

BHARAT HEAVY ELECTRICLES LIMITED

(A government of India undertaking)

Unit: High-Pressure Boiler Plant, Boiler Project P.O

Tiruchirappalli - 620 014.

MAINTENANCE & SERVICES / ELECTRICAL**NOTICE INVITING TENDER**

NAME OF WORK	CONDUCTING ENERGY AUDIT AT BHEL TRICHY HPBP COMPLEX – 2014
TENDER NO.	BHE: M&S: EA 2014 - 15
CONTRACT PERIOD	FOUR MONTHS
EARNEST MONEY DEPOSIT	RS 40,000/- <i>(EMD to be submitted in the form of DD only Offers without EMD will not considered for further evaluation)</i>
LAST DATE FOR RECEIPT OF TENDERS	ON OR BEFORE 15.09.2014 AT 14:30 HRS.
DATE OF TENDER OPENING	ON 15.09.2014 AT 15:00 HRS
TENDER SHOULD BE ADDRESSED TO	THE SENIOR MANAGER, MAINTENANCE & SERVICES/PLANNING, 2&4 BUILDING, BHARAT HEAVY ELECTRICALS LIMITED, TIRUCHIRAPPALLI - 620014, TAMIL NADU - INDIA.
TENDER DOCUMENTS	PART-I: TECHNO COMMERCIAL BID Part – I.A Qualification criteria Part – I.B Technical scope PART-II: PRICE BID
OFFER TO BE SUBMITTED AS	The Bidder shall submit the offer in TWO PARTS in two separate covers. 1. Techno Commercial Bid (Part-I) 2. Price Bid (Part-II) D.D for E.M.D should be submitted in a separate cover and superscripting the cover 'EMD'. (Covers should be superscripting Tender No.) <u>All the above 3 covers put into a large single cover and superscripting Tender Notice No:</u> The Part-I Techno Commercial Bid alone will be opened on the Tender opening date Part-II Price Bid of technically suitable bidders alone will be opened after giving prior intimation.

Regards

Sr. Manager / Plng / M&S

CONDUCTING ENERGY AUDIT AT BHEL TRICHY.

PART –I (TECHNO COMMERCIAL BID)

PART- I.A: QUALIFICATION CRITERIA

Sl. No	Description	Vendor to confirm
1	Vendor should have conducted at least 2 energy Audits in the past 5 years in PSU / Government / Semi Government Organization / Joint Venture company of PSUs or Govt. Organization or both / Private sector company registered under Companies Act 1956 whose contract demand is more than 10MVA or Total Plant annual energy consumption is more than 85,000 Million Kcal.	
2	List of organizations where the audit conducted as per Sl.No:1 should be attached along with the offer.	
3	Average annual financial turnover of the Vendor for last 3 financial years ending on 31 st March 2014, shall be at least Rs. 10 Lakhs and the bidder should submit audited balance sheet for the last three financial years, duly certified by chartered accountant/auditor.	
4	Vendor should have at least two accredited energy auditors of their own for conducting the energy audits. Copy of valid accreditation certificate shall be attached with the offer.	
5	In addition to the above Sl.No.4, other members of the audit team shall be certified Energy Auditors as their direct employee. Details shall be enclosed along with the offer.	
6	Performance certificate from minimum one organization with contract demand more than 10MVA or Total Plant annual energy consumption more than 85,000 Million Kcal where the energy audit was conducted in the past 5years shall be attached along with the offer.	
7	BHEL reserves the right to verify the information provided by the Vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall be rejected.	

PART- I.B: TECHNICAL DETAILS AND SCOPE

1.Preamble:

Bharat Heavy Electricals Limited (BHEL), Tiruchirappalli, Tamilnadu is a public sector undertaking engaged in the manufacture of equipment for power plant, industrial and oil sectors.

1.1-The products manufactured at BHEL TIRUCHY broadly include:

- Power Boilers
- Industrial Boilers and Recovery Units
- Conventional and Special Valves
- Advanced Technology Products
- Oil Field Equipment
- Seamless Steel Tube Plant

1.2- Electrical System:

The plant is fed by TANGEDCO at a voltage of 110kV and with a contract demand of 15,500 kVA. The daily consumption of the plant on a working day is **1.5 Lakh Units** and monthly average consumption is of **40 Lakh units**.

2. Technical Details of the plant:

The detailed Energy Audit at High Pressure Boiler Plant should cover the Electrical and Thermal energy consuming sections as detailed below:--

2.1 - Electrical Power Distribution System comprising of

- a. 1 No. 110/11kVE HT Substation with 4 Nos of 10/12.5MVA oil cooled Transformers.
- b. 26Nos.of distribution sub-stations with 54Nos. of 11kV/415V Transformers of rating from 750Kva to 1600kVA of oil/ dry type.
- c. 8 Nos. of compact sub-stations with 750kVA transformers, 11 kV switch gears and 250 KVAR automatics switching capacitors.
- d. 20 Nos of compact sub-stations with 1000kVA transformers and 11 kV switch gears.
- e. LT Thyristor switched & contactor switched capacitor banks as well as Conventional capacitor banks for P.F. improvement in various Sub-stations.
- f. HT and LT cables, associated switch gears, main panel boards, PCC / MCC, distribution boards etc.

