



BIHAR STATE POWER GENERATION COMPANY LIMITED

Registered Office: 5th Floor, Vidyut Bhawan, Bailey Road, Patna – 800001

A Govt. of Bihar Undertaking, CIN: U40102BR2012SGC018888

NIT No: 09/PR/BSPGCL/2023

Selection of Consultancy Firm for Owners Engineer (OE) services required during Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 185 MW(AC) Solar PV Power Plant with 254 MWh Battery Energy Storage System at Kajra, Lakhisarai Distt., Bihar, India

December 2023

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A. Disclaimer

1. The information contained in this Request for Proposal document (hereafter referred to as “NIT” or subsequently provided to Applicant(s), whether verbally or in documentary or any other form, by or on behalf of the BSPGCL (hereinafter referred to as Company), or any of its subsidiary or employees or advisors, is provided to Applicant(s) on the terms and conditions set out in this NIT and such other terms and conditions subject to which such information is provided.
2. This NIT is not an agreement and is neither an offer nor invitation by the Company to the prospective Applicants or any other person. The purpose of this NIT is to provide interested parties with information that may be useful to them in the formulation of their application for qualification and thus selection pursuant to this NIT. This NIT may not be appropriate for all persons, and it is not possible for the Company, its employees or advisors to consider the objectives, financial situation and particular needs of each party who reads or uses this NIT. The assumptions, assessments, statements and information contained in this NIT may not be complete, accurate, adequate or correct. Each Applicant should therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments, statements and information contained in this NIT and obtain independent advice from appropriate sources.
3. Information provided in this NIT to the Applicant(s) is on a wide range of matters, some of which may depend upon interpretation of law. The Company accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on law expressed herein.
4. Company, its employees and advisors make no representation or warranty and shall have no liability to any person, including any Applicant or Bidder, under any law, statute, rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this NIT or otherwise, including the accuracy, adequacy, correctness, completeness or reliability of the NIT and any assessment, assumption, statement or information contained therein or deemed to form part of this NIT or arising in any way with selection of Applicants for participation in the Bidding Process.
5. The Company also accepts no liability of any nature whether resulting from negligence or otherwise howsoever caused arising from reliance of any Applicant upon the statements contained in this NIT.
6. The Company may, in its absolute discretion but without being under any obligation to do so, update, amend or supplement the information, assessment or assumptions contained in this NIT. The issue of this NIT does not imply that the Company is bound to select and shortlist Applications and the Company reserves the right to reject all or any of the Applications or Bids without assigning any reasons whatsoever.
7. The Applicant shall bear all its costs associated with or relating to the preparation and submission of its Application including but not limited to preparation, copying, postage, delivery fees, expenses associated with any demonstrations or presentations which may be required by the Company or any other costs incurred in connection with or relating to its Application. All such costs and expenses will remain with the Applicant and the Company shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by an Applicant in preparation or submission of the Application, regardless of the conduct or outcome of the Bidding Process.

B. Notice Inviting Tender (NIT) Details

Sr. No.	Particulars	Details
1	E-Tendering Notice no:	/PR/BSPGCL/2023
2	Name of Work:	Selection of Consultancy Firm for Owners Engineer (OE) services required during Design, Engineering, Supply, Construction, Erection, Testing & Commissioning of 185 MW(AC) Solar PV Power Plant with 254 MWh Battery Energy Storage System at Kajra, Lakhisarai Distt., Bihar, India
3	Method of Selection	Quality and Cost Based Selection
4	E-Bid Portal (website):	https://eproc2.bihar.gov.in
5	E-Tender Cost:	Non-Refundable Fee of Rs. 10,000/-
6	Bid Processing Fee:	As per e-tender portal
7	Earnest money deposit (EMD):	Rs. 2,26,000/- Lakh
8	Document downloading/sale date starts:	01.01.2024 from 15:00 hrs
9	Pre-Bid Meeting Date:	08.01.2024 after 11:00 hrs
10	E-Bid submission end date:	22.01.2024 upto 16:00 hrs
11	Last date for submission of hard copies of requisite documents:	22.01.2024 upto 15:00 hrs
12	Opening date of Techno-commercial e-bid (Part-I):	22.01.2024 after 17:00 hrs
13	Opening date of e-bid Part-II (Financial):	To be notified after Technical Part evaluation through the web portal https://eproc2.bihar.gov.in
14	Consortium Allowed:	Yes
15	Sub-Contracting Allowed:	No
17	Proposal Language:	English
18	Proposal Currency:	INR
19	Account Details for E-Tender Cost and Bid Processing	To be deposited online through the web portal https://eproc2.bihar.gov.in
20	Contact Person for addressing queries & clarifications	Name: Sri Rajeev Kumar Singh Designation: Electrical Superintending Engineer Address: 5 th Floor, Vidyut Bhawan, Bailey Road, Patna - 800001 Phone No: 7763813865 Email id: rsinghprojects@gmail.com
21	Contact Person for hard copy submission	Name: Sri Dilip Kumar Designation: Chief Engineer, BSPGCL Address: 5 th Floor, Vidyut Bhawan, Bailey Road, Patna - 800001 Email id: chiefengineerbspngcl@gmail.com
22	Proposal Validity Date	180 days from Proposal Submission Date

