CONTENTS

1.0 SCOPE:

This Procedure covers the general requirement for hydro testing of Pressure parts, piping, and equipments etc.at project site.

2.0 PURPOSE:

This Procedure provides guidelines on requirements, performance, inspection and documentation for hydrostatic testing.

3.0 AREA OF APPLICATION :

This procedure is applicable to perform hydro testing of Pressure parts, piping, equipments etc. for erection & associated works of Boiler & Auxiliaries & TG auxiliaries of 4X135 MW TPP at warora.

4.0 REFERENCE DOCUMENTS:

4.1 ASME SEC-I

4.2 ASME B 31.1

4.3 Indian Boiler Regulation (IBR)

4.4 Approved Drawing

4.5 Project Specification

5.0 PRE-REQUISITES:

5.1 Pressure parts, piping Material should be erected as per approved drawing.

5.2 All pipes should be physically examined from outside and for large pipe visual inspection from inside shall also be performed.

5.3 All inspection reports i.e. final visual, NDT, PWHT, PMI etc. (Mechanical & NDT clearance) should be reviewed and signed by Client/Owner.

5.4 All pressure gauges should be calibrated & within specified ranges.

5.5 All supports should be installed as per approved drawing.

6.0 EQUIPMENTS & ACCESSORIES:

6.1 Filling pump & Pressurizing pump.

6.2 Filling & pressurizing hose, gate valve, pressure relief valve, NRV for Filling/pressurization/venting & draining line

6.3 Calibrated pressure gauge with valid calibration certification min. two (02) nos.

6.4 Filtered water & Hand Tools.

7.0 GENERAL REQUIRMENTS/TEST PREPARATION FOR TESTING:

7.1 Before pressure testing, all piping shall be cleaned by flushing with cleaned filtered water, to make it free from dirt, loose scale, debris and other loose foreign material.

7.2 Testing shall be carried out with permanent gasket unless specified.

7.3 All system to be hydro tested shall be vented at the high points & drained at the low points.

7.4 Wherever in the system, any void exists like absence of control valves, instruments etc. it shall be filled with temporary spools

7.5 All weld joints, mechanical joints, screwed or flange etc. shall be left exposed for examination during the test.

7.6 Before pressurizing the system, each weld joint shall be cleaned by wire brush to free it from rust or any other foreign matter.

7.7 Lines which are directly open to atmosphere need not be tested, but all joints shall be visually inspected.

7.8 Ensure all flanged and bolted connections are tight.

8.0 TEST MEDIUM; TEST PRESSURE & TEST PRESSURE GAUGE:

8.1 TEST MEDIUM:

8.1.1 Hydro testing shall be carried out using clean & filtered water.

8.1.2 System subjected to DM water shall be tested with DM water only.

8.1.3 Water temperature during hydro test shall be recorded but in no case less than 20^0C.

8.2 TEST PRESSURE:

8.2.1 Hydro test pressure shall be as per approved drawing, project specification

and applicable codes/standards.

8.3 TEST PRESSURE GAUGE:

8.3.1 All gauges used for hydro testing shall be within specified range as per approved drawing, project specification and applicable codes/standards. Digital type pressure gauge may be used without range restriction provided the combined error due to calibration and reliability dose not exceed 1% of test pressure.

8.3.2 Gauge shall be of a good quality and in first class working condition.

8.3.3 Prior to hydro test, all (Min. Two (02) nos) test pressure gauge shall be calibrated & valid calibration certificate shall be maintained.

9.0 TESTING PROCEDURE:

9.1 All vents and other connections used as vents shall be left open while filling the system with test fluid for complete removal of air.

9.2 For pressurising & depressurising the system, temporary isolation valves shall be provided if vents, drains do not exist in the system.

9.3 Pressure shall be applied only after the system/line is ready and clearance from client/owner.

9.4 Pressure shall be applied by means of suitable test pump or other pressure source which shall be isolated from the system as soon as pressure is reached and stabilized the system.

9.5 A pressure gauge shall be provided at the pump discharge for guidance in bringing the system to the required pressure.

