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SCOPE OF WORK

Sub: Service Contract for residual design and detail engineering for Main Fractionator of HRPL Barmer – Reg.

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1. INTRODUCTION:

Bharat Heavy Electricals Limited (BHEL) HPVP, located at Visakhapatnam, Andhra Pradesh is awarded order for supply of Main Fractionator column for PFCC package of HRRL, Barmer. M/s EIL is the Owner / PMC and the direct customer for BHEL

BHEL HPVP intend to seek engineering services from an “Engineering sub-Contractor” (EC) for residual design and detailed engineering work along with preparation of procurement, manufacturing drawing and design documentation etc.

EC shall ensure to develop and complete the documents and drawings in line with the contract specification, good engineering practice and meeting the project schedules and requirements.

2. SCOPE OF WORK OF EC:

A brief scope of work is indicated below. However, the complete scope requirement complying with the customer technical specifications attached shall be in the scope of EC/ bidder. **EC shall fulfil all requirements regarding residual design and drawings related activities as specified in PR No. B224-111-CC-PR- 6006-2025, Rev. A.**

a) Mechanical Design:

Residual Mechanical Design of column includes the following items.

- i. Design of lifting trunnion & tailing lug and stiffening block arrangement for total column and for handling of sub sections (If required WRC / FEA calculations need to be submitted).
- ii. Transportation & Lifting Arrangement with suitable saddles for multi-modal transport (road & sea shipment).
- iii. Elevated saddles for Site assembly work.
- iv. Design of Saddles for Hydro test.
- v. Design of Flanges for Feed Nozzle (N1A/B-72” NPS) & O.H. Vapor (N2-96” NPS) including WRC / FEA calculations for Nozzle Loads.
- vi. Design of Companion flanges for O.H. Vapour Nozzles (Nozzle Mark 2”).
- vii. Pipe Davit.
- viii. Internals (Other than items supplied by internal supplier).

b) Design / drawing approval:

Drawings prepared by the EC shall be in suitable quality for the approval of BHEL / Customer/ and their consultant and no unfinished/ semi-finished drawings are acceptable. Once the drawing is submitted, BHEL/ Customer or consultant will offer comments and corrections. The agency is responsible for incorporating the same in the drawing for getting the final approval from end customer.

The Design Documents / drawings may undergo revision by virtue of comments or by addition of data etc., EC is expected to carry out the revision of drawings and resubmit without additional cost. EC is expected to bring to the notice of BHEL-HPVP, any aspect of Customer Specification, which is at variance with provisions and Standard Practice. It is up to BHEL-HPVP, to consider the same and give a decision before agency proceeds with further Engineering.

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The EC shall submit the soft copy of the design documents & drawings as and when it is completed by them, immediately for HPVP scrutiny. Once HPVP satisfies with the Design Documents / drawings, then it will be submitted to Customer/ consultant for review / approval. In case HPVP has any comments on the drawing submitted the same will be returned to EC with comments. The EC has to revise and resubmit the drawing for onward submission to customer / consultant. The EC shall attend meetings at BHEL HPVP Visakhapatnam, for taking inputs, to participate in discussions, to evaluate progress of the job, whenever it is required. However, the frequency of visits shall be at least once in two weeks for meetings without additional cost.

c) General Assemble drawing:

The General Assembly Drawing (GAD) was already prepared by BHEL and submitted to customer for approval. After receipt of approval / comments from the customer, the same will be shared to EC along with native file as information. Incorporation of all customer comments in GAD shall be taken care by BHEL (Not by EC). EC to take note of all such comments, so that further detailed manufacturing assembly can be prepared / modified accordingly.

d) Detailed Manufacturing drawings along with BOM:

EC to submit residual calculations, detailed drawings, Bill of Materials (BOM) covering all technical requirements & erection requirements to BHEL & Customer for their approval / information. Necessary revisions / modifications in the documentation required to comply the observations / comments of BHEL / Customer / Licensor need be taken care and revised documents needs to be submitted.

