

Enquiry No. B/4066/6/4335/V1

PRE-QUALIFICATION REQUIREMENTS

Bidders are required to meet the pre-qualification requirements (PQR) for supply of AOP with AC Motor and EOP with DC Motor as per criteria stipulated below:

Sl. No.	Pre-Qualification Requirements	Vendor's confirmation Indicating page no. where documents are placed																				
A.	<u>Brief Introduction about the equipment: -</u> Auxiliary oil pump (AOP) with AC Motor & Emergency oil pump (EOP) with DC Motor are centrifugal pumps, vertically mounted on Main Oil Tank (ie Oil reservoir) & are used to supply ISO VG46 grade oil to steam turbine and Generator bearings of 210MW/250MW/270MW/300MW/500MW/600MW rating. BHEL purchases AOPs which have two duty points. One duty point corresponds to the pressure and flow required for supply of oil to bearings in running condition of Steam Turbine. Second duty point corresponds to pressure and flow required for supply of oil to bearings during turbine barring. The scope of supply shall include complete pumps i.e. Auxiliary oil pump with AC Motor & Emergency Oil Pump with DC Motor assembly along with coupling, pump base plate, flanges, gaskets, counter flanges, fasteners, suction pipe, & discharge pipe, cable glands & all the items required for safe operation of pump. Starter resistance box (Casing starter) & Field trimmer resistance (FTR) shall be supplied along with DC motor for Emergency oil Pump.																					
B.	<u>Acceptance Criterion for Vendor:-</u> 1. For each Material Code in Table-1, Vendor/ its principle should have experience of engineering, manufacturing, testing and supply of at least two Centrifugal pump-motor set with AC/DC motor after 2012 satisfying all of the following criteria: - a. Where pump is vertically mounted on top of steel Oil Tank. b. Flow rate of pump $\geq x$ LPM with Discharge Pressure of pump $\geq y$ bar (x and y are defined as in Table-1) c. Where pump is used to supply Lube oil to Steam Turbine/Gas Turbine rotors. d. Where rating of power plant is $> 200\text{MW}$ e. Where document as per Clause C below are submitted. <table><tr><th colspan="4">TABLE-1 (Value of x and y)</th></tr><tr><th>Material Code</th><th>Description</th><th>Value of x (LPM)</th><th>Value of y (bar)</th></tr><tr><td>W90311918018</td><td>Emergency Oil Pump with DC motor</td><td>1800</td><td>2</td></tr><tr><td>W90311917305</td><td>Auxiliary Oil Pump with AC motor</td><td>6000</td><td>6</td></tr><tr><td>W90311917208</td><td>Auxiliary Oil Pump with AC motor</td><td>2700</td><td>8</td></tr></table>	TABLE-1 (Value of x and y)				Material Code	Description	Value of x (LPM)	Value of y (bar)	W90311918018	Emergency Oil Pump with DC motor	1800	2	W90311917305	Auxiliary Oil Pump with AC motor	6000	6	W90311917208	Auxiliary Oil Pump with AC motor	2700	8	
TABLE-1 (Value of x and y)																						
Material Code	Description	Value of x (LPM)	Value of y (bar)																			
W90311918018	Emergency Oil Pump with DC motor	1800	2																			
W90311917305	Auxiliary Oil Pump with AC motor	6000	6																			
W90311917208	Auxiliary Oil Pump with AC motor	2700	8																			

