

# **2x660MW KHURJA (TG)**

## **TECHNICAL SPECIFICATION**

### **FOR**

### **AIR TRAPS**


**SPECIFICATION NO.: PE-TS-475-555-M011**

**Rev. No.: 00**



**BHARAT HEAVY ELECTRICALS LIMITED, POWER SECTOR  
PROJECT ENGINEERING MANAGEMENT  
NOIDA, INDIA**


552721/2021/PS-PEM-MPL

	<b>TECHNICAL SPECIFICATION FOR AIR TRAPS 2x660MW KHURJA (TG)</b>	SPECIFICATION NO.: PE-TS-475-555-M011
		REV. NO.: 00
		DATE: 10.11.2021
		SHEET 1 OF 1

### CONTENTS



S. No.	SECTION	TITLE	NO. OF SHEETS
1.	SECTION-I	SPECIFIC TECHNICAL REQUIREMENTS	3
2.	SECTION-II	i) DATA SHEET-A ii) QUALITY PLAN (BALL FLOAT AIR TRAP) iii) QUALITY PLAN (EXT. 'Y'-TYPE STRAINER) iv) COMPLIANCE SHEET	2 3 2 1

552721/2021/PS-PEM-MPL

	<b>TECHNICAL SPECIFICATION FOR AIR TRAPS 2x660MW KHURJA (TG)</b>	SPECIFICATION NO: PE-TS-475-555-M011
		REV. NO.: 00
		SECTION: I
		DATE: 10.11.2021

## SECTION-I

### SPECIFIC TECHNICAL REQUIREMENTS

 	<b>SPECIFIC TECHNICAL REQUIREMENTS FOR AIR TRAPS</b>  <b>2x660MW KHURJA (TG)</b>	SPECIFICATION NO: PE-TS-475-555-M011
		SECTION : I
		REV. NO.: 00
		DATE: 10.11.2021
		SHEET 1 OF 3

## 1 GENERAL

- 1.1 The air traps and strainer shall meet the technical requirements and conform to the requirements of Section-I and Data sheet-A of Section-II. However, in the event of contradictions between Section-I & Section-II/Data Sheet-A, Data Sheet-A will prevail.
- 1.2 The technical requirements for air traps and strainer shall, in general, be as per the attached Data Sheet-A of Section-II

## 2 SCOPE OF SUPPLY

- 2.1 The air traps along with strainer shall be supplied as per Data Sheet-A of Section-II. For detail refer the same.
- 2.2 Commissioning spares, if any.
- 2.3 Mandatory spares as applicable depending upon the project requirement.

## 3 DESIGN REQUIREMENTS



All traps shall be suitable for removal of water from compressed air piping and shall be suitable for the service conditions i.e. flow, temperature and pressure under which they are required to operate. Those performing similar duties shall be interchangeable with each other unless otherwise specified.

## 4 CONSTRUCTION FEATURES:

- 4.1 The traps covered in the specification shall be of Ball Float Type with auto-drain arrangement conforming to supplier's own proven design and shall be with External Strainer designed suitably to prevent the internals of the trap from damage due to dirt etc.
- 4.2 The traps should be with internals easily accessible and replaceable.
- 4.3 Arrow showing inlet should be cast on the body of traps.
- 4.4 For ball float type traps, trap design should take care of removal of entrapped air for proper functioning of trap. A balancing line connection at the top of the body shall also be provided.
- 4.5 A metallic (stainless steel plate 2mm thick) nameplate shall be fitted on each trap. Nameplate inscription required for each trap shall be indicated at the contract stage. Inscriptions shall be engraved 1 mm deep filled with enamel paint.

## 5 MATERIALS

- 5.1 The materials of construction of main parts of traps shall be specified in Data Sheet-A.
- 5.2 The materials of construction of the remaining parts shall be suitable for the service conditions shall be subject to approval of the purchaser.
- 5.3 Materials used in manufacture of traps shall be of tested quality.

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		SECTION : I
		REV. NO.: 00
		DATE: 10.11.2021
		SHEET 2 OF 3

## 6 TESTING AND INSPECTION

- 6.1 The items covered under this contract shall be subjected to inspection, testing and quality surveillance. The Inspection Agency shall, at all reasonable times have access to Vendor's works, Quality Control records and all facilities as reasonably required for carrying out the inspection and testing efficiently, and these shall be provided by the vendor free of cost.
- 6.2 The minimum NDT/testing and inspection requirements for traps shall be as per the attached Quality Plan. However, in case of order, final inspection and testing shall be carried out as per the final approved quality plan without any price implications.