Note:

- Bid shall be accepted through the e-tender portal. Tender issuing authority is not responsible for the delay/downloading of tender document by the recipient due to any problem in accessing the e-tender website. The tender issuing authority is also not responsible for delay in uploading bids due to any problem in the e-tender portal.
- BSPGCL reserves the right to reject any or all proposals or cancel the bid without assigning any reason thereof.

C. Introduction

1. Bihar is one of the fastest growing states in India. The rapid economic growth and infra structural development in the state needs to be supported by a proportionate growth in electricity generation. The current installed power capacity in Bihar stands at 9250 MW. The renewable contributing to almost 15% of the total allocated power capacity to Bihar. With its large population and rapidly growing economy, Bihar needs access to clean, cheap and reliable sources of energy. Beside addressing the energy demand and access issue, the renewable energy project would attract employment opportunities and Investments in Bihar.
2. Bihar State Power Holding Company Limited (BSPHCL), formerly Bihar State Electricity Board (BSEB) is a state-owned electricity regulation board operating within the state of Bihar in India. BSEB was established in 1958 as a statutory corporation under the Electricity (Supply) Act, 1948. BSEB formally started functioning as 5 companies on 1 November 2012, namely:
Bihar State Power Generation Company Limited (BSPGCL)
Bihar State Power Transmission Company Limited (BSPTCL)
North Bihar Power Distribution Company Limited (NBPDCCL)
South Bihar Power Distribution Company Limited (SBPDCL)
Bihar State Power Holding Company Limited (BSPHCL - apex holding company)
3. Bihar State Power Generation Company Limited (BSPGCL), a Bihar State-owned power generating utility established in November 2012, is committed to expanding its renewable energy (RE) portfolio. Recognizing the significance of RE in addressing environmental concerns and ensuring sustainable power generation, BSPGCL is implementing a comprehensive strategy to harness Bihar's abundant solar potential.
4. At the forefront of BSPGCL's RE endeavors is the establishment of Solar Power Plants with Battery Energy Storage Solutions (BESS) at strategic locations across Bihar. These integrated systems will not only generate clean solar power but also store excess energy during peak production periods, ensuring a reliable and consistent supply. To further augment its RE capacity, BSPGCL is actively procuring power for its sister DISCOMs through tariff-based competitive bidding from grid-connected Ground Mounted Solar PV Power Projects along canal banks, reservoirs, dams and even private ponds with raised structures under the RESCO model. This approach leverages private sector expertise and financing to accelerate the development of solar power projects. These projects offer several advantages, including reduced land requirements, minimized evaporation from water bodies, and enhanced energy production due to the cooling effect of water.

D. Background:

The 'Owner' M/s Bihar State Power Generation Company Limited (BSPGCL) is developing a large scale Solar PV project of 185 MW(AC) with Battery Energy Storage Solutions (BESS) of minimum 254 MWh capacity in Kajra, Lakhisarai Distt., Bihar.

With reference to the Engineering, Procurement & Construction (EPC) Contract, BSPGCL seeks to appoint an Owners Engineer (OE) whose primary task shall be to assist and monitor the process during the detailed design, construction and commissioning of the plant to be undertaken by the EPC Contractor.

E. Objective:

OE shall provide support in line with EPC contract documents to BSPGCL during the detail design review for overall project, construction supervision, supervision of testing and commissioning.

F. Scope of Services:

OE shall start their evaluation of the engineering designs, the work plans, the quality action plans, field quality plans and site project monitoring phase followed by Project commissioning phase During induction phase, the selected OE will also work closely with BSPGCL or its hired engineering firms to understand various project design and sizing parameters including engineering assumptions made during the tendering phases per the EPC contract terms and conditions only.