	2. For AOP AC motor, Vendor should have commissioned the pump set with AC motor of 415V-AC, (+/-10%), 50Hz (+/-5%) with starting current limited to 600% + (tolerances) as per IS: 12615-2011/ IEC 60034 and supplied for at least one executed P.O. 3. For EOP DC motor, Vendor or their sub vendor should have commissioned the pump set with DC motor of 220V-DC (-15%, +10%) feeder supply with fixed starting resistance for limiting the starting current of DC motor. Further, "Field Trimmer Resistances" shall also be supplied along with DC motor and vendor should have commissioning experience for at least one executed P.O. 4. AC and DC motors shall be sourced from internationally reputed suppliers.	
C.	Submission of documents conforming to Clause B:- - Vendor to furnish copy of Purchase Order of any one project. - Vendor to furnish customer approved / end user certified copy of General Arrangement drawing/ cross-sectional drg/characteristic curves /technical datasheet of any one project. - Vendor to furnish end user certificate (EUC) for any one project containing following information:- - Type of Pump: Centrifugal Pump - Name and Address of Plant: - Discharge Pressure of Pump and Flow rate: - Type of Power Plant: Steam Turbine/ Gas Turbine - Rating of Power Plant: EUC shall on the letterhead of owner of plant and shall be original ink signed by an authority not less than manager rank. EUC shall contain details of signing authority such as Name, designation, contact number, email address etc. - Vendor should have detailed "Motor Data Sheets" with GA drawings of Motor, "Starting Resistance Box" & motor JB (junction box) details, Motor characteristic curves, Wiring diagrams etc. The same shall be furnished of any executed project. - Vendor should have "Type Test reports" for AC & DC motors which should not be older than 10 years. The same shall be furnished of any executed project. - The double compression type cable glands and suitable Lugs to be supplied along with motor terminal box suiting to power cable sizes (in BHEL/Customer scope) for AC & DC motors, which shall be specified during detailed engineering. <u>Exemption from Submission of documents:</u> Vendors, who have supplied Centrifugal Pumps to BHEL (any unit) satisfying criteria in Clause B are exempted from submission of documents provided they furnish BHEL with PO nos of supply (to BHEL).	

	TABLE-2: TO BE SUBMITTED FILLED BY VENDORS ALONGWITH OFFER.																																																																	
	<table><tr><td>Sl. no.</td><td>Description</td><td>Example field</td><td></td><td></td></tr><tr><td>1</td><td>Pump type</td><td>Centrifugal</td><td></td><td></td></tr><tr><td>2</td><td>Mounting</td><td>Vertically mounted on top of steel oil tank</td><td></td><td></td></tr><tr><td>3</td><td>Flow rate (LPM)</td><td>4000</td><td></td><td></td></tr><tr><td>4</td><td>Discharge Pressure (bar)</td><td>7</td><td></td><td></td></tr><tr><td>5</td><td>Type of Power Plant</td><td>Steam Turbine/ Gas Turbine</td><td></td><td></td></tr><tr><td>6</td><td>Rating of Power Plant (MW)</td><td>300</td><td></td><td></td></tr><tr><td>7</td><td>Application of Pump</td><td>To supply lubrication oil to steam/gas turbine bearings</td><td></td><td></td></tr><tr><td>8</td><td>End Customer Name</td><td>ABC</td><td></td><td></td></tr><tr><td>9</td><td>Project name</td><td>XYZ</td><td></td><td></td></tr><tr><td>10</td><td>Purchase Order No.</td><td></td><td></td><td></td></tr><tr><td>11</td><td>Contact details, Telephone no's & Email id of End user</td><td>.....</td><td></td><td></td></tr></table>					Sl. no.	Description	Example field			1	Pump type	Centrifugal			2	Mounting	Vertically mounted on top of steel oil tank			3	Flow rate (LPM)	4000			4	Discharge Pressure (bar)	7			5	Type of Power Plant	Steam Turbine/ Gas Turbine			6	Rating of Power Plant (MW)	300			7	Application of Pump	To supply lubrication oil to steam/gas turbine bearings			8	End Customer Name	ABC			9	Project name	XYZ			10	Purchase Order No.				11	Contact details, Telephone no's & Email id of End user				
Sl. no.	Description	Example field																																																																
1	Pump type	Centrifugal																																																																
2	Mounting	Vertically mounted on top of steel oil tank																																																																
3	Flow rate (LPM)	4000																																																																
4	Discharge Pressure (bar)	7																																																																
5	Type of Power Plant	Steam Turbine/ Gas Turbine																																																																
6	Rating of Power Plant (MW)	300																																																																
7	Application of Pump	To supply lubrication oil to steam/gas turbine bearings																																																																
8	End Customer Name	ABC																																																																
9	Project name	XYZ																																																																
10	Purchase Order No.																																																																	
11	Contact details, Telephone no's & Email id of End user																																																																	
D.	BHEL reserves the right to ask for more information / documents/ clarifications. Vendor's offer shall not be considered if vendor fails to furnish the document / information / clarifications as mentioned above or vendor doesn't meet the acceptance criteria as mentioned above.																																																																	
E.	BHEL reserves the right to verify information submitted by vendor. In case of information/data furnished by the vendor found false/incorrect, BHEL reserves the right to reject their offer for the above items.																																																																	

Notes:

1. BHEL would consider the offers and open the price bids of only those bidders, who fulfill the Pre-Qualification requirements (PQRs).



