

1x660 MW BHUSAWAL TPS UNIT-6

TECHNICAL SPECIFICATION FOR STEAM TRAPS

SPECIFICATION NO. PE-TS-415-100-M010



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

	TECHNICAL SPECIFICATION STEAM TRAPS 1x660 MW BHUSAWAL TPS UNIT-6		SPECIFICATION NO. PE-TS-415-100-M010
			SECTION: -
		REV. NO.: 00	DATE: 18.01.2021
		SHEET 1 OF 1	

CONTENTS

S No.	SECTION	TITLE	NO. OF SHEETS
1.	SECTION-I	SPECIFIC TECHNICAL REQUIREMENTS	4
2.	SECTION-II	i) DATA SHEET-A	2
		ii) QUALITY PLAN	11
		iii) COMPLIANCE SHEET	1

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	TECHNICAL SPECIFICATION STEAM TRAPS		SPECIFICATION NO. PE-TS-415-100-M010
			SECTION: -I
	REV. NO.: 00		DATE: 18.01.2021
	SHEET 1 OF 1		

SECTION-I

SPECIFIC TECHNICAL REQUIREMENTS

	SPECIFIC TECHNICAL REQUIREMENTS STEAM TRAPS 1x660 MW BHUSAWAL TPS UNIT-6		SPECIFICATION NO. PE-TS-415-100-M010
			SECTION: I
		REV. NO.: 00	DATE: 18.01.2021
		Sheet 1 of 4	

1. GENERAL

- 1.1 The steam traps shall meet the technical requirements and conform to the requirements of this Section-I and Data sheet A of Section II. However, in the event of contradictions between Section –I & Section –II/ Data sheet A, Section –II/ Data sheet A will prevail.

2. SCOPE OF SUPPLY

- 2.1 The steam traps (Thermodynamic and Inverted Bucket type 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.

3. DESIGN REQUIREMENTS AND CONSTRUCTION FEATURES

- 3.1 The traps covered in the specification shall be of Thermodynamic, Inverted Bucket with auto-drain arrangement conforming to supplier's own proven design.
- 3.2 All traps shall be with integral/external strainer designed suitably to prevent the internals of the trap from damage due to dirt etc. The strainer shall have a screwed blow-off connection with a removable plug.
- 3.3 Straining area of strainer shall be kept as minimum four times of the pipe cross-sectional area.
- 3.4 The traps should be suitable for horizontal/vertical mounting with internals easily accessible and replaceable.
- 3.5 Arrow showing inlet should be cast on the body of traps and strainers.
- 3.6 Wherever steam traps are coming under purview of IBR, the relevant stipulations of IBR shall be applicable for compliance.
- 3.7 The trap cover shall be such that it can be removed without breaking the inlet or discharge pipe.
- 3.8 On line cleaning of the strainer element shall also be possible.
- 3.9 Seat diameter for Inverted Bucket trap shall be selected based on the required maximum condensate flow rate & working pressure which will be indicated at ordering stage.
- 3.10 All traps and strainers shall have socket weld ends as per ANSI B16.11 for size NB 40 mm and smaller and butt weld ends as per ASME B16.25 for size NB 50 mm and above.
- 3.11 A metallic (stainless steel plate 2mm thick) nameplate shall be fitted on each valve. Nameplate inscription required for each valve shall be indicated at the contract stage. Inscriptions shall be engraved 1 mm deep filled with enamel paint.

4. MATERIALS

- 4.1 The materials of construction of main parts of traps shall be specified in Data sheet-A.
- 4.2 The materials of construction of the remaining parts shall be suitable for the service conditions shall be subject to approval of the purchaser.
- 4.3 Materials used in manufacture of traps shall be of tested quality. The internals components of internals shall be stainless steel construction (AISI 316).

	SPECIFIC TECHNICAL REQUIREMENTS STEAM TRAPS 1x660 MW BHUSAWAL TPS UNIT-6	SPECIFICATION NO. PE-TS-415-100-M010	
		SECTION: I	
		REV. NO.: 00	DATE: 18.01.2021
		Sheet 2 of 4	

5. TESTING AND INSPECTION

- 5.1 The items covered under this contract shall be subjected to inspection, testing and quality surveillance as per the quality plans attached with this specification. 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.
- 5.2 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 (By BHEL/Customer) quality plan without any price implications.
- 5.3 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 (as applicable). All inspection and testing, as per approved QP, 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 (Lloyds, TUV or equivalent).
- 5.4 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.