The OE will assist the BSPGCL (Owner) and will act under the directions of the Owner and will be delegated to the extent required for performance of these scope of services. The general OE scope shall comprise (broadly) the following activities:

I. Phase A - During Detailed Design

Preparation of Project Planning and Monitoring framework, Evaluation of the project design proposed by the EPC Contractor including conformance with ESMP measures to be implemented in design phase; review of construction arrangements, construction drawings and documents (to be furnished by the EPC Contractor to be selected by the BSPGCL) including performance witnessing and analysis assessment of construction risks and issues; review of the solar resources, respective technologies and energy yields; assessment of battery use, cases' duty cycles proposed by EPC Contractor, Review project's integration into the grid.; review of As-built drawings of the Project, review the EPC contractor's O&M arrangements and capabilities or any other tasks required for the successful completion of the design phase.

II. Phase B - During project construction, testing and commissioning

Supervise the execution of the contract in consultation with BSPGCL to ensure the contract is executed in full conformity with contract conditions, with specific requirements that OE will provide on-site monitoring of project progress throughout the construction period of the project, providing suggestions for correction and improvements as required; review and comment on the appropriateness and implications of any change orders,, and issue draw and/or milestone certificates (as necessary); confirm compliance with agreed-upon ESMP requirements including but not limited to environmental, health and safety measures,, monitor transmission line and substation construction and interface with Bihar State Power Transmission Co. Ltd. (BSPTCL), Review completion test procedures and results; assess contractor compliance with performance tests and/or payment of

penalties as defined in their respective construction or supply contracts and issue an opinion as to conformance; review punch lists for each contract; witness and issue a professional opinion on the OAT/performance tests; and issue provisional and final certificates of completion as defined in the conditions of the contract. BSPGCL requires that the OE will organize monthly progress review meetings with the contractor in association with BSPGCL and provide fortnightly reports throughout the construction period of the project. BSPGCL also requires that the OE mobilizes at Kajra site location with appropriate experts for the full duration of this Phase.

Phase A - During detailed design:

During this phase, the OE is expected to support BSPGCL in the due diligence of the detailed design provided by the contractor, solar, battery and balance of plant (BOP) technologies, construction schedules, tests, guarantees and O&M undertaking the following tasks:

Task A.1: Review Project Design, Construction and Operating Plans: Project Planning: Establishment of Project Monitoring Cells at BSPGCL HQ, Patna and Site, Review of the L2 and L3 Schedules submitted by the EPC Contractor, periodic review of supply schedules in co-ordination with site activities, identification of project management critical paths and raising timely alerts, monitoring of sub- contracts, Review the technical design of the Project and projected performance for compliance with tender documents, internationally accepted industry standards & practices. OE will provide an opinion on the quality of design and equipment with respect to its service life, as well as the operating history of major equipment. More specifically, the following should be addressed (including but not limited to):

1. Assess the quality of modeled/measured site solar data, other reference data and meteorological data.
2. Assessment of the impact of climate / weather (precipitation, temperature, humidity) at site on plant performance, including battery cooling requirements
3. Battery and Battery Management System (BMS) design for the proposed use cases
4. Independent review of energy projections, including:
 - a. Review of siting for each solar field and solar plant layout
 - b. Review of shading assessment
 - c. Estimate of the gross energy production
 - d. Assessment of the losses
 - e. Assessment of the Plant Management Control Systems and its ability to balance overall production with storage utilization in such a way to maximize plant revenues as per the PPA
 - f. Assessment of the net energy production (with battery system, including parasitic battery losses particularly from but not limited to cooling)
5. Review of the proposed project design, including: i) solar panels, central/string inverters, batteries, control systems (SCADA and Energy Management Systems); transformers, electrical systems (A.C & D.C), ii) plant design requirements; iii) proposed design of project facilities.
6. Review of original equipment manufacturer (OEM) technical specifications, drawings and test reports, and work instructions and protocols.
7. Review the proposed site layout, and the mechanical and electrical layouts.
8. Review of design, drawing, testing and soil investigation reports of all civil foundation (solar mounting pile, transformer etc.), roads, control room, drain, fence, cable trench and other civil works with suitable recommended structures/foundations. All electrical system review like equipment designing, engineering drawing, cable schedule, earthing, transmission line system,

lightning, fire-fighting system etc., ensuring proper design and functionality requirements for integration of solar& storage system (BESS), design requirements for availability of real time data at state load dispatch center (SLDC) (as per requirement of SLDC). Review with Bihar DISCOM and BSPTCL design, drawing and testing of all electrical BOP works (substation, bay-extension, transmission lines, etc.). Review of all As-Built drawings of the Project. Design review of all the components linked to the said project is in the scope of OE (and not limited to the above).