Document No.
4-11917-BOI-01
Rev. No. - 00

REFERENCE TO SPECIFICATION NO. : ST39014

APPLICATION : STEAM TURBINE

ITEM : AUXILIARY OIL PUMP WITH A.C.MOTOR

ADDITIONAL SPECIFICATIONS :

1. PUMP NAME PLATE SHALL BE BILINGUAL IN HINDI AND ENGLISH LANGUAGES.

2. ADD THE FOLLOWING MATTER IN CLAUSE NO. 5.5.

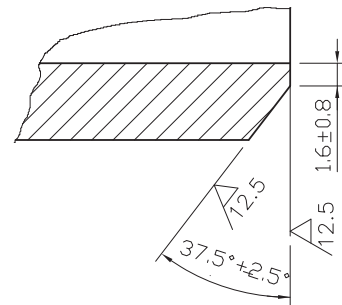
ALL THE SEATING MACHINED SURFACES OF THE BED PLATE TO BE MAINTAINED FOR 0.5 mm FLATNESS.

3. WHEREVER REQUIRED THE PUMP DATA SHEETS, G.A. DRAWING, CHARACTERISTIC CURVES AND CROSS SECTIONAL DRAWING ARE TO BE APPROVED BY CUSTOMER/CONSULTANT.

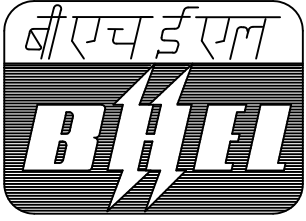
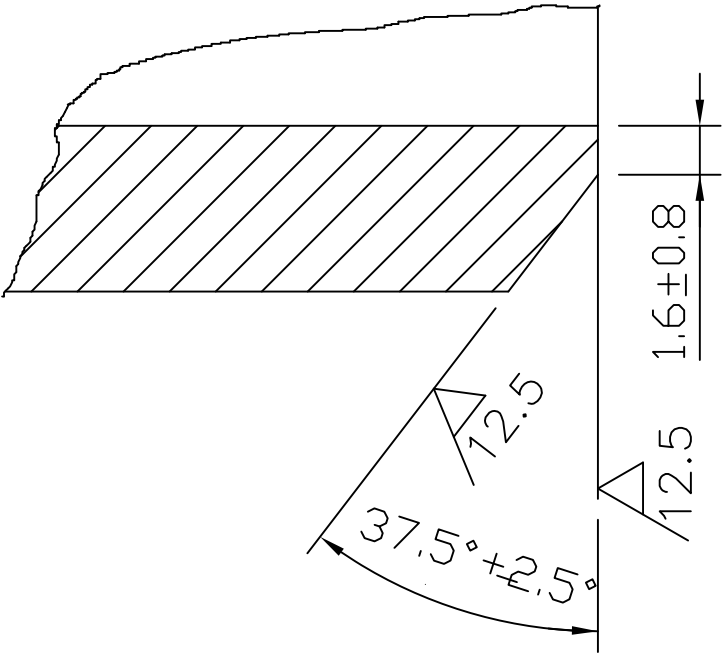
4. SUCTION AND DISCHARGE SIZES WILL BE OF BUTT WELDED TO SUIT FOLLOWING PIPE SIZES AND EDGE PREPARATION.

SUCTION $\phi 219.1 \times 6.35$
(Alongwith counter flange)

DISCHARGE $\phi 219.1 \times 8.18$



(V. K. GUPTA)
STE-TL

SIGN & DATE			Document No.
			4-11918-BOI-01
SUPERSEDES INVENTORY NO.			Rev. No. - 00
REFERENCE TO SPECIFICATION NO. : ST39015 APPLICATION : STEAM TURBINE ITEM : EMERGENCY OIL PUMP D.C. MOTOR			
ADDITIONAL SPECIFICATIONS : 1. PUMP NAME PLATE SHALL BE BILINGUAL IN HINDI AND ENGLISH LANGUAGES. 2. ADD THE FOLLOWING MATTER IN CLAUSE NO. 5.3. ALL THE SEATING MACHINED SURFACES OF THE BED PLATE TO BE MAINTAINED FOR 0.5 mm FLATNESS . 3. WHEREVER REQUIRED THE PUMP DATA SHEETS , G. A. DRAWING , CHARACTERISTIC CURVES AND CROSS SECTIONAL DRAWING ARE TO BE APPROVED BY CUSTOMER/CONSULTANT. 4. SUCTION AND DISCHARGE SIZES WILL BE OF BUTT WELDED TO SUIT FOLLOWING PIPE SIZES AND EDGE PREPARATION. SUCTION Alongwith counter flange) Ø141.3x6.55 DISCHARGE Ø168.3x7.11  (STE-TL)			
SIGN & DATE			
INVENTORY NO.			



