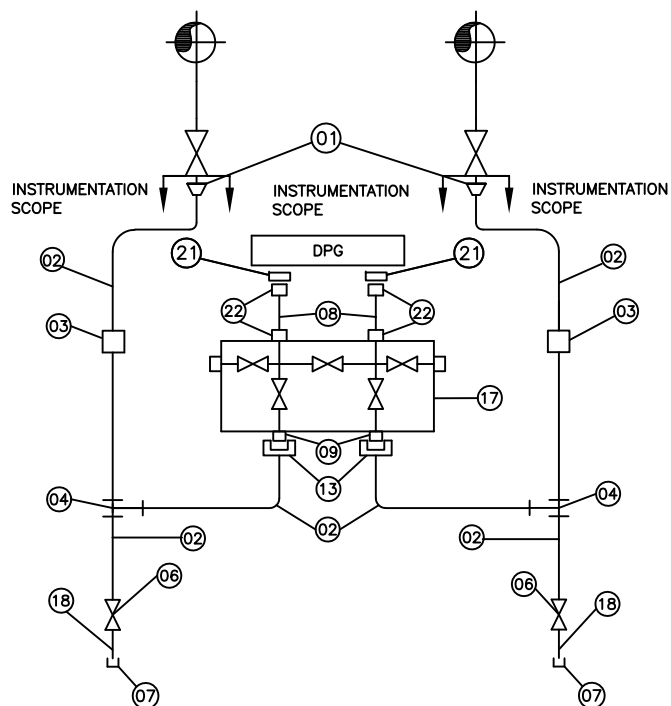
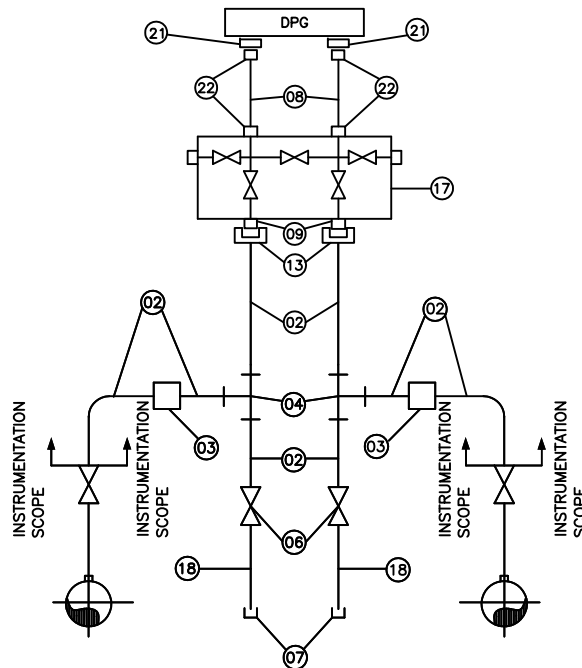




WATER SERVICE



AIR SERVICE

ITEM NO	ITEM/DESCRIPTION	MATERIAL	SIZE	QTY	
				WATER	AIR
01	REDUCER (IF APPLICABLE)	SS316	1" X 1/2"SW	02	00
02	SEAMLESS PIPE	SAME AS MAIN PIPE	1/2"	A/R	A/R
03	FORGED COUPLING	SAME AS MAIN PIPE	1/2" SW	A/R	A/R
04	FORGED TEE	SAME AS MAIN PIPE	1/2" SW	02	02
06	FORGED GLOBE VALVE	SAME AS MAIN PIPE	1/2" SW	02	02
07	CAP	SAME AS MAIN PIPE	1/2" NPTF	02	02
08	SEAMLESS TUBE	SS316	1/2" OD	A/R	A/R
09	ADAPTOR – M TO M	SS316	M20X1.5M X 1/2" NPTM	02	02
17	FIVE VALVE MANIFOLD WITH DRAIN PLUG	SS316	1/2" NPTF	01	01
16	CHEMICAL SEAL	SS316	1/2" NPTF X 1/2" NPTF	00	00
13	NUT & TAIL PIECE WITH ANNEALED COPPER/SS304 WASHER	SS316	NUT SIZE : M20 X 1.5 WITH 100MM TAIL	02	02
18	NIPPLE	SAME AS MAIN PIPE	1/2" NPTM X 1/2" SW	02	02
22	TUBE FITTING DFDC	SS316	1/2" NPTM X 1/2"OD TUBE	04	04
21	CONNECTOR – F TO F	SS316	1/2" NPTF X 1/2" NPTF	02	02



TITLE :-

INSTRUMENT INSTALLATION DIAGRAM

DIFFERENTIAL PRESSURE GAUGES

DRG. NO.

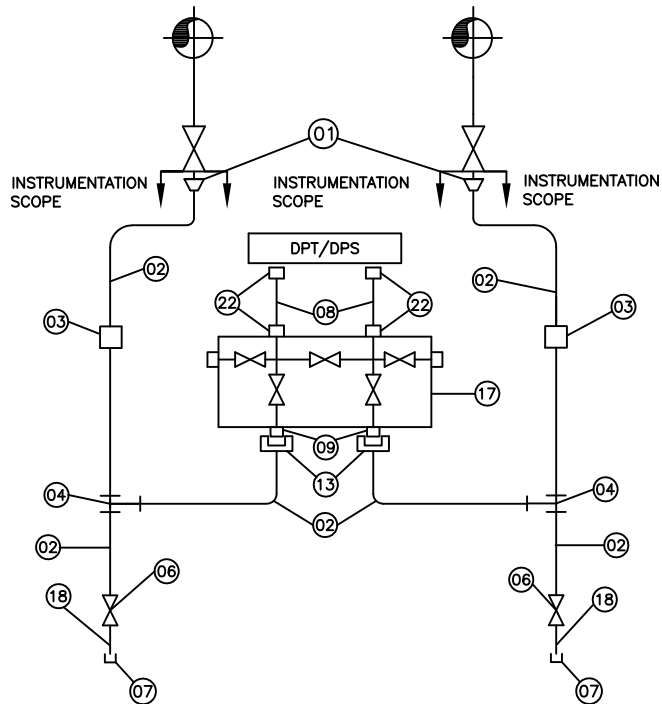
PE-DG-999-145-IXXX

REV. NO.

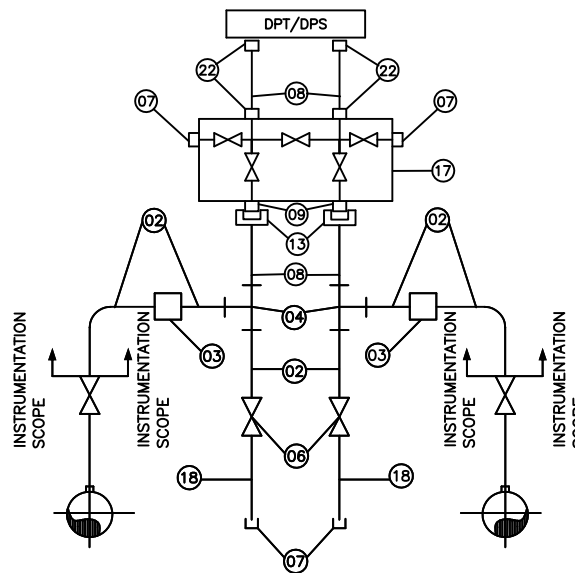
00 DATE 05.11.13

SHT

7 OF 9



WATER SERVICE



AIR SERVICE

ITEM NO	ITEM/DESCRIPTION	MATERIAL	SIZE	QTY	
				WATER	AIR
01	REDUCER (IF APPLICABLE)	SS316	1" X 1/2"SW	02	00
02	SEAMLESS PIPE	SAME AS MAIN PIPE	1/2"	A/R	A/R
03	FORGED COUPLING	SAME AS MAIN PIPE	1/2" SW	A/R	A/R
04	FORGED TEE	SS316	1/2" SW	02	02
06	FORGED GLOBE VALVE	SS316	1/2" SW	02	02
07	CAP	CS	1/2" NPTF	02	02
08	SEAMLESS TUBE	SS316	1/2" OD	A/R	A/R
09	ADAPTER – M TO M	SS316	M20X1.5M X 1/2" NPTM	02	02
17	FIVE VALVE MANIFOLD WITH DRAIN PLUG	SS316	1/2" NPTF	01	01
16	CHEMICAL SEAL	SS316	1/2" NPTF X 1/2" NPTF	00	00
15	CONNECTOR – M TO M	SS316	1/2" NPTM X 1/2" NPTM	00	00
13	NUT & TAIL PIECE WITH ANNEALED COPPER/SS304 WASHER	SS316	NUT SIZE : M20 X 1.5 WITH 100MM TAIL	02	02
18	NIPPLE	SAME AS MAIN PIPE	1/2" NPTM X 1/2" SW	02	02
21	CONNECTOR – F TO F	SS316	1/2" NPTF X 1/2" NPTF	00	00
22	TUBE FITTING DFDC	SS316	1/2" NPTM X 1/2"OD TUBE	04	04



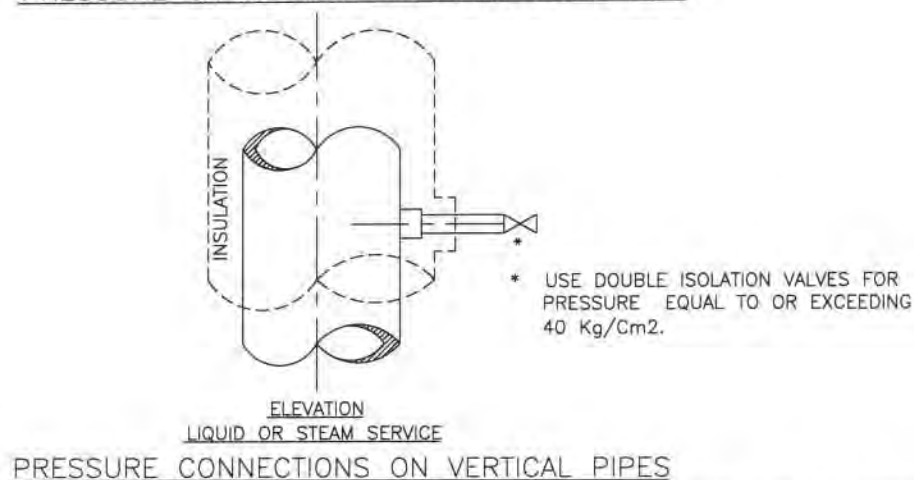
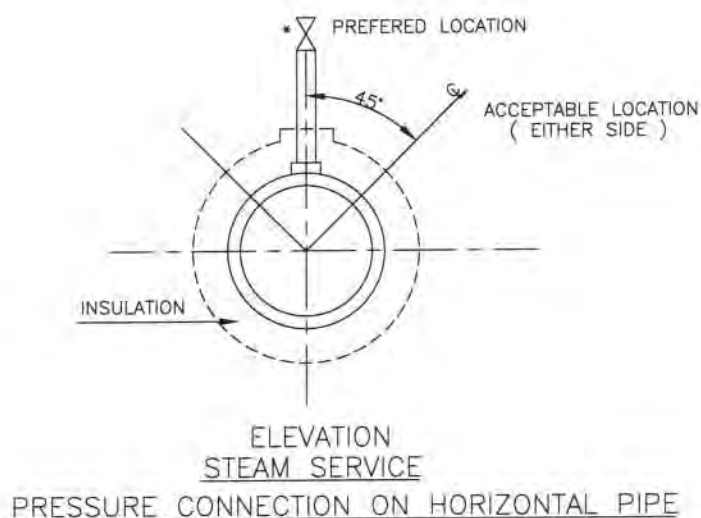
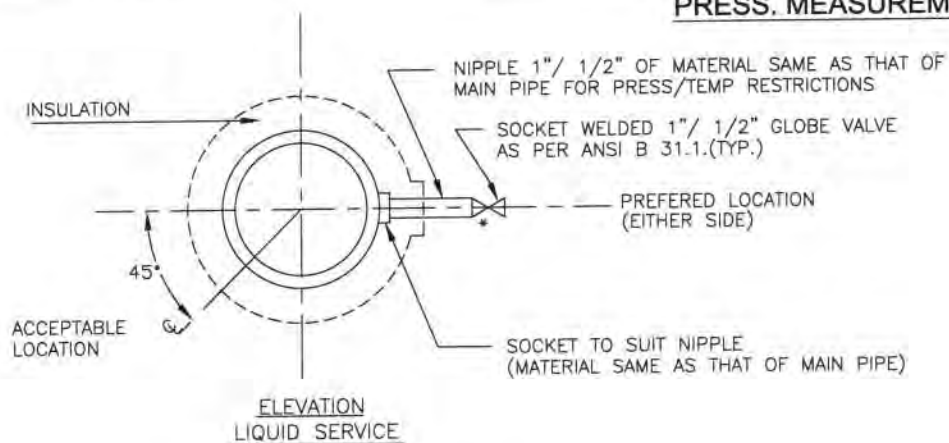
TITLE :-

INSTRUMENT INSTALLATION DIAGRAM

DIFFERENTIAL PRESSURE SWITCHES/TRANSMITTERS

DRG. NO.	PE-DG-999-145-IXXX			
REV. NO.	00	DATE	05.11.13	
SHT	8	OF	9	

PRESS. MEASUREMENT

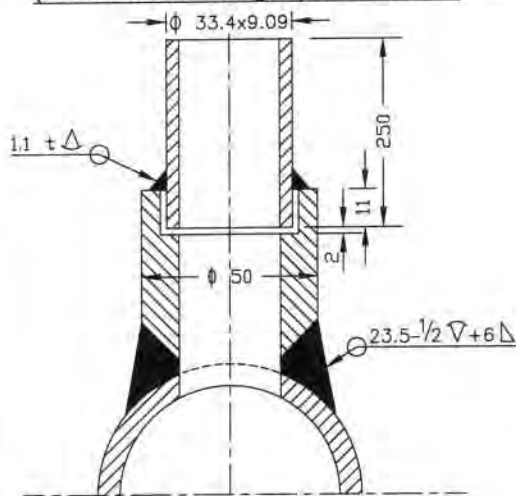


FOR TENDER PURPOSE ONLY

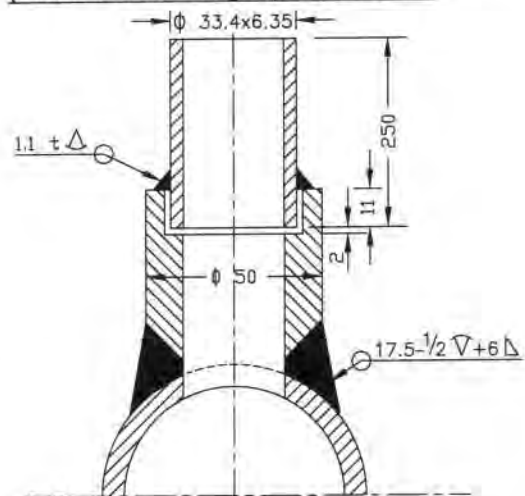
एन टी पी सी NTPC NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION									
PROJECT TYPICAL THERMAL POWER PROJECT									
TITLE INSTRUMENT SOURCE CONNECTION DETAILS									
A	FIRST ISSUE								
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	CAI	ARCH. APPD. DATE
Cleared By									
SIZE	A4	SCALE	N.T.S.	DRG. NO.	0000-999-POI-A-035				REV. NO.
					Sheet 1 of 14				A

PRESSURE MEASUREMENT

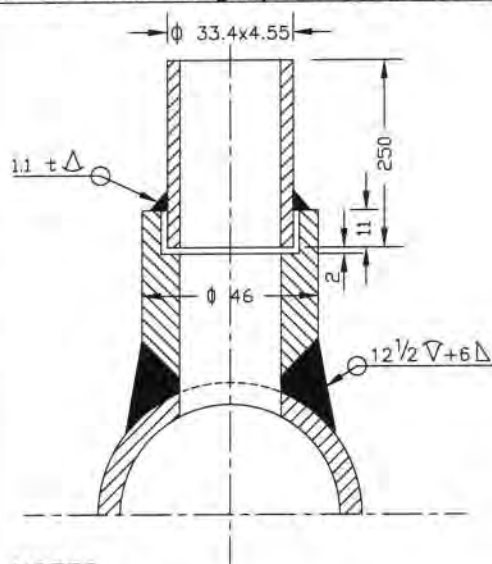
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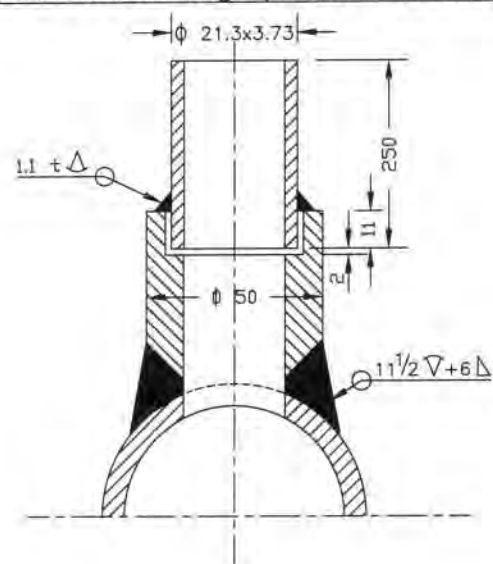
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(SYSTEM PR. <40Kg/Sq cm Nb 25 CL 3000)



(SYSTEM PR. <40Kg/Sq cm Nb 15 CL 3000)



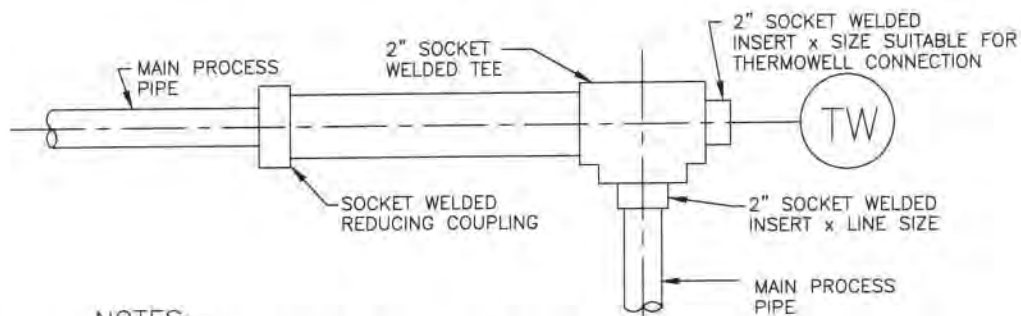
NOTES:-

1. MATERIAL OF THE BOSS AND NIPPLE SHALL BE THE SAME AS THE PIPE INTO WHICH IT IS WELDED AND CONFIRM TO ANSI B 16.11.
2. THE LENGTH OF THE NIPPLE SHOULD BE 250mm.
3. THE OTHER END OF THE NIPPLE SHALL BE SOCKET WELDED WITH 1" GLOBE VALVE OF MATERIAL AS PER ANSI B 16.1.
4. TWO ISOLATED VALVES ARE TO BE USED FOR PRESSURE = >40 Kg/Cm².
5. EDGE HOLE MUST BE CLEAN AND SQUARE OR ROUNDED SLIGHTLY (1/64" RADIUS) FREE FROM BURRS, WIRE EDGES OR OTHER IRREGULARITIES.
6. ORIENTATION OF TAP WILL BE VARY WITH TYPE OF PROCESS FLUID AND NATURE OF RUN OF THE PIPE.
7. ACTIVITIES TO BE COMPLETED AT THE SHOP, WELD THE COUPLING (OR BOSS) ON THE PIPE AND DRILL PRESSURE CONNECTION HOLE (SAME AS I D OF NIPPLE) IN THE PIPE IN ALIGNMENT WITH HOLE IN THE COUPLING.
8. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.

FOR TENDER PURPOSE ONLY

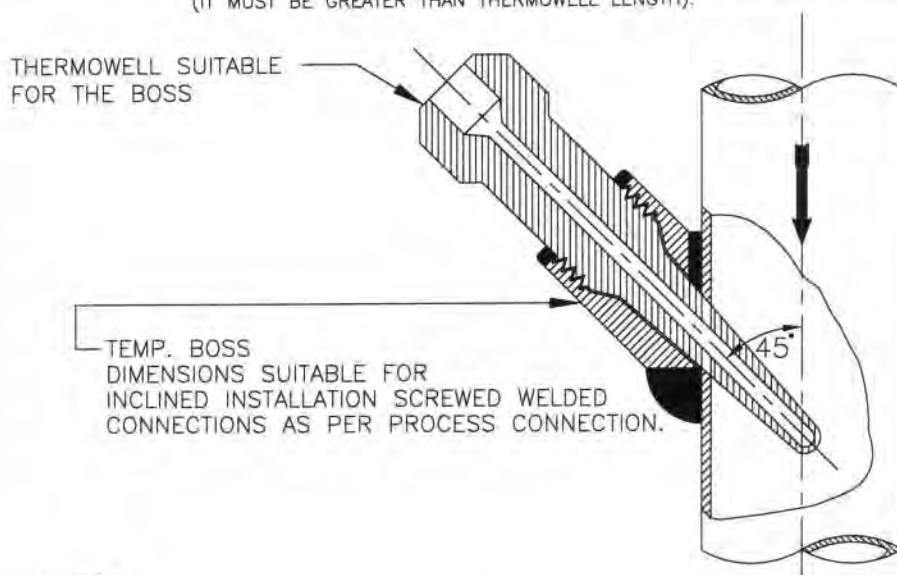
एन टी पी सी NTPC NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION													
PROJECT: TYPICAL THERMAL POWER PROJECT													
TITLE: INSTRUMENT SOURCE CONNECTION DETAILS													
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	C/L	ARCH.	APPR.	DATE		
A	FIRST ISSUE												
CLEARED BY										SIZE: A4	SCALE: N.T.S.	DRG. NO. 0000-999-POI-A-035	REV. NO. A
										SP-2 OF 14			

TEMP. MEASUREMENT



NOTES:-

1. THIS TYPE OF THERMOWELL INSTALLATION IS SUITABLE FOR THE PROCESS PIPE OF 2" NPS AND SMALLER.
2. FOR STEAM SERVICE THIS TYPE OF THERMOWELL INSTALLATION 90° BEND MAY BE USED ONLY IN VERTICAL PLANE.
3. THE LENGTH OF THE LARGER PIPE SECTION SHALL BE MINIMUM 150mm (IT MUST BE GREATER THAN THERMOWELL LENGTH).



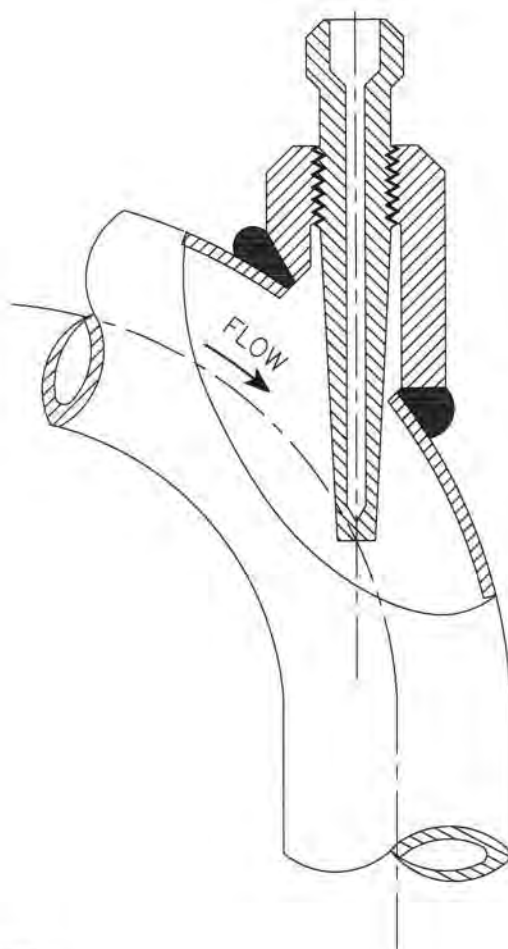
NOTES:-

1. INCLINED INSTALLATION OF THERMOWELL SHALL BE APPLICABLE FOR 4" AND SMALLER LINE SIZE BUT LIMITED TO MIN. 3" LINE SIZE.
2. FOR 2" AND SMALLER LINE SIZE NECESSARY EXPANDER OF MIN. 3" SIZE OF MAIN PIPING SPECIFICATION SHALL BE USED.
3. THIS TYPE OF INSTALLATION IS APPLICABLE FOR HORIZONTAL AND VERTICAL PIPE SECTION.
4. FOR STEAM SERVICES EXPANDER SECTION MAY BE USED ONLY IN VERTICAL RUN.
5. THE EXPANDER SECTION SHALL BE OF ADEQUATE LENGTH (ATLEAST 3-4 TIMES DIA OF THE MAIN PROCESS PIPE AT BOTH SIDE OF THE INSTALLED THERMOWELL).

FOR TENDER PURPOSE ONLY

एन टी पी सी NTPC NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION									
PROJECT TYPICAL THERMAL POWER PROJECT (SG PACKAGE) TITLE INSTRUMENT SOURCE CONNECTION DETAILS									
REV. NO. A DESCRIPTION FIRST ISSUE DRAWN DESIGN CHKD. M E C C&I ARCH. APPO. DATE 31.08.19 SIZE A4 SCALE N.T.S. DRG. NO. 0000-999/102-POI-A-035 REV. NO. A									
CLEARED BY Sh-4 Of 14									

TEMP. MEASUREMENT



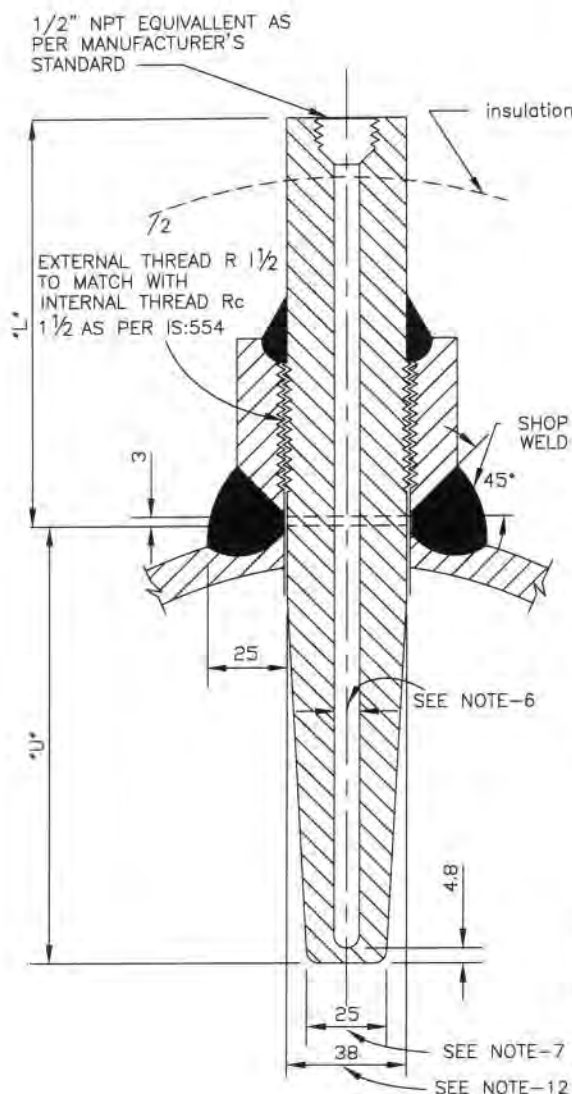
NOTES:-

1. FLOW INSTALLATION OF THERMOWELL SHALL BE APPLICABLE FOR 4" AND SMALLER LINE SIZE BUT LIMITED TO MINIMUM 3" LINE SIZE.
2. FOR 2" AND SMALLER LINE SIZE NECESSARY EXPANDER OF ELBOW FORM (AS SHOWN) OF MINIMUM 3" SIZE SHALL BE USED.
3. ELBOW EXPANDER SECTION IN HORIZONTAL PLANE MAY BE USED FOR LIQUID SERVICES. ONLY STEAM SERVICES EXPANDER SECTION MAY BE USED IN VERTICAL PLAN.

FOR TENDER PURPOSE ONLY

एन टी पी सी NTPC NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION									
PROJECT TYPICAL THERMAL POWER PROJECT TITLE INSTRUMENT SOURCE CONNECTION DETAILS									
REV. NO. A DESCRIPTION FIRST ISSUE DRAWN DESIGN CHKD. M E C DATE 30.06.18 SIZE A4 SCALE N.T.S. DRG. NO. 0000-999-POI-A-035 REV. NO. A									
SH-6 OF 14									

TEMP. MEASUREMENT



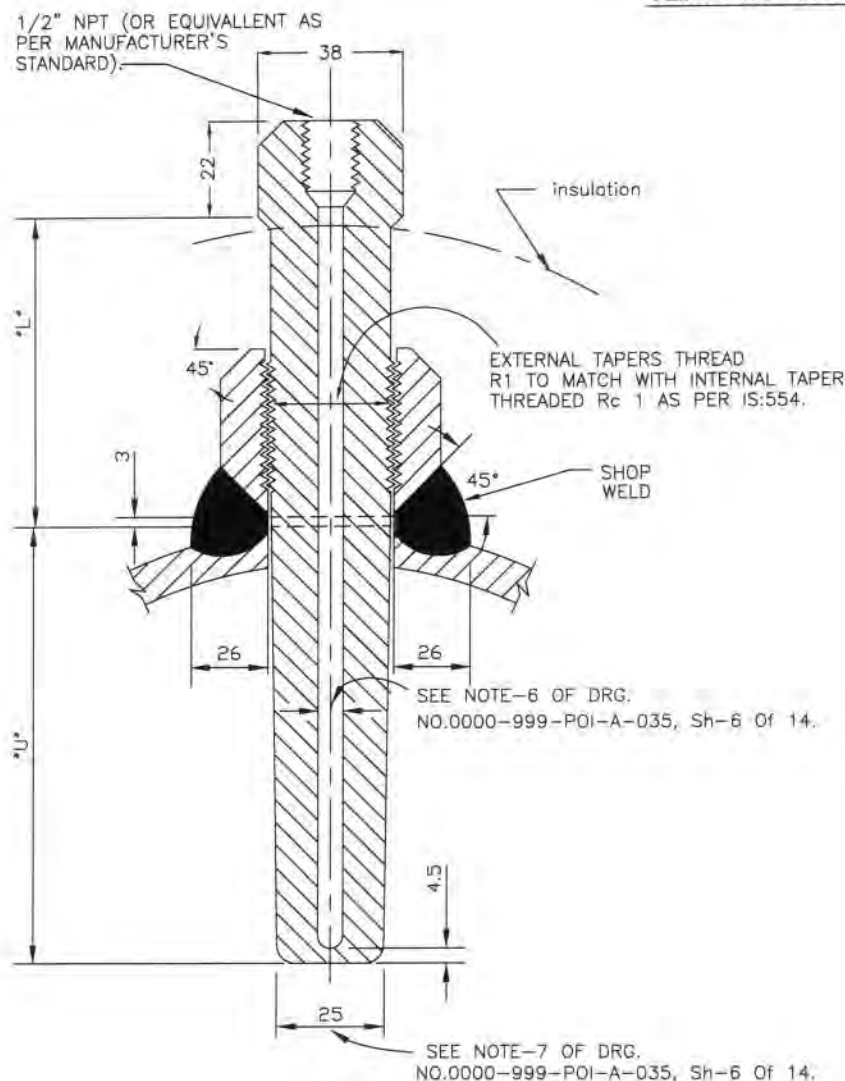
NOTES:-

1. THIS TYPE OF TEMPERATURE BOSS SHALL BE USED FOR THE PROCESS PRESS EQUAL/ABOVE 40 Kg/Cm²(g).
2. THE MATERIAL OF THE BOSS SHOULD BE SIMILAR TO THAT OF PIPING MATERIAL OF SPECIFICATION.
3. ALL WELD TO BE TESTED IN ACCORDANCE WITH APPLICABLE CODES BY MANUFACTURER.
4. MATERIAL OF THE THERMOWELL SHALL BE OF 316SS.
5. THERMOWELL SHALL BE DRILLED BARSTOCK TYPE.
6. INTERNAL BORE OF THE THERMOWELL SHOULD BE SELECTED BASED ON THE NORMAL SIZE OF THE SENSING ELEMENT AS PER ASME,PTC-19.3.
7. THE BOTTOM DIAMETER OF THE THERMOWELL TYPICALLY SHOWN HERE SHALL BE SUBJECT TO VARIATION BASED ON THE INTERNAL BORE OF THERMOWELL AND THICKNESS OF THERMOWELL MATERIAL TO WITHSTAND THE PROCESS PRESS.AND TEMP.,AS PER ASME,PTC-19.3.
8. THE TYPE OF TAPERED THERMOWELL SHALL BE USED FOR LIQUID VELOCITIES UP TO 92M.P.S.(300F.T.P.S.).
9. THERMOWELL WITH THE INSULATION LAG EXTENSIONS SHALL BE USED WHEREVER APPLICABLE.
10. ACTIVITIES TO BE COMPLETED AT THE SHOP. WELD THE BOSS ON THE PIPE AND DRILL THE HOLE IN THE PIPE IN ALIGNMENT WITH HOLE IN THE BOSS. PROVIDE INTERNAL THREAD AS PER IS:554 TO MATCH WITH THE THERMOWELL EXTERNAL THREAD.
11. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
12. WILL BE SUITABLE TO MATCH THE STUB DIMENSIONS AS PER RC 1 1/2
13. THE "U" & "L" DIMENSIONS SHALL BE BE SELECTED BASED ON PARTICULAR APPLICATION AND THE SAME SHALL BE SUBJECT TO OWNER'S APPROVAL DURING DETAILED ENGINEERING.
14. ALL DIMENSIONS ARE INDICATIVE ONLY.