## 7 EXCLUSIONS

Erection & Commissioning of equipment at site is excluded from the bidder's scope.

## 8 QUALITY ASSURANCE



- 8.1 The Quality Plan enclosed with this specification specify minimum quality control requirement. During contract stage vendor shall furnish this Quality Plan duly signed & stamped for BHEL approval. Quality plans shall be approved by BHEL and customer. All inspection and testing shall be carried out by BHEL/ BHEL representative and customer (as applicable). In case inspection is by both BHEL and their customer, then the inspection can be carried out jointly or separately, which will be informed later. In case of the foreign bidder, inspection shall be carried out by reputed third party.
- 8.2 There may be changes in quality plan depending on customer/consultant comments which will have to be accommodated by vendor at no extra cost.
- 8.3 The minimum NDT/testing and inspection requirements for air traps and strainer shall be as per the attached Quality Plan. However, in case of order, final inspection and testing shall be carried out as per the final approved quality plan without any price implications.
- 8.4 The charges for third party inspection (Lloyds, TUV or equivalent) for foreign bidders shall be included in the base price of the item by the bidder. This third party agency shall be approved by BHEL. Bidder to inform the same in the offer and mention the same in Quality Plan.

## 9 SURFACE PREPARATION AND GALVANIZING

- 9.1 The surfaces of equipment to be galvanised shall be thoroughly cleaned of all grease, oil, loose mill scale, dirt, rust and any other foreign materials as mentioned in IS:2629.
- 9.2 Traps & Strainers of Carbon Steel material bodies shall be hot dip galvanised as per IS:2629 after the necessary testing has been carried out. The minimum thickness of galvanizing shall be minimum 40 microns.

## 10 PACKING INSTRUCTION

- 10.1 Each trap and strainer shall be drained, cleaned, prepared and suitably protected in such a way so as to minimize the possibility of damage and deterioration during transit and storage.
- 10.2 The trap / strainer shall be dispatched in total assembled form.
- 10.3 Body ends shall be suitably sealed to protect them against damage during transit and storage.

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		SECTION : I
		REV. NO.: 00
		DATE: 10.11.2021
		SHEET 3 OF 3

10.4 Tag Nos. shall be incorporated in all the dispatch documents.

10.5 Proper care shall be taken to avoid damage to the finished surface during transit. All the traps and strainers shall be packed suitably in wooden cases in order to avoid damage during transit and also during storage at site in tropical climate conditions.

10.6 Vendor to provide the following:

- Photographs (soft) of Trap & strainer duly placed inside the wooden box just before final packing.
- Photographs (soft) of the wooden box in which the Trap & strainer have been finally packed just before dispatch.

Clearance for dispatch of traps & strainer will be given only after receiving the photos of traps & strainer in satisfactory condition as mentioned in the condition stated above.

## 11 SPARES

11.1 **Mandatory Spares:** These shall be as per Data Sheet-A.

11.2 Order for the spares may be placed simultaneously or otherwise at the option of purchaser.

## 12 DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

Bidder shall submit the following documents duly filled, signed and stamped along with the bid:

- Compliance sheet
- Documents as per the list indicated in the NIT.

The above are the only documents which will be used for technical evaluation unless other documents are asked for during technical clarifications. Any other technical document enclosed with the bid shall be ignored for the purpose of technical evaluation. All other documents attached with the specification are for information of the vendor and no comments shall be marked on these.

## 13 DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT



Category-A:

13.1 GA Drawing indicating complete cross sectional arrangement of valve, binding dimensions, dismantling clearances, condensate discharge capacity, weight and Bill of Material incorporating all material of construction (MOC) of various parts & relevant standard to which MOC confirms to.

13.2 Quality plan duly signed and stamped.


Approval of above documents shall be required for manufacturing clearance and the same shall be considered for delay analysis by BHEL.

552721/2021/PS-PEM-MPL

 	<b>TECHNICAL SPECIFICATION FOR AIR TRAPS 2x660MW KHURJA (TG)</b>		SPECIFICATION NO.: PE-TS-475-555-M011	
			SECTION: II	
			REV.: 00	DATE: 10.11.2021
			SHEET 1 OF 1	

