such ITC, or any other reasons not attributable to BHEL, tax amount shall be recoverable from the vendor/contractor along with interest levied/leviable on BHEL.</p> <p>GST liability arises on BHEL under reverse charge, any interest levied/leviable due to any reasons not attributable to BHEL shall be recovered from the vendor/contractor.</p> |
| 32 | New Clauses of GCC | <p>a) In case of discrepancy in CGST/SGST/UTGST/IGST rate corresponding to HSN code and quotes rates, the evaluation shall be done on quoted price and correct CGST/SGST/UTGST/IGST rate shall be considered for ordering (limited to quoted FOR Site Price)</p> <p>b) The bidder should have been registered with the appropriate authority under relevant GST laws.</p> <p>c) The bidder to specify in their offer (part 1 bid) the category of registration under GST i.e. registered dealer and composite dealer</p> <p>d) No CGST/SGST/UTGST/IGST will be reimbursed to composite dealer. In the event of any GST quoted by composite dealer, the same shall be considered for evaluation purpose. However, the ordering will be done without considering the tax.</p> <p>In the event of any change in the status of vendor from composite to regular dealer after the submission of the bid but before the supply, no reimbursement of CGST/SGST/UTGST/IGST will be made. However, the vendor has to raise the invoice strictly, as per the law, by adjusting their ex-works price.</p> |

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| 33 | Conflict of Interest among Bidders/ Agents | <p>"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:</p> <ul style="list-style-type: none"> a) they have controlling partner (s) in common; or b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c) they have the same legal representative/agent for purposes of this bid; or d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder, or e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/ Assemblies from. one bidding manufacturer in more than one bid; or f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorise only one agent/dealer. There can be only one bid from the following: <ul style="list-style-type: none"> 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal, or g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid, or h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business. " |
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| 34 | NOTE | <p>Delivery Challans & Invoices /Service Entry Sheet in the format as specified under GST laws mentioning your GSTIN No, item HSN/SAC No should accompany supply.</p> <ol style="list-style-type: none"> 1. GST portion of invoice shall be released only upon vendor declaring such invoice in his GSTR-1 return and receipt of goods/services and tax and confirmation of payment of GST thereon by vendor on GSTN Portal. 2. Bank Guarantee of appropriate value may be obtained from vendor which shall be valid at least one month after the confirmation of payment date by vendor on GST portal and receipt of Tax invoice and receipt of goods, whichever is later. [if (a) above could not be complied]. 3. In case GST credit is delayed/denied to BHEL due to non/delayed receipt of goods and/or tax invoice or expiry of timeline prescribed in GST law for availing such ITC, or any other reasons not attributable to BHEL, GST amount shall be recoverable from vendor along with interest levied/BG of appropriate value may be obtained from vendor alternatively payment covering GST portion including interest thereon shall be release to vendor only upon completion of these requirements. <p>In case vendor delays declaring such invoice in his return & GST credit by BHEL is denied or reversed subsequently as per GST law, GST amount paid by BHEL towards such ITC reversal as per GST Law shall be recoverable from vendor/contractor along with interest levied/leviable.be obtained from vendor alternatively payment covering GST portion including interest thereon shall be released to vendor only upon completion of these requirements.</p> |
| 35 | Arbitration & Conciliation Clause | <p>The Conciliation Scheme 2018 attached as <u>Annexure-A</u> shall be applicable. The Signed & Stamped copy of the same to be attached along with the offer as a mark of acceptance.</p> <p>Arbitration & Conciliation Clause:</p> <p>a) In case of contractors/vendors /consultants other than Public Sector Enterprise (PSE) or a Government Department: The parties shall attempt to settle any disputes or difference arising out of the formation, breach, termination, validity or execution of the Contract; or, the respective rights and liabilities of the parties; or, in relation to interpretation of any provision of the Contract; or, in any manner touching upon the Contract, or in connection with this contract through friendly discussions. In case no amicable settlement can be reached between the parties through such discussions, in respect of any dispute; then, either Party may, by a notice in writing to the other Party refer such dispute or difference to the sole arbitration of an arbitrator appointed by Head of the BHEL –EDN/SBD. Such Sole Arbitrator appointed, shall conduct the arbitration in English language.</p> <p>The Arbitrator shall pass a reasoned award and the award of the Arbitration shall be final and binding upon the Parties.</p> <p>Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India) or statutory modifications or re-enactments thereof and the rules made thereunder and for the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be Bangalore.</p> |