FOR TENDER PURPOSE ONLY

एन टी पी सी NTPC NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION																			
PROJECT TYPICAL THERMAL POWER PROJECT																			
TITLE INSTRUMENT SOURCE CONNECTION DETAILS																			
A	FIRST ISSUE	DRWN	DESIGN	CHKD	M	E	C	CAI	ARCH.	APPD.	DATE	SIZE	SCALE	DRG. NO.	0000-999-POI-A-035	REV. NO.	A		
DESCRIPTION										Cleared by		SIZE A4		SCALE N.T.S.		DRG. NO. 0000-999-POI-A-035		REV. NO. A	
														SH-8 OF 14					

TEMP. MEASUREMENT



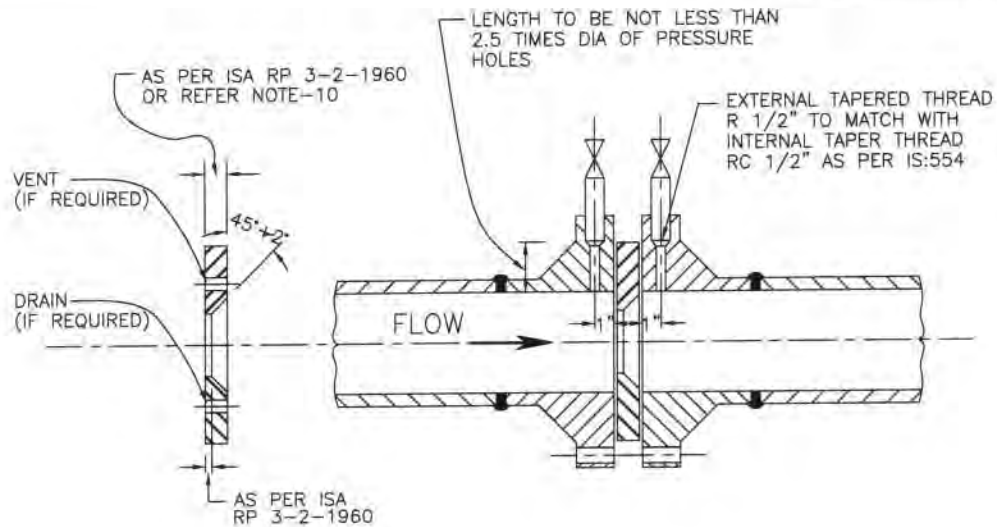
NOTES:-

1. THIS TYPE OF TEMPERATURE BOSS IS APPLICABLE FOR THE PROCESS PRESSURE/TEMPERATURE BELOW 40 Kg/Cm²(g)/400°C
2. FOR PRESSURE TIGHT JOINTS THE BOSS SHOULD HAVE INTERNAL TAPERED PIPE THREAD Rc 1 AS PER IS:554. THE LENGTH OF THREAD ENGAGEMENT SHOULD BE AS PER ABOVE STANDARD.
3. PIPES HAVING PROBABILITY OF PROLONGED VIBRATION SEAL WELDING MAY BE DONE ALL AROUND AFTER TIGHTENING THERMOWELL WITHIN THE BOSS.
4. SEE NOTES-2 TO 14 OF DRG. NO. 0000-999-POI-A-035, Sh-6 Of 14.

FOR TENDER PURPOSE ONLY

एन टी पी सी NTPC NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION																	
PROJECT TYPICAL THERMAL POWER PROJECT																	
TITLE INSTRUMENT SOURCE CONNECTION DETAILS																	
A	FIRST ISSUE	DRWN	DESIGN	CHKD	M	E	C	CL	ARCH.	APPD.	DATE	SIZE	SCALE	DRG. NO.	0000-999-POI-A-035	REV. NO.	A
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FLOW MEASUREMENT



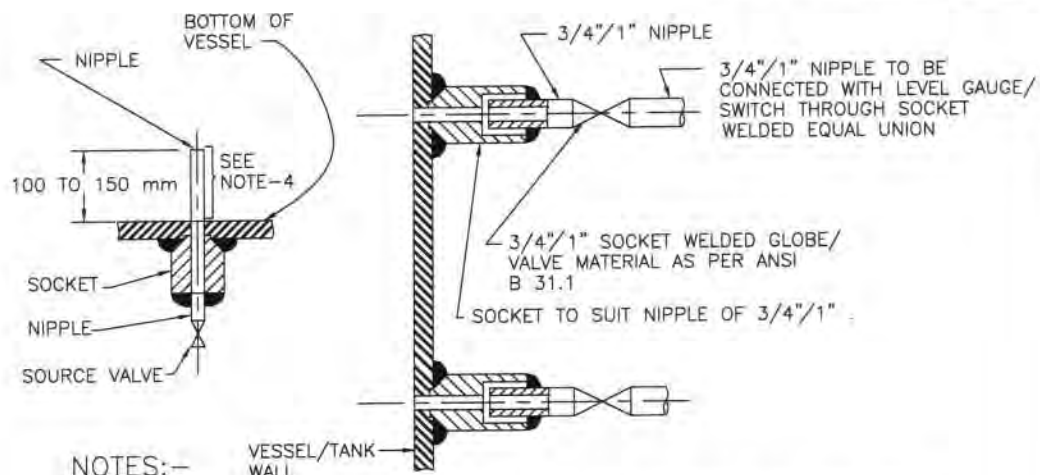
NOTES:—

- ORIFICE PLATE MOUNTED BETWEEN FLANGES WITH FLANGE TAPPING (AS SHOWN ABOVE) SHOULD BE LIMITED TO PIPE SIZES OF 2" OR LARGER.
- ORIFICE PLATE SHALL BE MOUNTED BETWEEN PIPING FLANGES WITH THE SHARP EDGE FACING UPSTREAM SUCH THAT CENTRE OF THE CONCENTRIC ORIFICE SHOULD BE WITHIN 0.79 mm (1/32") OF THE AXIS OF THE PIPE.
- TWO GASKETS SHALL BE INSERTED BETWEEN THE PLATE AND THE FLANGES AND INSIDE DIAMETER OF THE GASKETS SHOULD BE ATLEAST 1.5 mm (1/16") GREATER THAN THE INSIDE DIAMETER OF THE PIPE SO THAT THEY DO NOT PROTRUDE INTO THE PIPE.
- PIPING FLANGES SHALL BE ANSI WELD NECK, RAISED FACE TYPE. THE FLANGE IS TO BE ALIGNED WITH THE FACE PERPENDICULAR TO THE FLOW AXIS.
- BIDDER TO SUPPLY ORIFICE PLATE SPECIAL TYPE (HAVING PRESS. CONNECTIONS) OF FLANGES ALONG WITH GASKETS, NIPPLES AND SOURCE VALVES.
- ON HORIZONTAL PIPE RUN PRESSURE CONNECTIONS ARE TO BE TAKEN FROM SIDES FOR LIQUID AND STEAM SERVICE AND FROM TOP FOR DRY GAS SERVICE. FOR PROCESS LIQUIDS INSTALLATION OF PRESSURE TAPS MAY BE ALLOWED WITHIN AN ANGLE OF 45° ELBOW THE HORIZONTAL IN SPECIAL CASES BUT NO BOTTOM CONNECTIONS ARE ALLOWED.
- THE LOCATION OF PRESSURE TAPS MUST BE WITHIN 1.5 mm (1/16") OF THE DISTANCE SPECIFIED.
- MAXIMUM DIAMETER OF PRESS. CONNECTION HOLES SHALL BE AS PER RECOMMENDATIONS OF ASME PTC 19.5. THE DIAMETER OF THE HOLE SHOULD REMAIN THE SAME FOR A DISTANCE NOT LESS THAN 2.5 TIMES OF THE DIAMETER BEFORE EXPANDING INTO THE PRESSURE PIPE.
- THERE MUST BE NO BURRS WIRE EDGES OR OTHER IRREGULARITIES ALONG THE EDGE OF THE HOLE AND IT MUST BE SQUARE AND ROUNDED SLIGHTLY (1/64" RADIUS).
- ORIFICE PLATE SHOULD BE FLAT WITHIN 0.02 mm (0.001") AND THE SURFACE ROUGHNESS SHOULD NOT EXCEED 20 MICRO INCH. THE THICKNESS OF THE ORIFICE PLATE SHOULD BE AS PER EN ISO 5167:2003.
- FOR HORIZONTAL PIPE RUN DRAIN HOLES IN ORIFICE PLATES ARE AT THE BOTTOM (APPROX. TANGENT TO INSIDE DIA OF PIPE) FOR STEAM OR GAS SERVICE. VENT HOLES SHOULD BE LOCATED ON UPPER SIDE FOR INCOMPRESSIBLE FLUID.
- ORIFICE PLATE SHOULD BE OF 316 SS (ASTM A167-54 GRADE-II).
- RECOMMENDED MINIMUM LENGTHS OF STRAIGHT PIPE PRECEDING AND FOLLOWING ORIFICES SHALL BE AS PER EN ISO 5167:2003.
- THREE PAIRS OF PRESSURE TAPS SHALL BE PROVIDED WITH NIPPLES OF REQUIRED LENGTH AND SOURCE VALVES AND THE UN-USED TAPS ARE PLUGGED.
- THE INTERNAL TAPERED CONNECTION WITHIN THE FLANGE FOR PRESSURE TAPS SHOULD BE RC 1/2" AND THE NIPPLE SHOULD ALSO OF EXTERNAL THREADED R 1/2" AS PER IS:554. THE LENGTH OF THREADED ENGAGEMENT SHALL BE AS PER ABOVE STANDARD.

FOR TENDER PURPOSE ONLY

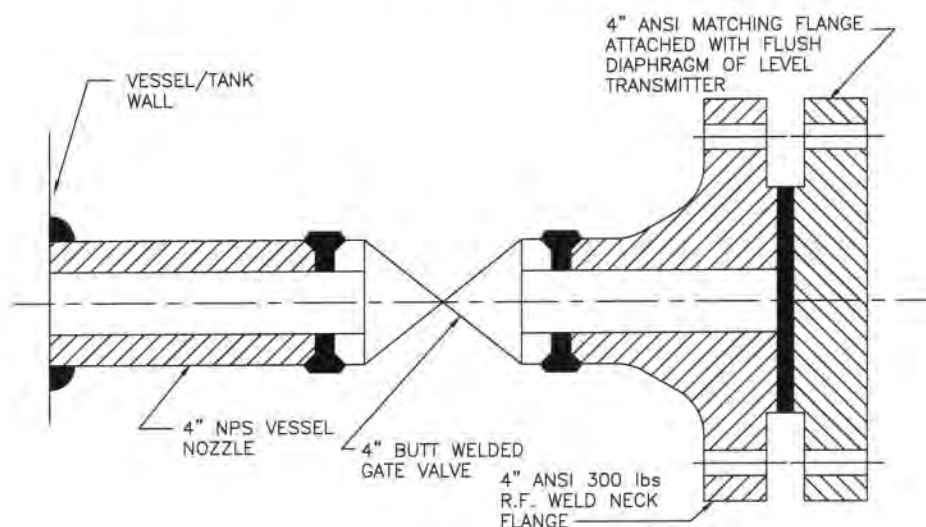
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PROJECT: TYPICAL THERMAL POWER PROJECT									
TITLE: INSTRUMENT SOURCE CONNECTION DETAILS									
REV. NO. A DESCRIPTION DRAWN DESIGN CHD. W. E. C. CAL. ARCH. APPD. DATE CLEARED BY SIZE A4 SCALE N.T.S. DRG. NO. 0000-999-POI-A-035 Sh-12 OF 14 REV. NO. A									

LEVEL MEASUREMENT



NOTES:-

1. THIS TYPE OF PROCESS CONNECTION SHALL BE USED FOR LEVEL GAUGE AND EXTERNAL CAGE TYPE FLOAT OR DISPLACER OPERATED LEVEL SWITCH.
2. FOR GAUGES 3/4" NIPPLE ALONG WITH 3/4" SW SOURCE VALVE AND FOR SWITCHES 1" NIPPLE ALONG WITH 1" SW SOURCE VALVE SHALL BE PROVIDED AS PROCESS CONNECTION.
3. SOURCE CONNECTION ON VESSEL SHOULD NOT BE LOCATED AT PLACES SUBJECTED TO INTERFACE AND TURBULENCE FROM INLETS AND OUTLETS.
4. IF LOWER CONNECTION IS TAKEN FROM BOTTOM OF THE VESSEL THEN THE NIPPLE MUST BE 100 mm TO 150 mm ABOVE THE BOTTOM OF THE VESSEL.



NOTES:-

1. THIS TYPE OF PROCESS CONNECTION SHALL BE PROVIDED FOR TANK LEVEL MEASUREMENT OF VISCOUS OR CORROSIVE LIQUID USING FLUSH DIAPHRAGM/WAFER TYPE LEVEL TRANSMITTER.
2. WELDING OF MATCHING FLANGE TO GATE VALVE SHALL BE DONE BY BIDDER.

FOR TENDER PURPOSE ONLY

NTPC LIMITED (A GOVERNMENT OF INDIA ENTERPRISE) ENGINEERING DIVISION PROJECT: TYPICAL THERMAL POWER PROJECT TITLE: INSTRUMENT SOURCE CONNECTION DETAILS											
										SIZE: A4 SCALE: N.T.S. DRG. NO.: 0000-999-POI-A-035 Sh-13 Of 14	REV. NO.: A
REV. NO.	DESCRIPTION	DRAWN	DESIGN	CHKD.	M	E	C	CL	ARCH.	APPD.	DATE
Cleared By											

	TECHNICAL SPECIFICATION DARLIPALI STPP PH-II (1X800 MW) COMPRESSED AIR SYSTEM	PE-TS-540-555-A001
		Rev. No. 00
		Date : AUG 2026

CATEGORY-I GUARANTEES

Auxiliary Power Consumption for Compressed Air System

CATEGORY-II GUARANTEES

Noise level for Compressors

CATEGORY-III GUARANTEES

PERFORMANCE GUARANTEES TO BE DEMONSTRATED AT SITE	
S.N.	DESCRIPTION OF TESTS TO BE PERFORMED
i)	Parallel operation of air compressors
ii)	Dew point of air at the outlet of air drying plants of instrument air compressor.
iii)	Pressure drop across the air drying plants of air compressors.
iv)	Vibration level of air compressors, blowers of air drying plant
PERFORMANCE GUARANTEES TO BE DEMONSTRATED AT SHOP	
S.N.	DESCRIPTION OF TESTS TO BE PERFORMED
i)	Capacity and discharge pressure of each air compressor.

Category-I Guarantees

Accept the equipment/system/plant after levying Liquidated Damages as specified in the specification somewhere else.

The liquidated damages shall be prorated for the fractional parts of the deficiencies. The performance guarantees coming under this category shall be called 'Category - I' Guarantees.

Category-II Guarantees

In case the performance guarantee(s) are not met by the Contractor during demonstration test, the Contractor shall carry out all necessary modifications and/or replacements to comply with the guaranteed requirements at no extra cost to the Employer and re-conduct the performance guarantee test(s) with Employer's consent. If, however, the demonstrated guarantee(s) are not met even after the above modifications / replacements within ninety (90) days, it will be concluded that, the equipment has failed to meet the guarantee(s). In such a case, Employer shall Reject the equipment/plant/system and recover from the Contractor the payments already made. The performance guarantees under this category shall be called 'Category - II' Guarantees.

Conformance to the performance requirements under Category -II is mandatory.

Category-III Guarantees

Accept the equipment/system after assessing the deficiency in respect of the various ratings, performance parameters and capabilities and recover from the contract price an amount equivalent to the damages as determined by the EMPLOYER. Such damages shall, however be limited to the cost of replacement of the equipment(s) / system(s) replacement of which shall remove the deficiency so as to achieve the guarantee performance. These parameters/capacities shall be termed as category - III, guarantees.



Guaranteed Power Consumption for Compressed Air System

Doc No: PE-PF-540-555-A001

Rev. No: 0

Date of issue Aug-26

NAME OF PROJECT:	1 X 800 MW DARLIPALI STPP
NAME OF PACKAGE:	COMPRESSED AIR SYSTEM
TECHNICAL SPECIFICATION:	PE-TS-540-555-A001

S. No. (1)	Description of Equipment (2)	Nos. of Equipment for GPC consideration (3)	Total Guaranteed Power Consumption for Each Equipment at Motor Input Terminals & control Panel (4)	Duty Factor (5)	Total (KW) (6) = (3)*(4)*(5)
1	Instrument air compressors (Oil free Screw / Centrifugal type) of capacity 55 NM3/Min. @ discharge pressure of 8.0 Kg/cm2(g).	2	To be filled by bidder	0.6	To be filled by bidder
2	Service air compressors (Oil free Screw / Centrifugal type) of capacity 55 NM3/Min. @ discharge pressure of 8.0 Kg/cm2(g).	1	To be filled by bidder	0.33	To be filled by bidder
3	Air Drying plant (Heaters) (if applicable)	2	To be filled by bidder	0.5	To be filled by bidder
4	Air Drying plant (Blowers) (if applicable)	2	To be filled by bidder	1	To be filled by bidder
				TOTAL	
Note :					

1	Estimated Power Consumption Figure for the compressed air system (For Working Drives Only) considered is 780 KW .
2	Bidders Guaranteed power consumption at motor input terminals (Not Shaft Power) considering motor efficiency of 95.0% (at full load) including power for control panel as furnished in guaranteed schedule shall be demonstrated by the successful bidder during performance testing at works/site.
3	The price quoted by the bidder shall be loaded @ US \$ 5,245 (US Dollar Five Thousand Two Hundred Forty Five only) for every additional kW increase in consumption from the base figure indicated at Note no. 1.0 above.
4	In case the successful bidder fails to establish / prove the guaranteed values of power consumption ((base figure of auxiliary power consumption or the GPC quoted by bidder, whichever is higher) on actual performance testing at the manufacturing works / site, penalty @ US \$ 5,245 (US Dollar Five Thousand Two Hundred Forty Five only) per one kW increase in power consumption figure shall be levied.
5	If the contract currency is other than US dollars, then the liquidated damages shall be in equivalent amount in contract currency based on Bill selling exchange rate of State Bank of India prevailing on 06.11.2025 .

Particulars of bidder / authorised representative

Name	Designation	Signature	Date	Company Seal

Standard TG PG Test Procedure of Compressed air System

Station Name--- Capacity		
1	OWNER	NTPC Limited (A Govt. of India Enterprise)
2	CONTRACTOR	Name-----
3	CONTRACT No.	
4	SUB-CONTRACTOR	
5	OWNER's Doc. No./Rev No	
6	CONTRACTOR's Doc. No. / Rev No.	/
7	SUB-CONTRACTOR's Doc No. / Rev. No.	/
8	DRG./DOC. Title	PG TEST PROCEDURE FOR Compressed air System
9	PURPOSE	FOR APPROVAL

REVISION STATUS FOR OWNER'S DOCUMENT

Revision No.	Date	Name (On behalf of Owner)	Comment	Date	Name On behalf of Contractor)	Comment	Remarks

OWNER's APPROVAL			CONTRACTOR's APPROVAL		
Authorized Representative	signature	Name	Authorized Representative	Signature	Name
Approved by			Approved by		
Checked by			Checked by		
Prepared by			Prepared by		

CONTENTS

1. Scope	5
2. Objective of the test	5
3. Test Conditions & Pre requisites of Test	6-7
4. Test Instrumentation	7-8
5. Test Methodology	8-10
6. Formats (As applicable)	11-12
7. Attachments	13

Test Parties: -

- a. **Witness :-** NTPC Limited (Herein after called NTPC)
- b. **Contractor: -** -----Name of organization
- c. **Sub- Contractor: -** -----Name of organization

*This document provides the Performance Guarantee Test Procedure for **Compressed Air System** Station Name-----, capacity----- to confirm that the following item meet the guarantee value as per **NTPC technical specification Functional Guarantee & Liquidated Damage (FGLD) & Attachment 10** (whichever is applicable).*

Scope: - PG test shall be Conducted as per Contract. The test procedure shall cover the performance test to be conducted at site for the Compressed air system and accordingly listed in this procedure. The test procedure shall cover the testing method for technical parameters, checking of ratings and performance requirements stipulated for various equipment covered in this procedure.

2. OBJECTIVE OF THE TEST: -

The objective of test is to be checking following parameters of air compressed system:

1. To check healthy condition of all equipment forming total compressed air system.
2. Operating parameters of the system to be logged for the complete cycle with online (calibrated) instruments at the time of test.
3. To check satisfactory operation of all safety switches and electrical interlocks for each individual equipment and for the complete system.
4. To check healthy condition of all electrical as well as instruments installed on air compressed system.
5. Operability test of balance system which cannot be operated/checked at the vendor's work/plant
6. Check parallel operation of working compressors
7. To check pressure, drop across ADP, capacity & outlet dew point of each ADP (Air Dryer Plant).
8. Noise level measurement, vibration/shock pulse measurement shall be conducted.
9. The capacity measurement & power consumption of the compressors shall be conducted either at the shop floor or test bed of vendor workshop. Signed Copies of the test reports by VENDOR & NTPC shall be furnished during the site PG test & it will be acceptable to both parties

VENDOR TO QUOTE/INCLUDE THE SUITABLE VALUE OF GUARANTEED PARAMETERS VALUE FOR SL NO, 6,7,8, 9 AS PER NTPC TECH SPECS (FGLD SHEET) ATTACHMENT 10 & APPROVED TECH DATA SHEET (WHICHEVER IS APPLICABLE)

3. Test conditions responsibility & prerequisites before the test NTPC

- i. Conductance of PG test by representatives of Vendor and NTPC as per the approved PG test Procedure.

- ii. Contractor shall be given permission to inspect the system in advance and make it ready for the test.
- iii. To ensure Continuous run of plant for at least two hours for stabilization of the system before commencement of PG test.
- iv. Availability of approved data sheets for the plant/system during the test.
- v. To ensure Cleanliness of Plant/System, filters etc & uninterrupted power supply within specified parameters during the test.
- vi. Availability of suitable fire protection system/firefighting equipment's to be ensured.
- vii. Successful completion of trial operation of Compressors.

CONTRACTOR

- I. Deputation of team to site to associate with the test to be ensured by the Contractor
- II. Readiness of Formats as well instrument availability for Recordings of Parameters for PG test requirements.
- III. Responsibility for conducting the test rests with Contractor.
- IV. Calibration of all instruments used during the test in an approved NABL labs/ labs certified by NTPC & Hand over of all calibration certificates (in original) to NTPC at least 15 days before start of the PG test.
- V. All the installation / commissioning protocols in respect of alarm/ annunciation/ control system, pipeline flushing, vibration & noise level measurement data of motors, fans & pumps during commissioning shall be made available during Guarantee Test.
- VI. Readiness of all protections, interlocks and safety switches to be ensured. Joint protocol in this respect shall be signed before the Test.
- VII. Sufficient skilled/ required Manpower availability & removal of Instruments as required/Instructed by NTPC.

The plant/ system shall be jointly inspected by NTPC and the contractor and a joint protocol shall be signed that the plant is fit for conducting guarantee Test

TEST INSTRUMENTS

All instruments required for the site performance test shall be provided/arranged by the Contractor. The instruments furnished below shall be used for the purpose of the PG. If additional instruments are required for the test, the same shall be arranged by supplier at the time of testing. **Calibration of all instruments used during the test in an approved NABL labs/ labs certified by NTPC & Hand over of all calibration certificates (in original) to NTPC at least 15 days before start of the PG test.**

- *Bearing Temperature* is to be measured using RTD by 0.5 % accuracy or better.
- *Pressure gauges* shall be used for recording the parameters of pumps.
Accuracy 0.5 % or better.
- *Wattmeter* of + 0.5 % accuracy class or better shall be used for power consumption measurement.
- **Vibration & Noise level** of motors, fans & pumps shall be measured by calibrated instruments.
- **Manometer** to be used for measurement of pressure drop across filters.

- o Voltage and current shall be measured using *tong tester/Clamp meter* of +/- 0.5 % accuracy class or better.

TEST METHODOLOGY

- **AIR DRYER**

DEW POINT

The demonstration of the Dew point temperature at atmospheric pressure at the rated full load to be carried out at site. The atmospheric Dew point temperature at the air dryer outlet shall be ----- deg C as per approved Dryer datasheet drawing no -----specification. The graph showing the relation between Atmospheric dew point (ADP)

& Pressure dew point(PDP) shall be provided by Contractor.

- PRESSURE DROP ACROSS AIR DRYER

The pressure drops across the air dryer, while the dedicated Instrument air compressor and dryer combination is working together at the rated load shall be recorded.

- AIR COMPRESSOR

PROTECTION AND ALARM CHECK

Operation of protection interlocks, alarms shall be checked and recorded. However, the joint inspection reports / protocols, made before / during commissioning of the units duly signed by the site officials shall be verified and considered as official documents for this purpose.

- DISCHARGE AIR PRESSURE: -

The compressor air discharge pressure and current shall be recorded in the format for the site performance test. Performance of receiver drain traps shall be checked and recorded in the format for the site performance test.

NOISE LEVEL MEASUREMENT

The specified noise level is ----- dB (A) as per standard reference code preferably ISO 2151 code.

Noise level shall be measured by a calibrated portable instrument. It shall be measured at 1 metre distance from the equipment and at 1.5 metre above the floor level. The readings shall be taken at all four sides of the compressor unit.

For eventual noise, from the discharge line, accessories and /or ancillary equipment which are not included, a correction factor of Maximum 8 dB (A) shall be allowed for background & ambient noise.

This correction factor is based on the background noise in the air compressor room having multiple compressor units along with the canopy with sound absorbing foam.

The noise levels shall be recorded in the format for the site test.

- **VIBRATION MEASUREMENT**

The vibration measurements shall be as per international standard (VOi 3836, Group 2) or ISO 10816-3.

Based on the above reference, the limits of vibration in terms of velocity shall be :-

Acceptable velocity value = 10 mm / sec [RMS] or less

The readings shall be taken with the calibrated portable instrument and recorded in the format for the site test.

CAPACITY & POWER MESUREMENT OF COMPRESSOR

Capacity & power consumption test copy witnessed at shop floor /Test bed of Contractor shall be acceptable for this test.

**Formats (Complete system) PROJECT: Station Name -----, Capacity (-----
 ----) PACKAGE : Compressed Air System Date :-----**

Compressor Model		Customer	
Compressor Make		O/A Number	
Compressor Sr. No		Consultant	
Main motor Sr. No		Main Motor Make	

● **PERFORMACE TEST DATA OF COMPRESSOR & AIR DRYER**

SL.NO	PARAMETER	UNIT	Reading 1	Reading 2
1.	Time	HR: MIN		
2.	Ambient Temperature	Deg C		
3.	Ambient Pressure	Bar A		
4.	Relative humidity	%		
5.	Compressor Discharge Pressure	Bar G		
6.	Cooling water inlet	Bar G		
7.	Cooling water outlet	Bar G		
8.	Cooling water inlet Temperature	Deg C		
9.	Cooling water outlet Temperature	Deg C		
10.	Main Drive motor Current	Amp		
11.	Auxiliary air compressor power	kW		
12.	Noise level	dBA		
13.	Vibration velocity	mm/sec		
Air dryer				
14.	Atmospheric dew point	Deg C		
15.	Air Pressure drop	Bar G		
16.	Cooling water inlet	Bar G		
17.	Cooling water outlet	Bar G		
18.	Cooling water inlet	Deg C		
19.	Cooling water outlet	Deg C		
20.	Air outlet pressure	Bar G		
21.	Air outlet temperature	Deg C		
22.	Air dryer power	kW		

● **PERFORMANCE GUARANTEES**

SL.NO	PARAMETER	Unit	Test value /Observation	Remarks
1.	Parallel operation of air compressors	-		Yes / No
2.	Air dryer plant power consumption	kW		OK / Not OK
3.	Atmospheric Dew point at outlet of Air Dryer Plant	Deg C		OK / Not OK
4.	Pressure drops across air dryer plant	Bar G		OK / Not OK
5.	Compressor Noise level	dBA		OK / Not OK
6.	Vibration velocity (RMS)	mm/se c		OK / Not OK

• **GENERAL PARAMETERS**

SL.NO	PARAMETER	Value/Observatio	Remarks
1.	General observation on equipment installation		OK / Not OK
2.	General observation on Compressor system layout and Piping		As per approved drawing
3.	Approved engineering doc + Shop test reports		Yes / No
4.	Availability of instruments for performance test as per		Yes / No
5.	Availability of safety equipment's at site		Yes / No
6.	Start equipment as per start up procedure in instruction manual		Yes / No
7.	Leakages in Pipe Joints (Soap solution method)		OK / Not OK
8.	Smooth operation of valves (Hand operation)		OK / Not OK
9.	Field instruments working		OK / Not OK

10.	Protection and Alarms		OK / Not OK
-----	-----------------------	--	-------------

Attachment (to be provided by Contractor)

- 1) NTPC Tech specifications sheet (FGLD) of Compressed Air system .
- 2) Attachment 10 or relevant document.
- 3) Approved data sheet if any.
- 4) Any transmittal received for this System.
- 5) ADP vs PDP graph to be provided by Contractor
- 6) Shop test reports of individual compressors showing FAD, DAP and specific power consumption

1.00.00 AIR COMPRESSOR SYSTEM

1.01.00 AIR COMPRESSORS:

- a) All pressure parts shall be hydraulically tested at not less than 150% of design pressure prior to painting and lining, if applicable. The test pressure will be maintained for 30 minutes.
- b) All other parts including inter-connecting piping shall be hydraulically tested wherever possible, as per relevant codes.
- c) Ultrasonic testing shall be carried out on all forgings and shafts (if dia.> 40mm). MPI/DP test will be done on machined areas of the above components.
- d) Rotor shall be statically and dynamically balanced as per relevant standard.

1.01.01 PERFORMANCE TEST (SHOP TEST) :

- a) Performance test on the compressors shall be carried out in accordance relevant standard. The test shall also include demonstration of loading and unloading mechanism (Capacity control) and operation of safety valves.
- b) Power consumption at motor input terminal at rated capacity as well as at fully unloaded condition of all the compressor shall be measured.
- c) Vibration and noise level measurement will be done during shop performance test.
- d) Test shall be carried out on all compressors with contract drive motor where power consumption for compressors has been indicated as a guaranteed parameter

1.02.00 AIR RECEIVER, HEAT EXCHANGERS, MOISTURE SEPERATORS, AIR DRYING PLANT:

- a) Each finished vessel shall be hydraulically tested to 150% of the design pressure for a duration of 30 minutes.
- b) NDT on weld joints shall be as per respective code requirements or the minimum as specified below:
 - (i) 100 % DPT on root run of butt welds.
 - (ii) 100% DPT on all finished butt welds and fillet welds
 - (iii) 10% RT on butt welds which shall include all T- joints.
- c) Tube to Tube sheet joint of the heat exchangers shall be subject to Mock-up test as per the relevant standards.
- d) Reactivation blowers shall be tested for FAD, temp. rise noise & vibration. Rotating parts shall be dynamically balanced.
- e) Completely assembled ADP shall be pneumatically tested at design pressure for a duration of 5 minutes. Functional and sequential operation testing of the completely assembled ADP shall be demonstrated at shop. Other accessories shall be tested as per relevant code and sections. Dew point measurement shall be done.

FOR E.O.T. CRANE REFER QA CHAPTER EOT CRANES AND HOISTS, FOR PIPES, FITTINGS, VALVES & RE JOINTS REFER QA CHAPTERS OF LP PIPING.

		ITEM : MATERIAL RECEIPT, STORAGE & PRESERVATION		STANDARD FIELD QUALITY PLAN				QP NO.: 0000-999-QOM-T-023 REV. NO: 00 DATE : 22.03.2016 PAGE 1 OF 2		REVIEWED BY: N. H.S. SHARAD SOMNATH DAS RAJEEV K. B. JAIN		APPROVED BY:  K. K. OJHA	
								VALID UPTO : 21.03.2019					
SI No	Activity & Operation	Characteristics	Class of Check	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record	D*	Remarks			
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	10			
Storage: Instructions & Facilities													
1	Availability of Storage/ Preservation Instructions/ Procedure for Material at site.	Verification	A	Verify	100%	Storage & Preservation Instruction/ Procedure/ Recommendation of Manufacturer/ NTPC	Site Register/Log Book						
2	Site Preparation for Storage e.g. Leveling, Raised platform/ availability of wooden planks/ suitable supports, preparation of Covered Shed/ Storage	Visual	A	Physical	100%	Storage & Preservation Instruction/ Procedure/ Recommendation of Manufacturer/ NTPC	Site Register/Log Book			Refer Note 1			
Material Receipt:													
3	Check for the availability of documents :- Shipping List/ Packing list / Loading Advice Slip / Delivery Challan/ LR/ RR / MDCC/ CHP	Record Verification	B	Review of Records	100%	Packing Slip, Delivery Challan, Approved BBU/ CHP/ MDCC/ LR/ RR	Site Register/Log Book			Refer Note 2			
4	Verify the Packing & Material received against the following:- a) Project/ Package No. b) Work order no. / BBU No. c) Item no./ Part No./DU No. etc. d) Identification of Material	Visual/ Record Verification	B	Visual, Review of Records	100%	Packing Slip, Delivery Challan, Approved BBU/ CHP/ MDCC/ LR/ RR	Should be properly correlated	Site Register/Log Book					
5	Check the Material / Item on receipt for the following - a) Packing condition b) Physical damage c) Quantity of components/ Any Shortage or Excess of quantity d) Correlation with identification as per CHP/ MDCC, if any e) Painting condition (as applicable)	Visual/ Record Verification	B	Visual, Review of Records	100%	Packing Slip, Delivery Challan, Approved BBU, CHP/MDCC/ LR/ RR	No Damage & Shortage of Quantity as per challan / CHP report/ MDCC	Site Register/Log Book	✓	Refer Note 3			

LEGEND: D* RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.

