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Il> --2.1."04"01 PREPARED :*STL(TL/Tif)* ISSUED :

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STEAM TURBINE ENGINEERING  
PROJECT STANDARD

5.0 PUMP SPECIFICATION:-

5.1 IDENTIFICATION NO. TO BE MENTIONED ON NAME PLATE AS FOLLOWS:-  
: MAY 31 AP 001 AND MAY 32 AP 001

5.2 TYPE SCREW TYPE POSITIVE DISPLACEMENT

DESIGN TEMPERATURE = 100°C , OPERATING TEMPERATURE = 65°C

VARIANT NUMBER	NORMAL DISCHARGE CAPACITY ( Litre/Sec )	NORMAL DISCHARGE PRESSURE ( Bar )
VAR. 1	1.26	120
VAR. 2	1.80	140
VAR. 3	1.68	189
VAR. 4	1.25	182
VAR. 5	2.25	182
VAR. 6	1.55	178
VAR. 7	1.3J	182
VAR. 8	1.27	182
VAA. 9	1.84	178

VARIANT NUMBER	NORMAL DISCHARGE CAPACITY ( Litre/Sec )	NORMAL DISCHARGE PRESSURE ( Bar )
VAA. 10		
VAA. 11		
VAA. 12		
VAA. 13		
VAA. 14		
VAA. 15		
VAA. 16		
VAA. 17		
VAA. 18		

PUMP SHALL BE SUITABLE FOR MOUNTING VERTICALLY ON THE OIL TANK. BASE PLATE OF PUMP SHALL MATCH THE COUNTER FLANGE PROVIDED ON THE TANK AS PER SKETCH ON PAGE 13. SMOOTH FUNCTIONING IS ENSURED BY MAINTAINING OIL LEVELS AS DEPICTED IN THE ARRANGEMENT ON PAGE 12.

5.3 DURING INITIAL START UP IN WINTER, OIL TEMPERATURE MAY GO AS BELOW AS 20°C.

6.0 MOTOR:-

A SUITABLE MOTOR CONFORMING TO THE PUMP REQUIREMENTS SHALL BE SUPPLIED. FOR DETAILS ON MOTOR, PLEASE REFER ANNEXURE-I.

7.0 DESIGN AND CONSTRUCTION OF PUMP:-

ALL MATERIALS USED IN THE CONSTRUCTION OF THE PUMPS SHALL BE SELECTED IN THE RANGE OF MATERIAL MOST APPROPRIATELY SUITABLE FOR THE PURPOSE AND SERVICE CONDITIONS. THE BIDDER SHALL FURNISH ALONGWITH THE OFFER, MATERIAL SPECIFICATION FOR ALL THE COMPONENTS TO BHEL FOR THEIR REVIEW AND ACCEPTANCE BY BHEL/OWNER. BHEL/OWNER RESERVES THE RIGHT TO ASK FOR CHANGES IN MATERIAL. THE SIZE SHALL BE STANDARDISED SO AS TO ENSURE INTERCHANGEABILITY.

7.1 SPECIAL TOOLS AND 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 ALONGWITH THE OFFER.

REV. NO.

08

WORKED BY

DHARAMPAL

WORKED BY

ANUJAIN

CHECKED BY

tsf



PRODUCT STANDARD

( STEAM TURBINE ENGINEERING )

स्वतंत्रता का प्रतीक है

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इस दस्तावेज़ में दी गई सूचना भारत की इलेक्ट्रिकल भारत लिमिटेड की संपत्ति है। इसका प्रयोग केवल भारत ही में किया जा सकता है। इस दस्तावेज़ को बिना अनुमति के किसी भी तरह का प्रयोग, जो कि कंपनी के हित में बाधित करने वाला हो, न किया जाए।

स्वतंत्रता का प्रतीक है

SIGN & DATE

21/9/06

स्वतंत्रता का प्रतीक है

INVENTORY NO.