## SECTION-II

- DATA SHEET - A
- QUALITY PLAN (BALL FLOAT AIR TRAP)
- QUALITY PLAN (EXT. 'Y'-TYPE STRAINER)
- COMPLIANCE SHEET



		<b>DATASHEET - A</b> <b>AIR TRAPS</b> <b>FOR</b> <b>2x660MW KHURJA (TG)</b>					SPECIFICATION NO.: PE-TS-475-555-M011			
							SECTION: II			
							SHEET 1 OF 2			
							REV. NO.: 00 DATE: 10.11.2021			
S. NO.	ITEM	MAX. WORKING PRESSURE (Kg/cm <sup>2</sup> )	MAX. WORKING TEMP. (Deg. C)	CONNECTING PIPE SIZE (OD x Thk.)	END CONN.	CONDENSATE DISCH. CAPACITY (Kg/Hr)	BODY MATERIAL	INTERNALS	QTY. (MAIN SUPPLY) NOS.	QTY. (MANDATORY SPARES) NOS.
1	a BALL FLOAT AIR TRAP (WITHOUT STRAINER) COMPLETE ASSLY.	8	50	34.2 x 4	Screwed as per IS:554	500	CCS	AISI 304	40	3
	b Ext. 'Y'-TYPE STRAINER COMPLETE ASSLY.							AISI 304	40	3

## Note:

1. Ball float air traps without strainers are used with external 'Y'-type strainers. In this case traps and external 'Y'-type strainers will be considered as single unit for ordering. Offers will only be considered when both the items are quoted.
2. For detailed material of construction refer page 2 of 2, of this Data Sheet-A.
3. Inlet & outlet size of Air Trap & Strainer (both) shall be matched with connecting pipe size by bidder. Bidder to consider all reducer/expander as required, in their scope.
4. Bidder may also offer model of higher condensate discharge capacity.
5. Equivalent/ superior material is also acceptable.
6. CCS: Cast Carbon Steel




552721/2021/PS-PEM-MPL

 	<b>DATA SHEET-A</b> <b>AIR TRAPS</b> <b>FOR</b> <b>2x660MW KHURJA (TG)</b>		SPECIFICATION NO.: PE-TS-475-555-M011
			SECTION: II
	REV. NO.: 00		DATE: 10.11.2021
	Sheet 2 of 2		

### **MATERIAL OF CONSTRUCTION FOR CARBON STEEL TRAPS & STRAINER**





			<b>PART NAME</b>	<b>MATERIAL REQUIRED</b>
A	BALL FLOAT AIR TRAP (WITHOUT STRAINER) COMPLETE ASSLY.	1	Body and Cover	Cast Carbon Steel as per ASTM A216 Gr. WCB ( <b>Hot Dip Galvanization</b> )
		2	Valve, Valve seat	AISI 420 (hardened to minimum 40 RC) Differential hardness shall be maintained between seats.
		3	Float unit assembly, Valve seat gasket, Pivot frame, Support frame and Pivot pin	AISI 304
		4	Bolts/ Nuts	ASTM A193 Gr.B7/ ASTM A194 Gr.2H
B	EXTERNAL 'Y'-TYPE STRAINER COMPLETE ASSLY.	1	Body & Cap	ASTM A216 Gr. WCB ( <b>Hot Dip Galvanization</b> )
		2	Screen	SS to AISI 304 (20 mesh)
		3	Gasket	Non - Asbestos type


**NOTE:** Equivalent/ superior material is also acceptable.

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	QUALITY PLAN						SPEC. NO: PE-TS-475-100-M011				DATE: 10.11.2021			
		CUSTOMER : THDC INDIA LIMITED (A Joint Venture of Govt. of India & Govt. of U.P.)						QP NO.: PE-QP-475-100-M001				DATE: 10.11.2021			
		PROJECT: 2x660MW KHURJA (TG)						PO NO.:				DATE:			
		ITEM: AIR TRAPS (BALL FLOAT)			SYSTEM: SERVICE AIR / INSTRUMENT AIR			SECTION: II				SHEET 1 OF 3			

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS CATEGORY	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	*	**			
					M	C/ N				D	M	C	N	

