



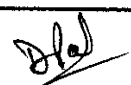










दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD	ST38013	
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सामग्री सूची संख्या (जो लघुलिपि मिली करती है) SUPERSEDES INVENTORY NO				
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स्वत्व अधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है। इसका प्रयोग एवं प्रकाशन के बिना भारत हेवी इलेक्ट्रिकल्स की लिखित अनुमति के बिना नहीं किया जाये।				
दिनांक SIGN & DATE	24/10/06			
सामग्री सूची संख्या INVENTORY NO	P-5539			
REV. NO. 04				
निर्माणकर्ता WORKED BY	D.PAL		16/06/06	
जांचकर्ता CHECKED BY	ANUJ JAIN		16/06/06	


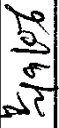


1.9	The discharge branch of the pump shall be taken out above the base plate by the supplier.
1.10	The pumps shall be provided with drainage and venting devices.
1.11	All pump parts conveying oil shall be of oil tight construction. Compression type fittings are not permissible.
1.12	Pump running at subcritical speeds, it shall be ensured that the critical speed lies above the maximum speed attainable during operation with a minimum margin of 15% of rated speed. For pump running at supercritical speeds, it shall be ensured that there is a difference of sufficient magnitude. The margin between the bordering critical speeds and pump rated speed shall be at least 20% of the rated speed. The type of coupling between pump & drive unit is to be taken into account while calculating the critical speeds for bending forces.
1.13	Seals are to be designed such that they can be removed and reinstalled several times without effecting the sealing quality.
1.20	<u>COUPLING</u> Suitable coupling with guards shall be provided for coupling pump with motor and shall be designed to facilitate easy alignment. One set of coupling pins/ bolts shall be supplied in spare.
1.30	<u>FOUNDATION</u> The pumps shall be mounted in the oil tank and hung from base plate at the tank top into the tank. For further details please refer the drawing No. attached herewith (STE-TL-001). All the seating machined surfaces of the base plate to be maintained for 0.5 mm flatness.
1.40	<u>SPECIAL TOOL & TACKLES</u> One set of tools required for erection, operation and maintenance of the pumping sets shall be supplied together with each pump. List of these tools shall be submitted along with the offer.
2.0	<u>QUALITY ASSURANCE, INSPECTION AND TESTING</u>
2.1	The manufacturer shall conduct all tests required to ensure all the component parts of the pump offered conform to the requirements of the specification and is in compliance with the requirements of applicable codes and standards.
2.2	The bidder shall submit alongwith his offer quality plan in the enclosed format and in line with clause 2.0


२०१६/०४/२० SIGN & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST38013	
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२०१६/०४/२० INVENTORY NO	<p>These tests should be conducted as per DIN1944 class III or equivalent in the presence of BHEL/ customer. The characteristics have to be certified by BHEL/ customer representative.</p> <p>(f) Strip down examination to check the condition of bearing, mechanical clearances, axial play of the shaft etc.</p> <p>(g) Check the condition of the oil seals and any seepage of oil through the seals.</p> <p>2.5.3 After testing the pump, all the surfaces and internals shall be thoroughly cleaned, dried and conserved. All metallic surfaces except bright parts exposed to weather shall be given a suitable priming coat and then two coats of approved paints. Ensure assembly of all the components of pump as one unit and pack in water and dust proof package. The packages should be sufficiently strong to safeguard against any damage during transit and is safe for two years in a very damp atmosphere.</p> <p>2.5.4 Test certificates indicating the test results of material testing NDT, dynamic balancing, hydraulic test, performance test, strip down examination etc. shall be furnished.</p> <p>3.0 <u>PREAPPROVAL DOCUMENTS AT THE TIME OF OFFER</u></p> <p>3.1 Assembly drawing with parts lists. Nozzle sizes and their coordinates base plate details and cross sectional arrangement along with static and dynamical loading.</p> <p>3.2 Calculation with necessary drawings (Torque / speed characteristics etc.) power requirement.</p> <p>3.3 All welding shall be carried by qualified welder as per ASME sec.IX.</p> <p>3.4 Examination of the pre-approval documents by BHEL shall not release the manufacturing and his subcontractors, of their responsibilities. The approval documents shall form the basis for the order. No changes shall be made without approval from BHEL.</p> <p>3.5 Quality plan, detailing out various stages of manufacturer along with relevant documents standards, acceptance levels, inspection document raised.</p>				
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स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारता भारती इलेक्ट्रिकल लिमिटेड की संपत्ति है। इसका प्रयोग सीधे या अप्रत्यक्ष रूप से किसी भी प्रकार प्रयोग, आदि के बिना किया जाना नहीं चाहिए।					
२०१६/०४/२० INVENTORY NO P-5539	REV. NO. 04	निर्माणकर्ता WORKED BY D.PAL			16/06/06
		जांचकर्ता CHECKED BY A. JAIN			16/06/06