P-5134

REV. NO. 08

- 7.2 THE MATERIALS OF CONSTRUCTION OF THE PUMPS SHALL BE SUCH AS TO RESIST CORROSION AND EROSION AND SHALL GIVE A LONG TROUBLE FREE SERVICE.
- 7.3 THE SUPPLIER SHALL ALSO FURNISH THE METHOD AND FREQUENCY OF LUBRICATION OF THE BEARINGS AND QUANTITY AND TYPE OF LUBRICANT REQUIRED FOR NORMAL OPERATION. BUT LUBRICATION OF BEARINGS WITH THE OIL BEING HANDLED IS PREFERRED.
- 7.4 THE DESIGN SHALL BE SUCH AS TO KEEP THE FRICTIONAL LOSS AND WEAR CAUSED BY END THRUST TO THE MINIMUM. IT WILL ALSO ENSURE MINIMUM WEAR AND CAVITATION IN MECHANICAL SEALS AND BEARINGS. LONG AND TROUBLE FREE SERVICE SHALL BE ENSURED. THE ROTORS OF THE PUMP SHOULD BE DESIGNED IN SUCH A MANNER SO THAT MINIMUM VIBRATIONS ARE EXPERIENCED. THE SOUND PRESSURE LEVEL OF PUMP MOTOR SET SHOULD NOT BE GREATER THAN 85 dBA TO A REFERENCE OF 0.0002 MICRO BAR WHEN MEASURED AT A DISTANCE OF 1.5 METERS ABOVE FLOOR LEVEL AND ONE METRE HORIZONTALLY FROM THE BASE OF EQUIPMENT AND VIBRATIONS ARE IN THE PERMISSIBLE RANGE AS PER VDI 2056.
- 7.5 SEALS MUST COMPLY WITH THE FOLLOWING PROPERTIES
  - Co.> READY ACCESS AND AMENABILITY FOR MAINTENANCE WORK.
  - Cb> NO CONTAMINATION OF THE MEDIUM FROM MATERIAL ABRASION FROM THE SEALS.
  - Cc> NO SEEPAGE OF LUBRICANTS INTO THE FLOWING MEDIUM.
  - Cd) MINIMUM LEAKAGE LOSSES WITH THEIR CONTROLLED REMOVAL.
- 7.6 TO FACILITATE TRANSPORT AND ERECTION, LIFTING HOOKS OR ERECTION EYES SHALL BE FITTED AT SUITABLE POINTS ON THE COMPONENTS. THEIR LOCATIONS MUST BE SHOWN ON THE DIMENSIONAL DRAWING.
- 7.7 PUMP BEARINGS SHALL BE DESIGNED SO AS TO ASSURE 50,000 hrs CONTINUOUS SERVICE FOR FRICTION BEARINGS & 30,000 hrs FOR BALL & ROLLER BEARINGS.
- 7.8 THE MECHANICAL DESIGN SHALL ALLOW EASY ACCESS TO VARIOUS PARTS OF CARRYING OUT MAINTENANCE WORK.
- 7.9 THE DISCHARGE BRANCH OF THE PUMP SHALL BE TAKEN OUT ABOVE THE BASE PLATE BY THE SUPPLIER.
- 7.10 THE PUMPS SHALL BE PROVIDED WITH DRAINAGE AND VENTING DEVICES.
- 7.11 ALL SYSTEM PARTS CARRYING OIL SHALL BE OF OIL TIGHT CONSTRUCTION COMPRESSION-TYPE FITTINGS ARE NOT PERMISSIBLE.
- 7.12 FOR SCREW PUMPS RUNNING AT SUBCRITICAL SPEEDS, IT SHALL BE ENSURED THAT THE CRITICAL SPEED LIES ABOVE THE MAXIMUM SPEED ATTAINABLE DURING OPERATION WITH A MINIMUM MARGIN ON 15X OF RATED SPEED. FOR PUMPS RUNNING AT SUPER CRITICAL SPEEDS, IT SHALL BE ENSURED THAT THERE IS DIFFERENCE OF SUFFICIENT MAGNITUDE (NOT LESS THAN 20X) BETWEEN THE OPERATING SPEED AND THE BORDER IN CRITICAL SPEEDS. ALLOWANCES SHALL BE MADE FOR THE TYPE OF COUPLING BETWEEN THE PUMP AND MOTOR WHILE CALCULATING THE CRITICAL SPEEDS.

WORKED BY	DHARAMPAL	15/6/06
ANUJ JAIN		15/6/06

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ALLOWANCES SHALL BE MADE FOR THE TYPE OF COUPLING BETWEEN THE PUMP AND MOTOR WHILE CALCULATING THE CRITICAL SPEEDS.

7.13 COUPLING

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SUITABLE COUPLING WITH GUARDS SHALL BE PROVIDED FOR COUPLING PUMP WITH MOTOR. IT SHALL BE DESIGNED TO FACILITATE EASY ALIGNMENT. ONE SET OF COUPLING BOLTS SHALL BE SUPPLIED IN SPARE.

7.14 FOUNDATION

THE PUMP SHALL BE MOUNTED ON THE OL TANK AND HUNG FROM BED PLATE AT THE TANK TOP INTO THE TANK. FOR FURTHER DETAILS PLEASE REFER PAGE NO. 12 AND 13. ALL THE SEATING MACHINED SURFACES OF BED PLATE TO BE MAINTNNED FOR 0.5 mm FLATNESS.

8.0 QUALITY ASSURANCE, INSPECTION AND TESTING

{a) THE MANUFACTURER SHALL CONDUCT ALL TESTS REQUIRED TO ENSURE ALL THE COMPONENTS PART OF THE JACKING OL PUMP OFFERED, CONFORM TO THE JI:QUIREMENTS OF THE SPECIFICATION AND IN COMPLIANCE WITH REQUIREMENTS OF APPLICABLE CODES AND STANDARDS.

{b) THE BIDDER SHALL SUBMIT ALONGWITH HIS OFFER QUALIiy PLAN.

8.1 THE PARTICULARS OF THE PROPOSED SHOP TESTS AND PROCEDURES FOR THE TESTS SHALL BE SUBMITTED TO BHEL/ITS CUSTOMER FOR APPROVAL ALONGWITH QUALIiy. PI,AN.

8.2 THE MATERIAL SHALL BE DESPATCHED ONLY AFTER INSPECTION AND CLEARENCE OF MATERIAL BY BHEL OR ITS CUSTOMER AND APPROVAL OF TEST CERTIFICATE BY BHEL/ITS CUSTOMER.