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| | | <p>The cost of arbitration shall be borne as decided by the Arbitrator upon him entering the reference. Subject to the Arbitration Clause as above, the Courts at Bangalore alone shall have exclusive jurisdiction over any matter arising out of or in connection with this Contract. Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the parties shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and efficiency in a professional manner except where the Contract has been terminated by either Party in terms of this Contract.</p> <p>b) in case of Contract with contractors/vendors /consultants when they are a Public Sector Enterprise (PSE) or a Government Department: In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, 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 Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the Arbitrator shall be binding upon the parties to the dispute, provided, however, any Party aggrieved by such Award may make further reference for setting aside or revision of the Award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the Parties hereto finally and conclusively. The Parties to the dispute will share equally the cost of arbitration as intimated by the Arbitrator.”</p> |
| 36 | Provisions vendors for MSE | <p>PROVISIONS APPLICABLE FOR MSE VENDORS (MICRO AND SMALL ENTERPRISES)</p> <p>Benefits/facilities as applicable for Micro and Small Enterprises (MSEs) shall be available to MSE vendors registered with Government Designated Authorities as per the Purchase & Price Preference Policy of the Government subject to them becoming eligible otherwise. Vendors who qualify as MSE vendors are requested to submit applicable certificates (as specified by the Ministry of Micro, Small and Medium Enterprises) at the time of vendor registration.</p> <p>Vendors have to submit the Udyog Aadhaar Memorandum (UAM)/UDYAM Registration Certificate along with attested copy of a CA certificate [Annexure-2(A) / Annexure-2(B)] applicable for the relevant financial year (latest audited) along with the tender documents in the Part-I Bid to avail the applicable benefits.</p> <p>Date to be reckoned for determining the deemed validity will be the date of bid opening (Part I in case of two-part bid and three-part bid).</p> |

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| | | <p>Documents have to be notarized/attested by a Gazetted officer and must be valid as on the date of Part-I Bid opening for the vendors to be eligible for the benefits applicable for MSE vendors. Please note that no benefit shall be applicable if any deficiency in the above required documents are not submitted before the Price Bid Opening / Reverse Auction.</p> <p>If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal. Bidders to however note the documents that shall be furnished in order to establish credentials as MSE vendor should be as per the extant statutory requirements specified by the Ministry of Micro, Small and Medium Enterprises (MSME).</p> <p>PURCHASE PREFERENCE FOR MSE VENDORS: (For Items which are divisible in nature) MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 25% of the requirement against this tender provided:</p> <ol style="list-style-type: none"> 1. The MSE vendor matches the L1 price. 2. L1 price is from a non MSE vendor. 3. L1 price will be offered to the vendor nearest to L1 in terms of price ranking (L2 – nearest to L1). In case of non-acceptance by the MSE vendor (L2), next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band). 4. 3% of the 25% will be earmarked for women owned MSE's. 5. 25% of the 25% (i.e., 6.25% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (1) & (2) are fulfilled. 6. In case where no SC/ST category firms are meeting the conditions mentioned in (1) and (2) or have not participated in the tender, the 6.25% of earmarked quantity for SC/ST owned MSE firms will be distributed among the other eligible MSE vendors who have participated in the tender. <p>(For Items which are not divisible in nature) MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 100% of the requirement against this tender provided:</p> <ol style="list-style-type: none"> 1. The MSE vendor matches the L1 price. 2. L1 price is from a non MSE vendor. 3. L1 price will be offered to the vendor nearest to L1 in terms of price ranking (L2 – nearest to L1). In case of non-acceptance by the MSE vendor (L2), next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band). 4. No distribution shall be done specifically to women owned MSEs or SC/ST owned MSEs in such cases. <p>Documents to be submitted for claiming MSE status and intended benefits:</p> |
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| | | <p>Submission of updated Udyam Registration Certificate along-with Techno-commercial bid is required mandatorily.</p> <p>MSE suppliers can also receive payment through TReDS platform operated.</p> |
| 37 | Breach of contract, Remedies and Termination | <p>In case of breach of contract, wherever the value of security instruments like performance bank guarantee available with BHEL against the said contract is at least 10% of the contract value, the same will be encashed. In case the value of the security instruments available is less than 10% of the contract value, the balance amount shall be recovered from other financial remedies (i.e. available bills of the contractor, retention amount, any other amount payable to vendor from any units of BHEL, etc. with BHEL) or legal remedies shall be pursued. The balance scope shall be got done independently without Risk & Cost of the failed supplier/ contractor. Further, levy of liquidated damages, debarment, termination, de-scoping, short-closure, etc., shall be applied as per provisions of the contract.</p> <p>In any case of Breach of contract amount equivalent to 10% of the contract value in shall be recovered from the contractor.</p> |
| 38 | Compliance to order No. 25-111612018-PG, Dated 02.07.2020 of Ministry of Power, GOI | <p>Compliance to order No. 25-111612018-PG, Dated 02.07.2020 of Ministry of Power, GOI to be submitted in the bidder's letter head as per attached Annexure-4</p> <p>Note: Non-compliance of MoP Order and its subsequent amendment(s), (if any), by vendor shall lead to rejection of their offer or cancellation of contract, which is awarded by BHEL.</p> |
| 39 | e-Invoicing under GST | <p>E-Invoicing under GST to be done in line with the latest guidelines of GOI. It is the responsibility of the bidders to keep updated themselves of the guidelines.</p> <p>In case the vendor delays or fails to provide all the documents as per the Purchase Order at the time of submitting Tax Invoice to BHEL, any subsequent financial loss to BHEL on account of vendor shall be to vendor's account. BHEL has further right to take necessary steps to protect its interest at the time of release of payment.</p> |