निर्माण एवं परीक्षण SIGN & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD	ST38013			
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समीक्षा एवं मंजूरी INVENTORY NO	SUPERSEDES INVENTORY NO	<p>4.0 DOCUMENTS TO BE SUPPLIED AFTER THE PLACEMENT OF ORDER</p> <p>These shall be supplied in 10 copies each or two copies and a set of reproducible.</p> <p>4.1 Contractual drawings : 8 weeks</p> <p>4.2 Overhaul and spare parts lists : 8 weeks</p> <p>4.3 Equipment description : 8 weeks</p> <p>4.4 O & M manual (10 hard copy + 2CD) : 12 weeks</p> <p>4.5 Record of test on noise levels before dispatch</p> <p>4.6 Record of test to DIN 1944-III or equivalent : Before dispatch or equivalent.</p> <p>4.7 List of tools and tackles : 8 weeks</p> <p>4.8 The static/ dynamic loading details on support/ foundation should be furnished : 8 weeks</p> <p>5.0 NAME PLATE IDENTIFICATION MARKING SHOULD BE AS FOLLOWS</p> <p>The rating plate is to be made of X12 or Ni188 and plates should be provided in Hindi and English both.</p> <p>5.1 Type/ Designation.</p> <p>5.2 Manufacturer.</p> <p>5.3 Manufacturer's works No.</p> <p>5.4 Year of manufacturing.</p> <p>5.5 Purchaser's order No.</p> <p>5.6 Volumetric flow (l / m)</p>				
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निर्माण एवं परीक्षण SIGN & DATE	24/9/06					
समीक्षा एवं मंजूरी INVENTORY NO	P-5539	REV. NO. 04	निर्माणकर्ता WORKED BY	D.PAL		16/06/06
			जांचकर्ता CHECKED BY	A. JAIN		16/6/06

निर्माणकर्ता SIGN & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD	ST38013			
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निरीक्षण INVENTORY NO	निरीक्षण INVENTORY NO	5.7 Discharge pressure (Bar/ MWC) 5.8 Operating temp. (In ° C) 5.9 Flow medium. 5.10 Speed.				
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.		6.0 CLEANING & PAINTING, CONSERVATION, PACKING The surface shall be thoroughly cleaned of all mill scales, oxide and other coatings. The protective coating should be oil resistant to prevent contamination of oil specified and to prevent the deterioration of the coating itself. The supplier shall give exact and precise details about the measures envisaged by him for internal and external surface protection, which shall be checked & approved by BHEL/ Owner. All surfaces, which will not be easily accessible after the shop assembly shall before hand be treated and protected for life of the equipment. Instructions should be issued regarding reconsevation, deconsevation and storage of package. Contractor shall be responsible for all loss or damage during transportation, handling and storage due to improper packing.				
स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती लिमिटेड की संपत्ति है। इस दस्तावेज को बिना लिखित अनुमति के किसी भी प्रकार का प्रयोग नहीं किया जा सकता है।		7.0 GENERAL The tenderer can make suitable offers even if there are minor deviations which do not effect the efficient functioning of the equipment. However the deviations must be clearly spelt out. Supplier shall also fill in the blank data sheet as per Annexure-I and submit the same along with the offer. The offer may not be considered if all the technical particulars and information called for in the specifications are not submitted along with the offer.				
निरीक्षण INVENTORY NO		8.0 GUARANTEE 8.1 The supplier shall guarantee trouble free and satisfactory operation of the equipment for a period of 12 months after the installation and commissioning or for a period of 18 months from the day the equipment leaves the supplier's works. 8.2 The supplier shall guarantee the capacity, head and efficiency of the pump as per the tested characteristics with oil. 8.3 If during erection at site any deficiency in a part is detected, BHEL site representative shall prepare the assessment report and a copy of the same shall be forwarded to the supplier. The supplier shall replace/ rectify the concerned items free of charge within a week time after receipt of assessment report. The supplier if he so desire, may depute his representatives to site at his own cost otherwise the findings of BHEL representative shall be final and binding on the supplier of pumping set. 8.4 The supplier shall repair/replace the defective parts at his own cost during the guarantee period.				
निरीक्षण INVENTORY NO		9.0 SPARES The supplier shall quote item wise price of recommended spares for 3 years and 5 years operation respectively.				
निरीक्षण INVENTORY NO	REV. NO. 04	निर्माणकर्ता WORKED BY		D.PAL		16/06/06
निरीक्षण INVENTORY NO	P-5539	जांचकर्ता CHECKED BY		A. JAIN		16/6/06