8.3 THE MINIMUM TESTS/CHECKS TO BE CARRIED OUT ON THE JACKING OIL 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 QUALIiy PLAN, WHICH SHOULD ALSO INCLUDE TESTS/CHECKS CARRIED OVT BY SUPPLIER AS A PART OF THEIR NORMAL PARACTICE • THIS QUALITY PLAN IS SUBJECT TO THE APPROVAL OF BHEL /ITS CUSTOMER AND BHEL/ITS CUSTOMER RESERVES THE RIGHT TO ASK FOR ANY MORE CHECKS AT THE TIME OF QUAAIY PLAN FINALISATION.

6.3.1 TESTING OF MATERIALS

THE MATERIAL OF EACH COMPONENT SHALL BE TESTED AS PER RELEVANT SPECIFICATION FOR ITS CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES, VIZ. YS, UTS, IMPACT, % ELONGATION % RA ETC. AND NOT, UT ON SHAFT, MPI ON SCREWS AND CASING ETC. TO ENSURE FREEDOM FROM SURFACE AND SUB-SURFACE DEFECTS SHALL BE CARRIED OUT.


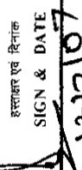


8.3.2 FOLLOWING TESTS SHALL BE CARRIED OUT DURING VARIOUS STAGES OF MANUFACTURE AT MANUFACTURER WORKS.








(o) CHECK FOR DIMENSIONS OF ALL COMPONENT PARTS INCLUDING SURFACE FINISH, AXIAL AND RADIAL RUN OUT OF SHAFT ETC.

(b) NON-DESTRUCTIVE EXAMINATION :- UT FOR SCREW BLANKS dt DPT/MPI ON SCREWS TO BE CARRIED OUT TO ENSURE SURFACE / SUB-SURFACE DEFECTS.

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		vri'fflf CHECKED BY	ANUJ JAIN		\s \ok




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सुपरसेड्स इन्वेंटरी SUPERSEDES INVENTORY	<p>(c) CHECK THE CONDITION OF THE OIL SEALS AND ANY SEEPAGE OF OIL THROUGH SEALS ETC.</p> <p>(d) HYDRAULIC TESTING OF THE CASING AND OTHER PRESSURE PARTS SHALL BE AS PER VDMA 24284.</p> <p>(e) CHECK FOR DIRECTION OF ROTATION OF PUMP.</p> <p>(f) PERFORMANCE TEST WITH CALIBRATED TEST BED MOTOR FOR VERIFICATION OF PUMP CHARACTERISTICS, VIZ. DISCHARGE AT THE GIVEN PRESSURE SCHEDULE OF POWER CONSUMPTION, NOISE AND VIBRATION LEVEL AS PER VDMA 24284.</p> <p>(g) STRIP DOWN TEST TO CHECK THE CONDITION OF BEARING, MECHANICAL CLEARANCES AND AXIAL PLAY OF SHAFT ETC.</p> <p>8.3.3 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 SAFEGAURD AGAINST ANY DAMAGE DURING TRANSIT AND IS SAFE FOR TWO YEARS IN A VERY DAMP ATMOSPHERE.</p> <p>8.3.4 TEST CERTIFICATES INDICATING THE ACTUAL TEST RESULTS OF MATERIAL TESTING, NOT, HYDRAULIC TEST, PERFORMANCE TEST, STRIP DOWN EXAMINATION Etc. SHALL BE FURNISHED.</p> <p>9.0 <u>PRE-APPROVAL DOCUMENTS AT THE TIME OF OFFER</u></p> <p>9.1 ASSEMBLY DRAWING WITH PART LISTS, NOZZLE SIZES AND THEIR COORDINATES, BASE PLATE DETAILS AND CROSS SECTION ARRANGEMENT ALONGWITH STATIC LOADING.</p> <p>9.2 CALCULATIONS WITH NECESSARY DRAWINGS (TORQUE/SPEED CHARACTERISTICS Etc), POWER REQUIREMENTS, TORQUE SETTING VALUE FOR MOTOR TRIP, PERMISSIBLE TORQUE VALUE FOR KEY AND POWER SHAFT.</p> <p>9.3 MAXIMUM MAGNETIC AND NON-MAGNETIC PARTICLE SIZE, WHICH CAN PASS THROUGH PUMP SCREW CLEARANCE WITHOUT DAMAGING THE PUMP SHALL BE SPECIFIED IN THE OFFER.</p> <p>9.4 QUALITY PLAN WITH DETAILS OF QUALITY LEVELS AND MANUFACTURING TOLERANCES. THIS SHOULD GENERALLY CONFIRM TO VDMA 24284. GENERALLY ACCEPTED ENGINEERING PRACTICES, IN PARTICULAR VDMA CODES AND STANDARDS OR EQUIVALENT SHALL BE APPLIED AND TAKEN INTO ACCOUNT FOR DESIGN OF SCREW PUMPS. THE CODES OF STANDARDS APPLIED IN EACH CASE SHALL BE SPECIFIED IN THE OFFER.</p> <p>9.5 FOR DOCUMENTATION ON MOTOR, PLEASE REFER ANNEXURE-I. EXAMINATION OF THE PRE-APPROVED DOCUMENTS BY BHEL SHALL NOT RELIEVE THE MANUFACTURER AND HIS SUBCONTRACTORS OF THEIR RESPONSIBILITIES. THE PRE-APPROVED DOCUMENTS SHALL FORM THE BASIS FOR THE ORDER. NO CHANGES SHALL BE MADE WITHOUT APPROVAL FROM BHEL.</p> <p>10.0 DOCUMENTS TO BE SUPPLIED AFTER THE PLACEMENT OF ORDER: THESE SHALL BE SUPPLIED EITHER IN FIVE COPIES EACH OR TWO COPIES AND A SET OF REPRODUCIBLE. SCHEDULE OF DOCUMENTS SHALL BE AS FOLLOWS:</p> <p>10.1 CONTRACTUAL DRAWINGS - 8 WEEKS</p> <p>10.2 OVERHAUL AND SPARE PARTS LISTS - 8 WEEKS</p> <p>10.3 EQUIPMENT DESCRIPTION - 8 WEEKS</p>		
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हस्ताक्षर एवं दिनांक SIGN & DATE  13/17/07			
सापत्नी सूची संख्या INVENTORY NO. P-5134	REV.NO. 09		WORKED BY DHARAMPAL  CHECKED BY ANUJ JAIN  M-tr J-01

