

PART III

TECHNICAL SPECIFICATION

1. Scope of work:

BHEL has submitted offer for Renovation and Modernization (R&M) and Life Extension (LE) of unit no. 6 & 7 (2 x 110 MW) of Barauni Thermal Power Station of BSEB, Bihar. The customer's consultant are NTPC, EOC, Noida. These units will be up-rated to 120 MW each along with R&M and LE. This specification is for consultancy services for balance of plant and electrical system packages for above renovation and modernization work.

The indicative list of Systems/ packages of electrical work and balance of plant shall be as given below:

SI No	Package/ system description
	Mechanical packages
1	Ash Handling System
2	Coal Handling System
3	Fuel oil system
4	Air Conditioning & Ventilation system
5	Compressed air system
6	Fire fighting and alarm system
7	CW system
8	DM Plant System , RO plant
9	Softening plant, chemical treatment for CW water
10	CW chlorination plant
11	Dosing system
12	Equipment cooling system
13	Miscellaneous pump house
14	Cooling towers
15	Tube well system, aeration / iron removal system
16	Cranes & Hoists
	Electrical
1	132 kV and 220 kV Switchyard
2	Transformers
3	HT & LT Switchgears
4	PA System
5	Power Plant Lighting
6	HT & LT Motors
7	Battery, Battery Chargers & DC System
8	Control & Protection System for Generator, GT, UAT, ST etc.
9	Control & Protection System for switchyard including Substation Automation System
10	HT & LT Cables, Cabling, Earthing & Lightning Protection including Busduct
11	Electrical Lab Instruments
12	Electrical System of all above mechanical packages

13	Control & Instrumentation System for all above packages (both electrical & mechanical)
	Civil
1	Civil for complete plant including BTG, BOP and electricals
	E & C
1	Mechanical, Electrical and C&I - Erection & Commissioning
	Any system other than above, required for BOP & Electrical

Essentially, all systems & work of a thermal power plant, except Boiler, ESP, Turbine, Generator & associated C&I, will come under BoP & Electrical. The list above is only tentative. Any work which is envisaged during discussions with customer and required to complete R and M work will be included or excluded from the scope. The BHEL offer to customer and subsequent MOM with customer are enclosed for bidder's reference. In case of any discrepancy between above documents and this specification, the same should be pointed out by bidders otherwise it shall be assumed that both documents are acceptable to bidder.

The Scope of R&M also includes overhauling & refurbishment. For this, detailed procedure/ methodology and comprehensive BOQ of spares shall be prepared by the consultant. Any RLA etc. required for this purpose shall also be included in scope of consultant.

Scope of work:

Consultant has to study the complete system by visiting the site, collect the data and interact with final customer /consultant for assessment of work.

The scope of work includes interaction with customer at site & Head Office, customer's consultant, preparation of technical specifications, BOQ and price estimate for floating tender for procurement of equipments/services for balance of plant and electrical equipments including associated C&I and civil/structural work for complete plant.

These being very old plants, complete information/ documents/ drawings may not be available with customer. The consultant will be required to collect all available drawings and documents from either plant or customer's head office, under intimation to us. The consultant shall be prepared to depute their person for this. All drawings, documents thus collected shall be handed over to BHEL after completion of engineering.

Whenever readymade information is not available, the consultant shall generate information by reverse engineering. consultant may have to depute their engineers/ designers/ draftsmen for collection of data, generation of drawings etc. at site.

Consultant has to prepare the Layout of Power Plant, Layouts of individual package/ system/ equipment, drawings required to procure the equipments, single line diagrams, logic diagrams, schematic diagrams, PI diagrams, basic design calculations, Manufacturing & Field QA plans, data sheets etc required to complete the BOP of R&M work.

The complete design and drawings required for civil construction work by civil contractor shall be prepared by consultant. The civil design calculations using

software like STAAD shall be submitted. Similarly, the complete drawings/ documents including piping layouts, piping isometrics on PDMS/ PDS, fabrication drawings, cable tray layouts, cable schedule etc. required for mechanical & electrical erection by mechanical/ electrical contractor shall be prepared by consultant based on inputs from equipment vendors.

3D drawings shall also be prepared by consultant, wherever required.

Consultant has to finalize battery limit of each package/system such that no work/supply is left unaccounted i.e. system integration & interfacing between each package has to be taken care off completely. System integration is inclusive of all equipment/system of Power plant such as Boiler, Turbine, Generator, Station C&I etc including BOP.

Consultant shall provide estimates for all specifications submitted by them. The estimates shall be based on budgetary estimates from established/ reputed vendors/ contractors.

Consultant will provide information on established suppliers/ contractors of equipment/ package and services. He will also help BHEL to evaluate technical & quality capability assessment of vendors, if felt necessary for any vendor/vendors. Consultant will provide technical clarification to BHEL if so desired by BHEL.

Consultant has to prepare drawings, field quality plan with inspection report formats for procurement, erection and commissioning, check list for each package/system of complete scope of R&M work. Various checks required beginning from receipt & storing of material to commissioning of system shall be mentioned in field quality plan.

Consultant has to resolve all technical problems that may occur during evaluation of technical bid, procurement of items, erection & commissioning and testing of system/package/equipment and power plant and during post commissioning for the period order has been received by visiting BHEL offices, sites, vendor works etc.

BHEL may depute its engineers to associate during detail preparation of specification, drawings etc. by consultant. Consultant will discuss all design parameters, drawings, layouts etc with BHEL engineer. However, all expenses like traveling allowance, daily allowance, local transport etc of BHEL engineers shall be borne by BHEL.

2.0 DOCUMENTATION

- 2.1 All Specifications and Design Documents shall be prepared in MS-Office and shall be neatly typed on A4 size paper. The format of design document shall be got approved by BHEL, Bhopal.
- 2.2 All drawings shall be prepared on AutoCAD or any other approved CAD software. Piping isometrics / 3 D drawings shall be prepared using PDMS / PDS. All drawings shall be prepared on standard sizes (viz. A0, A1, A2, A3, & A4). The 'Title Block' shall be as per BHEL, Bhopal's approved design. All

prints of the drawings shall be clear and legible. A key plan shall be incorporated in all drawings.

- 2.3 Upon completion of construction, the design drawings shall be revised to reflect accurately the Plant facilities as built. The drawings shall be issued under the appropriate revision and marked "AS BUILT".
- 2.4 The number of copies of design documents and drawings required to be submitted shall be decided on contract to contract basis as per BHEL contract with customer.
- 2.5 Transmittal of soft copies (in MS-Office or AutoCAD) through electronic media & hard copies by post need be undertaken.
- 2.6 All drawings/ documents furnished by consultant shall be property of BHEL
