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**TECHNICAL SPECIFICATION FOR WATER SOFTENING UNIT FOR
THERMAL SHOCK TEST INSTALLATION IN BLOCK-4 CIM SHOP: -
SPECIFICATION NO. EMT-6815**

SL.NO.	DESCRIPTION OF BHEL REQUIREMENT	REQUIRED	OFFERED	DEVIATION
1.0	PURPOSE :- The softening unit is required to remove scales (formed from dissolved salts) from industrial water to make it scale free. The treated water will be used for hot and cold cycling of stator winding bars of Turbo generators. These bars consist of number of hollow copper tubes through which cold and hot water is passed number of times to give thermal shock treatment to these hollow copper tubes. The softening unit should deliver scale free water which should be free from dissolved salts and solids so that scale particles are not passed on to the hollow copper tubes.			
2.0	SCOPE :- The scope of supply includes the design, manufacturing, supply, erection, commissioning and proving of water softening unit of capacity 2000 litres/hr, with our existing thermal shock installation. Any accessories like pumps, pipes, valves etc. required for this interfacing is in the scope of vendor.	01 No.		
3.0	TECHNICAL SPECIFICATIONS OF WATER SOFTENING UNIT:-			
3.1	Water softening unit will be attached to our existing thermal shock installation in Block-4, CIM shop. The softening unit will be fed through Industrial water having following properties:- Alkalinity, Max. 284 mg/litre Calcium as Ca, Max. 72.1 mg/litre Chloride as Cl, Max. 18 mg/litre Hardness, Max. 216 mg/litre Iron as Fe, Max. 0.06 mg/litre Magnesium as Mg, Max 8.7 mg/litre pH 7.1 Sulphate as SO ₄ , Max 11.6 mg/litre TDS, Max. 332 mg/litre			

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3.2	The softening unit should be capable of removing the dissolved salts from the industrial water @ 2000 litres/hr. & reduce the TDS value of industrial water to ≤ 10 mg/litre (ppm) and make it fit for further use for thermal shock treatment. The properties of treated water to be indicated by the supplier. The treated water will be stored in our existing stainless steel tank of capacity 690 litres and this water is to be fed to the thermal shock installation with the help of existing pump.			
3.3	Suitable diameter stainless steel pipe lines from running water tap to the softening unit and from softening unit to the storage tank to be supplied along with the softening unit. The necessary valves, etc. of stainless steel are also to be provided in the pipe lines by the vendor.			
3.4	All pipe lines, pumps, valves, flanges, nuts and bolts coming in contact with the treated water shall be made out of stainless steel.			
3.5	The space requirement including special requirement for drainage of salts and chemicals to be indicated. Any requirement of neutralization of acids or alkalis, if any to be clearly indicated.			
4.0	General Arrangement Drawing :			
4.1	Vendor shall furnish the General Arrangement . Drawing for water softening unit, along with the offer.			
4.2	Vendor shall also submit the General Arrangement Drawing of water softening unit for BHEL approval, within 4 weeks after placement of Purchase Order.			
5.0	FOUNDATION DRAWINGS:-			
5.1	The foundations drawings (If any) shall be supplied from the vendor at least 3 months advance before dispatch of the softening unit.			
5.2	BHEL will carry out civil foundation work as per supplier drawings only.			
6.0	SPARES :-			
6.1	Recommended spares for 2 years trouble free operation of the equipment, to be	Vendor to furnish the list of spares in		

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	quoted in the offer.	the offer.	(1)	
6.2	Salt for 2 years for 8 hours working per day should be supplied along with water softening unit.			
7.0	ENVIRONMENTAL CONDITION:-			
7.1	Ambient Temperature : 4°C to 45°C			
7.2	Relative humidity- 30 to 90 %			
7.3	Voltage fluctuation- +/- 15 %			
8.0	POWER SUPPLY			
8.1	BHEL will provide input power supply 3 phase, 3 wire, 415 +/- 15% volt, 50 +/- 3% Hz to Isolator Switch (BHEL scope) nearby softening unit.			
9.0	ERECTION & COMMISSIONING :-			
9.1	Water softening unit will be attached to our existing thermal shock test installation in Block-4, CIM. Erection, commissioning and proving of the softening unit shall be done by the vendor The softening unit will be finally accepted after successful performance at BHEL, Haridwar works.	Vendor To confirm		
9.2	During commissioning if any item is damaged / not functioning, vendor shall replace the same without any cost to BHEL.			
10.0	OPERATION & MAINTENANCE MANUAL :-			
10.1	Vendor shall furnish 3 sets of detailed Operation & Maintenance manual with the consignment. The operation & maintenance manual should contain drawings, make and specification of components used in water softening unit.			
11.0	GUARANTEE :-			
	Vendor shall furnish 24 months guarantee from date of commissioning of the water softening unit.	Vendor To confirm		
12.0	GENERAL:-			
	This water softening unit will be interfaced with existing thermal shock treatment plant. Vendor may see the actual plant at our BHEL Haridwar works, before submitting the offer.			


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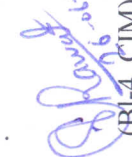
(WEX-4)

(CIM, BL-4)

QUALIFYING CONDITIONS FOR WATER SOFTENING UNIT FOR THERMAL SHOCK INSTALLATION:-

DESCRIPTION OF BHEL REQUIREMENT	TO BE SUPPLIED/ CONFIRMED/ SUBMITTED BY	OFFERED	DEVIATION	REMARKS
<p>Only those vendors should quote who have commissioned at least one water softening unit of capacity minimum 1000 liters/hr. capable of reducing water hardness ≤ 10 mg/liter (ppm) in the past fifteen years (on the date of opening of Tender) and referred softening unit is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender).</p> <p>The following information should be submitted by the vendor about the companies where similar softening units have been supplied. This is required from all the vendors for qualification of their offer.</p>	<p>Vendor to accept & confirm.</p>			
<p>1. Name of the customer / company where referred softening unit is installed.</p>	<p>Vendor to inform.</p>			
<p>2. Complete postal address of the customer.</p>	<p>Vendor to inform.</p>			
<p>3. Month & Year of commissioning</p>	<p>Vendor to inform.</p>			
<p>4. Parameters of softening unit supplied and application for which the softening unit is supplied.</p>	<p>Vendor to inform.</p>			
<p>5. Name and designation of the contact person of the customer.</p>	<p>Vendor to inform.</p>			
<p>6. Phone, FAX no. and email address of the contact person of the customer.</p>	<p>Vendor to inform.</p>			
<p>7. Performance certificate from the customers regarding satisfactory performance of softening unit supplied to them (Original Certificate or Through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.</p>	<p>Vendor to submit.</p>			
<p>8. BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.</p>	<p>Vendor to accept & confirm.</p>			


 (Bk-4 Mech. Maint.)
 S.R. MISHRA (SR PV)
 14/02


 (BI-4, CIM)

R. S. Kumar
 22/6/13
 (EMT)