दिनांक एवं हस्ताक्षर SIGN & DATE		<p style="text-align: center;"><b>&amp;NI&lt; atiiCHCb</b></p> <p style="text-align: center;"><b>PRODUCT STANDARD</b> ( STEAM TURBINE ENGINEERING)</p>	<p style="text-align: center;"><b>ST- 39003</b></p> <p style="text-align: center;">''' 0 13 em 6</p> <p style="text-align: center;">Page 6 of 13</p>						
सामग्री सूची संख्या को अतिरिक्तित्व अक्षर है SUPERSEDES INVENTORY		10.4 TEST CERTIFICATE OF ALL TESTS AS PER QUALITY PLAN, DRAWINGS DURING VARIOUS STAGES OF MANUFACTURE. ALSO REFER CLAUSE 8.2 AND 8.3.4 ABOVE.	- BEFORE DESPATCH						
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स्वत्वाधिकार एवं गोपनीय इस प्रलेख में दी गई सूचना भारत हेवी इलेक्ट्रिकल्स की संपत्ति है इस्का प्रयोग एवं प्रसारण के बिना की जायेगी जो कि कंपनी के हित में हानिकारक हो न किता जाय		<p>THE SURFACE SHALL BE CLEANED &amp; PREPARED FOR APPLICATION OF THE COATINGS BY BLASTING WITH NON-SILICATIC ABBRASIVE AGENTS. THE PROTECTIVE COATING SHOULD BE OIL RESISTANT TO PREVENT COTAMINATION OF OIL SPECIFIED TO PREVENT THE DETERIORATION OF THE COATING ITSELF. THE SUPPLIER SHALL GIVE EXACT AND PRECISE DETAILS ABOUT THE MEASURES ENVISAGED BY HIM FOR SURFACE PROTECTION, WHICH SHALL BE CHECKD AND APPROVED BY BHEL.</p> <p>INSTRUCTIONS SHOULD BE ISSUED REGARDING RECONSERVATION, DECONSERVATION ALONGWITH SPECIFICATION OF MATERIAL TO BE USED FOR ABOVE PURPOSE. 100% QUANTITY OF MATERIAL REQUIRED FOR RECONSERVATION AND DECONSERVATION AT SITE DURING STORAGE SHALL BE SUPPLIED ALONGWITH PUMP. ANY SPECIFIC INSTRUCTION TO BE FOLLOWED DURING STORAGE AT SITE TO AVOID ANY SEIZING ETC. SHALL ALSO BE INTIMATED. ALL SUCH INSTRUCTIONS SHALL BE MADE AVAILABLE TO SITE INCHARGE IN A SEPARATE COVER ( NOT PACKED WITH PUMP PACKAGE ).</p> <p>THE SUPPLIER SHALL BE RESPONSIBLE FOR ALL LOSS OR DAMAGE DURING TRANSPORTATON, HANDLING AND STORAGE DUE TO IMPROPER PACKING.</p>							
दिनांक एवं हस्ताक्षर SIGN & DATE 13/7/07	REV. NO. 09		<table border="1"> <tr> <td data-bbox="925 1711 1047 1795">WORKED BY</td> <td data-bbox="1055 1711 1209 1795">DHARAMPAL</td> <td data-bbox="1218 1711 1421 1795">  26-06-07         </td> </tr> <tr> <td data-bbox="925 1795 1047 1921">CHECKEEOBY</td> <td data-bbox="1055 1795 1209 1921">ANUJ JAIN</td> <td data-bbox="1218 1795 1421 1921">  26-06-07         </td> </tr> </table>	WORKED BY	DHARAMPAL	 26-06-07	CHECKEEOBY	ANUJ JAIN	 26-06-07
WORKED BY	DHARAMPAL	 26-06-07							
CHECKEEOBY	ANUJ JAIN	 26-06-07							