2.2 - Electrical motors in machine tools and cranes comprising of

- a. 3740 motors of capacity below 50 H.P.
- b. 246 motors of capacity above 50 H. P.

2.3 -Industrial, Office and street lighting comprising of

- a. 1913kW of industrial lighting in shop floors.
- b. 176kW of modular Office lighting
- c. 634kW of Office lighting
- d. 653kW High mast lighting
- e. 170kW of street lighting

2.4 -Air conditioning plants comprising of

- a. 3 x 86TR plant with 3x 90 H.P. motors.+03x 10H.P motors+03x5 H.P motors
- b. 2 x 40TR plant with 2x 50 H.P. motors.+02x 7.5H.P motors+01 x3 H.P motors.
- c. 12 x 16.6 TR plant=168.0 kW
- d. 19 x 12 TR plant=200kW
- e. 10 x 11 TR plant=104kW
- f. 6x 16.5 TR plant= 84kW
- g. 9x 7.5 TR plant= 76 kW
- h. 1 x 5 TR plant=6.0kW
- i. Water Chiller units (04Nos)=204.5 kW
- j. Cassette ACs (114Nos)= 472kW
- k. Room Air conditioners(Window:456Nos&Split:606)=2000kW

2.5 –Furnace comprising of

- a. 5Nos. of producer gasfired furnaces of capacity ranging from 10 Ton to 300 Ton.
- b. 14 Nos of LPG furnaces of capacity 50 to 100 Ton
- c. 21Nos.of Electrical heat treatment furnaces, salt bath furnaces etc.
- d. Some of the furnaces are compatible for both LPG & Producer gas.

2.6 –Producer gas plant with gas production capacity of 4x 4000Cu.mtr./Hr.

2.7 –Pumps associated with Cooling towers, A.C. Plants, Chilling plants, Producer gas.

2.8 –Air Compressor Station Comprising of

- a. Station I with 1x 1500 CFM and 5 x 1000CFM capacity compressors.
- b. Station II with 2x 1500CFM and 1 x 1000CFM capacity compressors.
- c. SRL HT Compressor with 2x3500CFM
- d. Unit II HT Compressor with 2x3000CFM

2.9 –Diesel Generation sets as shown below,

- a. 2x 2000kVADG Sets.
- b. 2 x 310kVADG Sets
- c. 3 x 500kVADG Sets
- d. 1 x 250kVADG Sets
- e. 1 x 100kVADG Sets

3. Scope of Work:

3.1 Electrical Distribution system:

1. Review of present electrical distribution like Single Line Diagram (SLD), transformer Loading, Cable Loading, Voltage Drops, normal and Emergency loads, Electricity distribution in various areas Study of Reactive power management and opportunities for power factor improvement.
2. Study of power qualities Harmonics, Current unbalance, Voltage unbalance etc
3. Exploring the energy conservation opportunities (ENCON) In electrical distribution system.
4. Thermograph study of Electrical Switch gears, cables and OH line termination sets.
5. Measurement of electrical energy generated and fuel consumption (based on drop in fuel level) for the available DG sets.
6. Evaluation of Specific Energy Generation Ratio (SEGR) and comparing with standards.
7. Analysis of loading pattern on Diesel Generator sets.
8. Audit should include full study (including harmonics) of any two substations as chosen by BHEL in-charge.

3.2 Lighting:

1. Examination of the lighting system in all the areas, measurement of illumination levels etc. to improve lighting efficiency and optimizing lighting levels as per ECBC Standard & comparison (ECBC-2006) published by Bureau of Energy Efficiency (BEE) Govt. of India.
2. To analyze possibilities to reduce energy consumption by incorporating energy Efficient lighting system, equipment's and lay out improvements.
3. Study of operating electrical parameters like voltage etc. in the lighting circuits.

3.3 Compressors:

The following energy saving opportunities should be explored during the detailed energy audit.

1. Optimization of system pressure in accordance with end use applications
2. Assessment of FAD & Estimating the kW/cfm for the compressors and to explore the opportunity of replacing with a higher efficiency compressor.
3. Leakage test to identify the losses in the systems & to suggest remedial measures for arresting the same.
4. Study of compressed air distribution network for pressure drops
5. Feasibility of introducing better control systems like an intermediate Controller/ Variable Frequency Drive
6. Study of compressor auxiliaries to identify possible energy saving opportunities.
7. Evaluation of specific energy consumption of the compressors, kW consumed Per cfm of air generated and compare with standards

3.4 Package/ Duct able split Air Conditioners:

1. Measurements of parameters like air flow, DBT, Power consumption etc. for PACs.
2. Estimation of TR and specific energy consumption kW/TR and comparing with the design values for PACs.
3. Study of air-conditioning requirement (in terms of temperature &RH), measurement of temperature& RH in various areas to identify potential for energy saving.
4. Air distribution study in air conditioned areas.