सामग्री सूची संख्या INVENTORY NO P-5533	स्वत्वाधिकार एवं गोपनीय The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way which is detrimental to the interest of the company.	सामग्री सूची संख्या INVENTORY NO	दिनांक एवं संशोधन & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD	ST38013																																					
						पृष्ठ 10 का 7 Page 7 Of 10																																					
<p align="center">ANNEXURE-I DATA TO BE FURNISHED BY BIDDER ALONG WITH BID FOR OIL PUMP</p> <p>1.0 EQUIPMENT AND SERVICE OFFERED</p> <p>Please state whether the following equipment service as specified in the data sheet are offered or not.</p> <table border="0"> <tr> <td>1.1</td> <td>Pump as per specification</td> <td>Yes/ No</td> </tr> <tr> <td>1.2</td> <td>Motor / Make</td> <td>Yes/ No</td> </tr> <tr> <td>1.3</td> <td>Necessary instruments, Test connections</td> <td>Yes/ No</td> </tr> <tr> <td>1.4</td> <td>Base plate as per drg.</td> <td>Yes/ No</td> </tr> <tr> <td>1.5</td> <td>Companion flanges</td> <td>Yes/ No</td> </tr> <tr> <td>1.6</td> <td>Spare parts</td> <td>Yes/ No</td> </tr> <tr> <td>1.7</td> <td>Maintenance and special erection tools</td> <td>Yes/ No</td> </tr> <tr> <td>1.8</td> <td>Commissioning of the set</td> <td>Yes/ No</td> </tr> </table> <p>2.0 DESIGN AND PERFORMANCE</p> <table border="0"> <tr> <td>2.1</td> <td>Rated capacity of each pump.</td> <td>M³/hr</td> </tr> <tr> <td>2.2</td> <td>Discharge head at rated capacity.</td> <td></td> </tr> <tr> <td>2.3</td> <td>Maximum discharge.</td> <td></td> </tr> <tr> <td>2.4</td> <td>Minimum discharge pressure corresponding to maximum flow.</td> <td></td> </tr> </table>								1.1	Pump as per specification	Yes/ No	1.2	Motor / Make	Yes/ No	1.3	Necessary instruments, Test connections	Yes/ No	1.4	Base plate as per drg.	Yes/ No	1.5	Companion flanges	Yes/ No	1.6	Spare parts	Yes/ No	1.7	Maintenance and special erection tools	Yes/ No	1.8	Commissioning of the set	Yes/ No	2.1	Rated capacity of each pump.	M ³ /hr	2.2	Discharge head at rated capacity.		2.3	Maximum discharge.		2.4	Minimum discharge pressure corresponding to maximum flow.	
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सामग्री सूची संख्या INVENTORY NO P-5533	REV. NO. 04	निर्माणकर्ता WORKED BY D.PAL	जांचकर्ता CHECKED BY A. JAIN	16/06/06	12/6/06																																						