भारतीय विद्युत प्राधिकरण SIGN & DATE  <b>27/9/16</b>	<b>स्वतन्त्राधिकार एव गोपनीय</b>  एव एव एव के भी एवं सुदृढा सारव ही प्रयोगेण के सम्पत्ति के सक्ता एव एव एव एव के सिरी भी एव एव, एव के सक्ता के सिरी के सिरी एव एव एव एव	<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this documents 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	भारतीय विद्युत प्राधिकरण SIGN & DATE  <b>27/9/16</b>
भारतीय विद्युत प्राधिकरण SIGN & DATE  <b>27/9/16</b>	<b>स्वतन्त्राधिकार एव गोपनीय</b>  एव एव एव के भी एवं सुदृढा सारव ही प्रयोगेण के सम्पत्ति के सक्ता एव एव एव के सिरी भी एव एव, एव के सक्ता के सिरी के सिरी एव एव एव एव	<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this documents 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	भारतीय विद्युत प्राधिकरण SIGN & DATE  <b>27/9/16</b>

भारतीय विद्युत प्राधिकरण INVENTORY NO. <b>P-5134</b>	REV. NO.  <b>08</b>	रचित/मूल WORKED BY  <b>DHARAMPAL</b>	<b>P1</b>
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12-01-2016 SIGN. & DATE		<b>3c&lt;ili; JUCiiCb</b>  <b>STEAM TURBINE ENGINEERING          PRODUCT STANDARD</b>	<b>ST39003</b>  पृष्ठ 13 का 9  Page 9 of 13
12-01-2016 SIGN. & DATE		<b>3c&lt;ili; JUCiiCb</b>  <b>STEAM TURBINE ENGINEERING          PRODUCT STANDARD</b>	<b>ST39003</b>  पृष्ठ 13 का 9  Page 9 of 13
12-01-2016 SIGN. & DATE		<b>3c&lt;ili; JUCiiCb</b>  <b>STEAM TURBINE ENGINEERING          PRODUCT STANDARD</b>	<b>ST39003</b>  पृष्ठ 13 का 9  Page 9 of 13

4.8.6 GROUNDING DEVICE : SUITABLE ARRANGEMENT SHALL BE PROVIDED FOR EARTHING THE MOTOR AT TWO SEPARATE AND DISTINCT CONNECTION POINTS. DESIGN OF EARTHING CONDUCTOR SHALL BE AS PER IS:4722.

4.8.7 TERMINAL CONNECTORS FOR STATOR (LEADS TYPE AND NUMBER) : 6, NEUTRAL SHALL BE CONNECTED EXTERNALLY IN THE TERMINAL BOX.

4.9 TERMINAL BOX : TERMINAL BOX SHALL BE PROVIDED WITH DOUBLE COMPRESSION TYPE BRASS CABLE GLANDS (Nickel Chromium PLAED HEAVY DUTY, CONFIRMING TO BS:6121) AND COPPER CABLE LUGS TO MATCH OWNER'S ALUMINIUM CABLES, THE SIZE OF WITCH SHALL BE INTIMATED LATER. TERMINAL BOX SHALL BE CAPABLE OF BEING ROTATED THROUGH 180' IN STEPS OF 90'. IT SHALL HAVE A DEGREE OF PROTECTION OF IP-55. IT SHALL ALSO BE SUITABLE TO WITHSTAND THE FAULT LEVEL OF 50 KA FOR 0.25 SECONDS.

4.10 WHETHER PHASES SEGREGATED : NO..

4.11 SPACE HEATERS TO BE PROVIDED.

4.12 RATED VOLTAGE FOR SPACE HEATERS 240 VOLTS

5.0 SPECIAL REQUIREMENTS:

5.01 THE MOTOR SHALL BE REWOUNDABLE.

5.02 THE MOTOR SHALL HAVE ON LINE GREASING FACILITY.

5.03 THE MOTOR CONSTRUCTION SHALL BE SUITABLE FOR EASY DISASSEMBLY AND REASSEMBLY.

5.04 THE MOTOR SHALL BE SUITABLE FOR WORKING IN AN ENVIRONMENT OF OIL FUMES WITHOUT ANY HAZARD. ENVIRONMENT!OF OIL FUMES WITHOUT ANY HAZARD.

5.05 SEPARATE TERMINAL BOX FOR SPACE HEATERS SHALL BE PROVIDED.

5.06 MOTOR SHALL BE PAINTED WITH PAINT SUITABLE FOR WORKING CONDITION AND ITS COLOUR SHALL BE INTIMATED LATER ON.

5.07 THE MOTOR SHALL BE THOROUGHLY DEGREASED AND SHARP EDGES AND SCALES REMOVED AND TREATED WITH ONE COAT OF PRIMER AND TWO COATS dF ENAMEL PAINT. MOTOR FAN ALSO BE PAINTED TO WITHSTAND CRRSION.

6.00 TESTS AT MANUFACTURER'S WORKS:-

(i) MOTOR AFTER COMPLETE ASSEMBLY SHALL BE SUBJECTED TO BOTH TYPE AND ROUTINE TESTS AS PER IS: 4722. TYPE TEST SHOULD NOT BE MO,RE THAN 5 YEARS OLD w.r.t. DATE OF ORDERING.