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| 40 | Declaration by bidder regarding protection of commercial interests of BHEL | The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process. In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines. |
| 41 | Note | <ol style="list-style-type: none"> 1. In place of EPD, Bangalore, it may be read as SBD Bangalore. 2. Any vendor who has been banned by BHEL or against whom action due to non-performance has been initiated by BHEL are not eligible for participation. Such offers will not be considered for evaluation and will be rejected. 3. Bidders shall confirm acceptance of technical specification which is part of the tender document (If Applicable). Any deviation from technical specification can be rejected at BHEL's discretion. 4. Amendments/addendums/circulars/Revisions thereto if any from Government or Statutory bodies or agencies shall be applicable if not explicitly stated above from time to time. It is the responsibility of the bidders to keep updated themselves of the same. The bidders shall submit their offers in compliance. |
| 42 | Pre-Qualification Requirement (PQR) | Applicable. Technical Pre-Qualification Requirement (PQR) - As per Tender document Financial Pre-Qualification Requirement (PQR) – Shall be specified later during floating the NIT (Purchase Inquiry) |
| 43 | MOU FORMAT | The MOU Format attached with the NIT is tentative. The same will be finalized with the qualified bidders on mutually agreed contract and legal terms and conditions. |
| 44 | Tax Deducted at Source (TDS) | <p>This has reference to the newly inserted Section 194Q under Income Tax Act 1961 (applicable w.e.f. 01.07.2021) for deduction of tax at source by a buyer of goods at the time of amount paid or credited for purchase of goods exceeding Rs. 50 lacs.</p> <p>The gist of the provisions of Section 194Q are as follows: Tax is required to be deducted at source by a purchaser of goods whose turnover for previous FY has exceeded Rs. 10 Crs. The seller should be a resident of India. TDS @ 0.1% shall be applicable on the amount paid /credited in case purchases from a seller exceeds Rs. 50 Lacs during a financial year. In case PAN of seller is not available or seller is a Specified person (Non-filer), TDS shall be deducted @ 5%. This provision shall not be applicable where tax is deductible under any other provision of I.T Act, 1961. Also, in case a particular transaction qualifies for deduction of TDS u/s 194-Q and the purchaser has deducted the TDS then the same transaction shall not attract TCS u/s 206C(1H).</p> |

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| | | <p>W.e.f. 01.07.2021, as per the above-stated provisions of I. Tax Act, 1961, BHEL HAVING PAN : AAACB4146P IS LIABLE TO DEDUCT TAX AT SOURCE UNDER SECTION 194Q OF THE INCOME TAX ACT AND ACCORDINGLY TDS AT APPLICABLE RATE ON THE PRESCRIBED VALUE UNDER SECTION 194Q WOULD BE DEDUCTED UNDER TAN : BLRB04342C BEFORE MAKING PAYMENT FOR PURCHASE OF GOODS.</p> <p>Thus, all the BHEL Partners are requested not to levy TCS w.e.f. 01.07.2021</p> |
| 45 | Quote with multiple options | Vendor's can quote for multiple options having different type as per Technical specifications. |
| 46 | Compliance to Government of India order OM No.6/18/2019-PPD dated 23.07.2020 & 24.7.2020 regarding restrictions under Rule 144 (XI) of the General Financial Rules (GFRs), 2017 | <p>I. 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.</p> <p>II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not failing in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.</p> <p>III. "Bidder from a country which shares a land border with India" for the purpose of this Order means:</p> <ol style="list-style-type: none"> 1. An entity Incorporated, established or registered in such a country; or 2. A subsidiary of an entity Incorporated, established or registered in such a country; or 3. An entity substantially controlled through entities incorporated, established or registered in such a country; or 4. An entity whose beneficial owner is situated in such a country, or 5. An Indian (or other) agent of such an entity; or 6. A natural person who is a citizen of such a country; or 7. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above <p>IV. The beneficial <i>owner</i> for the purpose of (iii) above will be as under:</p> <ol style="list-style-type: none"> 1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means. |

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| | | <p>Explanation-</p> <ol style="list-style-type: none"> a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company; b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholder's agreements or voting agreements; <ol style="list-style-type: none"> 2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership; 3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of Individuals; 4. Where no natural person is Identified under (1) or (2) or (3) above the beneficial owner is the relevant natural person who holds the position of senior managing official; 5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership. V. An Agent is a person employed to do any act for another or to represent another in dealings with third person. VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. <p>* The above clause is not applicable to the bidders from those countries (even if sharing a land border with India) to which the Gol has extended lines of credit or in which the Gol is engaged in development projects.</p> <p>* List of countries to which lines of credit have been extended or in which development projects are undertaken are available on the Ministry of External affairs website (https://www.mea.gov.in/)</p> <p>Compliance to Government of India order OM No.6/18/2019-PPD dated 23.07.2020 & 24.7.2020 regarding restrictions under Rule 144 (XI) of the General Financial Rules (GFRs), 2017 to be submitted on the bidder's letterhead as per Annexure-D(i) or Annexure-D(ii) – as applicable.</p> |
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| 47 | Compliance to order No. 25-111612018-PG, Dated 02.07.2020 of Ministry of Power, GOI | Not Applicable |
| 48 | Evaluation in case of more than one L-1 bidder | <p>In the course of evaluation, if more than one bidder happens to occupy L-1 status, effective L-1 will be decided by soliciting discounts from the respective L-1 bidders.</p> <p>In case more than one bidder happens to occupy the L-1 status even after soliciting discounts, the L-1 bidder shall be decided by a toss / draw of lots, in the presence of the respective L-1 bidder(s) or their representative(s).</p> <p>Ranking will be done accordingly. BHEL's decision in such situations shall be final and binding.</p> |
| 49 | Submission of Supplier registration Form | <p>Qualified Bidders shall be required to register with BHEL as per BHEL SEARP guidelines available on www.bhel.com and https://supplier.bhel.in/index.jsp. BHEL shall be entering into TC-MOU with registered suppliers.</p> |
| 50 | Quantity Variation | <p>BHEL Reserves the right to plus or minus 30% within contract period. The Purchaser shall have the right to increase or decrease quantities and scope upto the above extent of value and Seller/Contractor shall be bound to accept the same at the contracted prices without any escalation.</p> |
| 51 | No Relaxation for MSEs/Start-Ups for PQR criteria provided technical specifications are met: | <p>The Tracker system will serve as the foundation for mounting crucial components within the Solar Power Plant, including Solar PV Modules, dry module cleaning system etc. It is essential to recognize that the quality and longevity of this system directly impact the safety of the other Equipment/workforce operating within the plant premises due to presence of moving parts in the system itself.</p> <p>Considering the paramount importance of safety measures, it is imperative that the design & Supply of the tracker system be entrusted only to experts with significant experience in the field. Hence in line with the clarification issued by the Department of Expenditure, Ministry of Finance (vide No. F.20-2/2014-PPD(Pt.) dated 27.07.2017), no relaxation regarding prior experience shall be granted to any bidder for this Techno-Commercial MOU and Pre-bid tie up.</p> |