Document No.
4-11917-BOI-06
Rev. No. - 00

REFERENCE TO SPECIFICATION NO. : ST39014

APPLICATION : STEAM TURBINE

ITEM : AUXILIARY OIL PUMP

ADDITIONAL SPECIFICATIONS :

1. ADD THE FOLLOWING MATTER IN CLAUSE NO. 5.5

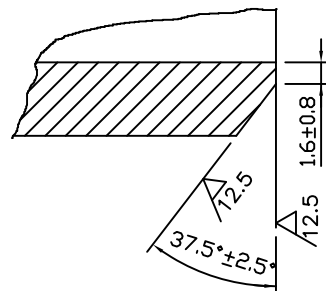
ALL THE SEATING MACHINED SURFACES OF THE BED PLATE
TO BE MAINTAINED FOR 0.5 mm FLATNESS .

2. SUPPLIER'S OFFER SHOULD BE IN SAME UNITS AS MENTIONED IN BHEL DOCUMENTS.

3. SUCTION AND DISCHARGE SIZES WILL BE OF BUTT WELDED TO SUIT FOLLOWING PIPE SIZES AND EDGE PREPARATION .

SUCTION $\phi 219.1 \times 6.3$
(Alongwith counter flange, if any)

DISCHARGE $\phi 219.1 \times 6.3$



(V. K. GUPTA)
STE-TL

Document No. - 4 18101 21 001		REV. NO.-00 DATE- 08.12.2005
APPLICATION : AUX. OIL PUMPS (AOP) FOR STEAM TURBINE ITEM : MOTORS (AC)		
<u>ADDENDUM TO ST39014:</u> <i>Following additional specifications shall be complied to:-</i> - In addition to clause no.-7.15 at page –5 of 7 of ST39014:- - Motor Terminal box- fault level shall be 50 KA (rms) 0.25 second for 415V- AC system. - Cable glands shall be Nickel-Chromium plated brass, heavy duty, double compression type, confirming to BS:6121 with lugs. - The sizes of cables for glands will be intimated later on. - Paint shade shall be “RAL 7032” against clause no.-8.06 at page-5 of 7 ST39014. - In addition to clause no.-9.0 at page –5 of 7 of ST39014, For Type & Routine Tests:- - Reports of type tests shall be those conducted within last five years. - Routine & Type tests shall be as per IS:325 - Motor data sheets & other documents shall bear the “Document no.” , “Revision no.”. & “Date” and shall be subject to BHEL/customer approval. - Motor noise level shall be limited so as to achieve the Pump-Motor set sound pressure level ≤ 85 dBA. Measurement shall be as per IS 12065. - Above additional requirements supersede the corresponding requirements of ST39014 & ST38013.		
(Vinod Kumar) Prepared & Checked by		(K. B.Batra) Approved by

Drawing No. - 4 18101 86 002		REV. NO.-00 DATE- 26.03.2004
APPLICATION : EMERGENCY OIL PUMPS (EOP) FOR STEAM TURBINE ITEM : MOTORS (DC)		
<u>ADDENDUM TO ST39015:</u> <i>Following additional specifications shall be complied to:-</i> - In addition to clause no.-7.14 at page –4 of 7 of ST39015:- (a) Cable glands shall be Nickel-Chromium plated brass, heavy duty, double compression type, confirming to BS:6121 with lugs. - In addition to clause no.-7.12 at page –4 of 7 of ST39015:- (a) The sizes of cables for Cable Glands will be intimated later on. - In addition to clause no.-7.10 at page –4 of 7 of ST39015:- Motor bearing shall be selected to take of the Vertical/Axial thrust of the motor and the bearing loading & selection criteria shall be furnished. - Paint shade shall be as per "RAL 5012 (Blue)", two coats of Red oxide Primer and Enamel paint . - Reports of type tests shall be those conducted within last five years. - Motor data sheets & other documents shall bear the "Document no." , "Revision no.". & "Date" and shall be subject to BHEL/customer approval.		
(Vinod Kumar) Prepared & Checked by		(K. B.Batra) Approved by

