



An ISO 9001  
Company

## **Bharat Heavy Electricals Limited**

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

RESEARCH and DEVELOPMENT / MHD Complex

|   |   |
|---|---|
| Design, Manufacture, Supply of Water Polishing Unit | Phone: +91 431 257 8608<br>Fax : +91 431 252 0696<br>Email : <a href="mailto:saru@bheltry.co.in">saru@bheltry.co.in</a><br>Web : <a href="http://www.bhel.com">www.bhel.com</a> |
|---|---|

|   |                         |   |
|---|-------------------------|---|
| <b>Reference Number:</b><br><b>R&amp;D:02</b> | <b>Date: 09.04.2008</b> | <b>Due date for submission of quotation:</b><br><b>23.04.2008 13.30 hrs</b> |
|---|-------------------------|---|

You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order

BHEL/Trichy is looking for offers for supply of Water Polishing Unit as per the specification attached. Interested bidders may please send the offers to the following address before the due date.

S Arumugam  
DGM/MM/R&D  
MHD Complex  
BHEL  
Trichy-620014

**BHARAT HEAVY ELECTRICALS LIMITED, TIRUCHIRAPPALLI**  
**RESEARCH AND DEVELOPMENT**

**Tender due on 23.04.08 13.30 hrs.**

**SPECIFICATION FOR WATER POLISHING UNIT**

**(specification is also hosted in [www.bhel.com](http://www.bhel.com) )**

**Spec.No: R&D:OTSC:59      Rev: 01**

**Dt. 09-04- 2008**

1. Product required: Water Polishing Unit
2. Quantity required: 1 Set
3. Application: To supply treated ultra pure water suitable for Supercritical Test Facility
4. Location: MHD Complex, BHEL, Tiruchirappalli, Tamil Nadu (100 M from Mean Sea Level)
5. Ambient conditions
- 5.1 Wet bulb temperature:  $27 \pm 3$  Deg.C
- 5.2 Humidity: 40 to 85%
- 5.3 The unit will be located in the open out door.

**6.0 BHEL's scope:**

- 6.1 Semi treated water piping to the unit
- 6.2 Required civil foundations.

**7.0 Supplier's scope:** Design, Manufacture, Supply to project site, supervision of erection and commissioning as per standard.

- 7.1 The system shall be designed in such a way for getting consistent treated water quality throughout the specified OBR. Detailed working sheet for the selection of resin quantity with back up technical details shall be furnished. The quantity of resin used shall be at least 25% higher than the design level.
- 8.0 All essential components of the system shall be covered by the supplier for 250 litres per hour treated water delivery at the output of final mixed bed and Output Between Regeneration (OBR) 30 tons of treated water. Items mentioned in Sl No. 8.1 to 8.6 shall be connected in series.
- 8.1 Input DM water storage tank 2000 litres (Syntex or equivalent make)
- 8.2 Pump rated for a minimum flow of 400 litres per hr and pressure rating & maximum flow for the pump shall be suitable for the application.
- 8.3 Required piping with valves
- 8.4 Mixed bed 1 with resins
- 8.5 De Oxygenator with resins including 25% of inert resin

8.6 Mixed Bed 2 with resins

8.7 Bed regeneration system including supply of compressed air system

8.8 Essential instruments such as pressure gauges, roto-meters (flow meters ) water output totalizing meter(cumulative water output meter), level indicators for reaction column.

8.9 Sampling system shall be given for measuring conductivity & Dissolved oxygen for on-line monitoring at the final treated water output location. Instruments for conductivity and dissolved oxygen level are not in the scope of Vendor.

8.10 Control panels

**9.0 Quality of water at inlet to water polishing unit:**

|                                   |                               |
|-----------------------------------|-------------------------------|
| 9.1 PH:-                          | 5.5 to 7.5                    |
| 9.2 Silica as SiO <sub>2</sub> :- | 5 ppm , maximum               |
| 9.3 Design temperature:-          | 35 Deg.C, maximum             |
| 9.4 Conductivity:-                | 20 micro siemens / cm,maximum |
| 9.5 Hardness:-                    | Nil                           |
| 9.6 Dissolved Oxygen:-            | 5 to 7 ppm                    |

**10.0 Required quality of treated water at the outlet**

|                          |                                      |
|--------------------------|--------------------------------------|
| 10.1 PH:—                | 6.5 to 7.0                           |
| 10.2 Conductivity: —     | 0.20 micro siemens / cm, maximum     |
| 10.3 SiO <sub>2</sub> :— | 0.01 ppm, maximum                    |
| 10.4 Sodium:-            | 0.003 ppm, maximum                   |
| 10.5 Dissolved oxygen —  | 0.01 ppm preferred, 0.10 ppm maximum |
| 10.6 Hardness :-         | Nil                                  |

11.0 The entire system except the input water storage tank shall be Skid mounted.

Required piping from input storage tank to the Skid shall be quoted in per meter length.

Maximum 20 m length can be considered.

12.0 Power supply available at BHEL: 415 V / 3 Ph / 50 Hz.

13.0 All drive motors shall be of M/s Kirloskar / Crompton Greaves / ABB / Siemens or any other reputed make.

14.0 Material of construction: All materials should be selected to suit rugged working condition and should have a minimum life of 25 years.

**15.0 Information required from supplier:**

**15.1 Along with offer**

- 15.1.1 Total offer price
- 15.1.2 Scheme - Without the scheme the offer will not be considered
- 15.1.3 Arrangement drawing
- 15.1.4 Specification for each system component
- 15.1.5 List and offer for essential spares for two years trouble free operations
- 15.1.6 Power of various drives
- 15.1.7 System performance guarantee detail
- 15.1.8 Equipment guarantee / warrantee detail
- 15.1.9 Code / standard followed
- 15.1.10 Feed water flow rate
- 15.1.11 Reject flow rate
- 15.1.12 Compressed air requirement. Flow & Pressure
- 15.1.13 List of Chemicals with quantity required for regeneration and other consumables
- 15.1.14 Scope expected from BHEL
- 15.1.15 Details of Civil work
- 15.1.16 Detail of Delivery period
- 15.1.17 List of customers to whom similar System had been supplied and are working satisfactorily
- 15.1.18 Detailed working sheet for selection of resin quantity with back up technical details Including make & data sheet
- 15.1.19 Guaranteed quality of treated water at the outlet of final mixed bed

## **15.2 Along with system**

- 15.2.1 Six copies of O & M manuals and drawings
- 15.2.2 Equipment guarantee / warrantee certificate
- 15.2.3 System Performance guarantee certificate

16.0 The scheme with valves, fittings, instruments, bill of materials and general arrangement drawing with dimensions & weight of each item shall be given to Purchaser for approval within a week for placing purchase order

17.0 The supplier shall separately quote for Erection & Commissioning supervision.  
No lodging and boarding will be provided by BHEL during the supervision period.

18.0 Delivery –Shall be within 8 weeks from the date of Purchase order.