The prepared Manufacturing drawings shall be suitable for fabrication of BHEL. It shall consist of BOM details along with dimensional details. The typical list of drawings has been specified in attached DCI. In addition to this list, EC shall prepare part drawings and sub assembly drawings like D' Ends, Stress Relieving arrangement drawings, transportation drawings for semi rolled cylindrical sections etc. which are required for fabrication.

When provided with the inputs for column, the detailed fabrication drawings shall be submitted progressively within 30 working days. However, the first drawing shall submit within 4 working days. Parallely, the preparation of drg. work (i.e. detail manufacturing drawings) can be taken up & the drawings with BOM shall be submitted within a week from the date of last input given to the EC.

e) Technical discussions with BHEL & Customer/consultant:

As part of execution & technical discussions, EC may require to attend the technical meetings at customer / PMC / Site / Internal Supplier offices along with BHEL for clarifications or discussions across the table.

f) Design of saddles & Transportation philosophy:

The EC shall design and prepare the respective documents & drawings suitable for hydro test and multi-modal transport (road & sea shipment).

In addition to the above EC shall also design elevated unloading saddle which are required at site for fixing of platforms and site joint welding.

g) As Built Drawings:

As built drawings shall be prepared by EC based on the actual dimensions while manufacturing. The inputs for preparation for As-Built drawings will be provided by BHEL after successful completion of hydro test / erection of internals. The agency shall submit the soft copy in editable form for all the documents.

3. PROCEDURE FOR SUBMISSION OF DRAWINGS / DESIGN DOCUMENTS

- i. BHEL will provide input data in the soft format as available from customer.
- ii. EC to submit the residual design, manufacturing and erection documentation in standard software's like MS Office, AutoCAD, PDF etc.
- iii. List of document submission schedule shall be finalized with successful bidder/EC in consultation with EIL during the kick off meeting.

4. DRAWING REVIEW AND APPROVAL

EC shall check and ensure for correct interfaces of customer documentation as per contract specification. All drawings and documents as indicated in the DCI shall be submitted to BHEL for their approval and review. EC to review and resubmit the documents incorporating the comments of customer/Consultant with a compliance report and this process shall continue till the documents are approved in code-1. Upon completion of project, based on site feedbacks, the as-built drawings are required to be submitted. All drawings and documents are required to be submitted in soft copy and BHEL will make necessary hard copies if required.

Initial submission as draft (Internal - between BHEL & EC) Rev A, B etc.)

Submission for customer/ BHEL. i.e. for Rev.0 & for Subsequent revisions till finalization)

Final documentation on CD (current revision soft copies shall also be forwarded to BHEL whenever asked for during the progress of the Project).

Mechanical Design shall be done using software like PV Elite 2020, STADD, Nozzle Pro, ANYSIS etc. and furnish the design output and inputs in the soft form as per the data exchange mutually agreed.

All drawings shall be made in R14 & above version of AutoCAD and other documents compatible MS office 97 version and above. During the progress of engineering, BHEL may like to exchange technical documents and drawings through electronic media (Internet), E-mail. EC should ensure that they have compatible workstation at their engineering office for this purpose.

5. SECRECY/ CONFIDENTIALITY

The work executed by the agency shall be treated as proprietary of BHEL & shall not be passed on / leaked to any person or agency out-side of BHEL. This shall be the responsibility of the contractor & his representatives.