9.6 The pump and the system to be tested shall be provided with separated calibrated test pressure gauge.

9.7 The pump shall be attended constantly during the test by an authorized person & shall be isolated from the system whenever the pump is to be left unattended.

9.8 Test pressure shall be maintained for a sufficient length of time to permit thorough inspection of all joints for leakage. Test period shall be maintained as per approved drawing, project specification and applicable codes/standards.

9.10 Care shall be taken to avoid increase in the pressure due to temperature variation during hydro test.

10.0 COMPLETION OF TESTING:

10.1 After hydro test has been completed, pressure shall be released in a manner and at a rate so as not danger to personnel or damage equipment.

10.2 All vents and drains shall be opened before the system is to be drained and shall remain open till all draining is complete so as to prevent formation of vacuum in the system.

10.3 After testing is competed the test blind shall be removed and system/piping isolated during hydro testing shall be connected using specified gasket, bolts, nuts etc.

10.4 Any joint found leaking during hydro test shall be retested to the specified pressure after repair.

11.0 ACCEPTANCE CRITERIA:

11.1 No leak on welded joints, mechanical joints and distortion shall be acceptable.

11.2 No leak on valve gland and bonnet or any other joint shall be acceptable.

11.3 The drop in pressure shall not be more than 1% per hour of the test pressure.

11.4 All unacceptable leakages shall be repaired & areas of repair shall be retested.

12.0 SAFTY:

12.1 To ensure that all personnel involved are adequately protected during the course of the hydro test.

12.2 No working on pressurized system shall be permitted.

12.3 pressurized systems shall not be left unattended.

12.4 The instruments, system etc. which are not designed for the test pressure shall be disconnected or isolated.

12.5 Orifices, discs, strainers shall be removed before hydro test.

13.0 RECORDS:

13.1 Records shall be maintained as per attached sample formats.

14.0 ATTACHMENTS:

14.1 Record of pressure test.

RECORD OF PRESSURE TEST

PROJECT : 4 X135 MW TPP,WORRORA	**UB ENGINEERING LTD**	**FORMAT NO :** UBEL/ WPCPL/ PRT/F-
OWNER:KSK	**RECORD OF PRESSURE TEST**	**REPORT NO:**
CLIENT:		**DATE:**

(A) CLERANCE FOR PRESSURE TESTING

	CHECKS	UBEL	CLIENT/ OWNER
1) Required Test Pressure & Medium :	Review		
2) Clearance of Testing Available:	Review		
3)Prior to Hydro-Test Punch Point (Enclosed) :	Review		
4) Requirment of Witness by Inspection Authority:	Review		
5) Capacity of Pressurizing Pump :	Review		
6) Pre-Test Flushing :	Review		
7) Requirment of Pressure Range & No. of Gauges :	Review		

LOOP CLEARED FOR PRESSURE TESTING :

	UBEL	CLIENT/OWNER
SIGNATURE:		
NAME:		
DATE:		

(B) PRESSURE TEST WITNESSED AND FOLLOWING DETAILS CHECKED

				CHECKS	UBEL	CLIENT/ OWNER
1) Cordon off Area For High Pressure Loop :				Witnessed		
2) Location & Capacity of Pressure Pump Used :				Witnessed		
3) Test Limit :				Witnessed		
4) Changed Test Limit Marked in Continuation Lopp File (If any) :				Witnessed		
5) Test Medium Used :				Witnessed		
6) Filling & Venting Completed at :			(AM/PM)			
7) Pressurising Completed at :			(AM/PM)			
8) Test Pressure (Actual):			(AM/PM)	Witnessed		
9) Testing Completed at :			(AM/PM)	Witnessed		
10) Pressure Gauge Details Used For Testing:						
	Gauge 1	Gauge 2	Gauge 3			
Tag. No :				Witnessed		
Range				Reviewed		
Cert. No				Reviewed		
Validity				Reviewed		
Location				Witnessed		
Pr. Reading				Witnessed		

PRESSURE TEST WITNESSED AND ACCEPTED BY :

	UBEL		CLIENT/OWNER
	EXECUTION	QA/QC	
SIGNATURE:			
NAME:			
DATE:			