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक 		ST38013	
सुपरसेड्स INVENTORY NO		STEAM TURBINE ENGINEERING PRODUCT STANDARD		पृष्ठ 10 का 2 Page 2 of 10	
समीचीन प्रती संख्या को अधिष्ठाता प्रमाण है		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 COUPLING Coupling shall be preferably pin bush or jaw type. 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. Coupling shall be preferably outside the pump base plate (towards motor side). FOUNDATION 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 SPECIAL TOOL & TACKLES 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. QUALITY ASSURANCE, INSPECTION AND TESTING 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			
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.		स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत भारती इलेक्ट्रिकल्स की संपत्ति है। इसका प्रयोग एवं अप्रयोग केवल से किया जाना चाहिए। इसकी कल्पना के बिना इसे हानिकारक हो न किया जाए।			
दिनांक एवं हस्ताक्षर SIGN & DATE		12/5/11			
समीचीन प्रती संख्या INVENTORY NO		REV. NO. 08		निर्माणकर्ता WORKED BY	
P-5539				H. GUPTA	
				जांचकर्ता CHECKED BY	
				ANUJ JAIN	

दिनांक एवं हस्ताक्षर SIGN & DATE		उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST38013	
SUPERSEDES INVENTORY NO.		2.3 The particulars of the proposed shop tests and procedures for the tests shall be submitted to BHEL / its customer for approval along with quality plan.		पृष्ठ 10 का 3 Page 3 of 10	
समूची सूची संख्या को अधिकतम जगह		2.4 The equipment shall be dispatched only after inspection and clearance of material by BHEL/ its customer and approval of test certificates by BHEL/ its customer.			
2.5 The minimum tests/ checks to be carried out on the pump as envisaged by BHEL are given below. This is however not intended to form a comprehensive testing programme as it is suppliers responsibility to prepare the detailed quality plan, which should also include tests, checks carried out by supplier as a part of their normal practice. This quality plan is subject to the approval of BHEL/ its customer. BHEL/ its customer reserves the right to ask for any more checks at the time of quality plan finalisation.					
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.		2.5.1 Testing of Materials The material of each component shall be tested as per relevant specification for its chemical composition and mechanical properties viz. YS, Impact, %age elongation % RA etc. Suitable NDT to ensure freedom from surface and subsurface defects shall be carried out.			
स्वत्वधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत भारी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं प्रसारण के बिना की जाने वाली है। इसका उपयोग बिना अनुमति के न किया जाए।		2.5.2 Following tests shall be carried out during various stages of manufacturing at manufacturer's works.			
दिनांक एवं हस्ताक्षर SIGN & DATE		(a) Check for dimensions of all the component parts including surface finish, axial and radial run out of shaft etc.			
25/2/12		(b) Non destructive examination DPT/ MPI on machined surfaces of casing and welds of discharge pipe, ultrasonic test on shaft ($\geq 50\text{mm}$) to be carried out.			
		(c) Dynamic balancing of the rotor to be carried out so to achieve the vibration level as per ISO 10816-7 category II . -Insitu acceptance test-4.2 mm/s(RMS) at motor DE and NDE. -Factory acceptance test- 5.1 mm/s(RMS) at motor DE and NDE.			
		(d) Pump casing and discharge pipe shall be subjected to hydraulic pressure test at 2 times the working pressure or 1.5 times the pump shut-off head whichever higher. Pump impeller shall be subjected to suitable NDT method like MPI/ DPT for surface defect examination. The pressure test shall be carried out with original bolts. Duration of hydraulic test shall be 30 minutes. The testing should be carried out at manufacturer's works in the presence of BHEL's / customer representative.			
		(e) Performance test shall be carried out with respective unit motor i.e. each pump shall be tested with its motor only. However, in case of D.C. motor the performance test may be carried out with test bed motor. Performance test shall include verification of pump characteristics e.g. discharge Vs pressure, power consumption, efficiency, vibration and noise level etc.			
समूची सूची संख्या INVENTORY NO.		REV, NO. 08		निर्माणकर्ता WORKED BY	
P-5539		SUPERSEDES		H. GUPTA	
				जांचकर्ता CHECKED BY	
				ANUJ JAIN	
				13/02/12	
				13/2/12	