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**TECHNICAL SPECIFICATION
FOR
DESIGN, MANUFACTURING,
SUPPLY, INSTALLATION AND
COMMISSIONING
OF
TRACKER SYSTEM
FOR
VARIOUS SOLAR PV PROJECTS
ACROSS INDIA**

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|----------------------------|------------------|---------------------------|---------------------|
| Revision details: 01 | Prepared by: VKC | Checked & Approved by: PM | Date: 04.09.2024 |
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**TECHNICAL SPECIFICATION FOR DESIGN,
MANUFACTURING, SUPPLY, INSTALLATION
AND COMMISSIONING OF TRACKER SYSTEM
FOR VARIOUS SOLAR PV PROJECTS ACROSS
INDIA**

PS-439-1426

Rev No: 01

1.0 INTRODUCTION

The PV modules shall be mounted on metallic structures called Module Mounting Structures (MMS) having adequate strength and appropriate design, which can withstand the load of the modules and design wind pressure. Modules shall be mounted on non-corrosive support structures with Automatic motor powered Realtime East-West tracking. This document describes the technical specification for design, manufacturing, supply, installation and commissioning of Tracker system.

2.0 BRIEF SCOPE OF DESIGN, SUPPLY AND WORKS

2.1. DESIGN

- I. Design, Engineering and approval from End customer of complete Tracker system along with all accessories.
- II. Design of MMS material for Tracker system including foundation design. Foundation design validation by trial pile test at site shall also be conducted by Vendor at site.

2.2. SUPPLY OF TRACKER SYSTEM

- I. Tracker System along with all accessories, tools & Consumables and mandatory spares specified.
- II. Module mounting arrangement and all associated accessories, as applicable.
- III. Any auxiliary requirement of trackers system for regular functioning or maintenance to be supplied.

2.3. WORKS & SERVICES:

- I. Demonstration of erection methodology and supervision of erection during complete erection of Tracking system. Erection works shall be done by BHEL Sub-contractor.
- II. Commissioning, trial run and acceptance test of Tracking system.
- III. Comprehensive AMC of complete Tracker system including all accessories on yearly basis for specified period.

Based on above scope of design, supply and works, a BOM will be prepared for providing quotations during project specific tendering. Detailed specification and scope elaborated in relevant section of the specification and its enclosures which are the integral part of the specification.



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2.4.BHEL SCOPE OF WORK (NOT INCLUDED IN SCOPE OF TRACKER VENDOR):

- I. Foundation works & Mechanical Installation of Trackers shall be done by BHEL's Subcontractor under supervision of tracker supplier.
- II. Dry Robotic Cleaning system shall be installed by BHEL's another Subcontractor. Tracker system should be compliant with dry robotic cleaning system.
- III. Supply of PV Module by BHEL.

3.0PROJECT INFORMATION:

Will be intimated at the time of inviting project specific tender.

4.0 SITE SPECIFIC DATA:

Will be intimated at the time of inviting project specific tender.

5.0MANDATORY TECHNICAL REQUIREMENTS/DOCUMENTS TO BE SUBMITTED BY THE BIDDER ALONG WITH TECHNICAL BID:

- I. Bidder should be a Manufacturer of Tracker System. A self-declaration along with details of manufacturing facilities to be submitted.
- II. Details and drawings of the Trackers being offered to BHEL.
- III. Indicative MQP and FQP of the Tracker System.

6.0TECHNICAL SPECIFICATIONS FOR TRACKER SYSTEM

6.1.GENERAL

The Tracker System shall be of proven design capable of tracking Sun's path actively, intended to maximize the energy output from PV Module. Design shall be based in accordance with the site climatic conditions and seismic loads, soil characteristics, thermal loads caused by expected fluctuations of materials and ambient temperatures and the minimum required design wind speed.

