



CLAUSE NO.	QUALITY ASSURANCE	
	<p>(2) Pump impeller shall be subjected to suitable NDT method like MPI/DPT for surface defect examination. Impeller of turbine shaft mounted main oil pumps shall also be subjected to an over speed test as per the guide lines followed for HP rotor.</p> <p>(3) Pump casing shall be subjected to hydraulic pressure test at 1.5 times the design pressure or meeting any national / international standard.</p> <p>(4) All pumps shall be performance tested at the manufacturer's works. Test shall include check for vibration and noise levels also. Procedure for performance testing shall be submitted to Employer for approval.</p> <p>(b) Oil purifiers.</p> <p>(1) All pressure parts will be subjected to hydraulic pressure test.</p> <p>(2) Components/parts of the equipment shall be subjected to suitable NDT depending upon the criticality of the application to ensure freedom from surface and sub surface defects.</p> <p>(3) All rotating parts like bowl assembly etc., shall be subjected to static and dynamic balancing test. In case of coalescer type oil purifier balancing test is not applicable.</p> <p>(4) The complete purifier shall be tested at manufacturer's works for capacity, mechanical running sequential operation and interlocks, moisture content, vapour tightness, vibration, noise level, quality improvements etc. Sample shall be drawn from inlet and outlet of purifier after works test and shall be tested for moisture content, chemical tests and particle size of impurities.</p> <p>(c) REFER RELEVANT CLAUSES OF THE SPECIFICATION FOR OTHER ITEMS SUCH AS PIPING, HEAT EXCHANGERS, VALVES, FILTERS, BLOWERS / EXHAUSTERS ETC IN THIS SYSTEM.</p>	
1.03.00	AIR COOLED CONDENSERS FOR MAIN TURBINE AND DRIVE TURBINE (IF OFFERED)	
1.03.01	<p>FABRICATION OF CONDENSER AND ACCESSORIES</p> <p>(a) All welds shall be visually examined. Radiographic examination of 10% of butt welds shall be carried out. However, for vacuum containing welds, R.T on at least 10% of each butt weld shall be carried out. Surface defect examination by magnetic particle inspection or equivalent test method shall be carried out for minimum 10% weldments. This shall apply to site welds also.</p> <p>(b) All edge preparations shall be examined for surface defects. Edge preparation for welds to be carried out at site shall be checked by magnetic particle inspection/Dye penetrant examination method before despatch.</p> <p>(c) In case of fabricated flanges, welds shall be checked by 100% radiographic/ultrasonic and 100% magnetic particle inspection methods to ensure freedom from internal and surface defects.</p>	
EPC PACKAGE FOR PATRATU SUPER THERMAL POWER STATION EXPANSION PHASE-I (3X 800MW)	TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC NO.: CS-9585-001-2	SUB-SECTION-E-08 STEAM TURBINE GENERATOR Page 11 of 21

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1.03.02	<p>FAN</p> <p>(a) Ultrasonic Test shall be carried out on shaft material diameter ≥ 40 mm.</p> <p>(b) Fan hub and fan blade shall be tested as per relevant material code requirement and shall be tested for internal defects as per relevant code.</p> <p>(c) Moment weight test on blades, blade track variation, tip clearance shall be checked.</p> <p>(d) In case of fabrication of hub and blades by welding, the weld joint shall be tested by RT.</p> <p>(e) Assembly fit up and balancing shall be checked.</p>			
1.03.03	<p>GEAR BOX</p> <p>(a) Gear box shall be tested as per relevant standard for performance, noise, vibration etc.</p> <p>(b) Gear box shall be tested for no load run test for 4 hours.</p>			
1.03.04	<p>MOTOR</p> <p>The respective specification covered elsewhere is to be referred.</p>			
1.03.05	<p>Piping</p> <p>(a) All piping joint shall be tested for 10% RT/UT. IBR code regulations 1950 shall be ensured for IBR piping and relevant original IBR certificates shall be furnished.</p> <p>(b) Condenser tubes/finned tubes shall be tested as per the requirements of relevant codes and standards.</p>			
1.03.06	<p>Steam Throw Off Device</p> <p>(a) Edge preparations shall be examined for surface defects by MPI/DPT. 10% radiographic or ultrasonic examination shall be carried out for all weldments.</p> <p>(b) Welds shall be subjected to surface defect examination by 10% magnetic particle/dye penetrant examination.</p>			
1.03.07	<p>SPRING ASSEMBLY (IF REQUIRED)</p> <p>(a) Static load testing of the springs shall be carried out and spring characteristics shall be drawn and verified.</p> <p>(b) Surface defect test shall be carried out on all the springs after coiling and heat treatment.</p> <p>(c) Surface cleaning shall be checked prior to painting and check for thickness of painting shall be carried out.</p>			
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CLAUSE NO.	QUALITY ASSURANCE	<div>एनटीपीसी NTPC</div>		
1.04.00	Condenser air evacuation system for main turbine condenser and drive turbine condenser (if offered)			
1.04.01	Pumps (a) Vacuum pump shafts shall be subjected to ultrasonic test. After finish machining, shaft shall be subjected to magnetic particle examination/dye penetration test. (b) Pump casings and impellers shall be subjected to magnetic particle/dye penetration test. Finished pump rotor shall be subjected to dynamic balancing. (c) Pump casings shall be subjected to hydraulic test at 1.5 times the shut off pressure or twice the maximum operating pressure, whichever is higher. (d) Each pump shall be tested at supplier's works at full speed and load conditions to demonstrate successful operation and performance in accordance with the design requirements. (e) Supplier shall demonstrate by carrying out visual cavitation test that pump will be operating under all operating condition including blank off condition without cavitation. (f) REFER RELEVANT CLAUSES OF THE SPECIFICATION FOR OTHER ITEMS SUCH AS HEAT EXCHANGERS, FILTERS, PIPING, VALVES, ETC. IN THIS SYSTEM.			
1.04.02	The complete package shall be subjected to hydraulic pressure and leakage test and shop tested to check interlocks and functional requirements. The one complete unit shall also be subjected to demonstrate successful operation and performance testing, with saturated air conditions at condenser design vacuum point as well as vacuum pump design point with total minimum three points. The test should be conducted with the respective motors to be supplied. The test shall include check for vibration and noise level.			
1.05.00	FEED WATER HEATER, DRAIN COOLERS, GLAND STEAM CONDNSER, HEAT EXCHANGERS & PRESSURE VESSELS / STORAGE TANKS			
1.05.01	All raw materials used shall have co-related mill test certificate meeting mandatory and supplementary checks of material specification.			
1.05.02	Material for Tube plates shall be ultrasonically tested. Finished plates shall be subjected to suitable NDT. For claddd plates, bonding shall be checked by UT. Vendor shall furnish their practice regarding manufacturing & NDT for supply of claddd plates for Employer's review. Drilled Tube plates shall be checked for ovality of holes, ligaments, surface finish etc.			
1.05.03	Dished ends shall be subjected to 100% MPI and RT/UT on welded joints. Knuckle portion shall be checked by MPI for surface defects and thinning shall be checked by UT.			
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