1.0	MATERIALS													
1.1	BODY, COVER	1.PHYSICAL & CHEM. PROPERTIES	MA	PHYS.& CHEM, TEST	ONE PER HEAT	---	APPD. DRG./ REL. STANDARD	APPD. DRG./ REL. STANDARD	MILL TEST CERT.	√	P/ W	V	V	CORRELATION REQUIRED FOR BODY AND COVER WITH MILL TEST CERTIFICATE
		2.SURFACE DEFECTS	MA	VISUAL	100%	---	MSS-SP-55	MSS-SP-55	INSPN. REPORT	√	P/ W	V	V	
1.2	FLOAT UNIT ASSEMBLY, VALVE SEAT, PIVOT FRAME, SUPPORT FRAME, PIVOT PIN ,GASKET	1. PHYS., CHEM. PROPERTIES	MA	PHYS., CHEM. TEST	ONE PER HEAT	---	APPD. DRG./ REL. STANDARD	APPD. DRG./ REL. STANDARD	TEST CERT	√	P/ W	V	V	
		2. SURFACE DEFECTS	MA	VISUAL	100%	---	MSS-SP-55	MSS-SP-55	INSPN. REPORT	√	P/ W	V	V	
1.3	FASTENERS	1. PHYS., CHEM. PROPERTIES	MA	PHYS., CHEM. TEST	100%	---	APPD. DRG./ REL. STANDARD	APPD. DRG./ REL. STANDARD	TEST CERT	√	P/ W	V	V	
2.0	IN-PROCESS													
2.1	ALL COMPONENTS	1.DIMENSIONS	MA	MEASUREMENT	100%	---	MFG. DRAWING	MFG. DRAWING	INSPN. REPORT	√	P/ W	V	V	
		2. SURFACE DEFECTS	MA	VISUAL	100%	---	MFG. DRAWING	MFG. DRAWING	INSPN. REPORT	√	P/ W	-	-	
2.2	VALVE, VALVE SEAT	1. SURFACE DEFECTS	CR	PENETRANT TEST	100%	---	ASTME-165	NO DEFECTS	INSPN. REPORT	√	P/ W	V	V	
		2. HARDNESS	MA	TESTING	100%	---	APPD. DRG./ RELEVANT STANDARD	RELEVANT STD	INSPN. REPORT	√	P/ W	V	V	
		3. BALL IMPRESS	MA	BY AIR	100%	---	SEAT SURFACE SHALL HAVE METAL TO METAL CONTACT		INSPN. REPORT	√	P/ W	V	V	
3.0	SUB- ASSEMBLY													
3.1	VALVE & VALVE SEAT	1. LEAK TIGHTNESS	CR	AIR/HYDRO	100%	---	APPD. DRG	APPD. DRG.	INSPN. REPORT	√	P/ W	V	V	
3.2	COVER	1. ALIGNMENT	MA	VISUAL	100%	---	APPD. DRG	PROPER FITTING	INSPN. REPORT	√	P/ W	V	V	


BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL					
ENGINEERING			QUALITY			Sign & Date		Doc No:					
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name		Seal	
Prepared by:	 ASHISH KUMAR VERMA	A K Verma	Checked by:	 Ashish Panigrahi	Ashish Panigrahi			Reviewed by:					
Reviewed by:	 Kuldeep Kumar	Kuldeep Kumar	Reviewed by:	 RITESH KUMAR JAISWAL	R K Jaiswal			Approved by:					

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	QUALITY PLAN					SPEC. NO: PE-TS-475-100-M011	DATE: 10.11.2021		
		CUSTOMER : THDC INDIA LIMITED (A Joint Venture of Govt. of India & Govt. of U.P.)					QP NO.: PE-QP-475-100-M001	DATE: 10.11.2021		
		PROJECT: 2x660MW KHURJA (TG)					PO NO.:	DATE:		
		ITEM: AIR TRAPS (BALL FLOAT)		SYSTEM: SERVICE AIR / INSTRUMENT AIR			SECTION: II	SHEET 2 OF 3		

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS CATEGORY	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	*	**			
					M	C/ N				D	M	C	N	