6.2.CODES AND STANDARDS

The Tracker system must conform to the latest edition of any of the following IEC/ equivalent standards for Tracker system design qualification and type approval.



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| CODES | Description |
|------------------------------|--|
| UL 2703 | Standard for Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels or equivalent |
| UL 3703 | Standard for Solar Trackers or equivalent |
| IEC TS 62727 | Photovoltaic systems - Specification for solar trackers |
| IEC 62817:2014+AMD1:2017 CSV | Photovoltaic systems – Design qualification of solar trackers |
| IS 875: Part 1 & 2 | Code of practice for the design loads for buildings and structures- |
| IS 875: Part 3 | Code of practice for the design loads for buildings and structures-Wind Loads |
| IS 800: 2007 | Code of practice for use of structural steel in general building construction |
| IS 4759 | Hot-dip zinc coatings on structural steel and other allied products |
| IS 1868 | Anodic Coatings on Aluminium and its Alloys |

**Equivalent National and International standard/code would also be acceptable
Module Mounting structures (MMS) with trackers.**

6.3.DESIGN

- Single axis East-West real time tracking
- Configuration - Both, single and multi-rows options are accepted.
- Tracker Range of Movement (ROM): +/- 45 degrees or better
- DC Self-powered drive system with battery backup of 3 days autonomy.
- Individual row-level bi-directional control
- Redundant communication (wireless) for individual Trackers
- Stow configuration: optimal Angle, as per aero elastic instability analysis.
- Design wind speed as per site condition, basic wind speed as per wind map of India from IS 875 Part 3: 2015.



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- i) Suitable material for corrosion category compliance as per Corrosion map of India, EN ISO 14713, EN ISO 1461, EN ISO 12944-5 or ASTM 123.
- j) Operational temp: -10 to 50 degree Celsius.
- k) Comprehensive Integration to Plant SCADA with Tracker system to be done. Any communication cable, if required shall be provided and laid by Vendor only. BHEL SCADA to show all parameters of tracking system.
- l) Cleaning - Compliant with robotic module cleaning
- m) The minimum design clearance (at the highest tilt angle) between the lower edge of the modules and the developed ground level shall be 400mm for Single Axis Tracker based system.
- n) Foundation system shall be designed and adopted as per approved geotechnical investigation report and relevant IS standard. Considering the substrata condition, advanced and mechanized steel pile foundations may also be opted for MMS of a solar PV system. A pile cap should be cast by concrete of min. M25 grade having projecting length 150 mm above the ground level and minimum 250mm below the ground level to minimize the corrosion in the steel section. Length and other parameter of pile can be decided by performing the pile load tests and applying a suitable factor of safety as per code/ approved methodology.

6.4.REQUIREMENTS

- a) Tracking system shall be followed by either means of sun's positioning algorithm or optimization algorithm with a minimum tracking accuracy of $\pm 2^\circ$ between the pointing vector of the sun and the pointing vector of the modules.
- b) The tracking system shall have back tracking algorithm to avoid inter-row shading and optimizing irradiance collection for both row avoidance shading and diffuse light optimization.
- c) All local tracking controls shall be mounted on the tracking structure. A suitable arrangement/bellows shall be provisioned to protect actuator assembly from extreme outdoor harsh condition, dust and UV rays.
- d) In case of failure of supply, the arrays should return to the stow position. Bidder shall supply a tracking mechanism with an inbuilt feature for meeting the requirement.



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- e) All modules associated with a specific tracking system should be connected to a common inverter.
- f) Suitable redundancy in sensing and auxiliary power supply shall be provided for fail-safe stowing of trackers. Redundancy in control is also desirable for the safe operation of trackers. Detail of the scheme for various redundancy shall be finalized at the time of detailed engineering.
- g) Safety measures such as stop devices shall be applied to ensure personal safety.
- h) Tracker shall be equipped with safety features like, auto high wind stow to the designed angular position and shall have uninterrupted communication with monitoring console/station. It should be capable of sending alarms to the monitoring station in case of failure or abnormal operations of the tracking systems.
- i) For each row an earthing cable shall be installed to interconnect all metallic parts of foundation, tracker structure and PV modules of each table.
- j) Tracker design shall also include a provision for fastening DC cables to the structure each 500mm without causing tearing or fluttering of cables.
- k) Tracker shall able to track as per proposed stow strategy supported by Wind Tunnel test.
- l) Tracker Torque Tubes should be galvanized in accordance with, ISO 1461, ISO 14713, ISO 9223, or relevant standard as per Corrosive Category of proposed Solar PV Site.
- m) Minimum 400mm clearance to be maintain at module edge with maximum angle.

6.5. MODULE MOUNTING ARRANGEMENT

a) Module mounting structures shall be designed to withstand the extreme weather conditions in the area. The site design wind speed factors k_1 , k_2 , k_3 and k_4 and pressure coefficient shall conform to IS 875 (Part-3): 2015 or as per a Wind Tunnel Study from a reputed national/international facility, for the design of MMS. However, design wind pressure to be considered for design, shall not be taken less than the minimum wind pressure “ p_d ” as mentioned in the Technical Specification.