- e) All specification, drawings and documents and bill of materials (BOM) shall be prepared in the formats as per BHEL requirement.
- f) Since speedy delivery of documents is essential for such a time scheduled progress, it shall be the responsibility of the EC to ensure timely delivery of all documents.
- g) EC shall indicate broadly in their offer the estimated man hour break-up against the DCI for carrying out the engineering work. In case, it becomes necessary at engineering stage, to delete any item from the scope of work of the consultant, for whatever reason or if the consultant does not carry out engineering for any item for his own reasons or if BHEL is forced to carryout engineering on its own due to delay / unsatisfactory performance by the consultant, payment to the consultant will not be made (proportionately, based on man-hours indicated) for those items of work, not engineered by the consultant.
- h) EC shall provide adequate and decent office arrangements to BHEL/ vendors/ customer visiting their offices for any meeting / discussion.
- i) For support engineering services at site, BHEL will not provide any accommodation at site. Engineering sub-contractor engineers visiting the project site shall come fully prepared for the assignment given by BHEL. The cost of such travels shall be included in their lump sum price.
- j) BHEL shall have the right to remove from work (in the engineering work) or at project site any of the employees of the EC who is in the opinion of BHEL is not suitable to perform work assigned to him or on account of improper conduct or negligence in duty.
- k) The EC shall estimate revision/modification of drawings/documents that can be anticipated for completion of the project of such a nature based on his experience. EC shall resubmit the drawings within max. one week from the date of inputs from BHEL. No extra payment shall be made for any engineering modifications/ revisions which may be necessary by BHEL/ Customer. No extra payment shall also be made for the duplication/preparation of the required no of copies to be submitted to BHEL /Customer or due to EC's errors or omissions. No extra payment shall be made for the revision/rectification/re-preparation of drawings/documents/manuals demanded by BHEL/Customer on quality grounds.
- l) Any additional drawings / documents, which is outside the agreed scope shall be carried out by EC expeditiously. Engg. hours for such additional scope shall be estimated and mutually agreed on completion of total engineering of the project, and shall be paid as computed & mutually agreed, along with the final payment.
- m) The Engineering sub-contractor shall familiarize fully with the standard / procedures / practice / quality requirements of BHEL / Customer and also the site conditions, to avoid any dispute at later date and after order placement.
- n) BHEL shall not pay any amount, other than the fee specifically agreed, towards any cost incurred by the Engineering sub-contractor by way of salaries to his employees (income and taxes) insurance of any nature, benefits/bonus to the employees, etc. BHEL's liability is limited to the amount contracted for the services to be rendered under the scope of work defined.
- o) The Engineering sub-contractor shall not commit any expenditure on behalf of BHEL without BHEL'S Consent in writing during the execution of the work defined in the scope.
- p) Engineering sub-contractor (i.e. EC) shall bear all expenses/fee penalties if it infringes on patents/licenses of any persons/organizations or in case of suits, court proceedings, damage claims etc., due to any reason whatsoever.

- q) The Engineering sub-contractor shall ensure that it possesses the latest revisions of various national and international standards, codes of practices, statutory regulations etc. as applicable for execution of the engineering work. BHEL shall not provide any such documents to EC. Engineers of EC assigned for this project shall have familiarities on relevant documents as above mentioned for their use and applications.
- r) The Engineering sub-contractor shall maintain at their own cost the personal accidents policy, life insurance and / or any such insurance required in respect of his personal deputed to site / BHEL.
- s) BHEL reserves the right to terminate or suspend the contract or withdraw part of the scope of the work at any stage of its execution, if it found that the EC has not met its obligation for the performance / progress is not up to the expected standards and overall work is likely to suffer. In such an event, BHEL shall give 15 days' notice in writing. In such case all costs incurred accordingly by BHEL to complete any work forming part of the contract shall be recovered from the EC. In case of such premature termination of contract, BHEL reserves the right to claim damages from the Engineering sub-contractor including the initiation of judicial proceedings.
- t) The Engineering sub-contractor shall keep all information/data/drawings etc. related to the work as confidential information and shall not divulge or use the information indirectly or directly in any way detrimental to the interest of BHEL. All drawings, documents, manuals, design calculations including all originals prepared or obtained during the work shall remain the property of BHEL and shall be handed over to BHEL on demand.
- u) The Engineering sub-contractor shall comply with the laws and regulations of the country, the state and territories concerned during the progress of the work.
- v) In the event of any query, dispute, or difference arising out or in connection with the contract, whether during the progress of work or after its completion, BHEL and the EC shall nominate one arbitrator each. The arbitration shall be conducted in accordance with the latest provisions of the Indian arbitration act 1940.
- w) The EC shall ensure that all engineering services required for the completeness of the project be carried out to the ultimate satisfaction of BHEL and customer. Any activity, which has not been spelt out in this specification, but is required for completeness of the job and for safe & satisfactory performance of the systems engineer, shall be deemed to be included in engineering work of EC for the given scope.
- x) The EC shall submit progress report on the status of the work entrusted to him periodically and as mutually agreed up on.
- y) The EC shall be fully responsible for the accuracy and adequacy of engineering services rendered by him. Any modifications / rectification, if required in engineering and design shall be carried at / expeditiously by the Engineering sub-contractor at his own cost. Losses /damages if any due to wrong engineering shall be compensated by the EC and a maximum of 10% of the lump sum engineering fee shall be deducted from the bills of EC arising out of such errors.
- z) If due to some unforeseen circumstances or at the request of BHEL's customer, it becomes necessary to suspend / terminate the project engineering work, the EC shall be asked to stop work and it shall be paid only for the work done till the date of notification and as per rules asserted by BHEL. No other damages/cancellations charges whatsoever, arising out of such suspensions/cancellation, shall be payable by BHEL.