4.0	<b>HYDRAULIC TEST ( FOR CCS MATERIAL, TEST TO BE CONDUCTED BEFORE GALVANISING)</b>													
4.1	BODY COVER SHELL TEST	LEAK TIGHTNESS OF BODY	CR	HYDRO. TEST AT 1.5 TIMES OF TRAP DESIGN PRESSURE	100%	---	APPD. DRG. / DATA SHEET	NO LEAKAGE	TEST CERT	√	P/ W	V	V	
5.0	<b>GALVANISING (APPLICABLE FOR CCS MATERIAL ONLY)</b>													
5.1	HOT DIP GALVANISING OF BODY, COVER	1. SURFACE PREPARATION & THICKNESS OF GALVANISING & UNIFORMITY.	MA	VISUAL & MEASUREMENT	100%	REFER NOTE '2'	IS:2629	IS:2629 #	INSPN REPORT	√	P/ W	W	W	# THE MINIMUM THICKNESS OF GALVANIZING SHALL BE MINIMUM 40 MICRONS.
6.0	<b>ASSEMBLY (FOR CCS MATERIAL, TEST TO BE CONDUCTED AFTER GALVANISING)</b>													
6.1	COMPLETE ASSEMBLY	1. CLEANLINESS & COMPLETENESS, DIMENSIONS, THREADING ENDS, ARROW MARKING ETC.	MA	VISUAL & MEASUREMENT	100%	REFER NOTE '2'	APPROVED DRAWING	APPROVED DRAWING	INSPN REPORT	√	P/ W	W	W	
		2. LEAK TIGHTNESS OF BODY	CR	HYDRO. TEST AT 1.5 TIMES OF TRAP DESIGN PRESSURE	100%		APPD. DRG. / DATA SHEET	NO LEAKAGE	TEST CERT	√	P/ W	W	W	
		3. FUNCTIONAL TEST ( VISUAL DISCHARGE OF CONDENSATE)	CR	FUNCTIONAL TEST AT MINIMUM 6KG/CM <sup>2</sup> PRESSURE	100%		APPD DRG. / GIVEN PROCEDURE ON NOTE NO. '7'	NO AIR LEAKAGE	INSPN REPORT	√	P/ W	W	W	
6.2	FLOW CAPACITY TEST (TYPE TEST)	CONDENSATE DISCHARGE	CR	DISCHARGE FLOW	100%	---	REFER NOTE '7'	APPD.DRG	TYPE TEST CERT	√	P/ W	V	V	BHEL ENGG. APPROVAL OF TYPE TEST REPORT TO BE VERIFIED DURING INSPECTION.
7.0	END CONN.	DIMENSIONS	CR	MEASUREMENT	100%	REFER NOTE '2'	APPD. DRG.	APPD.DRG	INSPN REPORT	√	P/ W	W	W	

BHEL					BIDDER/ SUPPLIER			FOR CUSTOMER REVIEW & APPROVAL				
ENGINEERING			QUALITY			Sign & Date		Doc No:				
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name	Seal		Reviewed by:	Sign & Date	Name	Seal	
	Ashish Kumar Verma	A K Verma		Ashish Panigrahi	Ashish Panigrahi			Approved by:				
Reviewed by:	Kuldeep Kumar	Kuldeep Kumar	Reviewed by:	Ritesh Kumar Jaiswal	R K Jaiswal							

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1	2	3	4	5	6		7	8	9	*	**			
					M	C/ N				D	M	C	N	
8.0	PACKING	PACKING SOUNDNESS	MA	VISUAL	100%	100%	APPD. DRG. / PACKING PROCEDURE (IF APPL ICABLE)	APPD. DRG. / PACKING PROCEDURE (IF APPL ICABLE)	INSPN REPORT	√	P/ W	W	V	REFER NOTE '3'


**NOTES:**

- In case of foreign supplier, all test certificates shall be furnished by the supplier, duly witnessed/verified by supplier's TPI.
- 10% or min. 2 nos. at random by BHEL/Customer & 100% by supplier for each type, size & rating.
- Following to be noted for packing:
  - Material shall be packed suitably in order to avoid damage of paint and valve during transit and also during storage at site in tropical climate conditions.
  - Photographs of the packing just before dispatch for information of PEM.
- The latest revisions/year of issue of all the standard indicated in the QP shall be referred.
- BHEL reserves the right for conducting repeat test, if required.
- FUNCTIONAL TEST PROCEDURE.**
  - COMPRESSED AIR (MINIMUM AT 6 Kg/cm<sup>2</sup> PRESSURE) TO BE SUPPLIED IN A MIXING CHAMBER.
  - WATER IS ADDED IN THE SAME CHAMBER SO THAT AIR IN THE CHAMBER HAS SUFFICIENT MOISTURE.
  - 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.**

**LEGENDS:**





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


BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared by:	 ASHISH KUMAR VERMA	A K Verma	Checked by:	 Ashish Panigrahi	Ashish Panigrahi			Reviewed by:			
Reviewed by:	 Kuldeep Kumar	Kuldeep Kumar	Reviewed by:	 RITESH KUMAR JAISWAL	R K Jaiswal			Approved by:			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	QUALITY PLAN						SPEC. NO: PE-TS-475-100-M011		DATE: 10.11.2021	
		CUSTOMER : THDC INDIA LIMITED (A Joint Venture of Govt. of India & Govt. of U.P.)						QP NO.: PE-QP-475-555-M016		DATE: 10.11.2021	
		PROJECT: 2x660MW KHURJA (TG)						PO NO.:		DATE:	
		ITEM: 'Y'-TYPE STRAINER			SYSTEM: SERVICE AIR / INSTRUMENT AIR			SECTION: II		SHEET 1 OF 2	

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS CATEGOR	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	*	**			
					M	C/ N				D	M	C	N	