If the Bidder is going for wind tunnel test for the design and analysis of complete MMS and solar tracking system following shall be ensured.

- i. It must be done from an institute of repute (IITs / SERC or equivalent) in India)/ international facility.



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ii. Bidders must ensure that offered tracker has proven design with wind tunnel test simulating actual site conditions. The analysis and design shall be completed within two months from the actual date of issue of LOA.

iii. Test results and design must comply with relevant Indian/ International codes.

iv. The design shall be shown in STAAD pro or similar commercially available software for further checking of BHEL/End Customer as and when required.

b) The structural material and design shall be as per Design Criteria for Module Mounting Structures (MMS). The structural Material Yield Strength and Minimum Design Thickness can be as per “Proprietary Design” of Tracker supplier, and It shall conform to Indian / international code design provisions. The Proposed Solar PV tracker system same should be certified for successful performance of MMS and tracker system by designer for its design life of 25 Years after COD. The Solar PV tracker system shall also fulfil the requirements of PQC given in tender document.

c) The design and the calculations for the MMS and the foundation system shall be submitted for prior approval of BHEL/End Customer before the commencement of construction and shall be based on the soil Geotechnical Investigation report.

e) The Structure shall be designed and analyzed in accordance with finite element method, the fundamental principles of Engineering using commercially available software (such as STAAD pro or similar), with dead load and wind load considered as per IS: 875 (Part 1& 3, respectively) or as per Wind Tunnel study done from a reputed national/international facility. Analysis shall be done as per appropriate load combinations preferably as per IS codes.

f) The Structure must be provided with limit switches to control the rotation of the frame.

g) Vendor to submit .shd file of Tracker system or key parameters of tracking system required for Energy simulation in PV Syst Software.

g) All nuts & bolts or clamps shall be of Stainless steel, Aluminium or Metal Alloy type for a module to structure connection, and other structural bolts shall be of grade HDG 5.6 or 8.8 or exclusively designed for solar tracker systems by manufacturers. Which should suffice the design life for 25 years and more for Corrosive Category proposed for Solar Park and confirm to Indian / international code provision.



6.6. PROTECTION AGAINST CORROSION & UV

Appropriate measures shall be considered, as required, to protect the structure, foundation, and all components against corrosion during the expected lifetime of the Plant. Structural steel shall be hot dip galvanized as per ISO 1461 (or BS 729), EN 10346, ISO 14713, IS 4759, ISO 9223 and as per Corrosive Category of proposed Solar PV Site.

Non-metallic materials placed outdoors shall be UV and sand resistant and withstand high ambient temperature operation regimes as per the climatic conditions over the whole Plant design lifetime, and where materials are specified in any part of this RFP, those characteristics are to be considered as a minimum requirement. Metallic materials are not explicitly required to be UV resistant but in case protective coating is required, this shall be UV and sand resistant.

All materials used for concrete, reinforced concrete structures, steel structures, aluminum structures or structural elements or any other building material shall be of high quality, free from defects likely to undermine the strength and duration of service of the Plant.

6.7. BEARING

- a) The bearing should be type tested for operation cycles which solar plant will go through in its life of 25 years.
- b) Preferably there should not be any lubrication in the bearing, but if there is any, then it should be maintenance free. No cleaning should be needed.
- c) The bearing should also be resistant to dust, water and any other external parameters.

6.8. MOTOR AND ACTUATOR

- a) The motor should be IP 65 or better and it should be powered by reliable supply to drive the link through gear or hydraulic/electric actuator.
- b) The temperature rises in the motor during operation specified in IS12802: 1989 should not be more than approximately 10°C.
- c) The location and moisture or fumes shall not seriously interfere with the operation of the motor.
- d) The severity of vibration for the motors shall be within the limits specified in IS 12075: 1987.

6.9. CONTROLLERS



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- a) Trackers should have an industrial grade system for its automatic control and operations. For all outdoor controllers, it should be housed in IP-65 enclosure.
- b) Battery back-up should be provided for Controller and motor for at least 15 minutes with power pack cum UPS. Alternatively, the bidder can provide backup power from the UPS of inverter room or CMCS room.
- c) The controller must be enabled with a feature of stowing during highspeed winds.
- d) The Real Time Clock (RTC) of the trackers shall have a facility to be time synchronized with SCADA on Network Time Protocol (NTP).
- e) A suitable communication link between the master controller of tracker and tracker SCADA system shall be arranged. The software for communication and analysis shall be provided by the tracker supplier. Tracker SCADA shall be interfaced with solar SCADA on an open protocol such as MODBUS.
- f) Battery back-up should be provided for Controller and motor as per design specified in Cl 6.2. Alternatively, the bidder can provide backup power from the UPS of inverter room or CMCS room.