CLASS OF CHECK 'A' SHALL BE WITNESSED BY NTPC FQA ENGINEER IN ASSOCIATION WITH EXECUTING ENGINEER & SURVEILLANCE BY HEAD FQA. CLASS 'B' SHALL BE WITNESSED BY NTPC ERECTION ENGINEER & SURVEILLANCE BY FQA.

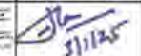
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ENGG. DIV./QA&I

		ITEM : MATERIAL RECEIPT, STORAGE & PRESERVATION		STANDARD FIELD QUALITY PLAN				QP NO.: 0000-999-QOM-T-023 REV. NO: 00 DATE : 22.03.2016 PAGE 2 OF 2		REVIEWED BY: N. H.S. SHARMA SOMNATH DAS RAJEEV KR JAIN		APPROVED BY:  K. K. OJHA	
						VALID UPTO : 21.03.2019							
Sl No	Activity & Operation	Characteristics	Class of Check	Type of Check	Quantum of Check	Reference Document	Acceptance Norms	Format of Record	D*	Remarks			
1.	2.	3.	4.	5.	6.	7.	8.	9.		10			
6	Ensure non-conforming/ Damaged & rejected components are identified & stored separately and reported to Main Contractor/ Manufacturer.	Visual/ Record Verification	A	Visual, Review of Records	100%	Storage & Preservation Instruction/ Procedure, CHP/MDCC	Storage & Preservation Instruction/ Procedure,	Site Register/Log Book	√	Refer Note 4			
7	Issuing of Material Receipt Certificate (MRC)	Record Verification	B	Review of Records	100%	Packing Slip, Delivery challan, Approved BBU, CHP/MDCC/ SI/ RR/ LR	Packing Slip, Delivery challan, Approved BBU/CHP/MDCC	MRC	√	Refer Note 5			
Storage													
8	Material storage & Preservation: Check for proper Storage, Shelf life, Preservation etc.	Visual/ Record Verification	A	Verify	100%	As per storage instructions Point No. 1 above		Site Register/Log Book		Refer to supplier's recommendation for long storage.			
9	Periodic Inspection of Stored Items for their condition & Preservation	Visual	B	Verify	100%	As per storage instructions Point No. 1 above		Site Register/Log Book	√	Surveillance by NTPC FQA			
Notes: 1. Prior to despatch of first lot of Materials, confirmation regarding availability of storage facility as per Storage Instruction/ Procedure shall be obtained through NTPC site FQA. 2. All items identified in Contract shall be received with proper dispatch clearance i.e. either with MDCC, in case of BBU or with CHP clearing despatch. 3. Correlation will be established between received Materials & MDCC/ CHP/ MTC/ HEAT No etc., as applicable. 4. Dispositioning of Non-conforming /Rejected materials shall be done with intimation to NTPC FQA. 5. Before release of any Material Receipt Certificate (MRC), FQA clearance shall be obtained w.r.t. proper Storage & Preservation of Materials as per Manufacturer recommendations.													

LEGEND: D* RECORDS, IDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
CLASS OF CHECK 'A' SHALL BE WITNESSED BY NTPC FQA ENGINEER IN ASSOCIATION WITH EXECUTING ENGINEER & SURVEILLANCE BY HEAD FQA. CLASS 'B' SHALL BE WITNESSED BY NTPC ERECTION ENGINEER & SURVEILLANCE BY FQA.

	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.): मद (सामग्री, वर्ग, ग्रेड, रैंकिंग, रेंज, आकार आदि): COMPRESSED AIR SYSTEM		STANDARD FIELD QUALITY PLAN स्टैंडर्ड फील्ड क्वालिटी प्लान (ERECTION)		QP NO / क्यूपी सं.:	0000-999-QOM-T-020	REVIEWED BY: द्वारा समीक्षा की गई:	REVIEWED BY: द्वारा समीक्षा की गई:	APPROVED BY: द्वारा अनुमोदित:	
					REV NO / संशोधित सं.:	01	R S PANGTEY		SUDHANSU HU SEKHAR MISHRA	
					DATE/ तिथि	03.01.2025	RAKESH SINGH PANGTEY	DHEERAJ JAIN	S. S. MISHRA	
					PAGE// पृष्ठ	Page 1 of 3				
CONFORMING TO CODE: कोड के अनुरूप:										
SL. NO क्र. सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS विशेषताएं	CLASS# वर्ग#	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण M C/N एम सी/एन	REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप	REMARKS/ टिप्पणियां	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	

1.0	MATERIALS RECEIPT, STORAGE & PRESERVATION								
	REFER SFQP NO. 0000-999-QOM-T-023, REV.00 (MATERIAL RECEIPT, STORAGE AND PRESERVATION)								
2.0	ERECTION								
2.1	Foundation i) Grouting (if applicable) ii) Matching of co-ordinates, Dimensions iii) Levelling and chipping / Dressing wherever required iv) Position of Bolt Holes	Completeness, Water/Spirit level & Dimensions	B	Visual, Measurement	100%	Approved Drawing	Approved Drawing	Erection Protocol/Site Logbook	✓
2.2	Compressor With Control Panel & Motor i) Correct Positioning, Co-ordinates ii) Levelling of base frame, Water & Air Piping iii) Alignment (if applicable)	Completeness, Dimensions	B	Visual, Measurement	100%	Approved Drawing/ Technical Specifications	Approved Drawing/ Technical Specifications	-do-	✓

LEGEND:/ संकेतिका:

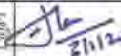
* RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. * "टिक" (✓) के साथ प्रमाणित रिकॉर्ड, क्यूए दस्तावेजीकरण में आपूर्तिकर्ता द्वारा अनिवार्य रूप से शामिल किया जाएगा।

A = CRITICAL, B=MAJOR, C=MINOR: 'A' SHALL BE WITNESSED BY NTPC FQA, 'B' SHALL BE WITNESSED BY NTPC ERECTION / CONSTRUCTION DEPTT. AND 'C' SHALL BE WITNESSED BY MAIN SUPPLIER (A & B CHECK SHALL BE NTPC CHP STAGE) वर्ग #: ए = महत्वपूर्ण, बी=मुख्य, सी= मामूली; 'ए' एनटीपीसी एफएक्यू द्वारा प्रमाणित किया जाएगा, 'बी' एनटीपीसी उत्पादन / विनिर्माण विभाग द्वारा प्रमाणित किया जाएगा। तथा, 'सी' मुख्य आपूर्तिकर्ता द्वारा प्रमाणित किया जाएगा (ए व बी की जांच एनटीपीसी के सीएचपी चरण की तरह होनी चाहिए)

FORMAT NO.: QS-01-QAI-P-07A/F4-R1
प्रारूप सं.

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ENGG. DIV./QA&I
अभि. प्रभाग/क्यूए व आई

	ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.): मद (सामग्री, वर्ग, ग्रेड, रैंकिंग, रेंज, आकार आदि): COMPRESSED AIR SYSTEM		STANDARD FIELD QUALITY PLAN स्टैंडर्ड फील्ड क्वालिटी प्लान (ERECTION)			QPNQ / क्यूपी सं.:	0000-999-Q0M-T-020		REVIEWED BY: द्वारा समीक्षा की गई:	REVIEWED BY: द्वारा समीक्षा की गई:	APPROVED BY: द्वारा अनुमोदित:
						REVNO / संशोधित सं.:	01		R S PANGTEY	 DHEERAJ JAIN	SUDHANSU SEKHAR MISHRA S. S. MISHRA
						DATE/ तिथि	03.01.2025		RAKESH SINGH PANGTEY	DHEERAJ JAIN	
			CONFORMING TO CODE: कोड के अनुरूप:			PAGE/ पृष्ठ	Page 2 of 3				
SL. NO क्र. सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS# वर्ग#	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण M एम C/N सी/एन	REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप		REMARKS/ टिप्पणियां	
1.	2.	3.	4.	5.	6.	7.	8.	9.	D*	10.	

2.3	Air Dryers & Air Receivers i) Grouting of Foundation Bolts (as applicable) ii) Correct Positioning, Coordinates iii) Leveling iv) Connection of Piping & Instruments, Orientations v) Verticality of Air Receiver	Completeness & Dimensions	B	Visual, Measurement	100%	Approved Drawing	Approved Drawing	-do-	✓	
2.4	Welding	Completeness & DPT	A	Visual, Test	Note-1	ASTM E-165	ASME Sec. VIII, Dev-1, Mand. Append-8	-do-	✓	Note-2
2.5	Valve, Drain Traps, Piping and Instruments- i) Correct Positioning, Supports & Mountings ii) Pipeline Cleaning iii) Hydro / Pneumatic Test of Piping	Completeness Leakage test	B A	Visual	100%	Technical Specifications/ Approved Drawing/ Datasheet	Technical Specifications/ Approved Drawing/ Datasheet	-do-	✓	Note-3

LEGEND:/ संकेतिका:

* RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. /* "टिक" (✓) के साथ प्रमाणित रिकॉर्ड, क्यूए दस्तावेजीकरण में आपूर्तिकर्ता द्वारा अनिवार्य रूप से शामिल किया जाएगा।

A = CRITICAL, B=MAJOR, C=MINOR, 'A' SHALL BE WITNESSED BY NTPC FQA, 'B' SHALL BE WITNESSED BY NTPC ERECTION / CONSTRUCTION DEPTT. AND 'C' SHALL BE WITNESSED BY MAIN SUPPLIER (A & B CHECK SHALL BE NTPC CHP STAGE) वर्ग #: ए = महत्वपूर्ण, बी=मुख्य, सी= मामूली; 'ए' एनटीपीसी एफएक्वू द्वारा प्रमाणित किया जाएगा, 'बी' एनटीपीसी उत्पादन / विनिर्माण विभाग द्वारा प्रमाणित किया जाएगा। तथा, 'सी' मुख्य आपूर्तिकर्ता द्वारा प्रमाणित किया जाएगा (ए व बी की जांच एनटीपीसी के सीएचपी चरण की तरह होनी चाहिए)

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		ITEM (MATERIAL, CLASS, GRADE, RATING, RANGE, SIZE ETC.): मद्द (सामग्री, वर्ग, ग्रेड, रेटिंग, रेंज, आकार आदि): COMPRESSED AIR SYSTEM		STANDARD FIELD QUALITY PLAN स्टैण्डर्ड फील्ड क्वालिटी प्लान (ERECTION)		QP NO / क्यूपी सं.:		0000-999-QOM-T-020		REVIEWED BY: द्वारा समीक्षा की गई:		REVIEWED BY: द्वारा समीक्षा की गई:		APPROVED BY: द्वारा अनुमोदित:	
						REV NO / संशोधित सं.:		01		R S PANGTE		 RAKESH SINGH		SUDHANSHU SEKHAR MISHRA	
						DATE/ तिथि		03.01.2025		DHEERAJ JAIN		S. S. MISHRA			
						PAGE// पृष्ठ		Page 3 of 3							
CONFORMING TO CODE:															
कोड के अनुरूप:															
SL NO क्र. सं.	COMPONENT & OPERATIONS अवयव व संचालन	CHARACTERISTICS / विशेषताएं	CLASS# वर्ग#	TYPE OF CHECK जांच के प्रकार	QUANTUM OF CHECK जांच के परिमाण M एम C/N सी/एन	REFERENCE DOCUMENT संदर्भ दस्तावेज#	ACCEPTANCE NORMS/ स्वीकृत मानदंड	FORMAT OF RECORD/ रिकॉर्ड का प्रारूप	REMARKS/ टिप्पणियां						
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.						
2.6	Pre commissioning test- i) Motor IR Test ii) Oil & Grease Check as applicable iii) No load run test of compressor	Operational check	B	Visual, Measurement	100%	Approved Drawing/ OEM Guideline	Approved Drawing/ OEM Guideline	-do-	✓						

Notes

- 100% DPT on root run of butt welds & random 10% on all final welds. NTPC-FQA shall witness on random 10% of final welds.
- NTPC/Main Contractor approved WPS and Qualified Welders shall be utilized.
- Hydro test shall be performed for 30 Minutes at 1.5 X Design Pressure or 2 X Working Pressure, whichever is higher. The Pneumatic Test shall be conducted as per Technical Specifications.
- WPS shall be approved by BHEL. Welder's qualification shall be done by NTPC.

LEGEND:/ संकेतिका:

* RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. / * "टिक" (✓) के साथ प्रमाणित रिकॉर्ड, क्यूए दस्तावेजीकरण में आपूर्तिकर्ता द्वारा अनिवार्य रूप से शामिल किया जाएगा।

A = CRITICAL, B=MAJOR, C=MINOR; 'A' SHALL BE WITNESSED BY NTPC FQA, 'B' SHALL BE WITNESSED BY NTPC ERECTION / CONSTRUCTION DEPTT. AND 'C' SHALL BE WITNESSED BY MAIN SUPPLIER (A & B CHECK SHALL BE NTPC CHP STAGE) वर्ग #: ए = महत्वपूर्ण, बी=मुख्य, सी= मामूली; 'ए' एनटीपीसी एफएक्यू द्वारा प्रमाणित किया जाएगा, 'बी' एनटीपीसी उत्पादन / विनिर्माण विभाग द्वारा प्रमाणित किया जाएगा। तथा, 'सी' मुख्य आपूर्तिकर्ता द्वारा प्रमाणित किया जाएगा (ए व बी की जांच एनटीपीसी के सीएचपी चरण की तरह होनी चाहिए)

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STORAGE & PRESERVATION INSTRUCTIONS FOR COMPRESSED AIR SYSTEM

The types of storage are broadly classified under the following heads:

SL. NO.	STORAGE LEVEL	DESCRIPTION / REMARKS
1	Storage level 'A'	Outside with no protective cover (Open space / yard on raised surface, properly stacked and free from water logging & loading / undue weight).
2	Storage level 'B'	Outside with protective cover (Open space / yard on raised surface, properly stacked and free from water logging & loading / undue weight, covered with PVC / Tarpaulin).
3	Storage level 'C'	Indoor shelf items. Shall be stored in Pucca shed / in store and free from water logging & loading / undue weight and there shall not be acid / chemicals in vicinity
4	Storage level 'D'	Indoor clean conditions (stored in pucca shed, in store. The storage area shall be dry and free from dust and there shall not be acid / chemicals in vicinity).
5	Storage level 'E'	Indoor temperature & humidity controlled – air conditioned (stored in pucca shed, in store with controlled atmosphere)

Note:

1. The storage sheds shall be built in conformity with fire safety requirements. The stores shall be provided with adequate lights; fire extinguishers and 'No smoking' signs.
2. A separate yard shall be identified as "scrap yard", slightly away from main open yard to store wooden/steel scraps which are to be disposed-off.

Storage & Preservation Plan

This plan outlines the recommended storage conditions and preservation activities for the key components of the compressed air system

Sl. No.	Item/ Component	Storage Level	Frequency of Checks	Preservation Checks
1	Compressor & Motor Assembly	Level 'B' (Outside with Protective cover)	Once every 3 months	- Machine to be preserved in original factory packed condition - Check for physical damage, rust, or corrosion. - Ensure protective covers on openings are intact. - Rotate the motor shaft by a quarter turn to prevent bearing damage (if storage more than 6 months). - check and replace silica gel bags inside skid if storage more than 6 months

STORAGE & PRESERVATION INSTRUCTIONS FOR COMPRESSED AIR SYSTEM

Sl. No.	Item/ Component	Storage Level	Frequency of Checks	Preservation Checks
2	Air Dryer (Skid-Mounted Unit)	Level 'B' (Outside with Protective cover)	Once every 3 months	- Machine to be preserved in original factory packed condition - Inspect for any physical damage to skids, vessels, or piping. - Confirm that the Control Panel and instruments are protected from dust and moisture. - Ensure all air, water, and drain connections are securely capped or plugged . - Check the desiccant indicator (if visible) for signs of moisture saturation. - check and replace silica gel bags inside skid if storage more than 6 months
3	Air Receiver	Level 'B' (Outside with protective cover)	Once every 3 months	- Check for damage to the vessel, paint, nozzles, and supports. - Inspect for any signs of rust or corrosion on the exterior surfaces and nozzle flanges . - Verify that all nozzle openings and the manhole are securely covered. - Ensure the protective tarpaulin is secure and preventing water pooling.
4	Pipes (GI), Structural items (plates, rolled sections)	Level 'B' (Outside with protective cover)	Once every 3 months	- Check for damage to pipes and galvanization. - Ensure pipes are stacked properly on raised surfaces to avoid water logging. - Verify that all pipe ends are securely capped to prevent internal contamination . - Check for damage, corrosion in structural steel
5	Valves, pipe fittings, fasteners, gaskets	Level 'C' (Indoor shelf items)	Once every 3 months	- Inspect for damage, rust, or corrosion - Store on shelves to avoid damage.
6	Instruments (Gauges, Switches, Transmitters, RTDs,); Common Sequencing panel; UPS DB; Interface module	Level 'D' (Indoor clean conditions)	Once every 3 months	- Store in original packaging on designated shelves to protect from vibration and impact. - Check for any damage to the instrument housing, dial, or connection threads - Ensure desiccant packs, as applicable, are inside the packaging to absorb moisture.

For detailed procedures, such as specific lubricant requirements or testing of electrical components, always refer to the full Operation & Maintenance (O&M) manuals provided for each piece of equipment.



**PIPES, FITTINGS, BENDS, VALVES, COATING-WRAPPING, STRAINERS EXPANSION,
JOINTS, TANKS, FASTENERS, LINING ETC.**

	Tests/Check Items / Components	Material Test	DPT/MPI / RT	Ultrasonic Test	WPS/ WQS/PQR	Hydraulic / Water Fill Test	Pneumatic Test	Assembly Fit up	Dimensions	Functional/operatio nal Test	Other Tests	All Tests as per relevant Std	REMARKS
1	Pipes & Pipe Fittings	Y ^a	Y ^b			Y ¹			Y			Y	
2	Diaphragm Valves	Y ^a				Y ⁵			Y		Y ⁶		
3A	Cast Butterfly Valves (Low Pressure)					Y		Y	Y	Y	Y ⁷		
	Body	Y ^a	Y ^b										
	Disc	Y ^a	Y ^b										
	Shaft	Y ^a	Y	Y ^c									
3B	Fabricated Butterfly Valves	REFER NOTE 14											
4	Gate/ Globe/Swing Check / Ball Valves	Y ^a	Y ^b	Y ^c		Y ⁵	Y	Y	Y	Y	Y ⁸		
5	Dual Plate Check Valves	Y ^a	Y ^b	Y ^c		Y	Y	Y	Y	Y	Y ⁴		
6	Rolled & Welded Pipes and Mitre Bends	Y ^a	Y ³		Y	Y ³			Y		Y ^{3&15}	Y	
7	Coating & Wrapping of Pipes	Y ²									Y ²		
8	Tanks & Vessels	Y ^a	Y ^b		Y	Y			Y		Y ¹⁶		
9	Strainers	Y ^a	Y ^b		Y #	Y					Y ¹¹		#For Fabricated Strainer
10	Rubber Expansion Joints	Y ^a				Y ¹²		Y	Y		Y ¹³		
11	Internal Lining of Pipes	Y ^a							Y		Y ⁹		
12	Site Welding		Y ¹⁰		Y	Y							
NOTES (MEANING OF SUPERSCRIPTS)													
a	One per heat/heat treatment batch/lot.												
b	On machined surfaces only for castings and on butt welds.												
c	For shaft/spindles > or = 40 mm												
1	100% Hydraulic test shall be carried out. Weld joints not subjected to hydraulic test due to some unavoidable reasons, shall be subjected to 100% RT/PAUT.												
2	Spark Test, Adhesion Test and Material Test for primer and enameled & Coal Tar Tapes as per AWWA-C-203-91/ IS-10221 & IS 15337 as applicable.												
3	Followings are the testing requirements for fabrication of pipes at site												
	TESTS					QUANTUM OF CHECKS							
	WPS, PQR, Welder Qualification Test					100% Welders and WPS shall be qualified as per ASME- section IX							
	DPT on root run					100% for pipes up to 1200 mm diameter							
	DPT after back gauging					100% for pipes above 1200 mm diameter							
	RT / UT by (TOFD/PAUT) Technique					5% (100% of T Joints)							

	DPT on finished butt weld joints	10%
	Hydraulic Test	100%, 1.5 times the design pressure or 2 times the working-pressure whichever is higher.
4	Dry Cycle Test on Dual Plate Check valve spring for one lakh Cycles shall be carried out as a type test. If Dry Cycle test carried out earlier for same material & diameter, Test report shall be reviewed.	
5	Seat Leakage Test for Actuator Operated Valves, shall be done with by closing the valves with actuator.	
6	Tests on rubber parts shall be conducted per batch of rubber mix for tensile, Elongation, hardness, adhesion, spark test, bleed resistance test. In addition, type test for 50,000 cycles of each type of diaphragm shall also be conducted.	
7	Hydraulic Test of Body, Seat and disc-strength shall be carried out in accordance with governing design standard in presence of owner / owner's representatives. Actuator operated valves shall be checked for Seat Leakage by closing the valves with actuator. For Proof of Design Test refer respective chapters of engineering portion in the technical specification.	
8	Blue matching, wear travel for gates, valves, pneumatic seat leakage, and reduced pressure test for check valves shall be done as per relevant standard. Maximum allowable vacuum loss is 0.5 mm of Hg abs. for valves to be tested for vacuum operation for internal pressure 25 mm of Hg abs. for a period of 15 minutes. Fire safe test for ball valve shall be done wherever specified. In case of already carried out, the test report shall be submitted for review and acceptance by owner / owner's representatives. Valves shall be offered for hydro test in unpainted condition.	
9	Tensile, Elongation, Hardness, Specific Gravity, Lining Thickness, Humidity Check, Pipe temperature check, Adhesion Test and Holiday Detection Test etc as per applicable standard shall be done for all lining material and application.	
10	10% of welds (Root and finished welds) shall be subjected to DPT. (100% DPT for compressed air line and boiler & deaerator fill line.).	
11	Pressure drop across the strainer for each type and size as a special test shall be carried out. In case of already carried out, the test report shall be submitted for review and acceptance by owner / owner's representatives.	
12	During hydraulic and vacuum tests at 25mm Hg abs in 3 positions, the change in the circumference of arch should not be more than 1.5%. 24 hrs after the test permanent set in dimension should not exceed 0.5%.	
13	Tests on rubber for tensile, elongation, hardness, hydraulic stability check as per ASTM D 471, ozone resistance test as per ASTM D 1149/IS 3400 Part 20 aging test and adhesion strength of rubber to fabric, rubber to metal adhesion shall be carried out.	
14	In addition of all tests as indicated for Cast Butterfly valve being applicable for fabricated butterfly valves, following test shall be done for Fabricated Butterfly Valve: a. UT as per ASTM A-435/IS 11630 & IS 4225 on plate material for body and disc shall be carried out for plate thickness 25mm and above. b. 100% RT and DPT as per ASTM, Section-VIII, Division-I, on butt joints of body and disc. 10% DPT on other welds shall be done. c. Post weld heat treatment as per ASME, Section-VIII, Division-I on butt joints of body and disc. d. Welders and WPS shall be qualified as per ASME- section IX	
15	Maximum number of segments in segmental flanges shall be four (04) only. All butt weld joints in the segmental flanges shall be examined by RT/UT. Segmental flanges exceeding 37.5 mm thickness shall be stress relieved as per norms of ASME Section VIII after welding.	
16	For pressure vessel welds RT shall be done as per design code requirements.	

All Valves shall be offered for inspection in unpainted condition.

No repair welding is permitted on Cast Iron / Alloy Cast Iron Castings.

	TECHNICAL SPECIFICATION DARLIPALI STPP PH-II (1X800 MW) COMPRESSED AIR SYSTEM	PE-TS-540-555-A001
		Rev. No. 00
		Date : AUG 2026

Note : 1) This is an indicative list of tests/checks. The manufacture is to furnish a detailed Quality Plan indicating the practices & Procedure followed alongwith relevant supporting documents during QP finalisation

MEASURING INSTRUMENTS (1)									
Item Components	Dimensions (R)	Make, Model, Type, Rating (R)	Process / Electrical connection (R)	Calibration (R)	Test as per standard(R)	Insulation Resistance (R)	IBR Certification (As applicable)(R)	Hydro Test(R)	Material Test certificate (R)
Sub System Assembly									
Pressure Gauge (IS-3624)	Y	Y	Y	Y	Y				
Temp. Gauge (BS-5235)	Y	Y	Y	Y	Y				
Pr./D.P.Switch(BS-6134)	Y	Y	Y	Y	Y	Y			
Electronic Transmitter(IEC-60770)	Y	Y	Y	Y	Y	Y			
Temp. Switch	Y	Y	Y	Y	Y	Y			
RTD(IS-2848)	Y	Y	Y	Y	Y	Y			
Thermowell	Y		Y				Y	Y	Y
R-Routine Test A- Acceptance Test Y – Test applicable									

MEASURING INSTRUMENTS (2)

Item Components	GA, Dimensions, Paint Thickness ®	Make, Model, Type, Rating BOM®	Process / Electrical connection ®	Calibration/Functional Calibration®	Requirement as per standard ®	WPS approval (A)	Non-destructive testing ®	Calculation for accuracy ®	HV/ IR Test ®	IBR Certification as applicable ®	Hydro test ®	Material test certificate (A)	Integral Testing of complete System
Sub System Assembly													
Orifice plate(BS-1042)	Y	Y	Y	Y *	Y	Y **	Y **			Y	Y **	Y	
*Calibration to be carried out on one flow element of each type and size if calibration carried out as type test same shall not be repeated. ** As applicable													
R-Routine Test A- Acceptance Test Y – Test applicable													

ELECTRICAL ACTUATOR													
Test/Attributes Characteristics													
_____ ITEM/ COPONENT/ SUB SYSTEM ASSEMBLY/ TESTING	RPM ®	No Load Current ®	IR & HV Test®	Mounting Dimension®	All routine Test as per Standard & Specification®	Correct Phase Sequence®	Operation & Setting of limit Switch/Torque Switch®	Stall Torque/Current (A)	Hand Wheel operation/ Auto de clutch function (A)	Function of Aux. like Potentiometer, space heater, position indicator ®	EPT output ®	Local/ Remote (Open-Stop-Close) Operation®	Safety check (Single phasing, Phase correction, Tripping etc.) (A)
ELECTRICAL ACTUATOR with Integral Starter , Non- Intrusive Electrical Actuator (EN15714-2)													
Motor	Y	Y	Y	Y	Y								
Final Testing	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
® - Routine Test A - Acceptance Test Y - Test applicable													
Note:													
1) SIL 2 certificate													

PROCESS CONNECTION AND PIPING														
Tests	Visual & Dimensions ®	GA, BOM, Layout of component & construction	Paint feature Flattening, flaring, nyarotest, hardness check as per ASTM standard (A)	Component Ratings ®	Wiring ®	Make, Model, Type, Rating®	IR & HV ®	Review of TC for instrument/devices (R)	Accessibility of TBs/Devices	Illumination arounding ®	Tubing ®	Leak/Hydro test(A)	Chemical/physical properties of material (A)	Proof pressure test, Dismantling & reassembly test Hydraulic
Items														Tests as per standards & specification
Local Instrument enclosure	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y		
Local instruments racks	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y		
Junction Box	Y	Y*		Y		Y	Y							
Impulse pipes and tubes	Y		Y			Y							Y	
Socket weld fittings ANSI B-16.11	Y					Y							Y	Y
Instrument valves & Valve manifolds	Y					Y						Y	Y	
*-applicable for painted junction boxes.														
®-Routine Test A-Acceptance Test Y – Test applicable														

LOCAL CONTROL PANEL									
Tests									
Items									
Local Control Panel	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-Routine Test A- Acceptance Test Y – Test applicable									
Note:									
1) These test are minimum requirement.									
2) Pre power on check: - Wire dressing, looseness, Availability of Fuses and MCB, Modules are inserted properly, Earthing connection, Input Voltage checking.									

		MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN						OWNER :				
				ITEM		HEAT OF COMPRESSION AIR DRYER		QP NO				CONSULTANT :		
								REV				PROJECT :		
				SUB SYSTEM		COMPRESSED AIR SYSTEM.		DATE				PACKAGE VENDOR :		
								PAGE		Page 1 OF 4		BHEL DOC NO :		
SLNO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N					M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10.			11.
1.0 RAW MATERIAL INSPECTION														
1.1	MS PLATE FOR SHELL & DISHED END,	CHEMICAL PROPERTIES	B	CHEMICAL ANALYSIS	1 SAMPLE / HEAT		RELEVANT MATERIAL SPECIFICATION AS PER APPROVED DATA SHEET / APPROVED DRAWING		MILL TC / LAB TC	✓	P	V	V	REFER NOTE 1
		MECHANICAL PROPERTIES	B	MECHANICAL TESTS	1 SAMPLE / HEAT									
				INTERNAL DEFECTS	B	U. T. (32 MM & ABOVE THICK	100 %		ASME SEC. V / ASTM A 435	ASTM A 435	U. T. REPORT	✓	P	V
1.2	PIPES	CHEMICAL PROPERTIES	B	CHEMICAL ANALYSIS	1 SAMPLE / HEAT		RELEVANT MATERIAL SPECIFICATION AS PER APPROVED DATA SHEET / APPROVED DRAWING		MILL TC / LAB TC	✓	P	V	V	REFER NOTE 2
		MECHANICAL PROPERTIES	B	MECHANICAL TESTS	1 SAMPLE / HEAT									
1.3	BOUGHT OUT ITEMS	VISUAL, DIMENSIONAL	B	ITEM, MAKE, RANGE, DIMENSIONAL	100%		APPROVED DATA SHEET / APPROVED DRAWING		MTC / CALIBRATION REPORT	✓	P	V	V	REFER NOTE - 6
2.0 IN PROCESS INSPECTION														
2.1	DISHED END	CORRECT DIMENSIONS	B	MEASURE	100%		MANUFACTURING DRAWING		IR	✓	P	V	V	IN CASE OF JOINT IN DISH END, 100% RT ON JOINT TO BE DONE.
		RT ON DISHED ENDS (IF APPLICABLE)	B	RT AFTER FINAL WELDING	100%		ASME SEC. V	ASME SEC VIII DIV.1-UW-51	RT FILM, RT REPORT	✓	P	V	V	
		DPT ON KNUCKLE	B	DP TEST	100%		ASME SEC. V	ASME SEC. V	DPT REPORT	✓	P	V	V	
		THICKNESS THINNING	B	MEASURE	100%		APPROVED DRAWING/MANUFACTURING DRAWING / TECHNICAL SPECIFICATION		I.R.	✓	P	V	V	
2.2	FABRICATION OF AIR DRYER	CUTTING OF PLATES	B	VISUAL & MEASURE	100%	-	CUTTING PLAN / MANUFACTURING DRAWINGS		REGISTER		P	-	-	
		EDGE PREPARATION AND FIT UP	B	VISUAL & MEASURE	100 %	-	APPROVED WPS / FABRICATION DRAWING		REGISTER		P	-	-	
		WPS / WELDER QUALIFICATION	B	VISUAL & MECHANICAL TEST	100 %		ASME SEC. IX	ASME SEC. IX	QW 482, 483, 484	✓	P	V	V	REFER NOTE : 3
		NDT ON BUTT WELDS (LONGITUDINAL & CIRCUMFERENTIAL WELD JOINT FOR ADSORPTION TOWERS) AFTER BACK GOUGING & FINAL WELDING	B	DPT AFTER BACK GOUGING	100 %		ASME SEC. V	ASME SEC. VIII DIV. 1 APPENDIX 8	NDT REPORT	✓	P	V	V	
			B	RT AFTER FINAL WELDING	10 % ON BUTT JOINT INCLUDING 100% CROSS JOINT		ASME SEC. V	ASME SEC VIII DIV.1-UW-52	RT REPORT	✓	P	V	V	RT FILMS & REPORT WILL BE REVIEWED
		NDT ON BUTT WELDS & FILLET JOINTS IN SHELL & DISH AFTER FINAL WELDING	B	DPT	100 %		ASME SECTION V	ASME SEC. VIII DIV. 1 APPENDIX 8	NDT REPORT	✓	P	V	V	
LEGEND : Records, indentified with "Tick" (✓) shall be essentially included by SUPPLIER in QA documentation. ** M: MANUFACTURER/SUB-SUPPLIER, C: NOMINATED INSPECTION AGENCY N: CUSTOMER , P: PERFORM, W: WITNESS AND V: VERIFICATION. ND: NDT LAB R: TEST / DIMENTIONAL REPORT * RECORDS, INDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.														
MANUFACTURERS / SUB-SUPPLIER		MAIN SUPPLIER												
SIGNATURE		Page 1 OF 4												
				DOC NO : REVIEWED BY APPROVED BY APPROVAL SEAL										

MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN							OWNER :						
		ITEM	HEAT OF COMPRESSION AIR DRYER		QP NO				CONSULTANT :						
					REV				PROJECT :						
		SUB SYSTEM	COMPRESSED AIR SYSTEM.		DATE				PACKAGE VENDOR :						
PAGE	Page 2 OF 4				BHEL DOC NO :										
SLNO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS	
					M	C/N						M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10.			11.	
2.3	WELD QUALITY OF PIPE WELD & FILTERS WELD	DPT ON ROOT RUN & FINAL OF BUTT WELD	B	NDT - DPT	100%		ASME SEC V	ASME SEC. VIII DIV. 1 APPENDIX 8	IR	√	P	V	V		
2.4	HEAT EXCHANGER	TUBE TO TUBE SHEET FILLET WELD JOINT	B	NDT - DPT	100%		ASME SEC V	ASME SEC. VIII DIV. 1 APPENDIX 8	IR	√	P	V	V		
2.5	VESSEL (TOWER) MOISTURE SEPARATOR & HEAT EXCHANGERS	BOD SHELL STRENGTH TEST	B	HYDRO TEST	100 %		HYDRO TEST PRESSURE @ 1.3 TIMES OF DESIGN PRESSURE FOR 30 MIN	NO LEAKAGE & NO PRESSURE DROP	IR	√	P	V	V		
2.6	PNEUMATIC TEST	FOR COMPLETE ASSEMBLY OF AIR DRYER	B	PNEUMATIC TEST WITH SOAP BUBBLE	100%		PNEUMATIC TEST PRESSURE @ 1.1 TIMES OF DESIGN PRESSURE FOR 30MIN	NO LEAKAGE & NO PRESSURE DROP	IR	√	P	W	W	CHP 'W' AT THE TIME OF FINAL INSPECTION	
3.0	FINAL INSPECTION														
3.1	FINAL INSPECTION	DIMENSION, ORIENTATION	B	VISUAL	100%		AS PER APPROVED GA DRAWING / DATA SHEET		IR	√	P	W	W		
3.2	FUNCTIONAL TEST	PERFORMANCE TEST AT NO LOAD CONDITIONS	B	FUNCTIONAL / OPERATION OF VALVES & AUTO DRAIN TRAP	100%		APPROVED FUNCTIONAL TEST PROCEDURE (ENCLOSED) / APPROVED DRAWING / DATASHEET		IR	√	P	W	W		
3.2	CONTROL PANEL	WORKMANSHIP FINISH, SHADE	B	VISUAL	100%	100%	AS PER ELECTRICAL DRAWING / APPROVED DATA SHEET/ MFG STANDARD		IR		P	W	W		
		DRY FILM THICKNESS	B	MEASURE	100%	RANDOM	MINIMUM 50 MICRONS (POWDER COATED), 70 MICRONS (PAINTED)		IR		P	W	W		
		ADHESION TEST (PEEL OFF TEST)	B	MEASURE	100%	1 PANEL (RANDOM)	ASTM D 3359	NO PEEL OFF	IR		P	W	W		
		WIRING & COMPONENT LAYOUT, FITTING ACCESSIBILITY & SAFETY	B	VERIFICATION	100%	RANDOM	AS PER ELECTRICAL DRAWING / APPROVED DATA SHEET		IR		P	V	V		
		COMPONENTS MAKE IDENTIFICATION (MARKING / NAME PLATES)	B	VERIFICATION	100%	100%	AS PER ELECTRICAL DRAWING / APPROVED DATA SHEET		IR	√	P	V	V		
		PROPER WIRE TERMINATION	B	VERIFICATION	100%	RANDOM	NO LOOSE CONNECTIONS. ALL TERMINATIONS TO BE LUGGED		IR		P	V	V		
		DOOR AND LOCK FUNCTIONING	B	FUNCTIONAL	100%	RANDOM	PROPER OPENING & CLOSING, NO MISMATCH		IR		P	W	W		
		EARTHING CHECK	B	VERIFICATION	100%	RANDOM	APPROVED DRAWING / AS PER ELECTRICAL DRAWING		IR		P	V	V		
MANUFACTURERS / SUB-SUPPLIER		MAIN SUPPLIER	LEGEND : Records, indentified with "Tick" () shall be essentially included by SUPPLIER in QA documentation.												
			** M: MANUFACTURER/SUB-SUPPLIER, C: NOMINATED INSPECTION AGENCY N: CUSTOMER , P: PERFORM, W: WITNESS AND V: VERIFICATION. ND:NDT LAB R:TEST / DIMENTIONAL REPORT												
			* RECORDS, INDENTIFIED WITH "TICK" (√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.												
SIGNATURE		Page 2 OF 4													
			REVIWED BY												
			APPROVED BY												
			APPROVAL SEAL												

	MANUFACTURER'S NAME AND ADDRESS	MANUFACTURING QUALITY PLAN					OWNER :						
		ITEM	HEAT OF COMPRESSION AIR DRYER	QP NO					CONSULTANT :				
				REV					PROJECT :				
		SUB SYSTEM	COMPRESSED AIR SYSTEM.	DATE					PACKAGE VENDOR :				
PAGE	Page 3 OF 4				BHEL DOC NO :								

SLNO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD		AGENCY			REMARKS
					M	C/N				D	M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.		10.			11.
		OVERALL DIMENSIONS	B	MEASURE	100%	RANDOM	AS PER ELECTRICAL DRAWING / DATA SHEET		IR		P	V	V	
		DEGREE OF PROTECTION BY PAPER INSERTION	A	MEASURE	100%	100%	AS PER ELECTRICAL DRAWING / DATA SHEET		IR	√	P	V	V	
		IR TEST & HIGH VOLTAGE TEST	A	MEASURE	100%	100%	HV TEST AT 1.5 KV FOR ONE MINUTE IR TEST FOR 500V	WITH STOOD More than 50 MOhms	IR	√	P	W	W	
		FUNCTIONAL TEST	A	VISUAL, MEASURE, VERIFICATION	100%	1 PANEL RANDOM LY SELECT ED	AS PER ELECTRICAL DRAWING / DATA SHEET/ FINCTION TEST PROCEDURE		IR		P	W	W	
3.4	PAINTING	DFT / SURFACE FINISH	B	VISUAL & MEASURE	100%		AS PER MANUFACTURING STANDARDS,		IR	√	P	V	-	
3.5	INSULATION / CLADDING (AS APPLICABLE)	COMPLETENESS	B	VARIFICATION	100%		APPROVED DRAWING / DATASHEET		IR	√	P	V	-	
3.3	PACKING / AVAILABILITY OF ACCESSORIES	VISUAL	B	VISUAL	100%	--	MANFACTURER PROCEDURE.		IR	√	P	V	-	

NOTE

1	MS PLATES USED SHALL BE REPUTED MANUFACTURERS ONLY & BEING THE TOTAL PLATES QTY IS LESS. THESE PLATES SHALL BE SOURCED FROM AUTHORIZED DEALERS LIKE SAIL, JINDAL, ESSAR, LLOYD, & WELLSPUN, ETC.													
2	ALL THE INTERCONNECTING PIPING USED SHALL BE REPUTED MAKES & BEING THE TOTAL PIPE QTY IS LESS. THESE PIPES SHALL BE SOURCED FROM AUTHORIZED DEALERS OF TATA, JINDAL, SURYA ROSHINI & WELLSPUN													
3	LLOYDS/BVQI/BSI/BHEL/TUV APPROVED WPS WILL BE USED, QUALIFIED WELDERS WILL BE DEPLOYED. IF WELDERS ARE ALREADY QUALIFIED BY LLOYDS/BVQI/BSI/BHEL/TUV AND DOING THE SIMILAR JOBS THEN SAME SHALL BE VERIFIED IN PLACE OF WITNESSING.													
4	MEASUREMENT OF DEW POINT AND PERFORMANCE TEST DURING FINAL INSPECTION IS DEMONSTRATIVE AND INDICATIVE ONLY AND WILL BE DONE AT NO-LOAD AND THE SAME WILL BE ACCEPTED.FINAL DEW POINT & PERFORMANCE PARAMETER WILL BE DEMONSTRATED AT SITE ONLY.													
5.	BOUGHT OUT ITEMS													

Records, indentified with "Tick" (✓) shall be essentially included by SUPPLIER in QA documentation.

MANUFACTURERS / SUB-SUPPLIER	MAIN SUPPLIER	LEGEND	** M: MANUFACTURER/SUB-SUPPLIER, C: NOMINATED INSPECTION AGENCY N: CUSTOMER , P: PERFORM, W: WITNESS AND V: VERIFICATION. ND:NDT LAB R:TEST / DIMENTIONAL REPORT * RECORDS, INDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.			DOC NO	:			
		SIGNATURE			Page 3 OF 4			REVIWED BY	APPROVED BY	APPROVAL SEAL

		MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN						OWNER :			
				ITEM	HEAT OF COMPRESSION AIR DRYER	QP NO			CONSULTANT :				
						REV			PROJECT :				
				SUB SYSTEM	COMPRESSED AIR SYSTEM.	DATE			PACKAGE VENDOR :				
PAGE	Page 4 OF 4		BHEL DOC NO :										
SLNO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS
					M	C/N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10.		11.
	SN	ITEM		MAKE				REMARKS					
	1.	PRESSURE GAUGE		BHEL APPROVED MAKE				VERIFICATION OF MANUFACTURER'S CALIBRATION REPORT, TYPE, MAKE, RANGE, ACCURACY					
	2.	TEMPERATURE GAUGE		BHEL APPROVED MAKE				VERIFICATION OF MANUFACTURER'S CALIBRATION REPORT, TYPE, MAKE, RANGE, ACCURACY					
	3.	CYCLE CHANGE OVER VALVE		BHEL APPROVED MAKE				MANUFACTURER'S TEST CERTIFICATE FOR PNEUMATIC TEST OF BODY AND SEAT & MATERIAL					
	4.	BUTTERFLY VALVE		BHEL APPROVED MAKE				MANUFACTURER'S TEST CERTIFICATE FOR PNEUMATIC TEST OF BODY AND SEAT & MATERIAL					
	5.	5/2 WAY SOLENOID VALVES		BHEL APPROVED MAKE				MANUFACTURER'S TEST CERTIFICATE / INSPECTION REPORT					
	6.	DEW POINT METER		BHEL APPROVED MAKE				MANUFACTURER'S TEST CERTIFICATE /CALIBRATION REPORT					
	7.	AUTO DRAIN VALVE		BHEL APPROVED MAKE				MANUFACTURER'S TEST CERTIFICATE					
	8.	DIFFERENTIAL PRESSURE GAUGE		BHEL APPROVED MAKE				VERIFICATION OF MANUFACTURER'S TEST CERTIFICATE, TYPE, MAKE, RANGE, ACCURACY					
	9.	DIFFERENTIAL PRESSURE SWITCH		BHEL APPROVED MAKE				VERIFICATION OF MANUFACTURER'S TEST CERTIFICATE, TYPE, MAKE, RANGE, ACCURACY					
	10.	TEMPERATURE ELEMENT		BHEL APPROVED MAKE				VERIFICATION OF MANUFACTURER'S TEST CERTIFICATE, TYPE, MAKE, RANGE, ACCURACY					
6.	Note : As per SL NO.5 , the bought out items vendor makes are as per approved data sheet. (Enclosed Documents for reference)												
ABBREVIATIONS:- M.T.C. – MANUFACTURER'S TEST CERTIFICATE, L.T.C. – LAB TEST CERTIFICATE, IR – INSPECTION REPORT, UT REPORT – ULTRASONIC TEST REPORT, RT REPORT – RADIOGRAPHICREPORT, NDT – NON DESTRUCTIVE TESTING, HV – HIGH VOLTAGE TEST													

Records, indentified with "Tick" () shall be essentially included by SUPPLIER in QA documentation.

		LEGEND :				DOC NO :	
		** M: MANUFACTURER/SUB-SUPPLIER, C: NOMINATED INSPECTION AGENCY N: CUSTOMER , P: PERFORM, W: WITNESS AND V: VERIFICATION. ND: NDT LAB R: TEST / DIMENTIONAL REPORT * RECORDS, INDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.					
MANUFACTURERS / SUB-SUPPLIER		MAIN SUPPLIER					
SIGNATURE				Page 4 OF 4		REVIWED BY	
						APPROVED BY	
						APPROVAL SEAL	

	QUALITY PLAN			CUSTOMER:		PROJECT:			SPEC. NO :			
				BIDDER/VENDOR:		QP NO. PE-QP-408-555-M001		REV. 00 DT: 20.02.2018		SPEC. TITLE AIR TRAPS		
	SHEET 1 OF 3			SYSTEM SERVICE AIR/ INSTRUMENT AIR		ITEM: BALL FLOAT AIR TRAP			SECTION VOLUME			
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY		REMARKS	
									P	W	V	

1.0	MATERIALS											
1.1	BODY, COVER	1.PHYSICAL & CHEM. PROPERTIES	MA	PHYS.&CHEM, TEST	ONE /HEAT / HEAT BATCH	APPROVED DRAWING / TECH. SPEC.	APPROVED DRAWING/ TECH. SPEC.	TEST CERT.	3/2	2	1	- CO-RELATED TCs SHALL BE FURNISHED.
		2.SURFACE DEFECTS	MA	VISUAL	100%	MSS-SP-55	MSS-SP-55	LOG BOOK	3/2	2	1	
1.2	FLOAT UNIT ASSEMBLY, VALVE SEAT, PIVOT FRAME, SUPPORT FRAME, PIVOT PIN ,GASKET	1. PHYS., CHEM. PROPERTIES	MA	PHYS., CHEM. TEST	ONE /HEAT / HEAT BATCH	APPD. DRG	APPD. DRG	TEST CERT	3/2	2	1	
		2. SURFACE DEFECTS	MA	VISUAL	100%	MSS-SP-55	MSS-SP-55	INSPN. REPORT	3/2	2	1	
1.3	FASTENERS	1. PHYS., CHEM. PROPERTIES	MA	PHYS., CHEM. TEST	ONE PER TYPE	APPD. DRG	APPD. DRG	TEST CERT	3/2	2	1	
2.0	IN-PROCESS											
2.1	ALL COMPONENTS	1.DIMENSIONS	MA	MEASUREMENT	100%	MFG. DRAWING	MFG. DRAWING	INT. INSPN. REPORT	3/2	-	2	
		2. SURFACE DEFECTS	MA	VISUAL	100%	-DO-	-DO-	INSPN. REPORT	3/2	-	2	
2.2	VALVE, VALVE SEAT	1.SURFACE DEFECTS	CR	PENETRANT TEST	100%	ASTME-165	NO DEFECTS	INT. INSPN. REPORT	2	2	1	
		2. HARDNESS	MA	TESTING	100%	APPD. DRG.	APPD. DRG.	INT. INSPN. REPORT	2	2	1	
		3. BALL IMPRES	MA	BY AIR	100%	SEAT SURFACE SHALL HAVE METAL TO METAL CONTACT		INT. INSPN. REPORT	2	2	1	
3.0	SUB- ASSEMBLY											
3.1	VALVE & VALVE SEAT	1. LEAK TIGHTNESS	CR	AIR/HYDRO	100%	APPD. DRG	APPD. DRG.	INT. INSPN. REPORT	2	2	1	

BHEL	PARTICULARS	BIDDER/VENDOR	BIDDER'S/ VENDOR'S COMPANY SEAL
	NAME		
	SIGNATURE		
	DATE		

		QUALITY PLAN		CUSTOMER:		PROJECT:		SPEC. NO.:		
		SHEET 2 OF 3		BIDDER/VENDOR:		QP NO. PE-QP-408-555-M001 REV. 00 DT: 20.02.2018		SPEC. TITLE AIR TRAPS		
		SYSTEM		SERVICE AIR/ INSTRUMENT AIR		ITEM: BALL FLOAT AIR TRAP		SECTION VOLUME		
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V	REMARKS

3.2	COVER	1. ALIGNMENT	MA	VISUAL	100%	-DO-	PROPER FITTING	INT. INSPN. REPORT	2	2	1	The minimum thickness of galvanizing shall be minimum 40 microns.
4.0	HYDRAULIC TEST (FOR CCS MATERIAL, TEST TO BE CONDUCTED BEFORE GALVANISING)											
4.1	BODY COVER SHELL TEST	LEAK TIGHTNESS OF BODY	CR	HYDRO. TEST AT 1.5 TIMES OF TRAP DESIGN PRESSURE	100%	APPD. DRG./TECH. SPEC./DATA SHEET	NO LEAKAGE	TEST CERT	2	2	1	
5.0	GALVANISING (APPLICABLE FOR CCS MATERIAL ONLY)											
5.1	HOT DIP GALVANISING OF BODY, COVER	1. SURFACE PREPARATION & THICKNESS OF GALVANISING & UNIFORMITY.	MA	VISUAL & MEASURE-MENT	100%	IS:2629	IS:2629	INSPN REPORT	2	2,1*	-	
6.0	ASSEMBLY (FOR CCS MATERIAL, TEST TO BE CONDUCTED AFTER GALVANISING)											
6.1	COMPLETE ASSEMBLY	1. CLEANLINESS & COMPLETENESS, DIMENSIONS, THREADING ENDS, ARROW MARKING ETC.	MA	VISUAL & MEASURE-MENT	100%	APPROVED DRAWING	APPROVED DRAWING	INSPN REPORT	2	2,1*	-	
		2.LEAK TIGHTNESS OF BODY	CR	HYDRO. TEST AT 1.5 TIMES OF TRAP DESIGN PRESSURE	100%	APPD. DRG./TECH. SPEC./DATA SHEET	NO LEAKAGE	TEST CERT	2	1*	-	
		3.FUNCTIONAL TEST	CR	FUNCTIONAL TEST AT MINIMUM 6Kg/cm ² PRESSURE (VISUAL DISCHARGE OF CONDENSATE)	100 %	APPD DRG./ GIVEN PROCEDURE ON PAGE 3/3 OF THIS QP.	NO AIR LEAKAGE	TEST CERT.	2	1*	-	

BHEL		PARTICULARS		BIDDER/VENDOR	
		NAME			
		SIGNATURE			
		DATE			
				BIDDER'S/ VENDOR'S COMPANY SEAL	

		QUALITY PLAN		CUSTOMER:		PROJECT:		SPEC. NO.				
				BIDDER/VENDOR:		QP NO. PE-QP-408-555-M001		REV. 00 DT: 20.02.2018		SPEC. TITLE AIR TRAPS		
		SHEET 3 OF 3		SYSTEM SERVICE AIR/ INSTRUMENT AIR		ITEM: BALL FLOAT AIR TRAP		SECTION VOLUME				
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	
6.2	FLOW CAPACITY TEST (TYPE TEST)	CONDENSATE DISCHARGE	CR	DISCHARGE FLOW	1 PER PRESSURE RATING & ORIFICE SIZE TRAP	APPD. FLOW CAPACITY	APPD. FLOW CAPACITY	TYPE TEST CERTIFICA TE	3/2	2	1	
7.0	END CONN.	DIMENSIONS	CR	MEASUREMENT	100%	APPD. DRG./ TECH. SPEC	APPD.DRG/ TECH.SPEC	INSPN REPORT	3/2	2,1*	-	
8.0	PROVISION OF NAME PLATE WITH PURCHASER'S TRAP TAG NOS. & PACKING IN WOODEN CASES	AS PER TECHNICAL SPECIFICATION	MA	VISUAL	100%	--DO--	--DO--	(Soft copy of photographs)	2	2	1	Vendor to provide the following: Photographs of traps duly placed inside the wooden box just before final packing. Photographs of the wooden box in which the traps have been finally packed just before dispatch. Clearance for dispatch of traps will be given only after receiving the photos of traps in satisfactory condition as mentioned in the condition stated above.

FUNCTIONAL TEST PROCEDURE.

1. COMPRESSED AIR (MINIMUM AT 6 Kg/cm² PRESSURE) TO BE SUPPLIED IN A MIXING CHAMBER.
 2. WATER IS ADDED IN THE SAME CHAMBER SO THAT AIR IN THE CHAMBER HAS SUFFICIENT MOISTURE
 3. TRAP IS INSTALLED AT THE BOTTOM OF THIS CHAMBER AND ITS PERFORMANCE IS CHECKED.
- A GOOD PERFORMING TRAP DRAINS OUT ONLY WATER DROPLETS AND RETAINS COMPRESSED AIR BACK IN THE SYSTEM.

NOTE:-

CR- MEANS CRITICAL ACTIVITY
1 = PURCHASER (BHEL/CUSTOMER)
P = PERFORMED BY

MA- MEANS MAJOR ACTIVITY
2 = VENDOR
W = WITNESSED BY

MI- MEANS MINOR ACTIVITY
3 = SUB VENDOR OF THE VENDOR
V = VERIFIED BY

* The Quantum of check to be witnessed is 10% of quantity or Min. 2 Nos. at random by BHEL/Customer & 100 % by Vendor for each type, Size & Rating.

BHEL		PARTICULARS	BIDDER/VENDOR	
		NAME		
		SIGNATURE		
		DATE		
				BIDDER'S/ VENDOR'S COMPANY SEAL

	QUALITY PLAN		CUSTOMER:			PROJECT:			SPEC. NO.:			
			BIDDER/VENDOR:			QP NO.: PE-QP-408-555-M016		REV.00 DT: 20.02.2018		SPEC. TITLE AIR TRAPS		
	SHEET 1 OF 3		SYSTEM		SERVICE/INSTRUMENT AIR		ITEM: EXTERNAL Y-TYPE AIR STRAINER			SECTION VOLUME		
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY			REMARKS
									P	W	V	

1.0	MATERIAL CONTROL											
1.1	BODY, CAP	1 PHYS & CHEM PROPERTIES	MA	PHYS TESTS CHEM TESTS	ONE/HEAT/ BATCH	APPD. DATA SHEET/ TECH.SPEC.	APPD,DATA SHEET/ TECH.SPEC	TEST CERT.	3/2	2	1	CORRELATION REQD.
		2. SURFACE DEFECTS	MA	VISUAL	100%	—DO—	—DO—	INSPN. REPORT	3/2	2	1	
1.2	MESH	1. CHEM PROPERTIES	MA	CHEM. TESTS	1/SHEET	APPD. DATA SHEET/ TECH.SPEC.	APPD,DATA SHEET/ TECH. SPEC	TEST CERT	3/2	2	1	
		2. MESH SIZE/ PERFORATION DIA	MA	MEASUREMENT	SAMPLE PIECE	—DO—	—DO—	INSPN REPORT	3/2	2	1	
2.0	IN PROCESS CONTROL											
2.1	ALL COMPONENTS	1.WORKMANSHIP & FINISH	MA	VISUAL	100%	MFG DRG	MFG DRG	INSP REPORT	2	2	1	
		2.DIMENSIONS	MA	MEASUREMENT	100%	MFG DRG	MFG DRG	MFG DRG	2	2	1	
3.0	HYDRAULIC TEST (FOR CCS MATERIAL, TEST TO BE CONDUCTED BEFORE GALVANISING)											
3.1	BODY CAP	LEAK TIGHTNESS OF BODY	CR	HYDROTEST AT 1.5 TIMES OF STRAINER DESIGN PRESSURE	100%	APPD.DRG/T ECH. SPEC	NO LEAKAGE	TEST CERT	2	2	1	
4.0	GALVANISING (APPLICABLE FOR CCS MATERIAL ONLY)											

BHEL		PARTICULARS	BIDDER/VENDOR	
		NAME		
		SIGNATURE		
		DATE		
				BIDDER'S/ VENDOR'S COMPANY SEAL

	QUALITY PLAN		CUSTOMER:			PROJECT:			SPEC. NO :			
			BIDDER/VENDOR:			QP NO.. PE-QP-408-555-M016		REV.00 DT: 20.02.2018		SPEC. TITLE AIR TRAPS		
	SHEET 2 OF 3		SYSTEM SERVICE/ INSTRUMENT AIR			ITEM: EXTERNAL Y-TYPE AIR STRAINER			SECTION VOLUME			
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V			REMARKS

4.1	HOT DIP GALVANISING OF BODY, COVER	1. SURFACE PREPARATION & THICKNESS OF GALVANISING & UNIFORMITY.	MA	VISUAL & MEASURE-MENT	100%	IS:2629	IS:2629	INSPN REPORT	2	2,1 *	-	The minimum thickness of galvanizing shall be minimum 40 microns.
5.0	ASSEMBLY CONTROL (FOR CCS MATERIAL, TEST TO BE CONDUCTED AFTER GALVANISING)											
5.1	COMPLETE STRAINER	1. WORKMANSHIP AND FINISH	MA	VISUAL	100%	APPD.DRG	APPD.DRG	INSPN. REPORT	2	2	1	
		2. OVERALL DIMENSIONS	CR	MEASUREMENT	100%	--DO--	DO--	--DO--	2	2,1 *	1	
		3. LEAK TIGHTNESS OF BODY	CR	HYDROTEST AT 1.5 TIMES OF STRAINER DESIGN PRESSURE	100%	APPD.DRG/T ECH. SPEC	NO LEAKAGE	TEST CERT	2	2,1 *	1	
6.0	END CONN.	DIMENSIONS	CR	MEASUREMENT	100%	APPD DRG/ TECH SPEC.	APPD DRG/ TECH SPEC	INSPN REPORT	2	2,1 *	-	
7.0	PROVISION OF NAME PLATE WITH PURCHASER'S STRAINER TAG NOS IF ANY & PACKING IN WOODEN CASES	AS PER TECH. SPEC	MA	VISUAL	100%	TECH. SPEC	TECH. SPEC	(Soft copy of photographs)	3/2	2	1	Vendor to provide the following: a) Photographs of strainer duly placed inside the wooden box just before final packing. b) Photographs of the wooden box in which the strainer have been finally packed just before dispatch. Clearance for dispatch of valves/traps will be given

BHEL	PARTICULARS	BIDDER/VENDOR	BIDDER'S/ VENDOR'S COMPANY SEAL
	NAME		
	SIGNATURE		
	DATE		

		QUALITY PLAN		CUSTOMER:		PROJECT:				SPEC. NO :	
				BIDDER/VENDOR:		QP NO.. PE-QP-408-555-M016		REV.00 DT: 20.02.2018		SPEC. TITLE AIR TRAPS	
		SHEET 3 OF 3		SYSTEM SERVICE/ INSTRUMENT AIR		ITEM: EXTERNAL Y-TYPE AIR STRAINER				SECTION VOLUME	
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY P W V		REMARKS
											only after receiving the photos of valves/traps in satisfactory condition as mentioned in the condition stated above.

NOTE: CR = CRITICAL ACTIVITY

MA = MAJOR ACTIVITY

MI = MINOR ACTIVITY

1 = PURCHASER (BHEL/CUSTOMER) 2 = VENDOR

3 = SUB VENDOR OF THE VENDOR

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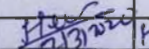
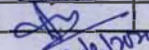
V = VERIFIED BY

* The Quantum of check to be witnessed is 10% of quantity or Min. 2 Nos. at random by BHEL/Customer & 100 % by Vendor for each type, Size & Rating.

BHEL	PARTICULARS	BIDDER/VENDOR	BIDDER'S/ VENDOR'S COMPANY SEAL
	NAME		
	SIGNATURE		
	DATE		

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO :		DATE:27.02.2020
		CUSTOMER :		QP NO.: PED-506-00-Q-006, REV-02		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS UPTO 55KW (LV (415V))	SYSTEM:	SECTION: II	SHEET 1 OF 2	

SI No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	*	**			
					M	C/N				D	M	C	N	
1.0	ASSEMBLY	1.WORKMANSHIP	MA	VISUAL	100%	-	MFG. SPEC.	MFG. SPEC.	-DO-		P	-	-	
		2.DIMENSIONS	MA	-DO-	-DO-	-	MFG. DRG./ MFG. SPEC.	MFG. DRG./ MFG. SPEC.	-DO-		P	-	-	
		3.CORRECTNESS COMPLETENESS TERMINATIONS/ MARKING/COLOUR CODE	MA	VISUAL	100%	-	MFG.SPEC./	MFG.SPEC.	-DO-		P	-	-	
2.0	PAINTING	1.SHADE	MA	VISUAL	SAMPLE	-	MFG. SPEC/ APPROVED DATASHEET	SAME AS COL.7	LOG BOOK		P	-	-	
3.0	TESTS	1.ROUTINE TEST INCLUDING SPECIAL TEST	MA	-DO-	100%	100%	IS-325 / IS-12615/ APPROVED DATA SHEET	SAME AS COL.7	TEST/ INSPN. REPORT		P	W	W	NOTE -1 & NOTE-2
		2.OVERALL DIMENSIONS & ORIENTATION	MA	MEASUREMENT & VISUAL	100%	100%	APPROVED DRG/DATA SHEET	APPROVED DRG/DATA SHEET	TEST/ INSPN. REPORT		P	W	W	NOTE -1 & NOTE-2

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Hema K. P. Dutt	Checked by:		Kunal Gandhi
Reviewed by:		P. Dutt	Reviewed by:		

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO :		DATE: 27.02.2020
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		ITEM: AC ELECT. MOTORS UPTO 55KW (LV (415V))		SYSTEM:	SECTION: II	

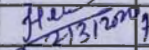
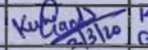
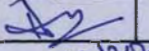
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					M	C/N				D	M	C	N	
4.0	PACKING	3.NAMEPLATE DETAILS	MA	VISUAL	100%	100%	IS-325 / IS-12615 / APPROVED DATA SHEET	SAME AS COL.7	TEST/ INSPN. REPORT		P	W	W	(H) APPLICABLE FOR EXPORT JOBS
		SURFACE FINISH & COMPLETENESS	MA	VISUAL	100%	100%	AS PER MFG. STANDARD / APPROVED PACKING DRAWING.(#)	AS PER MFG. STANDARD / APPROVED PACKING DRAWING.(#).	INSPC. REPORT		P	W	-	

NOTES:

- 1 ROUTINE TESTS ON 100% MOTORS SHALL BE DONE BY THE VENDOR. HOWEVER, BHEL/CUSTOMER SHALL WITNESS ROUTINE TESTS ON RANDOM SAMPLES. THE SAMPLING PLAN SHALL BE MUTUALLY AGREED UPON
- 2 FOR EXHAUST/VENTILATION FAN MOTORS OF RATING UPTO 1.5KW , ONLY ROUTINE TEST CERTIFICATES SHALL BE FURNISHED FOR SCRUTINY.
- 3 IN CASE TEST CERTIFICATES FOR THESE TESTS ON SIMILAR TYPE, SIZE AND DESIGN OF MOTOR FROM INDEPENDENT LABORATORY ARE AVAILABLE, THESE TEST MAY NOT BE REPEATED.
- 4 BHEL RESERVES THE RIGHT TO PERFORM REPEAT TEST, IF REQUIRED.
- 5 AFTER PACKING AND PRIOR TO ISSUE MDCC, PHOTOGRAPHS OF ITEMS TO BE DESPATCHED SHALL BE SENT TO BHEL FOR REVIEW.
- 6 IN CASE , ANY CHANGES IN QP COMMENTED BY CUSTOMER AT CONTRACT STAGE SHALL BE CARRIED OUT BY BIDDER WITHOUT ANY IMPLICATION TO BHEL/ CUSTOMER.