1.0	MATERIAS													
1.1	BODY, CAP	1. PHYSICAL & CHEM. PROPERTIES	MA	PHYS. & CHEM. TEST	ONE PER HEAT	---	APPD. DRG./ REL. STANDARD	APPD. DRG./ REL. STANDARD	MILL TEST CERT.	√	P/ W	V	V	CORRELATION REQUIRED FOR BODY AND COVER WITH MILL TEST CERTIFICATE
		2. SURFACE DEFECTS	MA	VISUAL	100%	---	APPD. DRG./ REL. STANDARD	APPD. DRG./ REL. STANDARD	INSP. REP	√	P/ W	V	V	
1.2	MESH	1. CHEM PROPERTIES	MA	CHEM TESTS	100%	---	APPROVED DATA SHEET	APPROVED DATA SHEET	TEST CERT.	√	P/ W	V	V	
		2. MESH SIZE/ PERFORATION DIA	MA	MEASUREMENT	100%	---	APPD. DRG	APPD. DRG	INSP. REP	√	P/ W	V	V	
2.0	INPROCESS CONTROL													
2.1	ALL COMPONENTS	1. WORKMANSHIP & FINISH	MA	VISUAL	100%	---	MFG DRG	MFG DRG	INSP REPORT	√	P/ W	V	V	
		2. DIMENSIONS	MA	MEASUREMENT	100%	---	MFG DRG	MFG DRG	INSP REPORT	√	P/ W	V	V	
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	NO LEAKAGE	TEST CERT	√	P/ W	V	V	
4.0	GALVANISING (APPLICABLE FOR CCS MATERIAL ONLY)													
4.1	HOT DIP GALVANISING OF BODY, COVER	1. SURFACE PREPARATION & THICKNESS OF GALVANISING & UNIFORMITY.	MA	VISUAL & MEASUREMENT	100%	REFER NOTE '2'	IS:2629	IS:2629	INSPN REPORT	√	P/ W	W	W	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	√	P/ W	V	V	

BHEL					BIDDER/ SUPPLIER			FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY		Sign & Date			Doc No:			
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name	Seal		Reviewed by:	Sign & Date	Name	Seal
		A K Verma			Ashish Panigrahi						
Reviewed by:	Sign & Date	Name	Reviewed by:	Sign & Date	Name			Approved by:	Sign & Date	Name	
		Kuldeep Kumar			R K Jaiswal						

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS	QUALITY PLAN		SPEC. NO: PE-TS-475-100-M011	DATE: 10.11.2021
		CUSTOMER : THDC INDIA LIMITED (A Joint Venture of Govt. of India & Govt. of U.P.)		QP NO.: PE-QP-475-555-M016	DATE: 10.11.2021
		PROJECT: 2x660MW KHURJA (TG)		PO NO.:	DATE:
		ITEM: 'Y'-TYPE STRAINER	SYSTEM: SERVICE AIR / INSTRUMENT AIR	SECTION: II	SHEET 2 OF 2

SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS CATEGOR	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD		AGENCY			REMARKS
1	2	3	4	5	6		7	8	9	*	**			
					M	C/ N				D	M	C	N	
		2. OVERALL DIMENSIONS	CR	MEASUREMENT	100%	REFER NOTE '2'	APPD.DRG	APPD.DRG	INSPN. REPORT	√	P/ W	W	W	
		3. LEAK TIGHTNESS OF BODY	CR	HYDROTEST AT 1.5 TIMES OF STRAINER DESIGN PRESSURE	100%		APPD.DRG	NO LEAKAGE	INSPN. REPORT	√	P/ W	W	W	
6.0	END CONN.	DIMENSIONS	CR	MEASUREMENT	100%		APPD. DRG	APPD DRG	INSPN REPORT	√	P/ W	W	W	
7.0	PACKING	PACKING SOUNDNESS	MA	VISUAL	100%	100%	APPD. DRG. / PACKING PROCEDURE (IF APPLICABLE)	APPD. DRG. / PACKING PROCEDURE (IF APPLICABLE)	INSPN REPORT	√	P/ W	W	V	REFER NOTE '3'

**NOTES:**

1. In case of foreign supplier, all test certificates shall be furnished by the supplier, duly witnessed/verified by supplier's TPI.
2. 10% or min. 2 nos. at random by BHEL/Customer & 100% by supplier for each type, size & rating.
3. Following to be noted for packing:
  - a. Material shall be packed suitably in order to avoid damage of paint and valve during transit and also during storage at site in tropical climate conditions.
  - b. Photographs of the packing just before dispatch for information of PEM.
4. The latest revisions/year of issue of all the standard indicated in the QP shall be referred.
5. BHEL reserves the right for conducting repeat test, if required.