(ii) IN ADDITION THE FOLLOWING TESTS SHALL ALSO BE CARRIED OUT:

12-01-2016 SIGN. & DATE		<b>3c&lt;ili; JUCiiCb</b>  <b>STEAM TURBINE ENGINEERING          PRODUCT STANDARD</b>	<b>ST39003</b>  पृष्ठ 13 का 9  Page 9 of 13
12-01-2016 SIGN. & DATE		<b>3c&lt;ili; JUCiiCb</b>  <b>STEAM TURBINE ENGINEERING          PRODUCT STANDARD</b>	<b>ST39003</b>  पृष्ठ 13 का 9  Page 9 of 13
12-01-2016 SIGN. & DATE		<b>3c&lt;ili; JUCiiCb</b>  <b>STEAM TURBINE ENGINEERING          PRODUCT STANDARD</b>	<b>ST39003</b>  पृष्ठ 13 का 9  Page 9 of 13

REV. NO. 08

WORKEDIYY	DHARAMPAL		15/06/06
CHECKED BY	ANUJ JAIN		15/6/06

विनांक एवं दिनांक SIGN & DATE  <b>B</b>	<b>B</b>	<p style="text-align: center;"><b>उत्पाद मानक</b></p> <p style="text-align: center;"><b>PRODUCT STANDARD</b></p> <p style="text-align: center;">(STEAM TURBINE ENGINEERING)</p>	<p style="text-align: right;"><b>ST- 39003</b></p> <p style="text-align: right;">110 13 (ft 10</p> <p style="text-align: right;"><b>Page 10 Of 13</b></p>				
भारती सूची संख्या की अधिकारिता कक्षा में	<p style="text-align: center;"><u>ADDITIONAL "TYPE TESTS:</u></p> <p>(a) DEGREE OF PROTECTION TEST TO CONFORM TO THE SPECIFIED OGRE£ OF PROTECTION. IN CASE THE TEST IS ALREADY CARRIED ON THE SAME FRAME SIZE OF MACHINE, THEN TEST REPORT S OULD BE FURNISHED.</p> <p style="text-align: center;">ADDITIONAL ROUTINE TESTS:</p> <p>(a) 20% OVERSPEED TEST FOR 2 MINUTES.</p> <p>(b) MEASUREMENT OF VIBRATION AS PER IS: 12075.</p> <p>(c) MEASUREMENT OF NOISE AS PER IS: 12065. MOTOR NOISE LEVEL SHALL BE LIMITED SO AS TO ACHIEVE PUMP-MOTOR SET NOISE LEVEL AS GIVEN IN CLAUSE 7.4 ON PAGE-3.</p>						
<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this documents 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	<p>7.0 DOCUMENTS TO BE SUPPLIED WITH OFFER :—</p> <p style="text-align: center;">THE OFFER SHOULD BE ACCOMPANIED WITH FOLLOWING DOCUMENTS IN TWO COPIES. THE OFFER WILL NOT BE CONSIDERED IF ALL THESE DOCUMENTS ARE NOT SUPPLIED.</p> <p>7.1 CHARACTERISTICS AT 80% , 100% AND 110% VOLTAGES:</p> <p>7.1.1 STARTING CURRENT V/S TIME.</p> <p>7.1.2 TORQUE V/S SLIP.</p> <p>7.1.3 THERMAL WITHSTAND CHARACTERISTIC FOR HOT AND COLD CONDITION.</p> <p>7.2 TYPE AND FRAME SIZE.</p> <p>7.3 STARTING TIME.</p> <p>7.3.1 WITH 100% VOLTAGE AT TERMINAL.</p> <p>7.3.2 WITH 85 % VOLTAGE AT TERMINAL.</p> <p>7.3.3 WITH 80 % VOLTAGE AT TERMINAL.</p> <p>7.4 SAFE STALL TIME AT 100 % RATED VOLTAGE UNDER HOT CONDmON.</p> <p>7.5 POWER (KW) RATING CALCULATION w,r.t. PUMP REQUIREMENT.</p> <p>7.6 EXPECTED UFE OF BEARING.</p> <p>7.7 DATA IN RESPECT OF ALL ITEMS MENTIONED AT PARA 1.0 TO 5.0 OF ANNEXURE I.</p> <p>8.0 <u>DOCUMENTS TO BE BJRNSHED WITHIN FOUR WEEKS OF PLACENEW OF ORDER (FOR BHEL OR IIFIR CUSTOMER'S APPROVAL.) —</u></p> <p>8.1 SIX HARD COPIES AND ONE SOFT COPY (IN PDF FORMAT) OF MOTOR DATA SHEET AND G.A. DRAWING.</p> <p>8.2 DRAWING SHOWING TERMINAL DETAIL OF ALL TERMINALS AND LOCATION AND DIMENSION OF TERMINAL BOXES.</p> <p>8.3 ROTOR WEIGHT AND TOTAL MOTOR WEIGHT.</p> <p>8.4 CHARACTERISTIC CURVES OF THE MOTOR.</p> <p>9.0 SIX COPIES OF TESTS CARRIED OUT AS PER CLAUSE NO. 6.0 ON EACH MOTOR SHALL BE FURNISHED TO BHEL FOR SCRUTINY AND APPROVAL ONLY ON ACCEPTANCE FROM BHEL SIDE, MOTOR CAN BE CONSIDERED SUITABLE FOR DISPATCH.</p>						
स्वयंसाधिकाए एवं गोपनीय इस दस्तावेज में की गई सूचना भारत के ही इलेक्ट्रिकल्स की संपत्ति है इसका प्रयोग एवं प्रसारण केवल ही भारती सूची संख्या में ही किया जाए							
दिनांक एवं विनांक SIGN & DATE 21/9/06							
भारती सूची संख्या INVENTORY NO. P-5134	REV. NO. 08	.e!"	<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">         त्रि-रिजिस्ट्रार WOUCEDBY       </td> <td style="width: 50%;">         DHARAMPAL       </td> </tr> <tr> <td style="width: 50%;">         त्रि-रिजिस्ट्रार CHECKIDBY       </td> <td style="width: 50%;">         ANUJ JAIN       </td> </tr> </table> <p style="text-align: right; font-size: 2em;"><b>TJJ</b></p> <p style="text-align: right; font-size: 1.5em;"><b>*k.</b></p> <p style="text-align: right; font-size: 1.5em;"><b>IL(d)</b></p>	त्रि-रिजिस्ट्रार WOUCEDBY	DHARAMPAL	त्रि-रिजिस्ट्रार CHECKIDBY	ANUJ JAIN
त्रि-रिजिस्ट्रार WOUCEDBY	DHARAMPAL						
त्रि-रिजिस्ट्रार CHECKIDBY	ANUJ JAIN						