LEGENDS:

*RECORDS, IDENTIFIED WITH "TICK"(✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
 ** M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, B: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, C: CUSTOMER,
 P: PERFORM, W: WITNESS, V: VERIFICATION, AS APPROPRIATE
 MA: MAJOR, MI: MINOR, CR: CRITICAL
 D: DOCUMENT

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Hema K.	Checked by:		KUNAL GANDHI
Reviewed by:		P. Dutt	Reviewed by:		

02/3/2020

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Doc No:			
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	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.:	DATE: 27.02.2020
		CUSTOMER :		QP NO.: PED-506-00-Q-007, REV-04	
		PROJECT:		PO NO.:	
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	

SI No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD	AGENCY			
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					M	C/N				D	M	C	N
1.0	RAW MATERIAL & BOUGHT OUT CONTROL												
1.1	SHEET STEEL, PLATES, SECTION, EYEBOLTS	1.SURFACE CONDITION	MA	VISUAL	100%	-	-	FREE FROM BLINKS, CRACKS, WAVINESS ETC	LOG BOOK		P	-	-
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	-DO-		P	-	-
		3.PROOF LOAD TEST (EYE BOLT)	MA	MECH. TEST	-DO-	-	-DO-	-DO-	TEST REPORT		P/V	-	-
1.2	HARDWARES	1.SURFACE CONDITION	MA	VISUAL	100%	-		FREE FROM CRACKS, UN-EVENNESS ETC.	-DO-		P	-	-
		2.PROPERTY CLASS	MA	VISUAL	SAMPLES	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	SUPPLIERS TC & LOG		P/V	-	-
1.3	CASTING	1.SURFACE CONDITION	MA	VISUAL	100%	-		FREE FROM CRACKS, BLOW HOLES ETC.	LOG BOOK		P/V	-	-
		2.CHEM. & PHY. PROP.	MA	CHEM & MECH TEST	1/HEAT NO.	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	SUPPLIER'S TC		P/V	-	-
		3.DIMENSIONS	MA	MEASUREMENT	100%	-	MANUFACTURER'S DRG.	MANUFACTURER'S DRG.	LOG BOOK		P/V	-	-
1.4	PAINT & VARNISH	1.MAKE, SHADE, SHELF LIFE & TYPE	MA	VISUAL	100% CONTINUOUS	-	MANUFACTURER'S DRG./SPEC	MANUFACTURER'S DRG./SPEC	LOG BOOK		P/V	-	-

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:	<i>[Signature]</i>	Hema K.	Checked by:	<i>[Signature]</i>	KUNAL GANDHI
Reviewed by:	<i>[Signature]</i>	P. DUTTA	Reviewed by:		

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Approved by:			



MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS

STANDARD QUALITY PLAN

CUSTOMER :

PROJECT:

ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))

SYSTEM:

SPEC. NO :

QP NO.: PED-508-00-Q-007, REV-04

PO NO.:

SECTION: II

DATE: 27.02.2020

SHEET 2 OF 9

SI No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY		
1	2	3	4	5	6		7	8	9	.	..		
					M	C/N				D	M	C	N
15	SHAFT (FORGED OR ROLLED)	1. SURFACE COND.	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	-DO-		P	-	-
		2. CHEM. & PHYSICAL PROPERTIES	MA	CHEM. & PHYSICAL TESTS	1/HEAT NO. OR HEAT TREATMENT BATCH NO	-	MANUFACTURER'S DRG / SPEC.	MANUFACTURER'S DRG / STD.	SUPPLIER'S TC		PV	-	-
		3. DIMENSIONS	MA	MEASUREMENT	100%	-	-DO-	MANUFACTURER'S DRG.	LOG BOOK		PV	-	-
		4. INTERNAL FLAWS	CR	ULTRASONIC TEST	100%	100%	ASTM-A388	MANUFACTURER'S STD.	-DO-	✓	PW	V	-
16	SPACE HEATERS, CONNec- TORS, TERMINAL BLOCKS, CABLES, CABLE LUGS, CARBON BRUSH TEMP. DETECTORS, RTD, BTD'S	1. MAKE & RATING	MA	VISUAL	-DO-	-	MANUFACTURER'S DRG./ STD.	MANUFACTURER'S DRG./STD.	-DO-		PV	-	-
		2. PHYSICAL COND.	MA	-DO-	-DO-	-	-	NO PHYS. DAMAGE, NO ELECTRICAL DISCONTINUITY	-DO-		PV	-	-
		3. DIMENSIONS (WHEREVER APPLICABLE)	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG. / STD	MANUFACTURER'S DRG. / STD.	-DO-		PV	-	-
		4. PERFORMANCE/ CALIBRATION	MA	TEST	100%	-	-DO-	-DO-	TEST REPORT		PV	-	-

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:	<i>[Signature]</i>	Hema K.	Checked by:	<i>[Signature]</i>	KUNAL GANDHI
Reviewed by:	<i>[Signature]</i>	P. Dutt	Reviewed by:		

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Approved by:			



MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS

STANDARD QUALITY PLAN

CUSTOMER :

PROJECT:

ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))

SYSTEM:

SPEC. NO.:

QP NO.: PED-506-00-Q-007, REV-04

PO NO.:

SECTION: II

DATE: 27.02.2020

SHEET 3 OF 9

SI No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY		
1	2	3	4	5	6		7	8	9	.	..		
					M	C/N				D	M	C	N
1.7	OTHER INSULATING MATERIALS LIKE SLEEVES, BINDINGS CORDS, PAPERS, PRESS BOARDS ETC.	1. SURFACE COND. ETC.	MA	VISUAL	100%	-	-	NO VISUAL DEFECTS	TEST REPORT		P/V	-	-
		2. OTHER CHARACTERISTICS	MA	TEST	SAMPLE	-	MANUFACTURER'S STD.	MANUFACTURER'S STD.	LOG BOOK AND OR SUPPLIER'S TC		P/V	-	-
1.8	SHEET STAMPING (PUNCHED)	1. SURFACE COND.	MA	VISUAL	100%	-	-	NO VISUAL DEFECTS (FREE FROM BURS)	LOG BOOK		P	-	-
		2. DIMENSIONS INCLUDING BURS HEIGHT	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG.	MANUFACTURER'S DRG.	-DO-		P/V	-	-
		3. ACCEPTANCE TESTS	MA	ELECT. & MECH TESTS	-DO-	-	MANUFACTURER'S DRG./ STD.	MANUFACTURER'S DRG./ STD.	SUPPLIER'S TC		P/V	-	-
1.9	CONDUCTORS	1. SURFACE FINISH	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	LOG BOOK		*P/V	-	-
		2. ELECT. PROP. & MECH. PROP	MA	ELECT. & MECH TEST	SAMPLES	-	MANUFACTURER'S DRG./ SPEC.	MANUFACTURER'S / SPEC.	SUPPLIERS TC & VENDOR'S TEST REPORTS		P/V	-	-

* MOTOR MANUFACTURER TO CONDUCT VISUAL CHECK FOR SURFACE FINISH ON RANDOM BASIS (10% SAMPLE) AT HIS WORKS AND MAINTAIN RECORD FOR VERIFICATION BY BHEL/CUSTOMER.

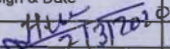
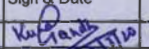
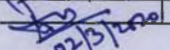
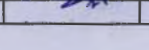
BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:	<i>[Signature]</i>	Hema K.	Checked by:	<i>[Signature]</i>	KUNAL GANDHI
Reviewed by:	<i>[Signature]</i>	P. Dutta	Reviewed by:		

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Approved by:			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.:		DATE: 27.02.2020
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SI No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY		
1	2	3	4	5	6		7	8	9				
					M	C/N				D	M	C	N
1.10	BEARINGS	3.DIMENSIONS	MA	MEASUREMENT	-DO-	-	-DO-	-DO-	Log Book		P/V	-	-
		1.MAKE & TYPE	MA	VISUAL	100%	-	MANUFACTURER'S DRG./ APPROVED DATASHEET	MANUFACTURER'S DRG./ APPROVED DATASHEET	-DO-		P/V	-	-
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	-	APPROVED DATASHEET	APPROVED DATASHEET/ BEARING MANUF'S CATALOGUES	-DO-		P/V	-	-
		3.SURFACE FINISH	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	-DO-		P/V	-	-
1.11	SLIP RING (WHEREVER APPLICABLE)	1.SURFACE COND.	MA	VISUAL	100%	-	-	-DO-	-DO-		P	-	-
		2.DIMENSIONS	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG	MANUFACTURER'S DRG	-DO-		P	-	-
		3.TEMP WITH-STAND CAPACITY	MA	ELECT.TEST	-DO-	-	MANUFACTURER'S STD / APPROVED DATASHEET	MANUFACTURER'S STD / APPROVED DATASHEET	-DO-		P/V	-	-
		4.HWIR	MA	-DO-	100%	-	-DO-	-DO-	-DO-		P/V	-	-
1.12	OIL SEALS & GASKETS	1.MATERIAL OF GASKET	MA	VISUAL	100%	-	MANUFACTURER'S DRG/SPECS	MANUFACTURER'S DRG / SPECS.	-DO-		P	-	-
		2.SURFACE COND.	MA	VISUAL	100%	-	-	FREE FROM VISUAL DEFECTS	-DO-		P	-	-
		3.DIMENSIONS	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S DRG	MANUFACTURER'S DRG	-DO-		P	-	-

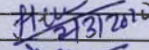
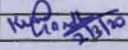
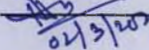
BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Hemra K.	Checked by:		RUNAL
Reviewed by:		P. Dutt	Reviewed by:		GAGAN

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	.	..			
					M	C/N				D	M	C	N	
2.0	IN PROCESS													
2.1	STATOR FRAME WELDING (IN CASE OF FABRICATED STATOR)	1.WORKMANSHIP & CLEANNES	MA	VISUAL	100%	-	-DO-	GOOD FINISH	LOG BOOK		P/W	-	-	
		2.DIMENSIONS	MA	MEASUREMENT	-DO-	-	MANUFACTURER'S DRG	MANUFACTURER'S DRG	-DO-		P	-	-	
2.2	MACHINING	1.FINISH	MA	VISUAL	100%	-	-DO-	GOOD FINISH	LOG BOOK		P	-	-	
		2.DIMENSIONS	MA	MEASUREMENT	-DO-	-	MANUFACTURER'S DRG	MANUFACTURER'S DRG	-DO-		P	-	-	
		3.SHAFT SURFACE FLOWS	MA	PT	100%	100%	MANUFACTURER'S STD./ ASTM-E165	MANUFACTURER'S STD./ APPROVED DATASHEET.	-DO-	✓	P	V	-	
2.3	PAINING	1.SURFACE PREPARATION	MA	VISUAL	100%	-	MANUFACTURER'S STD./APPROVED DATASHEET	SAME AS COL.7	LOG BOOK		P	-	-	
		2.PAINT THICKNESS (BOTH PRIMER & FINISH COAT)	MA	MEASUREMENT BY ELCOMETER	SAMPLE	-	-DO-	-DO-	-DO-		P	-	-	
		3.SHADE	MA	VISUAL	-DO-	-	-DO-	-DO-	LOG BOOK		P	-	-	
		4.ADHESION	MA	CROSS CUTTING & TAPE TEST	-DO-	-	-DO-	-DO-	LOG BOOK		P	-	-	

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Hema R.	Checked by:		KUNAL CHANDNI
Reviewed by:		P. Dutta	Reviewed by:		

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

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1	2	3	4	5	6		7	8	9	.	..			
				-	M	C/N				D	M	C	N	
2.4	SHEET STACKING	1.COMPLETENESS	MA	MEASUREMENT	SAMPLE	-	MANUFACTURER'S STD.	MANUFACTURER'S STD.	LOG BOOK		P	-	-	
		2.COMPRESSION & TIGHTENING	MA	MEASUREMENT	100%	-	-DO-	-DO-	LOG BOOK		P	-	-	
2.5	WINDING	1.COMPLETENESS	CR	VISUAL	100%	-	MANUFACTURER'S STD./APPROVED DATASHEET	MANUFACTURER'S STD./APPROVED DATASHEET	LOG BOOK		P	-	-	
		2.CLEANLINESS	CR	-DO-	-DO-	-	-DO-	-DO-	LOG BOOK		P	-	-	
		3.IR-HV-IR	CR	ELECT. TEST	100%	100%	IS-325//IS-12615/IEC-60034 PART-1	IS-325//IS-12615/IEC-60034 PART-1	LOG BOOK	✓	P	V	-	
		4.RESISTANCE	CR	-DO-	100%	100%	IS-325//IS-12615/IEC-60034 PART-1	IS-325//IS-12615/IEC-60034 PART-1	LOG BOOK	✓	P	V	-	
		5.INTERTURN INSULATION	CR	-DO-	-DO-	-	-DO-	-DO-	LOG BOOK		P	-	-	
2.6	IMPREGNATION	1.VISCOSITY	MA	PHY. TEST	AT STARTING	-	MANUFACTURER'S STANDARD	MANUFN'S STANDARD	LOG BOOK		P	-	-	
		2.TEMP. PRESSURE VACCUM	MA	PROCESS CHECK	CONTINUOUS	-	MANUFACTURER'S STANDARD	MANUFACTURER'S STANDARD	LOG BOOK		P	-	-	
		3.NO. OF DIPS	MA	-DO-	CONTINUOUS	CONTINUOUS	MANUFACTURER'S STANDARD	MANUFACTURER'S STANDARD	LOG BOOK	✓	P	V	-	THREE DIPS TO BE GIVEN

BHEL					
ENGINEERING			QUALITY		
Sign & Date	Name		Sign & Date	Name	
Prepared by: <i>[Signature]</i>	Hema K.		Checked by: <i>[Signature]</i>	KUNAL GANDHI	
Reviewed by: <i>[Signature]</i>	P. DUTTA		Reviewed by:		

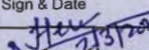
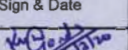
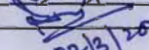
BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

02/3/2020

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.:		DATE: 27.02.2020
		CUSTOMER :		QP NO.: PED-508-00-Q-007, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	SHEET 7 OF 9	

SI No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	-	--			
					M	C/N				D	M	C	N	
2.7	COMPLETE STATOR ASSEMBLY	4.DURATION	MA	-DO-	CONTINUOUS	CONTINUOUS	-DO-	-DO-	LOG BOOK	✓	P	V	-	
		1.COMPACTNESS & CLEANLINESS	MA	VISUAL	100%	-	-DO-	-DO-	LOG BOOK		P	-	-	
2.8	BRAZING/COMPRESSION JOINT	1.COMPLETENESS	CR	-DO-	-DO-	-	-DO-	-DO-	LOG BOOK		P	-	-	
		2.SOUNDNESS	CR	MALLET TEST & UT	100%	100%	-DO-	-DO-	LOG BOOK	✓	P	V	-	
		3.HV	MA	ELECT. TEST	100%	100%	-DO-	-DO-	LOG BOOK	✓	P	V	-	
2.9	COMPLETE ROTOR ASSEMBLY	1.RESIDUAL UNBALANCE	CR	DYN. BALANCE	-DO-	-	MANUFACTURER'S SPEC./ ISO 1940	MANUFACTURER'S DWG.	LOG BOOK		P	-	-	
		2.SOUNDNESS OF DIE CASTING	CR	ELECT. (GROWLER TEST)	100%	100%	MANUFACTURER'S SPEC.	MANUFACTURER'S SPEC.	LOG BOOK	✓	P	V	-	
2.10	ASSEMBLY	1.ALIGNMENT	MA	MEAS.	-DO-	-	-DO-	-DO-	LOG BOOK		P	-	-	
		2.WORKMANSHIP	MA	VISUAL	-DO-	-	-DO-	-DO-	LOG BOOK		P	-	-	
		3.AXIAL PLAY	MA	MEAS.	100%	100%	-DO-	-DO-	LOG BOOK	✓	P	V	-	
		4.DIMENSIONS	MA	-DO-	-DO-	-	MANUFACTURER'S DRG./ MANUFACTURER'S SPEC.	MANUFACTURER'S DRG/ RELEVANT IS	LOG BOOK		P	-	-	
		5.CORRECTNESS, COMPLETENESS TERMINATIONS/ MARKING/ COLOUR CODE	MA	VISUAL	100%	-	MANUFACTURER'S SPEC.	MANUFACTURER'S SPEC.	LOG BOOK		P	-	-	
		6. RTD, 8TD & SPACE HEATER MOUNTING.	MA	VISUAL	100%	100%	MANUFACTURER'S SPEC.	MANUFACTURER'S SPEC.	LOG BOOK	✓	P	V	-	

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Hema K.	Checked by:		KUNAL GANDHI
Reviewed by:		P. Dutta	Reviewed by:		

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO.:		DATE: 27.02.2020
		CUSTOMER :		QP NO.: PED-506-00-Q-007, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	SHEET 8 OF 9	

SI No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY			
1	2	3	4	5	6		7	8	9	.	..			
					M	C/N					D	M	C	
3.0	TESTS	1.TYPE TESTS INCLUDING SPECIAL TESTS	MA	ELECT.TEST	1/TYPE/SIZE	1/TYPE/SIZE	IS-325//IS-12615/APPROVED DATASHEET	IS-325//IS-12615/APPROVED DATASHEET	TEST REPORT		P	W*	W*	* NOTE - 1
		2.ROUTINE TESTS INCLUDING SPECIAL TEST	MA	-DO-	100%	100%	-DO-	-DO-	-DO-		P	V/W ³	V/W ³	³ NOTE - 2
		3.VIBRATION & NOISE LEVEL	MA	-DO-	100%	100%	IS: 12075 / IEC 60034-14 & IS-12065	IS: 12075 / IEC 60034-14 & IS-12065	-DO-		P	V/W ³	V/W ³	³ NOTE - 2
		4.OVERALL DIMENSIONS AND ORIENTATION	MA	MEASUREMENT & VISUAL	100%	100%	APPROVED DRG/DATA SHEET	APPROVED DRG/DATA SHEET &	TEST/INSPC. REPORT		P	W	-	
		5.DEGREE OF PROTECTION	MA	ELECT. & MECH. TEST	1/TYPE/ SIZE	1/TYPE/ SIZE	IEC 60034-5//IS-12615	APPROVED DATASHEET	TC	✓	P	V	V	TC FROM AN INDEPENDENT LABORATORY, REFER NOTE-3
		6. MEASUREMENT OF RESISTANCE OF RTD & BTD	MA	-DO-	100%	100%	IS-325//IS-12615/IEC-60034 PART-1//S: 12802	IS-325//IS-12615/IEC-60034 PART-1//S: 12802	-DO-		P	V/W ³	V/W ³	³ NOTE - 2
		7. MEASUREMENT OF RESISTANCE, IR OF SPACE HEATER	MA	-DO-	100%	100%	IS-325//IS-12615/IEC-60034 PART-1	IS-325//IS-12615/IEC-60034 PART-1	-DO-		P	V/W ³	V/W ³	³ NOTE - 2
		8. NAME PLATE DETAILS	MA	VISUAL	100%	100%	IS-325//IS-12615& DATA SHEET	IS-325//IS-12615 & DATA SHEET	TEST/INSPC. REPORT		P	V/W ³	V/W ³	³ NOTE - 2
		9.EXPLOSION FLAME PROOF NESS (IF SPECIFIED)	MA	EXPLOSION FLAME PROOF TEST	1/TYPE	1/TYPE	IS 2148 / IEC 60079-1	IS 2148 / IEC 60079-1	TC	✓	P	V	V	TC FROM AN INDEPENDENT LABORATORY, REFER NOTE-3
		10. PAINT SHADE, THICKNESS & FINISH	MA	VISUAL & MEASUREMENT BY ELKOMETER	SAMPLE	SAMPLE	APPROVED DATASHEET	APPROVED DATASHEET	TC		P	W\$	W\$	SAMPLING PLAN TO BE DECIDED BY INSPECTION AGENCY ³ NOTE - 2

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:	<i>[Signature]</i>	<i>Hema K.</i>	Checked by:	<i>[Signature]</i>	<i>K. K. K.</i>
Reviewed by:	<i>[Signature]</i>	<i>P. D. D.</i>	Reviewed by:		

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO :		DATE: 27.02.2020
		CUSTOMER :		QP NO.: PED-506-00-Q-007, REV-04		
		PROJECT:		PO NO.:		
		ITEM: AC ELECT. MOTORS 55 KW & ABOVE (LV (415V))	SYSTEM:	SECTION: II	SHEET 9 OF 9	

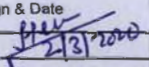
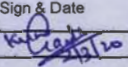
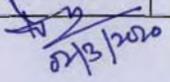
SI No.	Component & Operations	Characteristics	Class	Type of Check	Quantum Of check		Reference Document	Acceptance NORMS	FORMAT OF RECORD		AGENCY		
1	2	3	4	5	6		7	8	9	.	..		
					M	C/N				D	M	C	N
4.0	PACKING	SURFACE FINISH & COMPLETENESS	MA	VISUAL	100%	100%	AS PER MANUFACT. STANDARD / APPROVED CROSS SECTION DRAWING.	AS PER MANUFACT. STANDARD / APPROVED CROSS SECTION DRAWING.	INSPC. REPORT		P	W	.

NOTES:

- 1 DEPENDING UPON THE SIZE AND CRITICALLY, WITNESSING BY BHEL SHALL BE DECIDED.
- 2 ROUTINE TESTS ON 100% MOTORS SHALL BE DONE BY THE VENDOR. HOWEVER, BHEL/CUSTOMER SHALL WITNESS ROUTINE TESTS ON RANDOM SAMPLES. THE SAMPLING PLAN SHALL BE MUTUALLY AGREED UPON.
- 3 IN CASE TEST CERTIFICATES FOR THESE TESTS ON SIMILAR TYPE, SIZE AND DESIGN OF MOTOR FROM INDEPENDENT LABORATORY ARE AVAILABLE, THESE TEST MAY NOT BE REPEATED.
- 4 BHEL RESERVES THE RIGHT TO PERFORM REPEAT TEST, IF REQUIRED.
- 5 AFTER PACKING AND PRIOR TO ISSUE MDCC, PHOTOGRAPHS OF ITEMS TO BE DESPATCHED SHALL BE SENT TO BHEL PURCHASE GROUP FOR REVIEW.
- 6 IN CASE , ANY CHANGES IN QP COMMENTED BY CUSTOMER AT CONTRACT STAGE SHALL BE CARRIED OUT BY BIDDER WITHOUT ANY IMPLICATION TO BHEL/ CUSTOMER.

LEGENDS:

*RECORDS, IDENTIFIED WITH "TICK"(✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION.
 ** M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, S: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, C: CUSTOMER,
 P: PERFORM. W: WITNESS. V: VERIFICATION. AS APPROPRIATE
 MA: MAJOR, MI: MINOR, CR: CRITICAL
 D: DOCUMENT

BHEL					
ENGINEERING			QUALITY		
	Sign & Date	Name		Sign & Date	Name
Prepared by:		Hemma K.	Checked by:		KUNAL
Reviewed by:		P. Dutt	Reviewed by:		

BIDDER/ SUPPLIER	
Sign & Date	
Seal	

FOR CUSTOMER REVIEW & APPROVAL			
Doc No:			
	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

MANUFACTURE'S NAME & ADDRESS				MANUFACTURING QUALITY PLAN				PROJECT							
				ITEM : BALL VALVE		QP NO.		CONTRACT NO.							
				P.O. NO. :		REV. NO. :		DATE :		END USER :					
				P.O. DATE :		W.O. NO. :		PAGE : 1 OF 1		CONTRACTOR : BHARAT HEAVY ELECTRICAL LIMITED					
SL. NO.	COMPONENTS & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMATS OF RECORDS		AGENCY			REMARKS	
					M	C/N					M	C	N		
1.0	MATERIALS														
1.1	BODY, END PIECES, BALL & FASTNERS	Chemical Composition	Critical	Chemical Testing	One /Heat	One / Heat	Appd /Drgs Tech Spec	Appd Drgs / DS/MFG STD	Foundry TC	✓	P	V	V		
		Mechanical Properties	Critical	Mechanical Testing	One / Heat / Heat Treatment Batch			-	-	Foundry TC	✓	P	V	V	
		Heat Treatment (Only For Casting)	Critical	Heat treatment	100%	100%		-	-	Report	✓	P	V	V	
		Surface Defects	Major	Visual	100%	100%	MSS -SP-55	MSS-SP-55	Inspection report	-	P	-	-		
1.2	BALL, STEM AND GLAND (BAR STOCK)	Chemical Composition	Critical	Chemical Testing	One /Heat	One / Heat	ASTM STD	ASTM STD	Foundry TC & Lab Reports	✓	P	V	V		
		Mechanical Properties	Critical	Mechanical Testing	One / Heat / Batch	One / Heat / Batch	ASTM STD	ASTM STD	Foundry TC & Lab Reports	✓	P	V	V		
	STEM	Ultrasonic Test for Stem	Critical	Ultrasonic Test	100%	100%	ASTM B 16.34	ASTM B 16.34 & ASME B 16.34 ANNEXURE E	UT REPORT	✓	P	V	V	For dia>50mm above only.	
1.3	Body Seat & Seal (as applicable)	Hardness	Critical	Hardness Test	100%	100%	Tech. Spec/Applicable Std	Tech Spec. / Applicable Std	Test Certificate	✓	P	V	V		
1.4	QT	Functional port leakage test	Major	Review of Manufacturer TC	100%	100%	Apprd. Drg/DS/Mfg	Apprd. Drg / DS / Mfg Std.	Test Certificate	✓	P	V	V		
2.0	INPROCESS INSPECTION														
2.1	MACHINING OF BODY, END PIECES, BALL & STEM	Dimension	Major	Measument	100%	100%	Mfg Drgs	Mfg Drgs	Inspection report	✓	P	V	-		
2.2	Ball & Seat	Blue Matching (For Metal Seat)	Critical	Visual	100%	100%	The Surface shall be smooth and shall have uniform contact with seating surface.		IR	✓	-	P	-		
3.0	ASSEMBLY	Dimension	Major	Measument	10%	10%	Appd Drgs	Appd Drgs	-	✓	P	V	V		
4.0	TESTING														
4.1	SHELL	Leakage	Critical	Hydrostatic Pressure	100%	10%	Approved Drawings / DS/ Ref. standard	No Leakage	Test Certificate	✓	P	W	W		
4.2	HYDRO SEAT	Leakage	Critical	Hydrostatic Pressure	100%	10%	Approved Drawings / DS/ Ref. standard	No Leakage	Test Certificate	✓	P	W	W		
4.3	PNEUMATIC SEAT	Leakage	Critical	Air Pressure	100%	10%	Approved Drawings / DS/ Ref. standard	No Leakage	Test Certificate	✓	P	W	W		
4.4	PERFORMANCE / FUNCTIONAL CHECK	Operation (Opening & Closing)	Major	Visual	100%	10%	Drawing & Technical Spec.	Smooth Operation	Inspection report	✓	P	W	W		
5.0	FINAL INSPECTION	Cleanliness Completeness &	Major	Visual	100%	10%	As per Drg/ Tech Spec.	As per Drg/ Tech Spec.	Inspection report	✓	P	V	V		
5.1	PAINTING	DFT CHECK	Major	Visual	100%	10%	As per Drg/ Tech Spec.	As per Drg/ Tech Spec.	Inspection report	✓	P	V	V		
6.0	PROVISION OF NAME PLATE	As Per Spec	Major	Visual	As per Specification	As per Specification	As per Specification	As per Specification	Inspection report	-	P	V	V		
NOTE:- SS PARTS SHALL BE CHECKED AT 10% POSITIVE MATERIAL IDENTIFICATION (PMI) GRADE ANALYSER															
MANUFACTURER/SUB-SUPPLIER/MAIN SUPPLIER SIGNATURE				LEGEND: *RECORDS IDENTIFIED WITH TICK(*) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION M : MANUFACTURER / SUB-SUPPLIER C : MAIN SUPPLIER N : END USER & BHEL P : PERFORMANCE W : WITNESS V : VERIFICATION AS APPROPRIATE				DOC. NO. :							
								REVIEWED BY		APPROVED BY		APPROVAL SEAL			

MANUFACTURE'S NAME & ADDRESS				MANUFACTURING QUALITY PLAN				PROJECT							
				ITEM : CHECK VALVE	ACILQP NO. :		CONTRACT NO. :								
				P.O.NO. :	REV.NO. : DATE :		END USER :								
				P.O. DATE :	W.O. NO. :		CONTRACTOR : BHARAT HEAVY ELECTRICAL LIMITED								
				PAGE : 1 OF 1											
SL. NO.	COMPONENTS & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMATS OF RECORDS	AGENCY			REMARKS		
					M	C/N					M	C	N		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1.0	MATERIALS														
1.1	BODY, COVER, DISC, SEATRING & FASTNERS	Chemical Composition	Critical	Chemical Testing	One / Heat	One / Heat	Appd./Drgs Tech Spec	Appd Drgs / DS/MFG STD.	Foundry TC	✓	P	V	V		
		Mechanical Properties	Critical	Mechanical Testing	One / Heat / Heat Treatment Batch		-	-	Foundry TC	✓	P	V	V		
		Heat Treatment (Only For Casting)	Critical	Heat treatment	100%	100%	-	-	Report	✓	P	V	V		
		Surface Defects	Major		Visual	100%	100%	MSS-SP-55		MSS-SP-55	Inspection report	-	P	-	-
1.2	HINGE PIN (BAR STOCK)	Chemical Composition	Critical	Chemical Testing	One / Heat	One / Heat	ASTM STD	ASTM STD	Foundry TC & Lab Reports	✓	P	V	V		
		Mechanical Properties	Critical	Mechanical Testing	One / Heat / Batch	One / Heat / Batch	ASTM STD	ASTM STD	Foundry TC & Lab Reports	✓	P	V	V		
	HINGE PIN	Ultrasonic Test for Stern	Critical	Ultrasonic Test	100%	100%	ASTM B 16.34	ASTM B 16.34 & ASME B 16.34 ANNEXURE E	UT REPORT	✓	P	V	V	For dia>50mm above only.	
2.0	INPROCESS INSPECTION														
2.1	MACHINING OF BODY, COVER, DISC	Dimension	Major	Measument	100%	100%	Mfg Drgs	Mfg Drgs	Inspection report	✓	P	V	-		
2.2	DISC & SEATRING	Blue Matching (For Metal Seat)	Critical	Visual	100%	100%	The Surface shall be smooth and shall have uniform contact with seating surface.		IR	✓	-	P	-		
3.0	ASSEMBLY	Dimension	Major	Measument	10%	10%	Appd Drgs	Appd Drgs	-	✓	P	V	V		
4.0	TESTING														
4.1	SHELL	Leakage	Critical	Hydrostatic Pressure	100%	10%	Approved Drawings / DS/ Ref.standard	No Leakage	Test Certificate	✓	P	W	V		
4.2	HYDRO SEAT	Leakage	Critical	Hydrostatic Pressure	100%	10%	Approved Drawings / DS/ Ref.standard	No Leakage	Test Certificate	✓	P	W	V		
5.0	FINAL INSPECTION	Cleanliness Completeness &	Major	Visual	100%	10%	As per Drg/ Tech Spec.	As per Drg/ Tech Spec.	Inspection report	✓	P	V	V		
5.1	PAINTING	DFT CHECK	Major	Visual	100%	10%	As per Drg/ Tech Spec.	As per Drg/ Tech Spec.	Inspection report	✓	P	V	V		
6.0	PROVISION OF NAME PLATE	As Per Spec	Major	Visual	As per Specification	As per Specification	As per Specification	As per Specification	Inspection report	-	P	V	V		
NOTE:- SS PARTS SHALL BE CHECKED AT 10% POSITIVE MATERIAL IDENTIFICATION (PMI) GRADE ANALYSER															
MANUFACTURER/SUB-SUPPLIER		MAIN SUPPLIER		LEGEND: *RECORDS, IDENTIFIED WITH TICK(*) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M : MANUFACTURER / SUB-SUPPLIER C : MAIN SUPPLIER N : END USER & BHEL P : PERFORMANCE W : WITNESS V : VERIFICATION AS APPROPRIATE				DOC. NO. :							
SIGNATURE								REVIEWED BY			APPROVED BY			APPROVAL SEAL	

MANUFACTURE'S NAME & ADDRESS				MANUFACTURING QUALITY PLAN				PROJECT								
				ITEM : GATE VALVE		ACILQP NO. :		CONTRACT NO. :								
				P.O.NO. :		REV.NO. :		DATE :		END USER :						
				P.O. DATE :		W.O. NO. :				CONTRACTOR : BHARAT HEAVY ELECTRICAL LIMITED						
						PAGE : 1 OF 1										
SL. NO.	COMPONENTS & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMATS OF RECORDS		AGENCY			REMARKS		
					M	C/N						M	C	N		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1.0	MATERIALS															
1.1	BODY, BONNET, WEDGE, SEATRING & FASTNERS	Chemical Composition	Critical	Chemical Testing	One / Heat	One / Heat	Appd /Drgs Tech Spec	Appd Drgs / DS/MFG STD	Foundry TC	√	P	V	V			
		Mechanical Properties	Critical	Mechanical Testing	One / Heat / Heat Treatment Batch			-	-	Foundry TC	√	P	V	V		
		Heat Treatment (Only For Casting)	Critical	Heat treatment	100%	100%		-	-	Report	√	P	V	V		
		Surface Defects	Major	Visual	100%	100%	MSS-SP-55	MSS-SP-55	Inspection report	-	P	-	-			
1.2	STEM AND GLAND (BAR STOCK)	Chemical Composition	Critical	Chemical Testing	One /Heat	One / Heat	ASTM STD	ASTM STD	Foundry TC & Lab Reports	√	P	V	V			
		Mechanical Properties	Critical	Mechanical Testing	One / Heat / Batch	One / Heat / Batch		ASTM STD	ASTM STD	Foundry TC & Lab Reports	√	P	V	V		
	STEM	Ultrasonic Test for Stem	Critical	Ultrasonic Test	100%	100%	ASTM B 16.34	ASTM B 16.34 & ASME B 16.34 ANNEXURE E	UT REPORT	√	P	V	V		For dia>50mm above only.	
2.0	INPROCESS INSPECTION															
2.1	MACHINING OF BODY, BONNET, WEDGE & STEM	Dimension	Major	Measument	100%	100%	Mfg Drgs	Mfg Drgs	Inspection report	√	P	V	-			
2.2	WEDGE & SEATRING	Blue Matching (For Metal Seat)	Critical	Visual	100%	100%	The Surface shall be smooth and shall have uniform contact with seating surface.		IR	√	-	P	-			
3.0	ASSEMBLY	Dimension	Major	Measument	10%	10%	Appd Drgs	Appd Drgs	-	√	P	V	V			
4.0	TESTING															
4.1	SHELL	Leakage	Critical	Hydrostatic Pressure	100%	10%	Approved Drawings / DS/ Ref.standard	No Leakage	Test Certificate	√	P	W	V			
4.2	HYDRO SEAT	Leakage	Critical	Hydrostatic Pressure	100%	10%	Approved Drawings / DS/ Ref.standard	No Leakage	Test Certificate	√	P	W	V			
4.3	PNEUMATIC SEAT	Leakage	Critical	Air Pressure	100%	10%	Approved Drawings / DS/ Ref.standard	No Leakage	Test Certificate	√	P	W	V			
4.4	PERFORMANCE / FUNCTIONAL CHECK	Operation (Opening &Closing)	Major	Visual	100%	10%	Drawing & Techical Spec.	Smooth Operation	Inspection report	√	P	W	V			
5.0	FINAL INSPECTION	Cleanliness Completeness &	Major	Visual	100%	10%	As per Drg/ Tech Spec.	As per Drg/ Tech Spec.	Inspection report	√	P	V	V			
5.1	PAINTING	DFT CHECK	Major	Visual	100%	10%	As per Drg/ Tech Spec.	As per Drg/ Tech Spec.	Inspection report	√	P	V	V			
6.0	PROVISION OF NAME PLATE	As Per Spec	Major	Visual	As per Specification	As per Specification	As per Specification	As per Specification	Inspection report	-	P	V	V			
NOTE:- SS PARTS SHALL BE CHECKED AT 10% POSITIVE MATERIAL IDENTIFICATION (PMI) GRADE ANALYSER																
MANUFACTURER/SUB-SUPPLIER				MAIN SUPPLIER		LEGEND: *RECORDS IDENTIFIED WITH TICK(*) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION. M : MANUFACTURER / SUB-SUPPLIER C : MAIN SUPPLIER N : END USER & BHEL P : PERFORMANCE W : WITNESS V : VERIFICATION AS APPROPRIATE				DOC. NO. :						
SIGNATURE										REVIEWED BY		APPROVED BY		APPROVAL SEAL		