**LEGENDS:**

\*RECORDS, IDENTIFIED WITH "TICK"(√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION,


\*\* **M**: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, **C**: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, **N**: CUSTOMER,

**P**: PERFORM, **W**: WITNESS, **V**: VERIFICATION, AS APPROPRIATE, **D**: DOCUMENTATION

**MA**: MAJOR, **MI**: MINOR, **CR**: CRITICAL, **MTC**: Mill Test Certificate

BHEL			BIDDER/ SUPPLIER			FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:	
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name	Seal		Reviewed by:	Sign & Date
									Name
									Seal
Prepared by:	ASHISH KUMAR VERMA	A K Verma	Checked by:	Ashish Panigrahi	Ashish Panigrahi			Reviewed by:	
Reviewed by:	Kuldeep Kumar	Kuldeep Kumar	Reviewed by:	RITESH KUMAR JAISWAL	R K Jaiswal			Approved by:	

552721/2021/PS-PEM-MPL

	<b>COMPLIANCE SHEET</b> <b>AIR TRAPS</b> <b>2x660MW KHURJA (TG)</b>		SPECIFICATION NO.: PE-TS-475-555-M011	
			SECTION: II	
			REV. NO.: 00	DATE: 10.11.2021
	SHEET 1 OF 1			

**A. I hereby comply/not comply (\*) to all the requirements of this technical specification in totality.**

**\* In case the bidder does not comply to the technical specification, the deviations shall be explicitly listed in the technical deviation sheet of GCC. Deviations listed in technical deviation sheet shall only be considered.**

**Name of Bidder / Authorized Representative: -**

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**Designation: -**

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**Signature: -**

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**Company Seal: -**

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**Date: -**

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	<b>PRE - QUALIFYING REQUIREMENTS</b>	DOCUMENT NO.: PE-TS-475-000-M057
		REVISION NO.: 00
		DATE: 10.11.2021
		SHEET: 1 of 2

Standard document No.: PE-TS-999-000-M057

**Project: 2x660MW KHURJA (TG)****Package: Air Traps****CRITERIA FOR EVALUATION (TECHNICAL / FINANCIAL):****1. Technical Pre-Qualifying Requirements:**

1.1 The bidder should have designed, in-house manufactured, tested, inspected and supplied CS/SS ball float air traps (with external 'Y'-type strainer) with minimum condensate discharge capacity of 500Kg/Hr for use in a power plant or for similar application.

1.2 The item(s) mentioned in point 1.1 should have performed successfully for atleast one year. To establish meeting this requirement, the bidder shall conform to any one of the following clauses:

- (i) Execution of two purchase orders for different End-users with the item(s) performing successfully for one (1) year from date of commissioning to the date of bid submission as defined by BHEL-PEM in NIT. Different projects of a customer shall be considered as different End-users.
- (ii) Minimum one (1) repeat contract from two (2) different Purchasers (i.e. 2 Nos of Purchase orders from each purchaser). A contract shall be considered as repeat, when the second contract is given by the same purchaser after lapse of minimum one (1) year from supply completion of first contract.
- (iii) Execution of one (1) purchase order as per sl. no. (i) above from one End-user and one (1) repeat contract from another Purchaser as per sl. No. (ii) above.
- (iv) Three (3) repeat contracts from one (1) Purchaser. Second and third repeat contract shall be after lapse of minimum one (1) & two (2) years respectively from supply completion of first contract.

1.3 The bidder to furnish the following documents, as applicable, in support of the above:

- a) For point 1.2(i): Performance certificates from End-user (duly signed & dated) specifying that the product is performing successfully for one (1) year from date of commissioning along with correlated purchase order(s).
- b) For point 1.2 (ii) & (iv): Purchase order(s), Material dispatch clearance certificate (MDCC)/ Material receipt certificate (MRC)/Lorry receipt (LR)/Invoice.

1.4 In addition to above, bidder should have the following facilities for air traps and external strainer to meet BHEL's requirement as mentioned in Data Sheet-A of technical specification:

- a) Capability of designing and manufacturing of the item(s).
- b) In-house testing facilities for carrying out tests as per relevant standards & Quality plan. In case, the in-house testing facilities are not available, then bidder shall furnish undertaking that test(s) will be carried out from govt. approved lab or test house recognized by reputed customers.