दिनांक एवं हस्ताक्षर SIGN & DATE			उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST38013 पृष्ठ 10 का 4 Page 4 of 10	
SUPERSEDES INVENTORY NO.		भारतीय सूची संख्या को अधिगणित करता	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. (f) Strip down examination to check the condition of bearing, mechanical clearances, axial play of the shaft etc. (g) Check the condition of the oil seals and any seepage of oil through the seals.			
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.		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.	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.	2.5.5 Blue matching between motor base and pump base plate to be carried out if required.	3.0 <u>PREAPPROVAL DOCUMENTS AT THE TIME OF OFFER</u>	
स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत की इलेक्ट्रिकल्स की सम्पत्ति है। इसका प्रयोग एवं प्रसारण के बिना भारतीय सूची संख्या को ध्यान में रखकर किया जाना चाहिए।		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.	3.2 Calculation with necessary drawings (Torque / speed characteristics etc.) power requirement.	3.3 All welding shall be carried by qualified welder as per ASME sec.IX.	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.	
भारतीय सूची संख्या INVENTORY NO. P-5539		REV. NO. 08	SUPERSEDES		निर्माणकर्ता WORKED BY	H.GUPTA  13/02/12
		जांचकर्ता CHECKED BY	A. JAIN  13/2/12			

दिनांक एवं हस्ताक्षर SIGN & DATE				उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST38013	
श्रमती सूची संख्या INVENTORY NO.		SUPERSEDES INVENTORY NO.		पृष्ठ 10 का 5 Page 5 of 10			
श्रमती सूची संख्या INVENTORY NO.		4.0 DOCUMENTS TO BE SUPPLIED AFTER THE PLACEMENT OF ORDER These shall be supplied in 10 copies each or two copies and a set of reproducible. 4.1 Contractual drawings : 8 weeks 4.2 Overhaul and spare parts lists : 8 weeks 4.3 Equipment description : 8 weeks 4.4 O & M manual (10 hard copy + 2CD) : 12 weeks 4.5 Record of test on noise levels before dispatch 4.6 Record of test to DIN 1944-III or equivalent : Before dispatch or equivalent. 4.7 List of tools and tackles : 8 weeks 4.8 The static/ dynamic loading details on support/ foundation should be furnished : 8 weeks 5.0 NAME PLATE IDENTIFICATION MARKING SHOULD BE AS FOLLOWS The rating plate is to be made of X12 or Ni188 and plates should be provided in Hindi and English both. 5.1 Type/ Designation. 5.2 Manufacturer. 5.3 Manufacturer's works No. 5.4 Year of manufacturing. 5.5 Purchaser's order No. 5.6 Volumetric flow (l / m) 5.7 Discharge pressure (Bar/MWC) 5.8 Operating temp (In degree C) 5.9 Flow medium. 5.10 Speed.					
श्रमती सूची संख्या INVENTORY NO.		REV. NO. 08		निर्माणकर्ता WORKED BY		H.GUPTA	
श्रमती सूची संख्या INVENTORY NO.		CHECKED BY		A. JAIN		5/2/11	

निर्माण एवं संस्थापना SIGN & DATE				उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST38013	
तालिका पृष्ठी संख्या INVENTORY NO		SUPERSEDES INVENTORY NO		पृष्ठ 10 का 6 Page 6 of 10			
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. 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. 6.1 In the packing list, dispatchable unit, BHEL P.O.number, Project name should be mentioned. 6.2 O&M manual should be mentioned in the packing list. 6.3 A check list should be prepared with a column for tick marking, so that check list convert to an erection/commissioning reports. This check list should be part of O&M manual. 6.4 Lock washers shall be supply with all fasteners 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. 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 to shall prepare the assessment report and a copy of the same shall be forwarded 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. 8.5 The supplier shall guarantee vibrations at site as per clause 2.5.2 (C) of the specification. 9.0 SPARES The supplier shall quote item wise price of recommended spares for 3 years and 5 years operation respectively.					
स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत भारती इंजीनियरिंग लिमिटेड की संपत्ति है। इसका प्रयोग या अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो, न किया जाए।		निर्माणकर्ता WORKED BY H.GUPTA जांचकर्ता CHECKED BY A. JAIN					
तालिका पृष्ठी संख्या INVENTORY P-5539		REV. NO. 08		SUPERSEDES		13/02/12	



उत्पाद मानक

STEAM TURBINE ENGINEERING
PRODUCT STANDARD

ST38013

पृष्ठ 10 का 7
Page 7 Of 10

ANNEXURE-I
DATA TO BE FURNISHED BY BIDDER
ALONG WITH BID FOR OIL PUMP

1.0 EQUIPMENT AND SERVICE OFFERED

Please state whether the following equipment service as specified in the data sheet are offered or not