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ST- 39003

**PRODUCT STANDARD**  
( STEAM TURBINE ENGINEERING)

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Page 11 of 13

ANNEXURE-II

**DATA TO BE FURNISHED BY BIDDER ALONGWITH  
OFFER FOR JACKING OIL PUMP**

- 1.0 EQUIPMENT AND SERVICES OFFERED  
PLEASE STATE WHETHER THE FOLLOWING EQUIPMENT SERVICE AS SPECIFIED IN THE DATA SHEETS 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 DRAWING. 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
- 1.9 NO. OF PUMPS OFFERED.
- 2.0 DESIGN AND PERFORMANCE.
- 2.1 DESIGNED CAPACITY OF EACH PUMP. M<sup>3</sup>/hour
- 2.2 NORMAL DISCHARGE PRESSURE
- 2.3 EFFICIENCY
- 2.4 RATED SPEED
- 2.5 PERFORMANCE GUARANTEED 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)
- 2.8 MAXIMUM DISCHARGE PRESSURE FOR WHICH PUMP IS SUITABLE.
- 2.9 PARTY SHALL INFORM THE FILTRATION LEVEL OF THE FLOW MEDIA FOR PROPER FUNCTIONING OF PUMP.
- 3.0 MATERIAL OF CONSTRUCTION
- 3.1 CASING
- 3.2 DRIVING AND DRIVEN SPINDLE SCREW
- 3.3 BASE PLATE
- 3 WEARING RINGS
- 3.5 TYPE OF BEARINGS USED
- 3.6 TYPE OF COUPLING
- 3.7 PACKING
- 4.0 CONNECTIONS
- 4.1 SUCTION SIZE
- 4.2 DISCHARGE SIZE YES/NO
- 5.0 DRAWINGS
- 5.1 GENERAL ARRANGEMENT AND SECTIONAL DRAWING ENCLOSED WITH OFFER.
- 6.0 WEIGHT SCHEDULE
- 6.1 WEIGHT OF PUMP
- 6.2 WEIGHT OF MOTOR
- 6.3 WEIGHT OF PUMP WITH MOTOR AND BASE FRAME.
- 7.0 CHARACTERISTIC CURVES

1. & NICT C TIL & D 5  
 BHEL  
 13/7/07  
 SIGN & DATE  
 13/7/07

INVENTORY NO. P-5134

REV.NO.  
**09**

	DHARAMPAL	<i>Dharampal</i>	26-06-07
WORKED BY	ANUJ JAIN		
CHECKED BY		<i>Jain</i>	26-06-07

दिनांक एवं तिथि  
SIGN & DATE



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**PRODUCT STANDARD**  
( STEAM TURBINE ENGINEERING)

**ST- 39003**

13 of 12

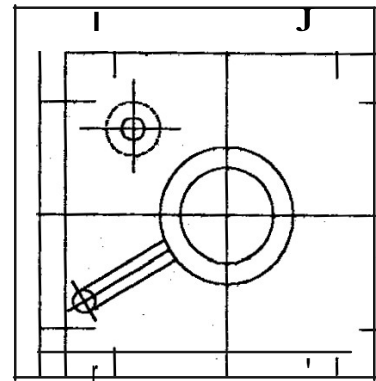
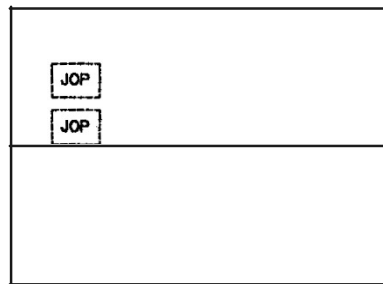
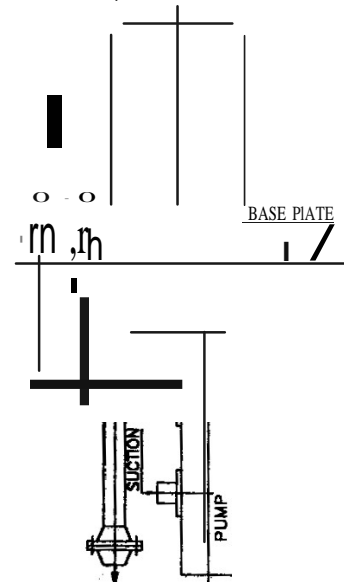
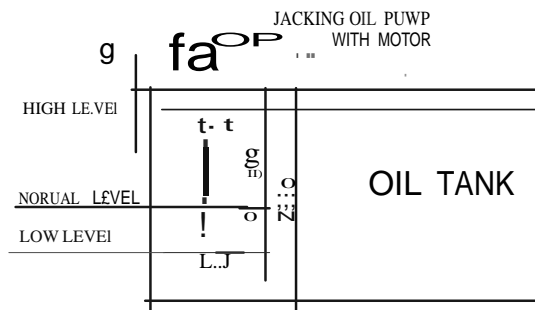
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संपत्ति सूची संख्या को  
अनुसंधान संख्या