9. Review of design pertaining to BESS, SCADA and EMS
10. Review design, performance as well as the systems' historical and projected reliability and operations under various operating conditions.
11. Transfer of skills and experience to the BSPGCL HQ and field teams in implementing and operating the proposed solar with storage project.
12. Risks and issues associated with the proposed solar with storage project to be identified
13. Join any meetings with BERC (Bihar regulator), SBPDCL& NBPDC (Bihar DISCOM), BSPTCL, BRENDA or any other agency as required by BSPGCL.
14. Review of consistency of the mitigation measures of environmental and social issues proposed by EPC with the plant design.
15. Identification of clearances and approvals required from different Government and Statutory agencies at various stages of development and operation of the project as per the legal framework of Government of India and Government of Bihar, Local Bodies etc. The successful bidder shall also be required to assist the BSPGCL in obtaining the required clearances/approval/ consent.

Task A.2: Site Visit and Review: Visit the Project site as per instruction of BSPGCL for smooth design implementation of project site. Review and comment on:

1. Site topography, terrain, and soil conditions for development and logistics impacts.
2. General condition of the grounds and equipment.
3. Access to available transportation, including roads and bridges, ports, railroads, airports for equipment maintenance, supply and replacement considerations.
4. Visual, environmental and social impacts.
5. Weather conditions (extreme wind conditions).
6. Any other material factors

Task A.3: Review Project Construction Plan and Documentation: Items to be reviewed and commented on include, but are not limited to:

1. Review completion requirements including performance guarantees and associated liquidated damages,
2. Review the proposed construction schedule, discuss the schedule with construction contractor(s), and determine whether adequate provisions have been made for design; for equipment procurement, fabrication, shipment and installation; and for start-up, site inspection testing of the Projects. Unknown or variable elements in the schedule will be identified, along with associated potential risks.
3. Review the planned drawdown schedule and comment whether the planned monthly drawdown is consistent with the Projects schedule.
4. Review and comment with respect to: specific milestones, ability to achieve milestones, expedite the milestone achievement process, completion terms and operational ramp up period.

5. Review of all documents submitted by EPC contractor like Quality Assurance Plan, Field Quality Plans, EHS plan, Environment and social risk and mitigation.

Task A.4: Review Tests and Guarantees: In compliance with EPC contract requirements and other international practices, the OE will be required to review tests and guarantees proposed by the contractor. The OE will specifically:

1. Review performance guarantees, including guarantees provided by equipment manufacturers. Advise on the need for additional insurance, if any.
2. Review test criteria as proposed by contractors and suppliers and comment on reasonableness of test criteria, ability of the test(s) to unambiguously demonstrate whether the contractor and suppliers' guarantees are met.
3. Conformance of test procedures to established codes and standards for testing Projects equipment.
4. Comment on the minimum performance criteria the Projects will be required to demonstrate as conditions precedent to Projects completion.

Task A.5: Document Review of Project's O&M: Review the project's O&M program for compliance with generally accepted and prudent utility practices, and the ability to operate in accordance with Pro Forma projections. Items to be reviewed include:

1. Corrective, preventive and predictive maintenance management systems, processes and procedures.
2. Reporting requirements.
3. Compliance with Project agreements and permits.
4. Review and make recommendations on major equipment maintenance program for the project life period and minimum maintenance requirements (in accordance with those recommended by the Manufacturer in O&M manuals).

Task A.6: Review the ability of the Project, based on the design criteria, to meet the operating and technical requirements of the applicable operational agreements.

Task A.7: Review of Permits and Licenses: Assess the ability of the Project, based on design criteria and intended modes of operation, to meet and maintain compliance with technical requirements of the applicable major permits including but not limited to following:

1. Transmission system interconnection permits, CEIG, CEA etc.
2. Other permits and licenses including necessary local and state permits E.g. for storage of hazardous material from State Pollution Control Board.

Task A. 8: Financial Model: The scope of work will include the development of a financial and economic model for the project for BSPGCL in close collaboration with the BSPGCL's finance team. The OE, along with the BSPGCL will develop the following assumptions in a manner that is reasonable and consistent with the design of the Project, expected operating scenarios, and Project agreements:

1. Project performance and reliability.
2. Penalty or time extension recommendations as per contract
3. Greenhouse gas emissions and other key performance indicators