Bidder to submit supporting documents (Purchase order(s) / Certificate indicating capacity and details / undertaking of manufacturing & testing facilities) for point (a) & (b) above.

**PREPARED BY:**

ASHISH KUMAR  
VERMA

**NAME:** A K Verma**DESIGNATION:** Dy. Manager**DEPT.:** PS-PEM/ MPL

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2.5.4.20=504696a747af96827c0909c70a170f856d952cc  
E0b0b0da1648301158B014, c=IN=ASHISH KUMAR VERMA  
Date: 2021.11.11 14:28:34 +05'30'

**REVIEWED BY:**

Kuldeep  
Kumar

**NAME:** Kuldeep Kumar**DESIGNATION:** Manager**DEPT.:** PS-PEM/ MPL

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**APPROVED BY:**

Bimal Kumar  
Agarwal

**NAME:** B K Agarwal**DESIGNATION:** AGM/ DH(MPL)

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Agarwal  
Date: 2021.11.15 14:13:01 +05'30'



	<b>PRE - QUALIFYING REQUIREMENTS</b>	DOCUMENT NO.: PE-TS-475-000-M057
		REVISION NO.: 00
		DATE: 10.11.2021
		SHEET: 2 of 2

1.5 To establish business continuity, bidder is required to submit at least two (2) Purchase orders for air traps and external "Y" type strainer in last 3 (three) years prior to the date of bid submission as defined by BHEL-PEM in NIT.

2.0 Bidder to also comply with general points mentioned below:

2.1 Offers of the JV companies/ Joint Bidders/ bidders having collaboration/ licensing agreement/ MOU/ Indian subsidiaries shall be evaluated as follows:

- If bidder happens to be an Indian subsidiaries of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR.
- If bidder happens to be the Joint Venture Company, then the credentials of any of JV partners can be also considered for meeting PQR.
- If bidder happens to be the having valid collaboration agreement/ MOU/ licensing agreement with some other company, then the credentials of collaborator/ MOU partner/ licensing company can also be considered for meeting PQR.

Note: If bidder(s) qualifies on the basis of credentials of his principal/ JV partner/ Collaborator/ joint bidder etc., then the principal/ JV partner/ Collaborator/ MOU partner/ joint bidder shall be responsible for overall design vetting and warranty/ guarantee of the package. The scope matrix clearly defining their respective roles including design vetting, manufacturing of critical component, E&C etc. and warranty/ guarantee shall be submitted along with the offer.

2.2 Bidder to note that the arrangement of bidding (joint bid partners/ collaborator/ MOU partner/ licensing company etc.) once offered to BHEL as a part of bidding documents cannot be changed till the execution of contract(s).

2.3 Consideration of offer shall be subject to customer's approval of bidders, if applicable.

2.4 Bidder to submit all supporting documents in English. If documents submitted by bidder are in language other than English, a self-attested English translated document should also be submitted.

2.5 Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder/collaborators to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.

2.6 After satisfactory fulfillment of all the above criteria/ requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.

2.7 Bidder to ensure that Third Party/customer issued certificates being submitted as proof of PQR qualification should have verifiable details of document/ certificate issuing authority such as name & designation of issuing authority and its organization contact number and email-id etc. In case the same found not available, purchaser has right to reject such document from evaluation.

<b>PREPARED BY:</b> <b>ASHISH KUMAR VERMA</b> <small>Digitally signed by ASHISH KUMAR VERMA DN: cn=RN, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=PS PEM, email=Kumar@PS-PS, cn=PS-PS, o=BHARAT HEAVY ELECTRICALS LIMITED, ou=PS 2.5.4.20=04698a7d7f9f9d27569d9c70a1709856d692c8 556e0b3a143067f08074, cn=ASHISH KUMAR VERMA Date: 2021.11.11 14:59:19 +05'30'</small> <b>NAME: A K Verma</b> <b>DESIGNATION: Dy. Manager</b> <b>DEPT.:PS-PEM/ MPL</b>	<b>REVIEWED BY:</b> <b>Kuldeep Kumar</b> <small>Digitally signed by Kuldeep Kumar Date: 2021.11.15 12:06:16 +05'30'</small> <b>NAME: Kuldeep Kumar</b> <b>DESIGNATION: Manager</b> <b>DEPT.: PS-PEM/ MPL</b>	<b>APPROVED BY:</b> <b>Bimal Kumar Agarwal</b> <small>Digitally signed by Bimal Kumar Agarwal Date: 2021.11.15 14:13:33 +05'30'</small> <b>NAME: B K Agarwal</b> <b>DESIGNATION: AGM/ DH(MPL)</b>
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