SIGN & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD	ST38013				
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SUPERSEDES INVENTORY NO.	<p>2.5 Shut off head.</p> <p>2.6 Performance guarantee when installed Yes/No as per given arrangement.</p> <p>2.6 Pump B.H.P./KW at rated capacity.</p> <p>2.7 Maximum allowable suction lift (for minimum NPSH REQUIRED).</p> <p>2.9 Efficiency.</p> <p>3.0 <u>MATERIAL OF CONSTRUCTION</u></p> <p>3.1 Casing.</p> <p>3.2 Impeller.</p> <p>3.3 Base plate.</p> <p>3.4 Wearing rings</p> <p>3.5 Shaft</p> <p>3.6 Stuffing box.</p> <p>3.7 Packing.</p> <p>3.8 Mechanical seal.</p> <p>4.0 <u>CONNECTION</u></p> <p>4.1 Suction size.</p> <p>4.2 Discharge size.</p> <p>5.0 <u>DRAWINGS</u></p> <p>5.1 General arrangement and sectional drawings enclosed with offer. Yes/No</p>						
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स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती इलेक्ट्रिकल्स लि. की संपत्ति है। इसका उपयोग बिना अनुमति के किसी भी प्रकार से नहीं किया जाना चाहिए।							
SIGN. & DATE 							
REV. NO. 04					निर्माकता WORKED BY जांचकर्ता CHECKED BY	D.PAL A. JAIN	 16/06/06  16/6/06

मी एम डी एल 	उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST38013	
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SUPERSEDES INVENTORY NO.				
COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	6.0 <u>WEIGHT SCHEDULE</u> 6.1 Weight of pump. 6.2 Weight of motor. 6.3 Weight of pump with motor and base frame. 7.0 <u>CHARACTERISTIC CURVES</u> 7.1 Power consumption / discharge flow. 7.2 Discharge quantity / Pressure. 7.3 Discharge / efficiency. 8.0 Any deviation taken against specifications. Yes/No 9.0 Deviation taken as mentioned here. 10.0 <u>CONSTRUCTION FEATURES</u> 10.1 Type of pumps. 10.2 No. of stages. 10.3 Type of impeller. 10.4 Type of stuffing box sealing offered. 10.5 Type of coupling offered. 10.6 Type of bearing and lubrication. 10.7 Impeller diameter. 11.0 Cross referred Standards: Nil			
स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में जोड़ें युक्त भागों को हटाने, नकल बनाने, प्रसारित करने, या अन्य किसी भी तरह का उपयोग, जो कि कंपनी के हित में हो, उसे मना किया गया है।				
REV. NO. 04				
INVENTORY NO. P-55-39	निर्माणकर्ता WORKED BY D. PAL 16/06/06			
	जांचकर्ता CHECKED BY A. JAIN 16/06/06			

समीचीन मूल्य में आता INVENTORY NO. P-5539	संशोधन एवं दिनांक SIGN & DATE 16/06/06	स्वतंत्र अधिकार एवं गोपनीय इस दस्तावेज में कोई भी अधिकार सुरक्षित है। इस दस्तावेज को बिना अनुमति के प्रसारित करना या इस दस्तावेज का उपयोग किसी भी उद्देश्य के लिए करना अवैध है।	COPYRIGHT AND CONFIDENTIAL The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	समीचीन मूल्य में आता है SUPERSIDES INVENTORY NO.	संशोधन एवं दिनांक SIGN & DATE							
REV. NO. 04	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>SECTION B-B</p> </div> <div style="width: 45%;"> <p>SECTION A-A</p> </div> </div>		<div style="text-align: center;"> <p>उत्पाद मानक</p> <p>STEAM TURBINE ENGINEERING</p> <p>PRODUCT STANDARD</p> </div>	<table border="1"> <tr> <td>निर्माणकर्ता WORKED BY</td> <td>DHARAMPAL</td> <td></td> <td>16/06/06</td> </tr> <tr> <td>जांचकर्ता CHECKED BY</td> <td>ANUJ JAIN</td> <td></td> <td>16/06/06</td> </tr> </table>	निर्माणकर्ता WORKED BY	DHARAMPAL		16/06/06	जांचकर्ता CHECKED BY	ANUJ JAIN		16/06/06
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1. TANK.
2. D.C. BEARING OIL PUMP.
3. A.C. AUXILIARY OIL PUMP.
4. A.C. AUXILIARY STAND BY OIL PUMP.
5. INJECTION PIPE.
6. SUGGESTION PIPE (INJECTOR).
7. INLET.
8. STRAINER.
9. PARTITION.
10. DRAIN.
12. JACKING OIL PUMP.

OIL TANK ARRANGEMENT
 DRG. NO. STE-TL-001