3.5 Furnaces and Ovens:

1. Measurement and analysis of operating parameters of furnaces to improve efficiency.
2. Analysis of temperature profile with respect to batch.
3. Measurement of surface temperature and other heat losses by conducting a heat balance.
4. Complete energy Study shall be conducted on two PG Furnaces & two LPG Furnace Including detailed Energy balancing, Proposals for Improvement of Energy Performance, Technical & Economical Feasibility report etc.
5. Analysis of usage pattern to identify (optimum loading) best operational practices for energy conservation.

3.6 Deliverables:

1. Discussion with plant officials for consensus on proposals and justifications.
2. Energy Conservation Measures having payback of less than 2years will be given in the report.
3. Compilation of detailed report comprising of observations & recommendations with Adequate financial justifications, vendor support data etc.
4. Final report submission indicating observations, analysis, graphs and recommendations.

4. Energy Audit Report:

The energy audit report shall be submitted in minimum of **3copies** and should contain the following:

1. Specific energy savings proposals
2. Full descriptions and figures if required
3. Method of implementing the proposals
4. Cost benefit analysis
5. Present energy consumption pattern
6. EnergyManagementGuidelinesto monitor andsustain thesavingsidentified.
7. The recommendations will be classified as non-capital proposals (proposals requiring no investment or in significant investment) and as capital proposals

5. Instruments required for Auditing:

The auditing company shall arrange their own instruments necessary for undertaking field testing & measurements, e.g. for measurement of various electrical and Thermal parameters like kW, power factor , voltage ,current, kVA, frequency and luminous intensity, fuel consumption, flow, flue gas parameter temperatures etc. The instrument used shall be of approved make & quality duly calibrated.

Valid calibration certificate from NABL accredited labs with traceability shall be submitted before starting the work.

6. Audit Team:

The audit team should comprise of personnel with professional degree in the disciplines of Electrical, Mechanical and Chemical Engineering.

The persons working on this project shall be approved BEE energy auditors. Necessary documents confirming the same shall be produced before starting the auditing.

7. General Conditions:

1. The final report should be submitted within a month from the date of final visit of your Audit team.
2. Three copies of the final report should be submitted after the completion of Energy Audit.
3. Preliminary and final presentation shall be given to discuss about the proposals after the completion of Energy Audit.
4. The rates quoted shall be firm and inclusive of Transportation of equipment, all allowances for the Engineers, Technician and other official, such as TA/DA, Boarding and lodging etc.
5. Food, Accommodation and Transport will not be provided by BHEL.
6. Necessary Free Entry passes will be arranged for the working officials, Equipment, and Tools etc. by BHEL.
7. The tenderer shall be responsible for the safety of the work man and the team.
8. Tenderers are requested to visit site before quoting to understand the entire nature of work.
9. Necessary support will be given by BHEL coordinators for conducting the audit.
10. Applicable taxes and duties shall be shown as extra.

8. GENERAL TERMS AND CONDITIONS:

- 1) All the workmen of contractor shall be covered under PF/ESI or General insurance
- 2) The vendor should follow all the safety requirements as per the norms of BHEL.
- 3) 100% payment will be made after completion of work by submission of invoice in triplicate duly certified the Area In charge.
- 4) Security Deposit shall be furnished by the successful vendor to the total contract value before starting the work. The rate of Security Deposit will be 10% of the contract value up to 10 Lakhs. Above Rs. 10 lakhs up to Rs.50 lakhs will be Rs.1 lakh + 7.5% of the contract amount exceeding Rs. 10 lakhs.
- 5) The Vendor may visit to the BHEL Premises before quoting to access the quantum of work.
- 6) Applicable Taxes, if any should be mentioned separately.

SERVICE TAX:

- 1) A copy of Service tax remittance Challan for previous quarter should be submitted along with offer if the contractor is claiming service tax.
- 2) If Contractor is exempted from service tax then a declaration that they are within the threshold limit should be submitted along with the offer.

CONDUCTING ENERGY AUDIT AT BHEL TRICHY.
PART -II (PRICE BID)

Sl.no	Description	Unit	Rate (inRs) (Lump sum)
1	Conducting Energy Audit at BHEL Trichy as per Techno-commercial scope part -I	Activity Unit	

Service tax extra as applicable

Note:Applicable Taxes, if any should be mentioned separately.