9. SPECIAL CONDITIONS OF CONTRACT FOR ENGINEERING CONTRACTOR:

1. **Pre - Qualification Criteria - (Technical):** EC should have executed mechanical design and detailed engineering of similar work (Weight of One Column shall be more than 400 Tons) in the past 7 years, and the equipment is in operation for one year. EC to submit their qualification documentation support of their qualification along the technical offer.
2. **Pre - Qualification Criteria - (Commercial):** EC should have executed similar single order of worth > 8 lakhs.
3. The validity of contract shall be of 12 months from the LOI.

10. TERMS OF PAYMENT:

Since time is the essence of this subcontracting, all critical documents shall be submitted by EC in a short period of 4 to 6 days from the date of input given by BHEL. However, the non-critical documents and subsequent revisions of documents can be submitted on mutually agreed schedule as per project requirement.

Milestone payments:

SL. NO.	MILESTONE DESCRIPTION	PERCENTAGE
1	Completion of Mechanical design as per clause 2a of Annexure-I and approval by EIL	20
2	Completion of Part drawings and BOM as per clause 2. d of Annexure-I	45
3	Completion of Design of saddles & Transportation philosophy as specified in specification.	20
4	Final documentation /As Built	15

Completion of all the above milestones will be considered for payment only if, concerned deliverables are acceptable to BHEL and EIL. BHEL will release payment to EC, within 45 days of acceptance of invoice by BHEL.

11. Documents to be submitted by EC as part of offer submission:

- A. **Technical offer** along with technical compliance.
- B. **Price offer.** Filled in Price format duly signed.
- C. Documentary evidence complying the technical Qualification criteria.
- D. Documentary evidence complying to the commercial qualification Criteria
- E. Un- priced Price format filled in as "quoted" along with number of man hours.

Bidder to submit their offer in two parts in a separate sealed covers. Both the sealed covers shall be submitted simultaneously on the day of bid submission with following instructions.

- First cover shall include SL. No A, C, D, E of above with a title on cover as "**Techno commercial offer**".
- Second cover shall include SL. No B above with a title on cover as "Price offer".

BHEL will open Techno commercial offer and evaluate the offer. Upon completion of evaluation of techno commercial offer, price bids are opened.

SIGNATURE OF TENDERER WITH SEAL


 (D Gowri Sankar)
 Dy. Manager (OS)
D. GOWRI SANKAR
 Dy. Manager (OS)
 Bharat Heavy Electricals Ltd.
 HPVP, VSP-530 012