6.10. STUDIES/REPORTS

The following studies, and reports shall be submitted by the Bidder for the offered solution. The studies and reports shall provide a positive outcome of the respective tests, designs, and concepts for the utilization of the proposed single axis tracking system in the Project:

a) Stow strategy control system: The Tracker supplier is solely responsible for the definition and implementation of a proper stow strategy, which clearly demonstrates and guarantees the safe operation of the tracker during all wind events with speed up to and including the maximum one defined as per local structural code. The following points, including but not limited to, should be made available as part of the safety stow strategy:

- Tracker inclination and orientation at safety stow position
- Maximum wind speed in [m/s] as [3-sec gust / 10min average] defined at 10m height which the tracker can withstand in working position
- Stow alarm function and wind speed at which it is triggered
- Safety strategy during installation / commissioning



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- In case that batteries are used, which is the minimum charge level required in order to reach safety stow position
 - Security of communication protocols required for the active stow
 - Time requirement to move the tracker from working position into stow position considering also safety factors
 - System redundancies that help to minimize risk of failure. Emergency system in case of tracking or measurement defects
 - Dynamic analysis and tests along with static coefficients based on the actual tracker configuration, stiffnesses and geometry
 - Aeroelastic instability analysis for the proposed tracker structure to show that the stow angle will not result in aeroelastic instability
 - Definition of tolerances, maximum terrain inclinations North-South, East- West
- b) Wind tunnel tests from a recognized wind expert institute (CPP Wind Engineering, RWDI or an alternative experienced institute subject to approval by the Off taker).
- c) Independent Engineers Bankability review report from reputable agencies like Black and Veatch, DNV, IITs or other premier institutions/agencies.
- d) Structure design review document from any IIT civil/Structural certifying department, if required.

7.0 QUALITY ASSURANCE PLAN (QAP) & INSPECTION:

- 1.1. Detailed Material Quality Plan (MQP) for Tracker and its accessories shall be submitted within 7 days from the manufacturing clearance for BHEL/End Customer's approval.
- 1.2. The Tracker and all its accessories shall be inspected by an authorized representative of BHEL/End Customer/TPI at Manufacturer's/Supplier's premises before dispatch as per approved QAP (Quality Assurance Plan) of manufacturing. The items shall only be dispatched after issue of Material Dispatch Clearance Certificate (MDCC).



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- 1.3. Bidder to raise inspection call 7 days in advance. The inspection call should contain BBU ref., QAP ref., internal test reports, RMTC etc. for review.
- 1.4. For Installation & Commissioning works, a detailed Field Quality Plan (FQP) shall be submitted within 7 days from the manufacturing clearance for BHEL/End Customer approval. The FQP shall detail out for all the works, equipment, services, quality practices and procedures etc in line with the requirement of the technical specifications to be followed by the BHEL Sub Contractor at site. Tracker Vendor has to supervise and ensure follow of FQP during Installation works.

8.0 WARRANTY FOR TRACKER SYSTEM:

- 10-year warranty starting with the successful commissioning of complete tracker system for the structural integrity of Tracker System including but not limited to the design, material, MMS, power unit, motor, gear, damper, controller etc.
- 25-year lifetime design (at least) considering local ambient conditions and in respect of all standards for the PV modules support structures and foundations
- 25 years for corrosion protection.

9.0 COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (AMC)

Bidder has to furnish comprehensive AMC on yearly basis from the date of completion of O & M of the Tracker system for period specified in Project Information. Comprehensive AMC shall include all preventive maintenance and breakdown maintenance including replacement of any component to ensure that equipment is working satisfactorily as per design/system requirement. Bidder has to depute sufficient no. of persons at site during AMC period as per project size requirement. During AMC period, the OEM is required to respond within one working day through telecom or any electronic means. This AMC to include the following:

- I. Attending to and resolving any breakdown/fault of the tracker system.
- II. Periodic maintenance schedule for checking the Tracker condition and any other maintenance needed to maintain healthiness of Tracker system. The bidder shall be



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responsible for supply of all spare parts, repairs / replacement of any defective equipment at his own cost as required from time to time during the AMC period.

- III. Bidder shall maintain a minimum stock of each component of Tracker system and its accessories as spare at site during complete AMC Period for maintenance of the system as per requirement. Bidder to replenish the spares if consumed and maintain minimum stock at any time during AMC period.
- IV. Schedule and methodology of checking of tracker system components periodically for its wear and tear.
- V. Schedule of preventive maintenance and checks
- VI. Mandatory quarterly to assess the Tracker system for any failure or any sign which may lead to subsequent failure. Vendor to send the assessment report to BHEL/End customer through email.

In case of severe breakdown of the system, OEM has to send their expert representative within 72 hours. For the minor faults not hampering the generation, the OEM has to get the fault rectified within 7 working days. Failure from the OEM to adhere the activity and the time schedule may lead to BG encashment.

10.0 DELIVERY SCHEDULE:

Will be intimated at the time of inviting project specific tender.

11.0 QUOTATION AND PRICE VARIATION DUE TO CHANGE IN PV MODULE CAPACITY

The bidder shall design the Tracker system as per the PV Module wattage for Min. 540 Wp. The quoted cost shall be based on minimum wattage of Modules and DC capacity specified in project information and BOQ. However, there is a contract price adjustment on account of variation of PV module wattage. Price variation shall be adjusted as per the formula below:

Award Price based on 540Wp = P

Reference Wp/SqM Considered for 540 Wp Module = 209.41

Contract Price Variation for each unit increment in Wp / SqM.

$\Delta P\% = (-) 0.27\% \times (Wp / SqM_{new} - 209.41)$



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Where,

SqM is Area of Module in m²

Wp/SqM_{new} is the Wp/SqM of Offered Module by BHEL.