MANUFACTURE'S NAME & ADDRESS				MANUFACTURING QUALITY PLAN				PROJECT							
				ITEM : BUTTERFLY VALVE		ACILQP NO. :		CONTRACT NO.							
				P.O.NO. :		REV.NO. :		DATE :		END USER :					
				P.O. DATE :		W.O. NO. :		CONTRACTOR : BHARAT HEAVY ELECTRICAL LIMITED							
				PAGE. : 1 OF 1											
SL. NO.	COMPONENTS & OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENTS	ACCEPTANCE NORMS	FORMATS OF RECORDS	AGENCY			REMARKS		
1	2	3	4	5	M	C/N	7	8	9	10	M	C	N	11	
1.0	MATERIALS														
1.1	BODY & DISC	Chemical Composition	Critical	Chemical Testing	One / Heat	One / Heat	Appd / Drgs Tech Spec	Appd Drgs / DS/MFG STD	Foundry TC	✓	P	V	V		
		Mechanical Properties	Critical	Mechanical Testing	One / Heat / Heat Treatment Batch			-	-	Foundry TC	✓	P	V	V	
		Heat Treatment (Only For Casting)	Critical	Heat treatment	100%	100%	-	-	-	Report	✓	P	V	V	
		Surface Defects	Major	Visual	100%	100%	MSS -SP-55	MSS-SP-55	Inspection report	-	P	-	-		
1.2	SHAFT (BAR STOCK)	Chemical Composition	Critical	Chemical Testing	One / Heat	One / Heat	ASTM STD	ASTM STD	Foundry TC & Lab Reports	✓	P	V	V		
		Mechanical Properties	Critical	Mechanical Testing	One / Heat / Batch	One / Heat / Batch	ASTM STD	ASTM STD	Foundry TC & Lab Reports	✓	P	V	V		
	SHAFT (BAR STOCK)	Ultrasonic Test for Stem	Critical	Ultrasonic Test	100%	100%	ASTM B 16.34	ASTM B 16.34 & ASME B 16.34 ANNEXURE E	UT REPORT	✓	P	V	V	For dia>50mm above only.	
1.3	Body / Disc Seat	Physical & Ozone Test	Critical	Physical & Ozone Test	One sample / Lot	One sample / Lot	Material specification	Relevant Material Std.	Test report	✓	P	V	V		
2.0	INPROCESS INSPECTION														
2.1	MACHINING OF BODY & DISC	Dimension	Major	Measurement	100%	100%	Mfg Drgs	Mfg Drgs	Inspection report	✓	P	V	-		
3.0	ASSEMBLY	Dimension	Major	Measurement	10%	10%	Appd Drgs	Appd Drgs	-	✓	P	V	V		
4.0	TESTING														
4.1	SHELL	Leakage	Critical	Hydrostatic Pressure	100%	10%	Approved Drawings / DS/ Ref.standard	No Leakage	Test Certificate	✓	P	W	V		
4.2	HYDRO SEAT	Leakage	Critical	Hydrostatic Pressure	100%	10%	Approved Drawings / DS/ Ref.standard	No Leakage	Test Certificate	✓	P	W	V		
4.3	PERFORMANCE / FUNCTIONAL CHECK	Operation (Opening & Closing)	Major	Visual	100%	10%	Drawing & Technical Spec.	Smooth Operation	Inspection report	✓	P	W	V		
5.0	FINAL INSPECTION	Cleanliness Completeness &	Major	Visual	100%	10%	As per Drg/ Tech Spec.	As per Drg/ Tech Spec.	Inspection report	✓	P	V	V		
5.1	PAINTING	DFT CHECK	Major	Visual	100%	10%	As per Drg/ Tech Spec.	As per Drg/ Tech Spec.	Inspection report	✓	P	V	V		
6.0	PROVISION OF NAME PLATE	As Per Spec	Major	Visual	As per Specification	As per Specification	As per Specification	As per Specification	Inspection report	-	P	V	V		
NOTE:- SS PARTS SHALL BE CHECKED AT 10% POSITIVE MATERIAL IDENTIFICATION (PMI) GRADE ANALYSER															
MANUFACTURER/SUB-SUPPLIER		MAIN SUPPLIER		LEGEND: *RECORDS IDENTIFIED WITH TICK(*) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION M : MANUFACTURER / SUB-SUPPLIER C : MAIN SUPPLIER N : END USER & BHEL P : PERFORMANCE W : WITNESS V : VERIFICATION AS APPROPRIATE				DOC. NO. :							
SIGNATURE								REVIEWED BY		APPROVED BY		APPROVAL SEAL			

		MANUFACTURE'S NAME & ADDRESS		REFERENCE QUALITY PLAN										
				ITEM : AIR DRYER		QIP NO. Rev : Date : Page :		Signed MFG GR		Qp No : Rev No : Date : Page :		Reviewed By		
SR. NO.	COMPONENTS AND OPERATORS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENTS	ACCEPTANCE	FORMAT OF RECORD	AGENCY				REMARKS
1	2	3	4	5	6		7	8	9	D	M	C	N	11
					M	C/N								
A MATERIAL INSPECTION														
1.1	ROTOR DRUM	CHEMICAL	MAJOR	CHEMICAL ANALYSIS	100%		APPROVED DATASHEET	APPROVED DATASHEET	COC	✓	V	V	V	
1.2	DRYER VESSEL COMPLETE	DIMENSIONS MECHANICAL	MAJOR	DIMENSIONS MECH.PROPERTIES	100%		MFG DRG APPROVED DATASHEET	MFG DRG	COC	✓	V	V	V	
1.3	REGEN.COOLERS	MECHANICAL CHEMICAL	MAJOR	CHEMICAL & MECH.	100%		APPROVED DATASHEET	APPROVED DATASHEET	COC	✓	V	V	V	
B INPROCESS INSPECTION														
2.1	REGEN.COOLERS	TIGHTNESS	MAJOR	HYDROSTATIC	100%		1.5 X DESIGN PRESSURE FOR 5 MIN.	NO LEAKAGE	COC [SEE NOTE 1]	✓	P	V	V	
2.2	DRYER VESSEL WATER SEPERATOR	TIGHTNESS	MAJOR	HYDROSTATIC	100%		1.5 X DESIGN PRESSURE FOR 5 MIN	NO LEAKAGE	COC [SEE NOTE 1]	✓	P	V	V	
2.3	WATER SEPERATOR GEAR BOX DRAIN VALVES MOTOR	FUNCTIONAL	MAJOR	FUNCTIONAL	100%		MFG DRAWING	MFG DRAWING	COC	✓	P	V	V	
C FINAL INSPECTION AT ATLAS COPCO AIRPOWER,BELGIUM														
3.1	ASSEMBLY AND TESTING	DIMENSIONAL APPEARANCE & COMPLETENESS	MAJOR	MEASUREMNT VISUAL	100%		APPROVED DRAWING	APPROVED DRAWING	INSP REPORT	✓	P	V	V	
		MECH.RUN TEST TIGHTNESS	MAJOR	FUNCTIONAL TEST HYDROSTATIC			APPROVED DRAWING 1.5 X DESIGN PRESSURE	APPROVED DRAWING NO LEAKAGE	COC COC [SEE NOTE 1]	✓ ✓	P P	V V	V V	
LEGEND: * Records identified with " Tick" (✓) shall be essentially included by supplier in QA documentation. ** M: Manufacturer / Sub Supplier, C: Supplier nominated inspection agency, P: Perform, W: Witness and V: Verification. N: END USER & BHEL														

		MANUFACTURE'S NAME & ADDRESS		REFERENCE QUALITY PLAN				एनटीपीसी NTPC		To be Filled				
				ITEM : AIR DRYER		QP NO. : Rev : Date : Page :		Sign of IECGR's : 		Qp No : Rev No : Date : Page : 2 OF 2 Valid Upto:		Reviewed By:		
SR. NO.	COMPONENTS AND OPERATORS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENTS	ACCEPTANCE	FORMAT OF RECORD	AGENCY				REMARKS
					M	C/N				D	M	C	N	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
					M	C/N								
	D FINAL INSPECTION													
4.1	FINAL INSPECTION AT ATLAS COPCO INDIA	MECH RUN TEST OF COMPLETE DRYER	MAJOR	DRUM ROTATION CHECK	100%	100%	APPROVED DRAWING/ APPROVED DATASHEET	SMOOTH OPERATION	INSP.REPORT	✓	P	W	W	
		TIGHTNESS OF COMPLETE DRYER		PNEUMATIC TEST	100%	100%	1.1 X WORKING PRESSURE	NO LEAKAGE						
	E PACKING AND DESPATCH													
5.1	PACKING SHIPPING	CHECK DOC. SEA WORTHY PACKING	MAJOR	VERIFICATION	100%		AS PER PACKING PROCEDURE	AS PER PACKING PROCEDURE	ALL SHIPPING DOCUMENTS		P/V	V		
NOTE : 1		SPECIFIC CONFIRMATION FROM AIRPOWER REGARDING THE HYDROTEST PRESSURE												
NOTE : 2		MATERIAL SHALL BE AS PER APPROVED DRG/TDS. INCASE NOT MENTIONED IN APPROVED DRG/TDS THEN AC STANDARDS SHALL BE APPLICABLE												

LEGEND : * Records identified with " Tick" () shall be essentially included by supplier in QA documentation

** M : Manufacturer / Sub Supplier C : Supplier nominated inspection agency, P : Perform; W : Witness and V : Verification

N : END USER & BHEL

Note : # NTPC Inspection engineer to check, approval date of reference document viz, a viz approval date of RQP at the time of inspection.

MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN										OWNER :		
		ITEM	AIR RECEIVER	QP NO			CONSULTANT :							
				REV			PROJECT :							
				SUB SYSTEM	COMPRESSED AIR SYSTEM.	DATE			PACKAGE VENDOR :					
				PAGE	Page 1 OF 2		BHEL DOC NO :							
SLNO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS	
1.	2.	3.	4.	5.	M	C/N	7.	8.	9.	D	10.		11.	
1.0 RAW MATERIAL INSPECTION														
1.1	MS PLATE FOR SHELL, DISHED END, FLANGES, SOCKET / PIPE FOR NOZZLES	CHEMICAL PROPERTIES	B	CHEMICAL ANALYSIS	1 SAMPLE / HEAT		RELEVANT MATERIAL SPECIFICATION AS PER APPROVED DATA SHEET / APPROVED DRAWING		MILL TC / LAB TC	✓	P	V	V	REFER NOTE 1
		MECHANICAL PROPERTIES	B	MECHANICAL TESTS	1 SAMPLE / HEAT									
		INTERNAL DEFECTS	B	U. T. (32 MM & ABOVE THICK	100 %		ASME SEC. V / ASTM A 435	ASTM A 435	U. T. REPORT	✓	P	V	V	
2.0 IN PROCESS INSPECTION														
2.1	DISHED END	CORRECT DIMENSIONS	B	MEASURE	100%		APPROVED DRAWING/MANUFACTURING DRAWING		DO	✓	P	V	V	IN CASE OF JOINT IN DISH END, 100% RT ON JOINT TO BE DONE.
		DPT ON KNUCKLE	B	DP TEST	100%		ASME SEC. V	ASME SEC. V	✓	✓	P	V	V	
		THICKNESS THINNING	B	MEASURE	100%		APPROVED DRAWING/MANUFACTURING DRAWING / TECHNICAL SPECIFICATION		DO	✓	P	V	V	
2.2	FABRICATION OF AIR RECEIVER	CUTTING OF PLATES	B	VISUAL & MEASURE	100%	-	CUTTING PLAN / MANUFACTURING DRAWINGS		REGISTER		P	-	-	
		EDGE PREPARATION AND FIT UP	B	VISUAL & MEASURE	100 %	-	APPROVED WPS / FABRICATION DRAWING		REGISTER		P	-	-	
		WPS / WELDER QUALIFICATION	B	VISUAL & MECHANICAL TEST	100 %		ASME SEC. IX	ASME SEC. IX	QW 482, 483, 484	✓	P	V	V	REFER NOTE : 3
		NDT ON BUTT WELDS (LONGITUDINAL & CIRCUMFERENTIAL WELD JOINT FOR ADSORPTION TOWERS) AFTER BACK GOUGING & FINAL WELDING	B	DPT AFTER BACK GOUGING	100 %		ASME SEC. V	ASME SEC. VIII DIV. 1 APPENDIX 8	NDT REPORT	✓	P	V	V	
		NDT ON BUTT WELDS & FILLET JOINTS IN SHELL & DISH AFTER FINAL WELDING	B	RT AFTER FINAL WELDING	10 % ON BUTT JOINT INCLUDING 100% CROSS JOINT		ASME SEC. V	ASME SEC VIII DIV.1-UW-52	RT REPORT	✓	P	V	V	RT FILMS & REPORT WILL BE REVIEWED BY NTPC. CHP.
		BOD SHELL STRENGTH TEST	B	DPT	100 %		ASME SECTION V	ASME SEC. VIII DIV. 1 APPENDIX 8	NDT REPORT	✓	P	V	V	CHP, NTPC SHALL WITNESS DPT DURING FINAL INSPECTION
			B	HYDRO TEST	100 %		APPLICABLE DESIGN STANDARD/APPROVED DRAWING		IR	✓	P	W	W	
3.0 FINAL INSPECTION														
3.1	FINAL INSPECTION	DIMENSION, ORIENTATION	A	VISUAL & MEASURE	100%		APPROVED DRAWING		IR	✓	P	W	W	
3.2	PAINTING	DFT / SURFACE FINISH	B	VISUAL & MEASURE	100%		AS PER MANUFACTURING STANDARDS,		IR	✓	P	V	-	REFER NOTE 4
		LEGEND : CL: (ACRITICAL, B:MAJOR C:MINOR) ** M: MANUFACTURER/SUB-SUPPLIER, C: NOMINATED INSPECTION AGENCY N: CUSTOMER, P: PERFORM, W: WITNESS AND V: VERIFICATION, ND: NDT LAB R: TEST / DIMENTIONAL REPORT RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER QA DOCUMENTATION.												
MANUFACTURERS / SUB-SUPPLIER		SIGNATURE _____ Page 1 OF 4												
		DOC NO : _____ REVISED BY _____ APPROVED BY _____ APPROVAL SEAL _____												

MANUFACTURER'S NAME AND ADDRESS		MANUFACTURING QUALITY PLAN							OWNER :				
		ITEM	AIR RECEIVER	QP NO				CONSULTANT :					
				REV				PROJECT :					
				DATE				PACKAGE VENDOR :					
SUB SYSTEM		COMPRESSED AIR SYSTEM.		PAGE	Page 2 OF 2			BHEL DOC NO :					
SLNO	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORM	FORMAT OF RECORD	AGENCY			REMARKS
					M	C/N				M	C	N	
1.	2.	3.	4.	5.	6.		7.	8.	9.	D	10.		11.
3.3	PACKING / AVAILABILITY OF ACCESSORIES	VISUAL	B	VISUAL	100%	—	APPROVED DRAWING		IR/CALIBRATION REPORT	✓	P	V	-
NOTE 1 MS PLATES USED SHALL BE REPUTED MANUFACTURERS ONLY & BEING THE TOTAL PLATES QTY IS LESS. THESE PLATES SHALL BE SOURCED FROM AUTHORIZED DEALERS LIKE SAIL, JINDAL, ESSAR, LLOYD, & WELLSPUN, ETC. 2 i. THE MS PLATES SHALL BE CUT ACCORDING TO CUTTING PLAN AND HEAT NO, PLATE NO OF EACH PLATE SHALL BE TRANSFERRED BY PUNCHING ON EACH PIECE FOR PROPER CORRELATION& TRACEABILITY. THE CUTTING PLAN SHALL INCLUDE COMPLETE DETAILS OF HEAT NO, PLATE NO,OF EACH CUT PIECE. ii. THE WELDING PLAN OF EACH FABRICATED PIECE SHALL INCLUDE JOINT NUMBER, WELDER NO, WHO CARRY OUT WELDING FOR COMPLETE TRACEABILITY. 3 BHEL APPROVED WPS WILL BE USED, QUALIFIED WELDERS WILL BE DEPLOYED, IF WELDERS ARE ALREADY QUALIFIED BY NTPC / LLOYDS/BVQI/BSI/BHEL/TUV AND DOING THE SIMILAR JOBS THEN SAME SHALL BE VERIFIED IN PLACE OF WITNESSING. RECORD WILL BE VERIFIED BY NTPC DURING INSPECTION. 4 INSIDE PAINTING IS APPLICABLE & SHALL BE DONE AS PER MANUFACTURING STANDARDS.													
ABBREVIATIONS:- M.T.C. – MANUFACTURER'S TEST CERTIFICATE, L.T.C. – LAB TEST CERTIFICATE, IR – INSPECTION REPORT, UT REPORT – ULTRASONIC TEST REPORT, RT REPORT – RADIOGRAPHICREPORT, NDT – NON DESTRUCTIVE TESTING													

		LEGEND : CL: (A:CRITICAL, B:MAJOR C:MINOR) M: MANUFACTURER/SUB-SUPPLIER, C: NOMINATED INSPECTION AGENCY N: CUSTOMER, W: PERFORM, W: WITNESS AND V: VERIFICATION. ND:NDT LAB R:TEST / DIMENTIONAL REPORT RECORDS, IDENTIFIED WITH "TICK" (✓) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER QA DOCUMENTATION.	DOC NO :		
MANUFACTURERS / SUB-SUPPLIER	MAIN SUPPLIER				
SIGNATURE		Page 2 OF 4	REVIEWED BY	APPROVED BY	APPROVAL SEAL

		MANUFACTURER'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT -					
				OIL FREE SCREW AIR COMPRESSOR		QP NO.- 17041 00 018		PACKAGE-					
				MODEL-		REV - 2		CONSULTANT-					
				SUB SYSTEM-		DATE - 10-08-23		OWNER/CUSTOMER-					
				COMPRESSED AIR SYSTEM.				MAIN CONTRACTOR- BHARAT HEAVY ELECTRICALS LTD					
SR. NO.	COMPONENTS AND OPERATORS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE	FORMAT OF RECORD	AGENCY**			REMARKS	
									P	W	V		
1	2	3	4	5	6	7	8	9	D*	10			11
A MATERIAL INSPECTION													
1.1	ROTOR	MATERIAL CHECK	MAJOR	MECH. TEST CHEM.ANALYSIS HARDNESS ULTRASONIC TEST	One per Heat/Batch	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERTF.	v	3		1,2	
1.2	COMPRESSOR CASING / ROTOR HOUSING	MATERIAL CHECK	MAJOR	MECH. TEST CHEM.ANALYSIS	One per Heat/Batch	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERTF.	v	3		1,2	
1.3	BULL GEAR	MATERIAL CHECK	MAJOR	MECH. TEST CHEM.ANALYSIS HARDNESS	One per Heat/Batch	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERTF.	v	3		1,2	
1.4	PINION	MATERIAL CHECK	MAJOR	MECH. TEST CHEM.ANALYSIS HARDNESS	One per Heat/Batch	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERTF.	v	3		1,2	
MANUFACTURER SUBCONTRACTOR		CONTACTOR		LEGEND : Records identified with 'V' shall essentially be included by contractor QAP document.				FOR CUSTOMER USE					
				1- CUSTOMER P - Performing the Test									
				2 - BHEL / BHEL's TPI W - Witnessing the Test									
				3. MANUFACTURER / V - Verifying the Test									
				D - Documents				NAME & SIGN OF APPROVING AUTHORITY					
SIGNATURE				** This is Category-I equipment. TANGEDCO/Consultant/TANGEDCO appointed TPIA (Final inspection including document review as per approved QAP).				PAGE 1 OF 4					

		MANUFACTURER'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT -					
				OIL FREE SCREW AIR COMPRESSOR		QP NO.- 17041 00 018		PACKAGE-					
				MODEL-		REV - 2		CONSULTANT-					
				SUB SYSTEM- COMPRESSED AIR SYSTEM.		DATE - 10-08-23		OWNER/CUSTOMER- MAIN CONTRACTOR- BHARAT HEAVY ELECTRICALS LTD					
SR. NO.	COMPONENTS AND OPERATORS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE	FORMAT OF RECORD	AGENCY**			REMARKS	
									P	W	V		
1	2	3	4	5	6	7	8	9	D*	10		11	
1.5	DRIVE SHAFT	MATERIAL CHECK	MAJOR	MECH. TEST	One per Heat/Batch	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERT.	√	3		1,2	
1.6	INTERCOOLER TUBES & TUBE SHEET	MATERIAL CHECK	MAJOR	CHEM.ANALYSIS HARDNESS ULTRASONIC TEST CHEM.ANALYSIS TENSILE STRENGTH	One per Heat/Batch				APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERT.	√	
1.7	INTERCOOLER SHELL	MATERIAL CHECK	MAJOR	CHEM.ANALYSIS TENSILE STRENGTH	One per Heat/Batch	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERT.	√	3		1,2	
1.8	AFTER COOLER TUBE & TUBE SHEET	MATERIAL CHECK	MAJOR	CHEM.ANALYSIS TENSILE STRENGTH	One per Heat/Batch	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERT.	√	3		1,2	
1.9	AFTER COOLER SHELL	MATERIAL CHECK	MAJOR	CHEM.ANALYSIS TENSILE STRENGTH	One per Heat/Batch	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF. CERT.	√	3		1,2	
2.0	OIL COOLER PLATE TYPE	MATERIAL CHECK DIMMENSION CHECK	MAJOR MAJOR	CHEM.ANALYSIS TENSILE STRENGTH MEASUREMENT	One per Heat/Batch 100%	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable) ACIL STD DRG.	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable) ACIL STD DRG.	CONF. CERT.	√	3		1,2	
MANUFACTURER		CONTACTOR		LEGEND : Records identified with 'V' shall essentially be included by contractor QAP document.				FOR CUSTOMER USE					
SUBCONTRACTOR				1- CUSTOMER P - Performing the Test									
				2 - BHEL / BHEL's TPI W - Witnessing the Test									
				3. MANUFACTURER / V - Verifying the Test									
SIGNATURE				** This is Category-I equipment. TANGEDCO/Consultant/TANGEDCO appointed TPIA (Final inspection including document review as per approved QAP).				NAME & SIGN OF APPROVING AUTHORITY					

		MANUFACTURER'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT -					
				ITEM - OIL FREE SCREW AIR COMPRESSOR		QP NO.- 17041 00 018		PACKAGE-					
				MODEL-		REV - 2		CONSULTANT-					
				SUB SYSTEM- COMPRESSED AIR SYSTEM.		DATE - 10-08-23		OWNER/CUSTOMER- MAIN CONTRACTOR- BHARAT HEAVY ELECTRICALS LTD					
SR. NO.	COMPONENTS AND OPERATORS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE	FORMAT OF RECORD	AGENCY**			REMARKS	
									P	W	V		
1	2	3	4	5	6	7	8	9	D*	10			11
B INPROCESS INSPECTION													
2.1	OIL COOLERS PLATE TYPE	TIGHTNESS	MAJOR	HYDROSTATIC	100%	ACIL MFG STD		CONF. CERT.	√	3		1,2	
2.2	INTERCOOLER [SHELL & TUBE]	TIGHTNESS	MAJOR	HYDROSTATIC	100%	ACIL MFG STD	NO LEAKAGE	CONF. CERT.	√	3		1,2	
2.3	AFTERCOOLER [SHELL & TUBE]	TIGHTNESS	MAJOR	HYDROSTATIC	100%	ACIL STD MFG DRG	NO LEAKAGE	CONF. CERT.	√	3		1,2	
2.4	SAFETY VALVE Water Shut Off Valve	SET PRESSURE	MAJOR	MEASUREMENT	100%	ACIL STD	SET.PRESSURE	CONF. CERT.	√	3		1,2	
2.5	ROTOR ELEMENT	SURFACE FINISH	MAJOR	VISUAL	100%	ACIL MFG STD	ACIL MFG STD	CONF. CERT.	√	3		1,2	
		COATING QUALITY	MAJOR	MEASUREMENT	100%	ACIL MFG STD	ACIL MFG STD		√	3		1,2	
		DYNAMIC BALANCING	MAJOR	BALANCING	100%	ACIL MFG STD	ACIL MFG STD		√	3		1,2	
2.6	COMPRESSOR CASING / ROTOR HOUSING LP & HP.	DIMENSION CHECK	MAJOR	MEASUREMENT	100%	Apprd.GA Drg	Apprd.GA Drg	CONF. CERT.	√	3		1,2	
		TIGHTNESS	MAJOR	HYDROTEST	100%	ACIL MFG STD	NO LEAKAGE	CONF. CERT.	√	3		1,2	
2.7	AIR ENDS [HP & LP SCREW ELEMENTS]	RUN TEST	MAJOR	FAD LEAKAGE ABNORMAL NOISE	100%	ACIL MFG STDs / ISO 1217 Ed 1996 std.	ACIL MFG STDs / ISO 1217 Ed 1996 std.	CONF.CERT	√	3		1,2	
2.8 a	OIL FILTER AIR FILTER THROTTLE VALVES	APPEARANCE	MAJOR	VISUAL	One per Heat/Batch	ACIL Mfg stdb	ACIL Mfg stdb	CONF.CERT	√	3		1,2	
2.8 b	CANOPY BASE FRAME Control Panel	APPEARANCE	MAJOR	VISUAL	100%	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	CONF.CERT	√	3		1,2	
MANUFACTURER		CONTACTOR		LEGEND : Records identified with 'V' shall essentially be included by contractor QAP document.				FOR CUSTOMER USE					
SUBCONTRACTOR				1 - CUSTOMER P - Performing the Test									
				2 - BHEL / BHEL's TPI W - Witnessing the Test									
				3. MANUFACTURER / V - Verifying the Test									
				D - Documents									
SIGNATURE				** This is Category-I equipment. TANGEDCO/Consultant/TANGEDCO appointed TPIA (Final inspection including document review as per approved QAP).				NAME & SIGN OF APPROVING AUTHORITY					

		MANUFACTURER'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT -																														
				OIL FREE SCREW AIR COMPRESSOR		QP NO.- 17041 00 018		PACKAGE-																														
				MODEL-		REV - 2		CONSULTANT-																														
				SUB SYSTEM- COMPRESSED AIR SYSTEM.		DATE - 10-08-23		OWNER/CUSTOMER- MAIN CONTRACTOR- BHARAT HEAVY ELECTRICALS LTD																														
SR. NO.	COMPONENTS AND OPERATORS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE	FORMAT OF RECORD	AGENCY**			REMARKS																										
1	2	3	4	5	6	7	8	9	D*	10	11																											
C FINAL INSPECTION																																						
3.0	OVERALL ASSLY. ALONG WITH MOTOR AND OTHER ACC.	DIMENSION & APPEARANCE	MAJOR	MEASUREMENT VISUAL	100%	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable)	INSP REPORT	V	3	1,2	Testing with BHEL supplied BHEL make motor. Only for reference. ANY TWO INTERLOCKS (Oil PRESSURE & TEMPERATURE) SHALL BE SHOWN. ##REFER NOTES.																										
3.1	RUN TEST AND PERFORMANCE TEST	Discharge pressure - 8 Bar Discharge Temperature - 46 Deg Shaft Power at load - 425 KW Shaft Power at load - 75 KW NOISE/ VIBRATIONS	CRITICAL	OPERATION & CONFORMANCE	100%	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable) PERFORMANCE TEST AS PER ISO 1217	APPROVED DATA SHEET / GA DRAWING / P&ID (As applicable) / DRGS & PERFORMANCE TEST AS PER ISO 1217		V	3	1,2																											
3.2	CONTROLLER, INSTRUMENTS & COMPRESSOR INTERLOCK CHECK	INSTRUMENT INTERLOCK CHECK	MAJOR	MEASUREMENT	100%	ACIL Mfg std																																
				VERIFICATION	100%	AS PER APPROVED COMPRESSOR WIRING DIAGRAM & P & ID	AS PER APPROVED COMPRESSOR WIRING DIAGRAM & P & ID	CONF. CERTF.	V	3	1,2																											
D PACKING AND DESPATCH																																						
4.1	PACKING SHIPPING	PACKING AND TRANSPORTATION PAITING	MAJOR	VERIFICATION	100%	AS PER ACIL PACKING PROCEDURE	AS PER PACKING PROCEDURE	ALL SHIPPING DOCUMENTS	V	3	1,2																											
4.2	PAINTING		MAJOR	VERIFICATION	100%	AS PER ACIL STD PAINTING PROCEDURE	AS PER ACIL STD PAINTING PROCEDURE	CONF.CERT	V	3	1,2																											
4.3	REVIEW OF Q.A DOCUMENT	-	MINOR	VERIFICATION	100%	AS PER APPROVED Q.A.P	AS PER APPROVED Q.A.P		V	3	1,2																											
<table border="1"> <tr> <td>MANUFACTURER</td> <td>CONTACTOR</td> <td colspan="2">LEGEND : Records identified with 'V' shall essentially be included by contractor QAP document.</td> <td rowspan="5">FOR CUSTOMER USE</td> </tr> <tr> <td>SUBCONTRACTOR</td> <td></td> <td>1- CUSTOMER</td> <td>P - Performing the Test</td> </tr> <tr> <td></td> <td></td> <td>2 - BHEL / BHEL's TPI</td> <td>W - Witnessing the Test</td> </tr> <tr> <td></td> <td></td> <td>3. MANUFACTURER</td> <td>V - Verifying the Test</td> </tr> <tr> <td></td> <td></td> <td></td> <td>D - Documents</td> </tr> <tr> <td colspan="2">SIGNATURE</td> <td colspan="2"> NOTE: ## Factory check for loose controllers for Air Compressors (To be supplied with compressed System Package) shall be witnessed by BHEL/CUSTOMER for Logic & software. Oil Pressure and Temperature interlocks will be shown by removing the transducers connections during the running of Compressor and after removal, will show reading on control panel 1. Statutory requirements will be complied. 2. Calibrated instruments shall be used for testing. 3. All the test certificates as per the approved quality plan shall be submitted to CUSTOMER /TPIA for review and further clearance. </td> <td></td> </tr> </table>													MANUFACTURER	CONTACTOR	LEGEND : Records identified with 'V' shall essentially be included by contractor QAP document.		FOR CUSTOMER USE	SUBCONTRACTOR		1- CUSTOMER	P - Performing the Test			2 - BHEL / BHEL's TPI	W - Witnessing the Test			3. MANUFACTURER	V - Verifying the Test				D - Documents	SIGNATURE		NOTE: ## Factory check for loose controllers for Air Compressors (To be supplied with compressed System Package) shall be witnessed by BHEL/CUSTOMER for Logic & software. Oil Pressure and Temperature interlocks will be shown by removing the transducers connections during the running of Compressor and after removal, will show reading on control panel 1. Statutory requirements will be complied. 2. Calibrated instruments shall be used for testing. 3. All the test certificates as per the approved quality plan shall be submitted to CUSTOMER /TPIA for review and further clearance.		
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OF APPROVING AUTHORITY

PAGE 4 OF 4

बी एच ई एल BHEL PEM :: C&I		STANDARD QUALITY PLAN FOR LOCAL CONTROL PANEL						STD QUALITY PLAN NO.: PE-QP-999-145-I056				
								VOLUME IIB				
								SECTION D				
								REV. NO. 01DATE: 22-02-2008				
					SHEET 1 OF 7							
Sl. No.	Component / operation	Characteristics Checked	* Cate gory	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
1.0	INCOMING Sheet Steel (CRCA & HR)	1. Chemical Composition	MA	Chemical analysis	Sample	Relevant standard	Relevant standard	Test Certificate	3	---	2	
		2. Bend Test	CR	Mech. test	Sample	Relevant standard	Relevant standard	Log Book	2	---	---	
		3. Surface finish	MA	Visual	100%	Factory Standard / Sample	Factory Standard / Sample	Log Book	2	---	---	
		4. Waviness	MA	Visual	100%	Factory Standard	No Waviness	Log Book	2	---	---	
		5. Thickness	MA	Measurement	100%	BHEL Spec.	BHEL Spec.	Log Book	2	---	---	
		6. Mill marking	MA	Visual	100%	Factory Standard	Factory Standard	Log Book	2	---	1	
2.0	Flats / Angles / Channels	1. Dimensions	MA	Measurement	Sample	Relevant standard	Relevant standard	Log Book	2	---	---	
		2. Surface Defects	MA	Visual	100%	Factory Standard / Sample	Factory Standard / Sample	Log Book	2	---	---	
		3. Straightness	MA	Measurement	100%	Factory Std.	Factory Std.	Log Book	2	---	---	
		4. Mill marking	MA	Visual	100%	Relevant standard	Relevant standard	Log Book	2	---	1	
3.0	Cables / Wires	1. Visual / Surface defects	MA	Visual	100%	BHEL Spec. and Relevant standard	BHEL Spec. and Relevant standard	Log Book	2	---	---	
		2. IR and HV	MA	Electrical	100%	BHEL Spec. and Relevant standard	BHEL Spec. and Relevant standard	Log Book	2	---	---	
LEGEND: * CR - Critical characteristics MA - Major characteristics MI - Minor characteristics												
\$ P - Agency Performing the Test. W - Agency Witnessing the Test. V - Agency Verifying the Test.												
1 - BHEL 2 - Vendor 3 - Sub-vendor												