- 7.1 POWER CONSUMPTION / DISCHARGE PRESSURE
- 7.2 DISCHARGE QUANTITY / DISCHARGE PRESSURE
- 7.3 DISCHARGE QUANTITY / EFFICIENCY
- 8.0 ANY DEVIATION TAKEN AGAINST SPECIFICATIONS. YES/NO
- 9.0 DEVIATIONS TAKEN AS MENTIONED HERE
- 10.0 HYDRAULIC TEST PRESSURE

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### OIL TANK ARRANGEMENT



स्वत्वाधिकार एवं गोपनीय  
इस दस्तावेज में की गई सूचना भारत की इलेक्ट्रिकल लिमिटेड की संपत्ति है इसका प्रयोग एवं प्रकाशक का अधिकार है किसी भी रूप में प्रयोग, जो कि कंपनी के हित में हानिकारक हो न किया जाए

दिनांक एवं तिथि  
SIGN & DATE

29/6/66

REV. NO.

08

WORKED BY

र.प्रतिभा

DHARAMPAL

CHHECKED BY

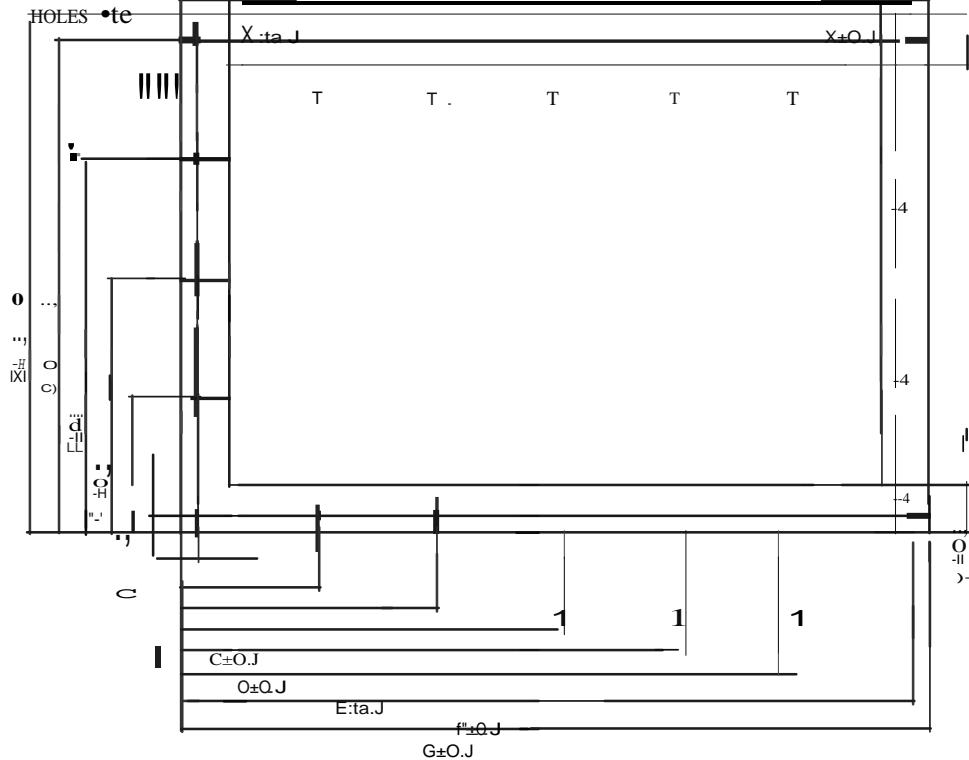
ANUJ JAIN

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**3C-2UG**  
**PRODUCT STANDARD**  
 (STEAM TURBINE ENGINEERING)

**BED PLATE EXISTING ON OIL TANK**



BED PLATE TYPE	A±0.J	8±0.3	C±0.J	O±0.3	E±0.J	F±0.J	J±0.J	G±0.J	H±0.3	J±0.J	X±0.J	NO. OFF HOLES	
M	700	700	50	250	<450	650	-	-	-	-	80	80	12
BB	700	700	35	245	455	665	-	-	-	-	60	60	12
CC	1320	900	30	240	450	660	870	1080	1290	85	85	20	

CROSS REFERRED STANDARDS: IS:325 • 15:2253 • 15:2254 • 15:3202 • IS:4027 • 15:4722 • 15:12065 • IS:12075 , VDMA:24284.

REV. NO.

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WORKED BY

DHARAMPAL

ANUJ JAIN  
CHECKED BY

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