- | | | |
|-----|--|---------|
| 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 |

2.0 DESIGN AND PERFORMANCE

- | | | |
|-----|---|--------------------|
| 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 | |

REV NO 08

निर्माकता

WORKED BY

D.PAL

जांचकर्ता

CHECKED BY

A. JAIN

16/06/06

16/6/06



उत्पाद मानक

ST38013

STEAM TURBINE ENGINEERING
PRODUCT STANDARD

पृष्ठ 10 का 8
Page 8 of 10

2.5 Shut off head

2.6 Performance guarantee when installed as per given arrangement Yes/No

2.6 Pump B.H.P /KW at rated capacity

2.7 Maximum allowable suction lift (for minimum NPSH REQUIRED).

2.9 Efficiency

3.0 MATERIAL OF CONSTRUCTION

3.1 Casing

3.2 Impeller

3.3 Base plate

3.4 Wearing rings

3.5 Shaft

3.6 Stuffing box

3.7 Packing

3.8 Mechanical seal

4.0 CONNECTION

4.1 Suction size

4.2 Discharge size

5.0 DRAWINGS

5.1 General arrangement and sectional drawings enclosed with offer Yes/No

COPYRIGHT AND CONFIDENTIAL
The information in this document is the property of Bharat Heavy Electricals Limited. It must not be copied, stored, or used in any way without the written consent of the company.

स्वत्वधिकार एवं गोपनीय

इस दस्तावेज़ में दी गई जानकारी भारत भारती लिमिटेड की संपत्ति है। इस दस्तावेज़ को बिना लिखित अनुमति के प्रसारित, प्रतिलिपि बनाना, या किसी भी रूप में प्रयोग करना गैर-कानूनी है।

REVISED BY
A. JAIN
2/9/06

REVISED BY
A. JAIN
P-55339

REV NO 08

निर्माणकर्ता

WORKED BY

D PAL

जांचकर्ता

CHECKED BY

A. JAIN

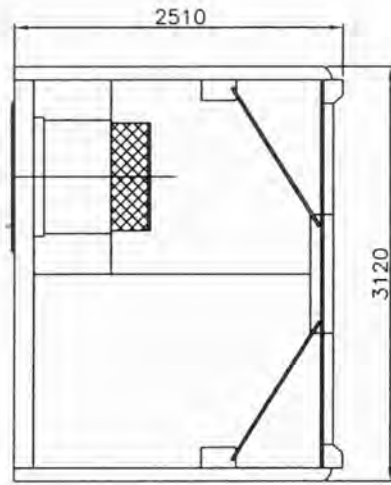
16/06/06

16/6/06

SIGN & DATE				उत्पाद मानक STEAM TURBINE ENGINEERING PRODUCT STANDARD		ST38013	
SUPERSEDES INVENTORY NO						पृष्ठ 10 का 9 Page 9 of 10	
संपत्ति सूची संख्या को अधिलेखित करना							
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.							
स्वत्वाधिकार एवं गोपनीय इस दस्तावेज में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं प्रकाशना के बिना की जा सकती है, जो कि कंपनी के हितों में प्रतिकारक हो न किया जाए।							
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 <u>CONSTRUCTION FEATURES</u> 8.1 Type of pumps. 8.2 No. of stages. 8.3 Type of impeller. 8.4 Type of stuffing box sealing offered. 8.5 Type of coupling offered. 8.6 Type of bearing and lubrication. 8.7 Impeller diameter. 9.0 Any deviation taken against specifications. Yes/No 10.0 Deviation taken as mentioned here. 11.0 Cross referred Standards: Nil							
REV. NO. 08		SUPERSEDES		निर्माणकर्ता WORKED BY H.GUPTA		13/02/12	
INVENTORY NO. P-5539				जांचकर्ता CHECKED BY A. JAIN		13/2/12	