Final Price after Correction = $(1 + \Delta P\%) \times P$

All values for calculation purpose would be rounded off to 2nd Decimal Place only.

Example:

Award Price including all Taxes and Duties (P) = INR 100 Crores (Say)

BHEL Offered Weighted Average Nominal Wattage = 590Wp with Module Dimensions as 2350x1150 (Say).

Wp / SqM for Offered Module i.e. Wp/SqM_{new} = 218.32

Difference of Wp / SqM = 218.32 - 209.41 i.e. (+)8.91

Correction on awarded price ($\Delta P\%$) = (-) 0.27% x (+) 8.91 i.e. (-)2.41%

Final Contract Price Post Correction = $(1 - 2.41\%) \times 100 \text{ Cr.} = 97.59 \text{ Crores}$

The reduction factor of price will be applied on all BOQ line items.

**SOLAR BUSINESS DIVISION****TPQR
REV.00****TENDER NO. MANPVT0003****TECHNICAL PRE-QUALIFICATION REQUIREMENTS (PQR)****Item: DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING OF TRACKER SYSTEM**

| Sl. No. | PRE-QUALIFICATION REQUIREMENTS | Bidders claim in respect of fulfilling the PQR Criteria | |
|---------|--|---|--|
| | | Name and Description of qualifying requirements | Supporting document |
| A | Technical Criteria | | |
| A1 | <p>The Bidder to be an OEM of tracker systems and should have designed, manufactured, supplied, erected/supervised erection, and commissioned/supervised commissioning Solar Tracker System of the proposed design/type of cumulative capacity of 50 MWp or above, out of which at least one such supply order for a single plant should be of 10 MWp or above capacity.</p> <p>The bidder may use the credentials of its Parent/Group/Holding company for meeting the requirement. The reference plant in which 10 MWp or above capacity Solar Tracker System was supplied, must have been in successful operation for at least one (1) year as on Offer submission date for Techno-Commercial MOU.</p> | <p>As an evidence vendor shall submit PO/WO copy, Completion certificates from Customer to be submitted for validation of the above experience clearly indicating date of commissioning and MW commissioned.</p> | <p>Supporting document (Attached / Not-attached) <input type="checkbox"/> / <input type="checkbox"/> (please tick at appropriate place)</p> |
| A2 | Technology criteria | <p>The proposed Tracker design/type shall be of proven technology with Independent Engineers Bankability review report from reputable agencies like Black and Veatch, DNV, IITs or other premier institutions/agencies.</p> | <p>Supporting document (Attached / Not-attached) <input type="checkbox"/> / <input type="checkbox"/> (please tick at appropriate place)</p> |
| A3 | <p>BHEL reserves the right to visit the plant cited in the experience certificate. Bidder has to arrange necessary permissions from Plant owner during visit.</p> | | <p>Accepted/Rejected <input type="checkbox"/> / <input type="checkbox"/> (please tick at appropriate place)</p> |

NOTE: Supporting documents for qualification against PQR needs to be enclosed._____
Seal and signature of the Bidder

TECHNO COMMERCIAL MEMORANDUM OF UNDERSTANDING (EXCEPT PRICE)
FOR DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING
OF TRACKER SYSTEM

BETWEEN

M/S. BHEL, SOLAR BUSINESS DIVISION, BANGALORE - 560012

&

.....

- 1.1 This Techno commercial MOU is signed for the DESIGN, MANUFACTURING, SUPPLY, INSTALLATION AND COMMISSIONING OF TRACKER SYSTEM as per the agreed specifications & commercial terms & conditions.
- 1.2 The various aspects covered in this MOU are as follows & it is agreed to follow the same without any deviation.
 - 1.2.1 Commercial Requirements as per GCC R0 & SCC R0.
 - 1.2.2 Technical Specifications DOC NO: PS-439-1426 Rev: 01
 - 1.2.3 PRE-QUALIFICATION REQUIREMENTS- DOC NO: TPQR Rev: 00
- 1.3 The party II agrees to take no deviation while submitting the offer, other than deviations agreed by BHEL with or without %age of cost of withdrawal as agreed in TC-MOU.
- 1.4 Same cost of withdrawal will be loaded in quote at the time of evaluation of price in enquiry, however bidder can withdraw such deviation in offer at the time of enquiry.

VENDOR'S SIGNATURE WITH SEAL

BHEL SBD

- 1.5 If any deviation is taken in the technical, commercial & quality points in the offer submitted by party II, the offer will be rejected straight away. Any request for revaluation will not be entertained.
- 1.6 If BHEL has any other requirement/deviation from the MOU for a particular enquiry, it shall be clearly given in the enquiry itself. Confirmation for that requirement/deviation alone is to be given by the bidder. All other terms & conditions shall be as per the MOU. Such deviations/requirements, if any, shall pertain to that enquiry alone and MOU shall be followed for all other enquiries unless otherwise specified.
- 1.7 This MOU shall be valid from _____.
- 1.8 The MOU shall stand valid for TWO (02) years from the date of finalization of the MOU. The MOU validity may be extended eve after the initial period of TWO years if required by BHEL, with the consent of party II. However, in case any change is required; the MOU may be amended before the expiry of the validity with mutual consent.