 PEM :: C&I		STANDARD QUALITY PLAN FOR LOCAL CONTROL PANEL							STD QUALITY PLAN NO.: PE-QP-999-145-I056			
									VOLUME IIB			
									SECTION D			
									REV. NO. 01		DATE: 22-02-2008	
									SHEET 2		OF 7	
Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
		3. Conductor a) Resistance b) Size c) Sheet colour	MA MA MA	Electrical Measurement Visual	100% 100% 100%	BHEL Spec. and Relevant standard	BHEL Spec. and Relevant standard	Log Book	2	---	---	
		4. Type / Routine Test Certificates	MA	Verification	100%	BHEL Spec. and Relevant standard	BHEL Spec. and Relevant standard	Log Book	3	---	2	
4.0	Electrical Components like Annunciator Transformers Lamps Switches PBs Contactors Relays Timers Space Heaters Thermostat Indicating meters etc.	1. Verification at make and Type 2. Verification of Test Certificates 3. Operation / Functional check 4. I.R. 5. H.V. 6. Calibration 7. Pick up / Drop off Voltage	CR CR CR MA MA MA MA	Visual Scrutiny of Type / Routine T.Cs. Electrical Electrical Electrical Electrical Electrical	Sample 100% Sample+ 100% 100% 100% 100% 100%	BHEL Spec. and BOM Relevant standard Relevant standard & Catalogue Relevant standard & Catalogue Relevant standard & Catalogue Relevant standard & Catalogue Relevant standard & Catalogue	BHEL Spec. and BOM Relevant standard Relevant standard & Catalogue Relevant standard & Catalogue Relevant standard & Catalogue Relevant standard & Catalogue Relevant standard & Catalogue	Log Book Log Book Log Book Log Book Log Book Log Book Log Book	2 2 2 2 2 2 2	--- --- --- --- --- --- ---	--- --- --- --- --- --- 1	+ for relay & contactors only @ for all components except relays & contactors.
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								VOLUME IIB				
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								SHEET 3 OF 7				
Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
5.0	Misc. Components like Gaskets, Terminal Blocks etc.	1. Verification of Type / Make	MA	Visual	Sample	BHEL Spec. & Mfrs. Catalogue	BHEL Spec. & Mfrs. Catalogue	Log Book	2	---	---	
		2. Surface defects	MA	Visual	Sample	BHEL Spec. & Mfrs. Catalogue	BHEL Spec. & Mfrs. Catalogue	Log Book	2	---	---	
		3. IR / HV on Terminal Blocks	MA	Electrical	Sample	BHEL Spec. & Mfrs. Catalogue	BHEL Spec. & Mfrs. Catalogue	Log Book	2	---	---	
6.0	IN PROCESS Blanking / Bending / Forming	1. Dimensions	MI	Measurement	100%	Approved Mfr. drgs.	Approved Mfr. drgs.	Log Book	2	---	---	
		2. Surface defects after bending	MA	Visual	100%	Factory Standard	Factory Standard	Log Book	2	---	---	
7.0	Nibbling / Punching	1. Cutout Sizes	MI	Measurement	100%	Approved Mfr. drgs.	Approved Mfr. drgs.	Log Book	2	---	---	
		2. Deburring	MA	Visual	100%	Approved Mfr. drgs.	Approved Mfr. drgs.	Log Book	2	---	---	
8.0	ASSEMBLY Frame Assembly & Sheet fixing	1. Dimensions	MA	Measurement	100%	Approved drg. / Mfr. Standards	Approved drg. / Mfr. Standards	Log Book	2	---	2	
		2. Alignment	MA	Measurement	100%	Approved drg. / Mfr. Standards	Approved drg. / Mfr. Standards	Log Book	2	---	2	
		3. Welding Quality	MA	Visual	100%	Approved drg. / Mfr. Standards	Approved drg. / Mfr. Standards	Log Book	2	---	2	
		4. Surface defects	MA	Visual	100%	Approved drg. / Mfr. Standards	Approved drg. / Mfr. Standards	Log Book	2	---	2	
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बीएसएल BHEL PEM :: C&I		STANDARD QUALITY PLAN FOR LOCAL CONTROL PANEL						STD QUALITY PLAN NO.: PE-QP-999-145-I056				
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								SECTION D				
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								SHEET 4 OF 7				
Sl. No.	Component / operation	Characteristics Checked	* Cate gory	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
9.0	Pre-treatment and Painting	1. Pretreatment Process	MA	Visual	100%	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
		2. Process parameters like bath temp. concentration etc.	MA	Measurement	Periodic	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
		3. Dipping / Removal Time	MA	Measurement	100%	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
		4. Surface quality after every dip	MA	Visual	100%	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
		5. Primer after phosphating	MA	Visual, Thickness	100%	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
		6. Putty Application & Rubbing after primer	MA	Visual	100%	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
		7. Paint first coat	MA	Visual, Thickness	100%	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
		8. Putty Application and Rubbing after first coat of paint	MA	Visual	100%	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
		9. Paint second coat	MA	Visual, Thickness, Scratch test Colour adhesion	100%	Factory Standard & Relevant standard	Factory Standard & Relevant standard	Log Book	2	---	1	
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									SHEET 5		OF 7	
Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
10.	Panel Wiring	1. Wiring Layout	MA	Visual	100%	Approved drgs. & Specs.	Approved drgs. & Specs.	Log Book	2	---	---	
		2. Wiring Termination (Crimped Lugs)	MA	Visual	100%	Approved drgs. & Specs.	Approved drgs. & Specs.	Log Book	2	---	---	
		3. Ferrule numbers	MA	Visual	100%	Approved drgs. & Specs.	Approved drgs. & Specs.	Log Book	2	---	---	
		4. Colour of wiring	MA	Visual	100%	Approved drgs. & Specs.	Approved drgs. & Specs.	Log Book	2	---	1	
		5. Size of Conductor	MA	Measurement	100%	Approved drgs. & Specs.	Approved drgs. & Specs.	Log Book	2	---	1	
11.	Component Mounting	1. Correct components	MA	Visual	100%	Approved drgs., Specs. & BOM	Approved drgs., Specs. & BOM	Log Book	2	---	---	
		2. Fixing	MA	Visual	100%	Approved drgs., Specs. & BOM	Approved drgs., Specs. & BOM	Log Book	2	---	---	
12.	FINAL Final Inspection	1. Workmanship	MA	Visual	100%	Factory Standard	Factory Standard	Inspection Report	2	1	1	At Random by BHEL, based on 100 % internal test reports by Mfr.
		2. Component layout (neatness, accessibility & safety) Mounting / Proper fixing of all components	MA	Visual	100%	BHEL approved drg. / Spec.	BHEL approved drg. / Spec.	Inspection Report	2	1	1	
		3. Components identification Marking / Name plates	MA	Visual	100%	BHEL approved drg. / Spec.	BHEL approved drg. / Spec.	Inspection Report	2	1	1	

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								VOLUME		IIB		
								SECTION		D		
								REV. NO.		01	DATE: 22-02-2008	
								SHEET		6	OF	7
Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
		5. Dimensions	MA	Measurement	100%	BHEL approved drg. / Spec., BOM	BHEL approved drg. / Spec., BOM	Inspection Report	2	1	1	At Random by BHEL, based on 100 % internal test reports by Mfr.
		6. Door functioning	MA	Functional	100%	BHEL approved drg. / Spec.	BHEL approved drg. / Spec.	Inspection Report	2	1	1	
		7. Paint Shade	CR	Visual	100%	BHEL approved drg. / Spec.	BHEL approved drg. / Spec.	Inspection Report	2	1	1	
		8. Paint Thickness	CR	Measurement	100%	BHEL approved drg. / Spec.	BHEL approved drg. / Spec.	Inspection Report	2	1	1	
		9. Workmanship of Gaskets	MA	Visual	100%	Factory Standard	Factory Standard	Inspection Report	2	1	1	
		10. Wiring Layout	MA	Visual	100%	BHEL approved drg.	BHEL approved drg.	Inspection Report	2	1	1	
		11. Wire Termination	MA	Pulling manually	Sample	-----	Firm termination	Inspection Report	2	1	1	
		12. Continuity	MA	Electrical	100%	-----	Continuity OK	Inspection Report	2	1	1	

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								SECTION D				
								REV. NO. 01 DATE: 22-02-2008				
								SHEET 7 OF 7				
Sl. No.	Component / operation	Characteristics Checked	* Category	Type/Method of Check	Extent of Check	Reference documents	Acceptance Norms	Format of Records	Agency ^{\$}			Remarks
									P	W	V	
13.	TYPE TEST	Degree of Protection	CR	Mech. Protection	Sample	BHEL approved spec., drg relevant IEC-60947, IEC-60079	BHEL approved spec., drg relevant IEC-60947, IEC-60079	Type Test Certificate	3	---	1	
14	ROUTINE TEST	IR before & after HV Test	CR	Electrical	100%	BHEL approved spec., drg., BOM & relevant standard	BHEL approved spec., drg., BOM & relevant standard	Test Report	2	1	1	
15	FUNCTIONAL TEST	1. Control Logic Operation	CR	Electrical	100%	BHEL approved spec. / drg.	BHEL approved spec. / drg.	Inspection Report	2	1	1	
		2. Instrument Calibration	CR	Electrical	10%	BHEL approved spec. / drg.	BHEL approved spec. / drg.	Inspection Report	2	1	1	
		3. Temperature rise	CR	Electrical	100%	BHEL approved spec/drg. & relevant standard	BHEL approved spec/drg & relevant standard	Inspection Report	2	1	1	

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TECHNICAL SPECIFICATION
DARLIPALI STPP PH-II (1X800 MW) COMPRESSED AIR SYSTEM

SUB VENDOR LIST & INSPECTION CATEGORISATION

S. No.	Item	QP/ Insp.	Proposed Subvendor	Place of Manufacturer	Remarks
1	AIR DRYING PLANT (HOC TYPE)	I	ACIL	BELGIUM	
			MELLCON ENGRS PVT LTD	GR NOIDA	
			DELAIR INDIA LTD	GURGAON	
			SUMMITS HYGRONICS	COIMBATORE	
			INDCON	DELHI	
			TRIDENT PNEUMATIC PVT LTD	COIMBATORE	
2	MS/GI Pipes –ERW IS 1239 / IS 3589	III	SAIL	Rourkela	
			JINDAL SAW LTD	BELLARY	SAW UP TO 3632 OD THICKNESS 16 MM
			Surya Roshni	ANJAR	SAW UP TO 2032 OD
			PSL	Chennai/Vizag/Kutch/Daman	
			LALIT PIPES AND PIPES LTD	THANE	SAW 350 TO 1400 NB
			Samshi Pipes Industries	Vadodara	SAW 450 TO 2540 NB
			Mukut Pipes	Rajpura	SAW UPTO 1800 NB
			Mann Ind	Indore	SAW UPTO 1400 NB
			JCO PIPES	Chindwara	SAW UPTO 1600 NB
			Mukat Tanks and Vessels	Tarapur	SAW 200 TO 1200 NB
			Ratnamani	Kutch/Chhatral	SAW 600 TO 2600 NB SAW 400 TO 3600 NB
			Welspun	Anjar/Bharuch	SAW UPTO 2600 NB
3	Forged/Formed fittings	III	CAPACITE STRUCURES PVT LTD	THANE	406.4 MM TO 3874 MM OD
			EBY	Taloja	
			Siddarth & Gautam	Faridabad	
			Pipefit	Baroda	
			MS Fittings	Kolkata	
			Tube Products	Baroda	
			Bharat Forge	Pune	
			NL Hazra	Kolkata	
4	Ball Valve	II	Precision Engg	Nasik	upto 400NB 150 class
			SWIMS TECHNOLOGIES	HUBLI	
			Microfinish Valves Ltd	Hubli	
			Flow chem. Industries	Ahemdabad	upto 50 NB 800 Class: 350NB 150 class
			A V Valves	Agra	
			GM ENGINEERING PVT. LTD	Rajkot	
			L&T VALVES LIMITED	COIMBATORE	
			WELLCAST INDUSTRIES	AHMEDABAD	
			Belgaum Aqua Valve	Belgaum	
5	CS/FS Gate/Globe/Check valves	II	Foures Engg	Thane	
			L & T Valves	Coimbatore	
			LEADER VALVES LTD.	Jalandhar	
			KSB Pump Ltd	Coimbatore	
			Niton Valves India Pvt Ltd	Navi Mumbai/Aurangabad	
			BHEL	IVP GOINDWAL	
			HAWA ENGINEERS	AHMEDABAD	

S. No.	Item	QP/ Insp.	Proposed Subvendor	Place of Manufacturer	Remarks
			SWIMS TECHNOLOGIES	HUBLI	
			HITECH ENGG PVT LTD	AHMEDABAD	
6	Air Receiver	II	Integrated Engineers	Mumbai	
			Diamond Fabricators	Pune	
			Parkaire	Delhi	
			Temasme Vesselex	Noida	
			United Engineering Works	Nasik	
			PEERFINTUBES & ENGINEERING	Ambernath, Thane, MH	
7	After Cooler (Shell & Tube Type)	II	PEERFINTUBES & ENGINEERING	Ambernath, Thane, MH	
8	Safety Relief Valve	III	LEADER	JALANDHAR	
			SPIRAX MARSHALL	PUNE	
			FISCHER SANMAR	CHENNAI	
9	Pr./Vacuum/Dp Gauges	III	Auxitrol	U.K	
			Switzer (for DP gauge)	Chennai	
			Budenburg	U.K	
			A.N.Instruments	Kolkata	
			Bells Control	Kolkata	
			Manometer India	Mumbai	
			H Guru Industries	Kolkata	
			Ashcroft India	Kalol	
			General Inst.	Mumbai/Goa	
			Gluck India	Mumbai	
			BOSE PANDA INSTRUMENTS PVT.LTD.	Kolkata	
			Forbs Marshall	Hyderabad	
			Gauge Bourdon	Mumbai	
			H Guru Instruments	Bangalore	
			Baumer Technologies	Mumbai	
10	Pr./Vacuum/DP.switch	III	Barton Inst.system	USA	
			Indfoss	Ghaziabad	
			SOR	USA	
			Dressor	USA	
			Delta control	UK	
			Trafag	Ranipet	
			GIC(Gauges Bourdon)	Parvel	
			ASHCROFT INDIA PVT LTD.	USA/GERMANY	
			Switzer	Chennai	
11	Temperature Gauge	III	Budenburg	U.K	
			A.N.Instruments	Kolkata	
			Bells Control	Kolkata	
			H Guru Industries	Kolkata	
			General Inst.	Mumbai/Goa	
			H Guru Instruments	Bangalore	
			Forbs Marshall	Hyderabad	
			Goa Instruments	Goa	
			Goa Thermostatics Instruments Pvt. Ltd.	Goa	
			Gauge Bourdon	Mumbai	
			Baumer Technologies	Mumbai	
			Ashcroft India	Kalol	
12	Transmitters (PT, TT, DPT, LT)	III	ABB	Faridabad	PRESSURE TRANSMITTER, DP TRANSMITTER and TEMP TRANSMITTER
			Yokogawa	Bangalore	
			Emerson	Mumbai	
			(ABB) -2600T series	Faridabad/Italy	
			Pune Techtrol Pvt. Ltd.	Pune	Only for capacitance Type Level Transmitter
			SIEMENS LIMITED	Mumbai	
			SMART INSTRUMENTS LTD, BRAZIL	Mumbai	LD-301 & T-301 TRANSMITTER FROM M/S SMART EQUIPMENTS BRAZIL.
			SBEM PVT. LTD.	Pune	Only for capacitance Type Level Transmitter
			TOSHNIWAL INDUSTRIES PVT. LTD.,	Ajmer	
			V. AUTOMAT & INTRUMENTS (P) LTD.	NEW DELHI	a)DISPLACEMENT TYPE TRANSMITTERS. b)PRESSURE AND DP TRANSMITTERS
			Honeywell Automation	NEW DELHI	
			Fuji	Japan	
			NIVO CONTROLS PVT. LTD.	Indore	For Capacitance type only
			Moore Industries International Inc.	CALIFORNIA, USA	Indian Associate - Chemtrol
			Endress + Hauser (India) Pvt. Ltd.,	NEW DELHI	TEMP. TRANSMITTER ONLY

S. No.	Item	QP/ Insp.	Proposed Subvendor	Place of Manufacturer	Remarks
13	Transmitters Profibus type	I	ABB	Bangalore	
14	Flow Switch	III	Switzer	Chennai	
			Levecon	Kolkata	
			DK Instruments	Kolkata	
			Delta	UK	
			ITT Barton	USA	
15	Temp Sensor	III	Pyro Electric	Mumbai	
16	Flow Indicator	III	Detriv	Mumbai	
			Sigma	Mumbai	
17	Auto Drain Trap	III	Eureca	Pune	
			Pennant	Pune	
			Forbes Marshall	Pune	
18	Dew point meter	III	GE Sensing	Ireland	
			Michell Instruments	UK	
			XENTAUR	USA	
			Shaw	UK	
19	Flow Meter / Rota Meter	III	Trac	Hyderabad	
			Eureca	Pune	Rota Meter only
			Flow Star Engg.	Faridabad	Rota Meter only
			Flow Tech instruments	Vadodara	Rota Meter only
			Instruments Engineers Pvt. Ltd.	Hyderabad	Rota Meter only
			Scientific Devices (Bombay) Pvt. Ltd.	Mumbai	Rota Meter only
			Emerson Process Management	singapore	Vortex Type
			ABB Ltd.	India	Vortex Type
			Krohne Marshall Pvt. Ltd.	India	Vortex Type
			Endress + Hauser (I) Pvt. Ltd	India	Vortex Type
			Yokogawa Electric Corporation(other than high temp & h2 services)	japan	Vortex Type
			Krohne Messtechnik GmbH & Co. Kg	Germany	Vortex Type
20	Solenoid Valve	III	HERION	GERMANY/ ITALY	
			ROTEX AUTOMATION LTD.	V V NAGAR/ BARODA	
			ASCO	CHENNAI	
			JEFFERSON	ARGENTINA	
			AVCON	MUMBAI	
21	Cable trays (max 300 meters)	III	INAR PROFILE	ANNAKAPALLI	
			ANAND UDYOG	THANE	
			MJ ENGG.	DELHI	
			INDIANA	MUMBAI	
			TECHNO ENGG	CHANDIGARH	
			JAMUNA METAL	DELHI	
			INDUSTRIAL PERFORATION	KOLKATA	
			VATCO	MUMBAI	
22	Cable Glands	III	SUNIL& COMPANY	KOLKATA	
			ARUP ENGG	KOLKATA	
			COMMET	MUMBAI	
			QUALITY PRECISION	KOLKATA	
23	Cable Lugs	III	DOWELLS	MUMBAI	
			CHETNA ENGG	NASIK	
			3D	VALSAD	
24	INSTRUMENT FITTINGS	III	AURA INCORPORATED	NEW DELHI	
			Astec Valves & Fittings Pvt. Ltd.,	Mumbai	
			Arya Crafts & Engineering Pvt. Ltd.	Mumbai	
			Comfit & Valve Pvt. Ltd.	Nandasan-Gujarat	
			FLUIDFIT ENGINEERS PVT. LTD.	Mumbai	
			Fluid Controls Pvt. Ltd.	Mumbai	
			HP VALVES & FITTINGS INDIA PVT. LTD.	Chennai	
			PRECISION ENGINEERING INDUSTRIES	Mumbai	
			Panam Engineers,	Mumbai	
			Perfect Instrumentation Control (India) Pvt. Ltd.	Mumbai	
			VIKAS INDUSTRIAL PRODUCTS	Noida	

S. No.	Item	QP/ Insp.	Proposed Subvendor	Place of Manufacturer	Remarks
25	Fibre Optic Cable	III	Birla Ericsson	Rewa	
			Finolex	Pune/Goa	
			Aksh Fibre	Bhiwadi	
			U M Cables Ltd	Silvassa (Daman)	
			KEC International Ltd	Mysore	
			Apar Industries Limited	Valsad (Gujrat)	
			HFCL	Goa	
			R&M	Switzerland	
			Molex	UK	
			Corning	USA	
26	Junction Box	III	AJMERA INDUSTRIAL & ENGINEERING WORKS	Mumbai	For galvanised & FRP Junction boxes
			FLEXPRO ELECTRICALS PVT. LTD.	Navsari, Gujarat	Metal type Junction boxes only
			K.S.INSTRUMENTS PVT.LTD.	Bangalore	
			SUCHITRA INDUSTRIES	Bangalore	
			Shrenik & Company,	Ahemdabad	
27	PAINTS	III	Asian Paints (I) Ltd.	Mumbai	
			Berger Paints India Ltd	Delhi	
			Goodlass Nerolac	Mumbai	
			Jenson & Nicholson (I) Ltd	Gurgaon	
			CDC carboline (I) Ltd.	Delhi	
			Shalimar Paints Ltd.	Gurgaon	
			Addison Paints Ltd	Chennai	
			Grand Polycoat	Mumbai	
			Bombay Paints	Mumbai	
			Jotun Paints	Pune	
			Hemple Paints	Singapore	
			NOTES:		
1.)	INSP. CAT I: FOR THOSE ITEMS THE QUALITY PLANS ARE APPROVED BY CUSTOMER AND FINAL ACCEPTANCE WILL BE ON PHYSICAL INSPECTION WITNESS BY BHEL & CUSTOMER.				
2.)	INSP. CAT II: FOR THOSE ITEMS THE QUALITY PLANS ARE APPROVED BY CUSTOMER. HOWEVER NO PHYSICAL INSPECTION WILL BE DONE BY BHEL / CUSTOMER. THE FINAL ACCEPTANCE BY BHEL / CUSTOMER SHALL BE ON THE BASIS OF REVIEW OF DOCUMENTS AS PER QP.				
3.)	INSP. CAT III: FOR THOSE ITEMS FINAL ACCEPTANCE BY BHEL / CUSTOMER BASED ON BIDDER'S COC.				
4.)	THE SUB VENDOR LIST ENCLOSED IS INDICATIVE ONLY AND IS SUBJECT TO APPROVAL / ACCEPTANCE BY CUSTOMER (NTPC) DURING DETIL ENGINEERING. ANY NEW SUPPLIER PROPOSE BY SUCCESSFUL BIDDER FOR ITEMS OTEHR THAN AIR COMPRESSOR, SHALL BE PROPOSE WITH REQUIRED DOCUMENTS (DULY FILLED SUB-VENDOR QUESTIONNAIRE, PERFORMANCE CERTIFICATE ALONG WITH OTHER BACK-UP DOCUMENTS) ETC. THE SAME SHALL SUBJECT TO BHEL AND CUSTOMER APPROVAL DURING DETAILED ENGINEERING STAGE WITHOUT ANY TECHNICAL, COMMERCIAL & DELIVERY IMPLICATIONS TO BHEL/NTPC.				
5.)	MAKE FOR INSTRUMENTS MOUNTED WITHIN COMPRESSOR AND DRYER SKID ARE ACCEPTABLE AS PER PROVEN EXPERIENCE OF OEM. HOWEVER, BIDDER SHALL SUPPLY ONLY REPUTED & EXPERIENCE MAKES OF BIDDER.				

 एक महारत्न कम्पनी		PROJECT : DARLIPALI SUPER THERMAL POWER PROJECT STAGE-II (1X800 MW)					LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				
		PACKAGE : EPC PACKAGES									REVISION NO : 00
		CONTRACTOR:									DATE :24.11.2023
		CONTRACT NO :									SUB SECTION: C&I
Sr No	Item Description	QP Inspection Category	QP No	QP submission SCH	QP approval SCH	Proposed Sub Supplier	Country	SS Approval Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark
		III				Phoenix Contact Inc	USA	A			Materiall will be allowed to dispatch from the vendor works as CAT-III item ,however all material except SS junction box will be available at DDCMIS supplier works for functional testing .
		III				Pepperl + Fuchs Pte Ltd	Singapore	A			Materiall will be allowed to dispatch from the vendor works as CAT-III item ,however all material will be available at DDCMIS supplier works for functional testing .
52	Stockyard Management System(Including 3D profiling scanner ,Thermal Imaging Camera, RTK GPS)										
		III				TSA	Brazil	A			For 3D profiling / Tripple-IN Germany make
		I				EIP Enviro	Noida	A			For 3D profiling / 1-Triple-IN Germany make Laser Scanner and RPU along with software from TSA Brazil inline with the M/s TSA Letter. 2- Other item like ethernet cable, Ethernet Switch, Junction Box required for execution of 3D stockpile management system can be supplied by EIP Enviro
53	Perimeter Intrusion Detection System										
		III				Senstar	Canada	A			
54	Radar based Perimeter Surveillance System										
		III				Magos System Ltd	Israel	A			Third Party “Cyber Penetration report “ shall be provided along with material TC/COC
55	Thermal Camera (PTZ)										
		III				FLIR Commercial Svstems INC	USA	A			

Main Contractor approved sources (Note-12)

MC-1	Amonia Analyser	III				Main Contractor Approved Sources				
MC-2	Amonia leak detector	III				Main Contractor Approved Sources				
MC-3	Air Filter Regulator	III				Main Contractor Approved Sources				
MC-4	Anemometer	III				Main Contractor Approved Sources				
MC-5	Annunciator	III				Main Contractor Approved Sources				
MC-6	Battery Health Monitoring System	III				Main Contractor Approved Sources				
MC-7	Biofouling/ Deposit Monitor	III				Main Contractor Approved Sources				
MC-8	Coal bunker Level monitor	III				Main Contractor Approved Sources				
MC-9	Compression Fittings(SS)	III				Main Contractor Approved Sources				
MC-10	Condensing Pots	III				Main Contractor Approved Sources				
MC-11	Conduits /Pipe (GI)	III				Main Contractor Approved Sources				
MC-12	Conduits lead coated (Flexible)	III				Main Contractor Approved Sources				
MC-13	Copper tubing/Brass connectors	III				Main Contractor Approved Sources				
MC-14	Coriolios Type Mass Flow meter	III				Main Contractor Approved Sources				
MC-15	Coupling /Interposing Relays	III				Main Contractor Approved Sources				
MC-16	Density Indicator	III				Main Contractor Approved Sources				
MC-17	Desk for OWS/EWS/Printer/Server	III				Main Contractor Approved Sources				

 एक महारत्न कम्पनी		PROJECT : DARLIPALI SUPER THERMAL POWER PROJECT STAGE-II (1X800 MW)					LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00	
		PACKAGE : EPC PACKAGES									DATE :24.11.2023	
		CONTRACTOR:									SUB SECTION: C&I	
		CONTRACT NO :										
Sr No	Item Description	QP Inspection Category	QP No	QP submiss ion SCH	QP approv al SCH	Proposed Sub Supplier	Country	SS Approval Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark	
MC-18	Digital Indicators	III				Main Contractor Approved Sources						
MC-19	Dust Sensor	III				Main Contractor Approved Sources						
MC-20	Dew point sensor/meter (H2)	III				Main Contractor Approved Sources						
MC-21	Flow Gauge	III				Main Contractor Approved Sources						
MC-22	Flow Indicator cum Totaliser	III				Main Contractor Approved Sources						
MC-23	Flow Switch	III				Main Contractor Approved Sources						
MC-24	FRP Junction Box	III				Main Contractor Approved Sources						
MC-25	Furniture for control Room(Chair, Almira, Lock)	III				Main Contractor Approved Sources						
MC-26	Furnace exit gas temp probe	III				Main Contractor Approved Sources						
MC-27	Graphic Interface Unit	III				Main Contractor Approved Sources						
MC-28	Hand Held Calibrator	III				Main Contractor Approved Sources						
MC-29	Hart Management System	III				Main Contractor Approved Sources						
MC-30	Humidistat / Thermostat / Gyserstat / Airstat	III				Main Contractor Approved Sources						
MC-31	Instant Corrosion Rate Monitor & Portable Corrosion Meter	III				Main Contractor Approved Sources						
MC-32	Impact head type flow element	III				Main Contractor Approved Sources						
MC-33	Instrument Tube Fittings (Air)	III				Main Contractor Approved Sources						
MC-34	Instrument Valve	III				Main Contractor Approved Sources						
MC-35	IR Detector	III				Main Contractor Approved Sources						
MC-36	KVM Switch/Matrix KVM Switch	III				Main Contractor Approved Sources						
MC-37	Level gauge (Transperent & Reflex, Tubular type)	III				Main Contractor Approved Sources						
MC-38	Level Indicator (Float & Board type)	III				Main Contractor Approved Sources						
MC-39	Level switch - Float/Displacer Type	III				Main Contractor Approved Sources						
MC-40	Level Switch (RF Type)	III				Main Contractor Approved Sources						
MC-41	Level switch capacitance type	III				Main Contractor Approved Sources						
MC-42	Limit Switch	III				Main Contractor Approved Sources						
MC-43	Maintenance and Calibration Equipment	III				Main Contractor Approved Sources						
MC-44	Mini UPS-Type C configuration	III				Main Contractor Approved Sources						
MC-45	Orifice plate assembly	III				Main Contractor Approved Sources						
MC-46	On line carbon in Ash analyser	III				Main Contractor Approved Sources						
MC-47	Pitot Tube	III				Main Contractor Approved Sources						
MC-48	Pr./Vaccum./DP Gauges	III				Main Contractor Approved Sources						
MC-49	Press, DP, Vaccum Switch	III				Main Contractor Approved Sources						
MC-50	Printer (Dot Matrix/Inkjet / Laser)	III				Main Contractor Approved Sources						
MC-51	Psychrometer	III				Main Contractor Approved Sources						
MC-52	Pulse jet Controller	III				Main Contractor Approved Sources						
MC-53	Pulse Valve	III				Main Contractor Approved Sources						
MC-54	Residual Chlorine Analyser	III				Main Contractor Approved Sources						
MC-55	Rotameter	III				Main Contractor Approved Sources						
MC-56	Reverse Rotation Indicator	III				Main Contractor Approved Sources						
MC-57	Synchronising Relay	III				Main Contractor Approved Sources						
MC-58	Synchroscope	III				Main Contractor Approved Sources						
MC-59	Semaphore Indicators	III				Main Contractor Approved Sources						
MC-60	Sight Flow Indicator	III				Main Contractor Approved Sources						
MC-61	Smart Positioner	III				Main Contractor Approved Sources						
MC-62	Socket Weld Fittings	III				Main Contractor Approved Sources						
MC-63	Solenoid Valve	III				Main Contractor Approved Sources						
MC-64	Solid Mass Flow Meter	III				Main Contractor Approved Sources						
MC-65	Terminal Block (Cage and Clamp type)	III				Main Contractor Approved Sources						
MC-66	Temperature cum Humidity Indicator	III				Main Contractor Approved Sources						

 एक महारत्न कम्पनी		PROJECT : DARLIPALI SUPER THERMAL POWER PROJECT STAGE-II (1X800 MW)					LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00
		PACKAGE : EPC PACKAGES									DATE :24.11.2023
		CONTRACTOR:									SUB SECTION: C&I
		CONTRACT NO :									
Sr No	Item Description	QP Inspection Category	QP No	QP submiss ion SCH	QP approv al SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark
MC-67	Temperature Element(Thermocouple , RTD & Thermowell)	III				Main Contractor Approved Sources					
MC-68	Temperature Gauge(With Thermowell)	III				Main Contractor Approved Sources					
MC-69	Temperature Switch	III				Main Contractor Approved Sources					
MC-70	Transducer	III				Main Contractor Approved Sources					
MC-71	Tube thicknes Meter	III				Main Contractor Approved Sources					
MC-72	Voltmeter/ Watterhour Meter	III				Main Contractor Approved Sources					
MC-73	Valve manifolds	III				Main Contractor Approved Sources					
MC-74	Electric to Pneumatic Converter	III				Main Contractor Approved Sources					
MC-75	Network components	III				Main Contractor Approved Sources					
MC-76	Isolator	III				Main Contractor Approved Sources					
MC-77	ORP Monitor /Analyser	III				Main Contractor Approved Sources					
MC-78	Ultrasonic Type Flow Transmitter	III				Main Contractor Approved Sources					
MC-79	Chlorine Leak detector	III				Main Contractor Approved Sources					
MC-80	Density Meter	III				Main Contractor Approved Sources					
MC-81	Electro Magenetic Flow meter	III				Main Contractor Approved Sources					
MC-82	Postive dispalcement Type Flow Meter	III				Main Contractor Approved Sources					
MC-83	Level Scanner (3 D)for Solid Application	III				Main Contractor Approved Sources					
MC-84	Mosaic tiles /Console items	III				Main Contractor Approved Sources					
MC-85	Electrical Control Panel (UCP/Backup)	III				Main Contractor Approved Sources					
MC-86	Electrical Indicating Instruments (Mosaic Compatible)	III				Main Contractor Approved Sources					
MC-87	OWS/EWS/Server	III				Main Contractor Approved Sources					
MC-88	Bio Matrix Reader	III				Main Contractor Approved Sources					
MC-89	ANPR	III				Main Contractor Approved Sources					
MC-90	UVSS	III				Main Contractor Approved Sources					
MC-91	Comd & Control System	III				Main Contractor Approved Sources					
MC-92	Access & Controllor Software	III				Main Contractor Approved Sources					
MC-93	IR LED based Illuminator	III				Main Contractor Approved Sources					
MC-94	ATB Bolloard	III				Main Contractor Approved Sources					
MC-95	Boom Barrier	III				Main Contractor Approved Sources					
MC-96	Touchless biometric recorder	III				Main Contractor Approved Sources					
MC-97	GPS Sensor based Vehicle Monitoring system	III				Main Contractor Approved Sources					
MC-98	10mp digital camera with tripod for photo capture	III				Main Contractor Approved Sources					
MC-99	2D GIS map application	III				Main Contractor Approved Sources					
MC-100	Audible alarm device	III				Main Contractor Approved Sources					
MC-101	CameraPoles	III				Main Contractor Approved Sources					
MC-102	Card Reader	III				Main Contractor Approved Sources					
MC-103	Door Frame Metal Detector -DFMD	III				Main Contractor Approved Sources					
MC-104	Door sensor	III				Main Contractor Approved Sources					
MC-105	Egress Switch	III				Main Contractor Approved Sources					
MC-106	EM LOCK	III				Main Contractor Approved Sources					
MC-107	Emergency exit / door override switch	III				Main Contractor Approved Sources					
MC-108	Emergency Siren /Hooter	III				Main Contractor Approved Sources					
MC-109	Flap barrier	III				Main Contractor Approved Sources					
MC-110	Flash Lights for covering perimeter area for clear view from PTZ in night time	III				Main Contractor Approved Sources					
MC-111	Geo fencing	III				Main Contractor Approved Sources					
MC-112	Glass Break switch at Emergency Exit	III				Main Contractor Approved Sources					
MC-113	Guard tour	III				Main Contractor Approved Sources					