INVENTORY NO. P-5539 REV. NO. 08	स्वाधिकार एवं गोपनीय इस प्रतिका में दी गई सुचना भारत की इलेक्ट्रिकल की सम्पत्ति है इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए । हस्ताक्षर एवं दिनांक S. Jm 13/02/12 उत्पाद मानक ST38013	उत्पाद मानक PRODUCT STANDARD STEAM TURBINE ENGINEERING	निर्माण एवं हस्ताक्षर SIGN & DATE समूची सूची संख्या को अधिकारिता करता है समूची सूची संख्या को अधिकारिता करता है
INVENTORY NO. P-5539 REV. NO. 08	स्वाधिकार एवं गोपनीय इस प्रतिका में दी गई सुचना भारत की इलेक्ट्रिकल की सम्पत्ति है इसका प्रयोग एवं अप्रत्यक्ष रूप से किसी भी तरह प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए । हस्ताक्षर एवं दिनांक S. Jm 13/02/12	उत्पाद मानक PRODUCT STANDARD STEAM TURBINE ENGINEERING	निर्माण एवं हस्ताक्षर SIGN & DATE समूची सूची संख्या को अधिकारिता करता है समूची सूची संख्या को अधिकारिता करता है

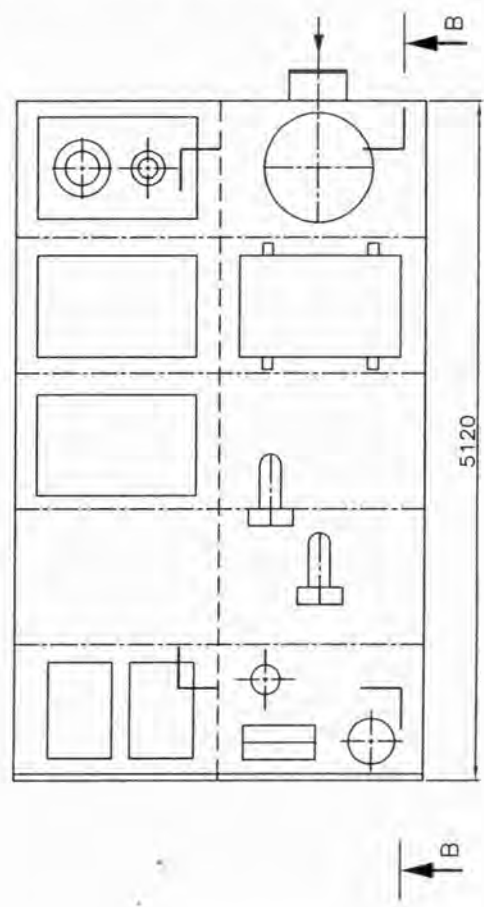
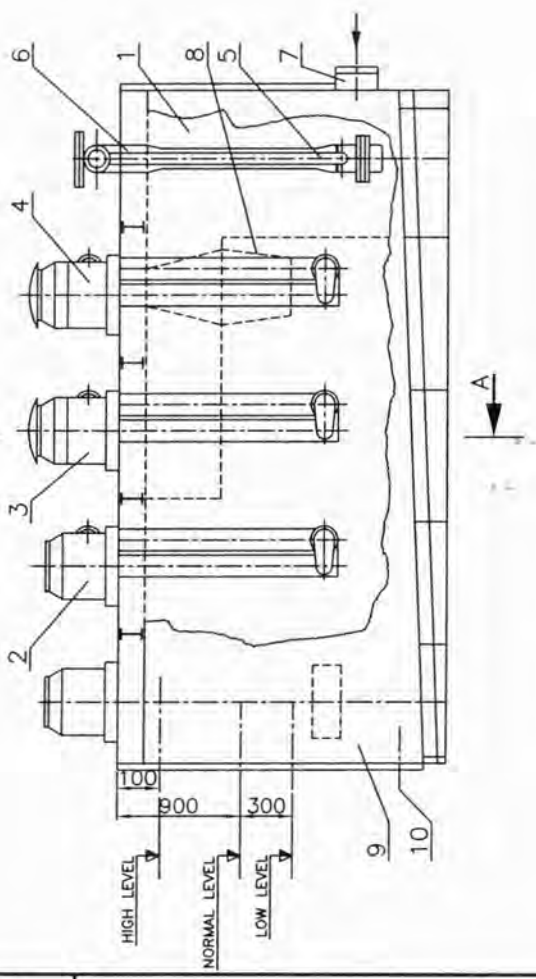
SECTION A-A



- 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. SUCTION PIPE (INJECTOR).
- 7. INLET.
- 8. STRAINER.
- 9. PARTITION.
- 10. DRAIN.

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

SECTION B-B



निर्माणकर्ता WORKED BY	H.GUPTA	13/02/12
जांचकर्ता CHECKED BY	A.JAIN	13/02/12