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		PACKAGE : EPC PACKAGES									DATE :24.11.2023	
		CONTRACTOR:									SUB SECTION: C&I	
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Sr No	Item Description	QP Inspection Category	QP No	QP submiss ion SCH	QP approv al SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark	
MC-114	Generator End Winding VMS	III				Main Contractor Approved Sources						
MC-115	Half Height Turnstile	III				Main Contractor Approved Sources						
MC-116	Handheld Walkie - Talkie	III				Main Contractor Approved Sources						
MC-117	HHMD	III				Main Contractor Approved Sources						
MC-118	Long Range RFID Reader	III				Main Contractor Approved Sources						
MC-119	Monitors 24 Inch Full HD	III				Main Contractor Approved Sources						
MC-120	Network Panel	III				Main Contractor Approved Sources						
MC-121	Optical Time Domain Reflector-meter (OTDR) with all accessories	III				Main Contractor Approved Sources						
MC-122	Panic Button with Audible Alarm	III				Main Contractor Approved Sources						
MC-123	Panic button/SOS button supportin SIP protocol	III				Main Contractor Approved Sources						
MC-124	RFID based Stickers	III				Main Contractor Approved Sources						
MC-125	Sliding Gate	III				Main Contractor Approved Sources						
MC-126	SMS gateway	III				Main Contractor Approved Sources						
MC-127	Storage Device (SAN/NAS/DAS) of 100 TB each	III				Main Contractor Approved Sources						
MC-128	Traffic Light	III				Main Contractor Approved Sources						
MC-129	Turnstile - half height	III				Main Contractor Approved Sources						
MC-130	SPIKE BARRIER	III				Main Contractor Approved Sources						
MC-131	CHAIN LINK FENCE	III				Main Contractor Approved Sources						
MC-132	X-ray Baggage Scanner	III				Main Contractor Approved Sources						
MC-133	Static Radio Set	III				Main Contractor Approved Sources						
MC-134	EPABX equipments	III				Main Contractor Approved Sources						
LEGENDS :												
1.0 SYSTEM SUPPLIER / SUB SUPPLIER APPROVAL STATUS CATEGORY												
A - For those items proposed vendor is acceptable to Customer. To be indicated with letter "A" in the list alongwith the condition of approval, if any.												
2.0 QP INSPECTION CATEGORY :												
CAT - I : For those items the Quality Plans are approved by Customer and final acceptance will be on physical inspection witness by Customer												
CAT - II : For those items the Quality Plans are approved by Customer. However no physical inspection shall be done by Customer. The final acceptance by Customer shall be on the basis of review of documents.												
CAT - III :For these items Quality control to be exercised as per Main contractor Quality Assurance System. The final acceptance by NTPC shall be on the basis of Certificate of Conformance (COC) by Main Contractor.												
UNITS/WORKS : Place of manufacturing- Place of main supplier of multi units/works.												
NOTE - 1 : A: Vendors to submit project specific documents as per Sub-QR requirements in case the Vendor is approved under collaboration agreement.												
B: In case approved sub vendor is offering product with latest model/series apart from earlier approved, vendors to submit project specific documents as per Sub-QR requirements.												
NOTE - 2 : For Instrument cable <= 1 KM inspection category CAT - III, For > 1 KM to <= 10 KM Inspection category CAT - II COC & FOR> 10 KM Inspection category CAT-I												
NOTE -3 : For Fiber Optic cable <=10KM inspection category CAT - III & for > 10KM Inspection category CAT-II												
NOTE-4 : Batteries for UPS <= 10 KVA and batteries for intelligent battery charger 24 V DC <= 40 Amp inspection category CAT-III & for Batteries for UPS> 10KVA and batteries for intelligent battery charger 24 V DC > 40 Amp rating												
NOTE-5 UPS <= 10 KVA rating inspection category CAT-III & for > 10KVA rating inspection category CAT-I												
NOTE - 7 - EMPTY CABINETS, COMPUTERS, SIGNAL ISOLATOR/ MULTIPLIER and TB SHALL ALSO BE ACCEPTABLE FROM OWNER ACCPETED IN QP. IF THE TOTAL INTEGRATED PANEL AND FAT IS CONDUCTED INDEGENEOUSLY												
NOTE-8 : For the C & I instrumnts mounted on the skid of the main item or supplied as a integral part of the main item, instrument to be supplied as per proven practice of the manufacturer meeting the Customer technical specification requirement.												
NOTE-9- This item is a bought out component of main equipments like DDCMIS ,PLC,TSI,CCTV ,PA system etc												
NOTE-10- For these controlled items, vendor shall be proposed for owner acceptance with-in the agreed contract schedule of the package												
NOTE-11 - Major Bought-Out-Items are to be procured from LOA approved sources & the same shall be finalized during the finalization of Manufacturing Quality Plan . MQP shall be duly vetted by OEM with their project specific authorisation letter .												
NOTE-12 : Main contractor apporved sub vendors are acceptable those are evaluated / assesesed as per Main contractor Quality Management System for vendor approval. Main contractor to inform the finally selected vendor to NTPC as soon as PO is placed for these items. In case of sub-QR Note-1 is also applicable.												

 एन टी पी सी NTPC		PROJECT : DARLIPALI SUPER THERMAL POWER PROJECT STAGE-II (1X800 MW)					LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00
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48	Vibration Monitoring System										
		II				Sensonics Technology India	Kundli	A			For Sensonic UK system
		II				BHEL	Bengaluru	A			1. Imported items like Vibration Monitors, Cross Connection Cables, Buffered Output Modules, and Piezoelectric Vibration Sensors, Eddy Current type Proximity Probe, Extension Cable and Signal Conditioner will be procured from Valmet Automation, Finland. 2.Indigenous items like Communication cables, networking components, blank panels, TB, OWS will be procured from NTPC approved sources.
		II				IRD Mechanalysis Ltd	Thane	A			Vibration sensors will be sourced from M/s Hansford UK ,however brand name of IRD and its logo is acceptable with suitable traceability of M/s Hansford ,UK.
		II				Forbes Marshall Pvt Limited	Pune	A			VMS hardware , Sensors ,extention cables shall be shinkawa Japan make .2. All other BOI shall be from LOA agreed sources
		II				GE	Pune	A			For GE Bentley , USA Make
		II				Rockwell Automation	Sahibabad	A			For Rockwell USA make
		II				SKF	Pune	A			For SKF USA make
		II				Imageneous Engineering Pvt Ltd	Vadodara	A			1-For Meggitt Switzerland make 2- Refer note 7
		II				Shinkawa	Japan	A			
		II				GE	USA	A			Bentley Niveda brand
		II				Meggitt	Switzerland	A			
		II				Sensonic Limited	UK	A			
49	Wireless Solution (Microwave Tower Communication)										
		I				L&T Technology Services (LTTS)	Bengaluru	A			1- Wireless Product (Access Point, Antenna) shall be M/s Cambium UK Make 2- Other Item like Switch, Cat-6 Cable can be supplied from M/s LTTS approved sources meeting technical requirements.
		I				Lotus wireless technologies India Pvt Ltd	Visakhapatnam	A			
		I				Sheetal Wireless Technologies Pvt Ltd	Pune	A			
		III				Proxim Wireless Corporation	USA	A			BOI shall be as per approval letter
50	Field Bus Cable/ Profibus Cable- PA & DP type										
		I				LAPP India Pvt Ltd	Bangalore	A			
		I				Thermo Cables Ltd.	Mahboobnagar	A			
51	Field bus components (Field bus modules ,segment protector ,surge protector & SS JB)										

 एन टी पी सी		PROJECT : DARLIPALI SUPER THERMAL POWER PROJECT STAGE-II (1X800 MW)					LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00
		PACKAGE : EPC PACKAGES									DATE :24.11.2023
		CONTRACTOR:									SUB SECTION: C&I
		CONTRACT NO :									
Sr No	Item Description	QP Inspection Category	QP No	QP submission SCH	QP approval SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark
		III				Mettlet Toledo India Pvt Ltd	Vasai	A			For pH Analyser (1. PH analyser from M/S Mettler Toledo GmbH Switzerland 2. Other components like, Housing, Panel mounting kit, Tubing's & easy clean mechanism will be supplied by M/s Mettler Toledo India Pvt Ltd)
		III				Endress Hauser India Pvt. Limited	Mumbai	A			For pH Analyser (1. pH sensor with cable , analyser ,retract & cleaning assembly , electrolyte reservoir (As applicable) will be supplied from Principals of M/S Endress Hauser India Pvt. Limited. 2. Other components like, Flow through assembly shall be supplied from M/S Endress Hauser India Pvt. Limited approved sources.)
		III				Thermo Fisher Scientific	USA	A			For Chloride,Dissolved Oxygen,Hydrazine
		III				ABB	UK	A			For Chloride,Dissolved Oxygen,Hydrazine, Phosphate, Silica,Sodium,Turbidity
		III				Hach	USA	A			For Conductivity, pH,Concentration, Phosphate, Silica,Turbidity
		III				ABB	USA	A			For Conductivity, pH
		III				Yokogawa	Japan	A			For Conductivity
		III				Hach	Switzerland	A			For Dissolved oxygen, Hydrazine, Silica,Sodium
		III				Yokogawa	Japan	A			For pH
		III				Eutech Instrument PTE Ltd	Singapore	A			For Silica
		III				Orion	USA	A			For Sodium
		III				SWAN Analytische Instrumente AG	Hinwil /Switzerland	A			For pH Analyzer , Conductivity analyser ,Dissolve Oxygen analyser , silica Analyzer , Sodium Analyzer , Hydrazine analyser , Turbidity analyser
		I				Forbes Marshall Pvt Ltd	Pune	A			For Conductivity & pH analyser
		I				METTLER TOLEDO INDIA PVT LTD	Mumbai	A			For Chloride Analyser
43	Temp Transmitter										
43-A	Temp Transmitter										
		III				Endress & Houser	Aurangabad	A			
		III				Emerson Process Management Ltd	Pawane	A			For M/s Emerson Singapore make
		III				Yokogawa	Bengaluru	A			Make Yokogawa japan and calibration at Yokogawa Bangalore
		III				ABB	Bengaluru	A			For M/s ABB Germany make
		III				WIKA Instruments India Pvt Ltd	Pune	A			For M/s WIKA Germany make Model no T-32
		III				Honeywell Automation India Ltd	Pune	A			
		III				Yokogawa	Japan	A			
		III				Moore	USA	A			
		III				M System co Ltd	Japan	A			Model No-B3HU-0

		PROJECT : DARLIPALI SUPER THERMAL POWER PROJECT STAGE-II (1X800 MW) PACKAGE : EPC PACKAGES CONTRACTOR: CONTRACT NO :					LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00 DATE :24.11.2023 SUB SECTION: C&I
Sr No	Item Description	QP Inspection Category	QP No	QP submission SCH	QP approval SCH	Proposed Sub Supplier	Country	SS Approval Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark
		III				Emerson	U.S.A/Singapore/ Germany	A			
		III				ABB	Germany	A			
		III				Emerson Process Management	Germany	A			
43-B	Temp Transmitter -Field Bus based Single/Dual Input										
		I				ABB India Ltd	Bengaluru	A			One no of TT will be available at DCS supplier for function testing of field bus communication with DCS during FAT
44	Turbine supervisory Instruments along with vibration analysis system.										
		I				GE	Pune	A			For GE Bently ,USA make system
		I				Meggitt India Pvt Ltd	Bengaluru	A			For Meggitt (Vibrometer) Switzerland make system
		I				Forbes Marshall	Pune	A			For Shinkawa ,Japan make system
		II				GE BENTLY	USA	A			
		II				SHINKAWA	JAPAN	A			
		II				MEGGITT	Switzerland	A			
45	Ultrasonic Type Flow Meter (for Stack)										
		III				Sick India Pvt Ltd	Mumbai	A			For Sick AG Germany make
		III				Sick AG	Germany	A			
		III				Durag	Germany	A			
		III				Teledyne	USA	A			
46	Ultrasonic type level Transmitter										
		III				EIP Enviro	Noida	A			1-Ultrasonic level Tx shall be BM Technology Italy make 2-Required mounting arrangement , Testing, Calibration shall be carried out at M/s EIP Works.
		III				E & H	Aurangabad	A			
		III				Emerson Process Management Ltd	Pawane	A			Complete Intrument Transmitter & Probe to be procured from Mobrey UK , only intergration & configuration at Pawane works
		III				BM Technology	Italy	A			
		III				Siemens Miltronics	Canada	A			
		III				Nivelco Process Control	Hungary	A			
		III				E & H	Germany	A			
		III				HAWK Measurement PTY Ltd	Australia	A			
47	UPS With ACDB										
		Note-5				Vertive Energy Pvt Ltd	Pune	A			Upto 125 KVA for 1 phase and 300 KVA for 3 Phase
		Note-5				Vertive Energy Pvt Ltd	Mumbai	A			Upto 160 KVA
		Note-5				Hitachi Hirel Power Electronics Pvt Ltd	Gandhinagar	A			Upto 200 KVA,
		Note-5				Fuji Electric Consul Neowatt Private Limited	Pune	A			Up to 100 KVA single phase
		Note-5				KELTRON	Trivendrum	A			
		Note-5				Merlin & Gerin	France	A			
		Note-5				Gutor	Switzerland	A			
		Note-5				AEG	Germany	A			
		Note-5				Fuji Electric	Japan	A			

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		PACKAGE : EPC PACKAGES									DATE :24.11.2023
		CONTRACTOR:									SUB SECTION: C&I
		CONTRACT NO :									
Sr No	Item Description	QP Inspection Category	QP No	QP submission SCH	QP approval SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark
		III				ENEVA	UK	A			For Extractive Type Dust density analyser
12	Electrical Actuators										
12-A	Electrical Actuator (With gear box if applicable)										
		II				Antrieb Technik Pvt Ltd	Chennai	A			For low torque applications only
		II				Auma	Bengaluru	A			
		II				Limitorque	Faridabad	A			Model no L120,SMB,LY series, Gear Box T, HBC Series
		II				Rotork	Bengaluru	A			For low torque app (Up to 1000 Nm)
		II				Rotork Controls (India) Private Ltd	Chennai	A			For low torque app (Up to 1000 Nm) & High torque 4000 to 7000 Nm With integral starter for non critical applications
		III				Auma	Germany	A			
		III				Limitorque	USA	A			
		III				Rotork	UK	A			For low torque app (Up to 1000 Nm)
		III				Nippon gear	Japan	A			
		III				Drehmo GMBH	Germany	A			C Matic Series (DMC/DMCR)
12-B	Electrical Actuator- Non-Intrusive (With gear box if applicable)										
		I				Auma India Pvt Ltd	Bengaluru	A			Also acceptable for Field Bus based applicable
		I				Rotork Control	Chennai	A			Upto 630Nm
		III				Flowserve	USA	A			Also acceptable for Field Bus based applicable
		III				Bernard Controls	France	A			
12-C	Electrical actuator for ID/FD/PA Blade pitch ,IGV &SCOOP										
		III				Harold Beck & Sons Inc	USA	A			
		III				SIPOS Aktorik GmbH	Germany	A			
13	Electronics Transmitter (Pressure , DP and DP based Flow/Level)										
13-A	Electronics Transmitter (Pressure , DP and DP based Flow/Level)										
		III				ABB Ltd	Bengaluru	A			2600T & critical item from ABB Italy/ Their approved source;
		III				Emerson Process Management Ltd	Pawane	A			
		III				Siemens Ltd	Thane	A			Model:-SITRANS P
		III				Honeywell Automation India Ltd	Pune	A			
		III				Baldota Control and Equipment Pvt Ltd	Navi Mumbai	A			PT & DPT of LD 301 Series (SMAR)
		III				Yokogawa India Limited	Bengaluru	A			EJA-E 110,430,530 SERIES & all raw material and BOI under knocked down condotion (sensor assembly as a single unit) shall be sourced from M/S Yokogawa Japan
		III				M/s Endress + Hauser India Automation Instrument Pvt Ltd	Aurangabad	A			
		III				Emerson (Rosemount)	USA	A			
		III				Yokogawa	Japan	A			

 एन टी पी सी		PROJECT : DARLIPALI SUPER THERMAL POWER PROJECT STAGE-II (1X800 MW)					LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00
		PACKAGE : EPC PACKAGES									DATE :24.11.2023
		CONTRACTOR:									SUB SECTION: C&I
		CONTRACT NO :									
Sr No	Item Description	QP Inspection Category	QP No	QP submission SCH	QP approval SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark
		III				ABB	Germany / Italy	A			2600T & critical item from ABB Italy/ Their approved source;
		III				Siemens	France	A			Sitrans P DSIII Series
		III				Fuji Electric	France	A			FCX -AIII SERIES
		III				Fuji	Japan	A			
13-B	Electronics Transmitter -Field Bus Based (Pressure , DP and DP based Flow/Level)										
		I				ABB India Ltd	Bengaluru	A			One no of Transmitter will be sent at DDCMIS supplier for function testing of field bus communication with DDCMIS during FAT
		I				Yokogawa India Limited	Bengaluru	A			EJA-E 110,430,530 SERIES & all raw material and BOI under knocked down condotion (sensor assembly as a single unit) shall be sourced from M/S Yokogawa Japan
14	EQMS										
		I				SWAN	Hyderabad	A			1. Conductivity analyser, pH analyser and Temperature Transmitter will be of M/s ABB, UK make . 2. TSS analyser will be of M/s Daeyoon, South Korea make . 3. Oil in water analyser will be of M/s TriOs, Germany make. 4. Online BOD/COD analyser will be of M/s Shimadzu, Japan make . 5. Flow meter will be of M/s Khrona Marshall, Maharashtra make. 6. Data Aquisition System will be procured from Knowledge Lens, Karnataka.
15	Fiber optic cable										
		Note-3				U M Cables Ltd	Silvassa (Daman)	A			
		Note-3				KEC International Ltd	Mysore	A			
		Note-3				Apar Industries Limited	Valsad (Gujrat)	A			
		Note-3				HFCL	Goa	A			
		Note-3				Aksh Fibre	Bhiwadi (Raj)	A			
		Note-3				Finolex Cable Ltd	Goa	A			
		Note-3				Birla Cable Limited	Rewa	A			
		Note-3				R&M	Switzerland	A			
		Note-3				Molex	UK	A			
		Note-3				Corning	USA	A			
16	Fire alarm Panel										
		II				Toshniwal Industrial Pvt Ltd	Ajmer	A			1.M/S Notifier Make Fire alarm Panel 2.PI Refer Note-07
		II				Bosch Security system	Bengaluru	A			1.Detector , Hooter, MCP, Modules, Panel shall be M/s Bosch Make
		II				Notifier	USA	A			
		II				Autronica	Norway	A			
		II				Schrack	Austria	A			



	Project/ परियोजना :Darlipali-II Package/ पैकेज : EPC Supplier/ आपूर्तिकर्ता: Contract No./ अनुबंध सं.:		INDICATIVE LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB-SUPPLIER APPROVAL क्वालिटी प्लान तथा सब -वेंडर के अनुमोदन सहित मदों की सूची			DOC. NO./ दस्तावेज सं.: REV. NO.: DATE/ तिथि : 22.04.2024 PAGE/ पृष्ठ :					
	S. N. क्र.सं.	Item / मद	QP/ Insp. Cat. क्यूपी/ निरी. श्रेणी.	QP No. / क्यूपी. सं.	QP Sub. Schedule क्यूपी उप.अनुसू चि	Proposed sub-supplier/ प्रस्तावित उप आपूर्तिकर्ता	Place/ स्थान	Sub-suppliers approval status / category उप आपूर्तिकर्ता के अनुमोदन की स्थिति /श्रेणी (NOTE-1)	Sub-supplier Details submission schedule/ उप आपूर्तिकर्ता के विवरण प्रस्तुतीकरण की सूची	Remarks/ टिप्पणी	Applicable Systems
					METALFAB HITECH	NAGPUR	A				
					SUPERTECH INDIA	G.NOIDA	A				
					GOODLUCK STEEL	SIKANDRABAD	A				
					BTL	KOLKATA	A				
					BTL	DURGAPUR	A				
					AMIYA COMMERCE	KOLKATA	A				
					NAMDHARI INDUSTRIAL	LUDHIANA	A				
					Ambabhawani Fab Engg Works LLP	Rajnandgan	A				
					THYSENKRUPP INDUSTRIES INDIA	HYDERABAD	A				
78	PIPE-SS ASTM A 312/ SS SEAMLESS	III			REMI	TARAPUR	A		ERW UPTO 400 NB,SEAMLESS UP TO 200NB		
					RATNAMANI	MEHSANA	A		ERW UPTO 500 NB, SS SEAMLESS - OD up to 168.3, thickness up to 3.4 mm, as per ASTM SA 312 Grade-TP 304		
					RATNAMANI	KUTCH	A		ERW UPTO 400 NB, SEAMLESS UPTO 50 NB ONLY, ARC WELDED UP TO 450NB		
					BHANDARI FOILS & TUBES LIMITED	DEWAS	A		ERW UP TO 300NB		
					APEX	BEHRORE	A		ERW UPTO 400 NB, SEAMLESS UPTO 50 NB.		
					PRAKASH STEELAGE	SILVASA	A		ERW UP TO 203NB		
					SHUBHLAXMI METALS AND TUBES	UMBERGAON	A		SEAMLESS UP TO 150MM and ERW UP to 250 NB Sch 40S		
79	PIPE-CS SEAMLESS ASTM A 106	III			ISMT	AHMADNAGAR	A		UPTO 273 MM OD		
					ISMT	BARAMATI	A		UPTO 273 MM OD		
					REMI	BHARUCH	A		UPTO 177.8 MM OD		
					MAHARASHTRA SEAMLESS	RAIGAD	A		UPTO 500 NB		
80	HCSD PUMP	I			WEIR MINERALS	NETHERLANDS	A				
					ABEL	GERMANY	A				
81	MOVABLE BARGE	II			FELUWA	GERMANY	A				
					CLEGHORN	HOWRAH	A				
82	Second Stage Conveyor and roll crusher for dry bottom ash system	I			NALANDA ENGINEERING ENTERPRISE	HOWRAH	A				
					L&T	KANSBAHAL	A				

ITEM WITH MAIN CONTRACTOR / BIS APPROVED SOURCES.										
1	BRANCH PIPE , COUPLING & NOZZLE (SS & GM)	II			BIS APPROVED SOURCES WITH VALID BIS LICENSE					FDPS
2	FIRE EXTINGUISHER	II			BIS APPROVED SOURCES WITH VALID BIS LICENSE					FDPS
3	WATER MONITOR	II			BIS APPROVED SOURCES WITH VALID BIS LICENSE					
4	PIPES-MS- (BLACK/ GI) AS PER IS:1239 & IS:3589 UPTO 1000 NB	II			(BIS MARKED, MANUFACTURERS WITH VALID BIS LICENSE)					WTP,CW,CT,CPU,FDP S,AC&VENTILATION, CHP,LHP&GHP,AHP
5	FIRE HOSE	II			BIS APPROVED SOURCES WITH VALID BIS LICENSE					FDPS
6	HYDRANT VALVE	II			BIS APPROVED SOURCES WITH VALID BIS LICENSE					
7	PIPES FOR IDLERS IS 9295	III			BIS APPROVED SOURCES WITH VALID BIS LICENSE					FDPS
8	BLOWERS, CENTRIFUGAL FAN,AXIAL FAN <10 KW	II			MAIN CONTRACTOR APPROVED SOURCES					WTP
9	CIO2 GENERATOR	II			MAIN CONTRACTOR APPROVED SOURCES					WTP
10	PIPING FABRICATION -HP>300PSI	II			MAIN CONTRACTOR APPROVED SOURCES					WTP,CPU
11	PUMP-METERING/DOSING	II			MAIN CONTRACTOR APPROVED SOURCES					WTP,CPU
12	PUMP - PP- ACID/ ALKALI UNLOADING	II			MAIN CONTRACTOR APPROVED SOURCES					WTP,CPU
13	PUMPS-SCREW TYPE	II			MAIN CONTRACTOR APPROVED SOURCES					WTP,CPU,FOH
14	RUBBER LINING OF TANKS/ VESSELS/ PIPES/ VALVES/FITTINGS	II			MAIN CONTRACTOR APPROVED SOURCES					WTP,CPU
15	RO PRESSURE TUBE	II			MAIN CONTRACTOR APPROVED SOURCES					WTP
16	TUBE SETTLER MEDIA	II			MAIN CONTRACTOR APPROVED SOURCES					WTP
17	WRAPPING & COATING MATERIAL -ANTI CORROSIVE TAPE	II			MAIN CONTRACTOR APPROVED SOURCES					CW,CT,LP PIPING, FDPS

					CONVERTEAM	FRANCE	A		UPTO 11KV 18 MW (*DOCUMENTS FOR NAME CHANGE TO GE CONVERTEAM SHALL BE SUBMITTED FOR APPROVAL)	
					ABB	VADODARA	A		UPTO 6.6KV 2500 KW 11KV 2000 KW FOR PUMP/ FAN/ COMPRESSOR UPTO 6.6KV 750KW FOR MILL, UPTO 6.6 KV 1300KW FOR CRUSHER WITH SCOOP COUPLING	
					IJLIN	KOREA	A		UPTO 11KV 2900 KW, 6.6KV 2500 KW	
					JYOTI	VADODARA	A		UPTO 6.6 KV 2250 KW EXCEPT CRUSHER & MILL APPLICATION	
					MARATHON	KOLKATA	A		RQP, UPTO 6.6 KV 1300 KW FOR CRUSHER WITH SCOOP COUPLING & 11 KV 1600 KW FOR OTHER APPLICATION EXCEPT CRUSHER & MILL	
					CGL (D5 INDUSTRIAL AREA)	MANDIDEEP	A		UPTO 1650 KW 6.6 KV, 1350 KW 11 KV FOR PUMP, FAN, COMPRESSOR. UPTO 3.3 kv 335 kw WITH FLEXIBLE COUPLING FOR MILL APPLICATION	
					CGL(PLOT 9)	MANDIDEEP	A		UPTO 11 KV 4MW FOR PUMP/FAN/COMPRESSOR	
					CG ELECTRIC SYSTEM	HUNGARY	A		UPTO 3.3 KV 1100 KW	
					TMEIC	BENGALURU	A		UPTO 11 KV 5000 KW	
11	LT MOTOR	CAT - I								
	Refer Note-7				ABB	FARIDABAD	A*	* SUBJECT TO VERIFICATION VISIT	UPTO 55KW	
					ABB	BANGALORE	A*		UPTO 690V, 475kW	
					JYOTI LTD.	VADODARA	A			
					TIPM	JAPAN	A		UPTO 15 KW (NON FLAME PROOF)	
					HYOSUNG	SOUTH KOREA	A			
					WEG	BRAZIL	A			
					HYUNDAI	SOUTH KOREA	A			
					LHP	SOLAPUR	A		UPTO 400KW FROM B-16 WORKS.	
					CGL	AHMEDNAGAR	A		UPTO 200KW FROM B-11 WORKS.	
					TMEIC	JAPAN (NAGASAKHI)	A		RQP, FOR FLAME PROOF MOTOR	
					NGEF	BANGALORE	A			
									UPTO 15 KW	
					BHARAT BIJLEE	MUMBAI	A		UPTO 160kW, RQP, FOR FLAME PROOF ALSO	
					KEC	BANGALORE/ HUBLI*	A		*UPTO 90KW, RQP, FOR FLAME PROOF ALSO	
					MARATHON	KOLKATA	A		RQP (UPTO 690V & 600 KW) FOR FLAME PROOF ALSO	
					ABB	SWEDEN	A		UPTO 55KW	
					HAVELL	NEEMRANA	A		UP TO 90KW	
					KAWAMATA	JAPAN	A		UP TO 75 KW	
					HEM Industries	DAMAN	A		UP TO 30 KW	
					TIPS	JAPAN	A		UP TO 45KW	
11.1	DC Motor (refer Note-7)	CAT I			CGL	MANDIDEEP	A			
12	LT Switchgear -Floor mounted Draw out type indoor switchgear Panel (MCC, ACDB / DCDB etc.)	CAT I								
					Schneider (formerly L&T)	Mumbai / Coimbatore/ Ahmednagar	A			
					C&S Electric	Noida / Haridwar	A			
					Schneider	Nasik	A		ACB from Schneider, France	
					Siemens	Kalwa	A		Conditions apply	
					Schneider	Vadodara	A			
12.1	Numerical Relays	CAT I								
					SEL	Pullman, USA	A			
					GE T&D	Stafford, UK	A		P14X, P34X, P44X, P64X, P74X models	

		PROJECT :DARLIPALI-II(1X800MW) PACKAGE : EPC CONTRACTOR: CONTRACT NO :					LIST OF ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00 DATE :31.03.2024 SUB SECTION: QA-TG(MECH)		
Sr No	Item Description	QP Inspection Category	QP No	QP submission SCH	QP approval SCH	Proposed Sub Supplier	Country	SS Approval_Status	SS Detail Sub.SCH	SS Approval SCH	Remark	Package Applicable	Provenness Clause (Refer Note-1)
						Leader	Jalandhar	A					
						BHEL	Trichy	A					
						Pentair (Tyco Sempel)	Trichy	A					
						HP Valves(Key Valves Technology)	Netherlands	A					
						IL	Palakkad	A					
						Steel Strong	Mumbai	A					
56	HP Feedwater Heaters Automatic (String Bypass) Isolation Valves	I				KSB	Germany	A					
						Tyco Sempell	Germany	A					
						Strack	Germany	A					
						BHEL	Trichy	A					
						Weir Valves & Controls UK Ltd.	UK	A					
						KSB	Germany /Coimbatore	A					
						L&T	Chennai	A					
						L&T	Coimbatore	A					
						Velan	Coimbatore	A			up to 2inch, #4500 (up to P92 grade)		
						HP Valves	Netherlands	A			Previous Name:Key Valves Technology		
						Weir Valves & Controls UK Ltd.	UK	A					
						BHEL	Trichy	A					
						Crane	USA	A					
						Samshin	S Korea	A					
						Pentair(Tyco Sempell)	Germany	A					
						Velan	Canada	A					
						ToA	Japan	A					
						Tyco	USA	A					
58	Safety Valves	I				BHEL	Trichy	A					
						Dresser	USA	A					
						Tyco	USA	A					
						Babcock	Spain	A					
						Flainger	Germany	A					
						Bopp & Reuther	Germany	A					
						Flainger	Nasik	A					
						Reineke	Germany	A					
						Valve Technology	USA	A					
						KSB	Coimbatore	A					
59	Forged Seel Valves up to 2" , Class 800 (FCS/FSS)	I				Leader	Jalandhar	A					
						L&T	Chennai	A					
						Velan	Canada	A					
						Fouress Engg	Ahmadnagar	A					
						Trillium Flow	Hubli	A					
						Velan	Canada	A					
						Steel Strong	Mumbai	A					
						L&T	Coimbatore	A					
						Plymouth	USA	A					
						Ratnamani	Kutchh	A					
						Neotiss Limited	Medak,AP	A			Remarks:Formerly Vallourec Heat exchanger Tubes Ltd/ CST Valinox Ltd.		
						REMI Edelstahl Tubulars Ltd.	Tarapur	A					
						Shin han Metal	S Korea	A					
						Valtimat	France	A					
						Nippon Steel Corp.	Japan	A					
						Ratnadeep Metal & Tubes Ltd	Mehsana	A					
60	Condenser Tubes(SS Welded)	I				Maxim Tubes	Gandhinagar	A					