NOTE: There may be minor changes in quality plan depending on customer/consultant comments which will have to be accommodated by vendor at no extra cost.

6. EXCLUSIONS

Erection & Commissioning of equipment at site

7. SURFACE PREPARATION & PAINTING

- 7.1 The surface preparation of all exterior and interior surfaces of traps and strainers shall include the following:
 - a) Removal of oil, grease and dirt.
 - b) Removal of rust and scale etc.
 - c) Sand blasting/ shot blasting.
- 7.2 Surface preparation shall be as per SSPC-SP-3/ Power Tool Cleaning followed by 2 coat of Heat Resistance Aluminium paint conforming to IS 13183 Gr. I or equivalent, paint shade Aluminium and total DFT of paint will be equal to 80 microns minimum. However, the same will be according to customer approved drawing.

	SPECIFIC TECHNICAL REQUIREMENTS STEAM TRAPS 1x660 MW BHUSAWAL TPS UNIT-6		SPECIFICATION NO. PE-TS-415-100-M010
			SECTION: I
		REV. NO.: 00	DATE: 18.01.2021
		Sheet 3 of 4	

8. PACKING INSTRUCTIONS:

- 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.
- The trap and strainer shall be dispatched in total assembled form.
- Body ends shall be suitably sealed to protect them against damage during transit and storage.
- Trap and strainer Tag Nos. shall be incorporated in all the dispatch documents.
- 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 for a period of 15-18 months.
- Vendor to provide the following:
 - Photographs (soft) of traps and strainers duly placed inside the wooden box just before final packing.
 - Photographs (soft) of the wooden box in which the traps and strainers have been finally packed just before dispatch.

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

9. SPARES

- Mandatory Spares:** As per Datasheet-A.

10. DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

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

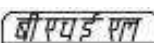
- Compliance sheet
- Documents as per the list indicated in the NIT.

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 them.

11. DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT:

11.1 CATEGORY-A

- GA Drawing indicating complete cross sectional arrangement of traps and strainer. Binding dimensions, dismantling clearances, weight and Bill of Material incorporating all material of construction (MOC) of various parts & relevant standard to which MOC confirms to.
- Quality plans of steam traps (Thermodynamic and inverted bucket) and Y- type strainer duly signed and stamped.

	SPECIFIC TECHNICAL REQUIREMENTS STEAM TRAPS 1x660 MW BHUSAWAL TPS UNIT-6	SPECIFICATION NO. PE-TS-415-100-M010	
		SECTION: I	
		REV. NO.: 00	DATE: 18.01.2021
		Sheet 4 of 4	

Submission/Resubmission of above documents shall be considered for delay analysis by BHEL

11.2 CATEGORY-B

- a) Test procedure for functional test of traps (Thermodynamic and Inverted bucket)
Test procedure is required as information.

	TECHNICAL SPECIFICATION STEAM TRAPS 1x660 MW BHUSAWAL TPS UNIT-6		SPECIFICATION NO. PE-TS-415-100-M010
			SECTION: -II
		REV. NO.: 00	DATE: 18.01.2021
		SHEET 1 OF 1	

SECTION-II

- DATA SHEET – A
- QUALITY PLAN
- COMPLIANCE SHEET

DATASHEET - A																		
REQUIREMENT OF STEAM TRAPS																		
FOR 1x660 MW BHUSAWAL TPP UNIT-6																		
																		
SPECIFICATION NO.: PE-TS-415-100-M010																		
VOL: IIB																		
SECTION: II																		
REV:00																		
DATE: 18.01.2021																		
SHEET 1 OF 2																		
SL. NO.	TAG Nos.	TYPE	CONNECTING PIPE SIZE (NB)	PIPE THICKNESS (MM)	SERVICE DESCRIPTION	SERVICE	DESIGN PRESURE (KG/CM2G)	DESIGN TEMP(deg C)	OPERATING PRESSURE AT INLET OF TRAP (kg/cm2)	OPERATING PRESSURE AT D/S OF TRAP (kg/cm2)	MAX. CONDENSATE RATE (KG/HR)	FACTOR OF SAFETY	BODY	MATERIAL BODY INTERNAL	PIPE END CONNECTION	IBR REQUIRED	TOTAL QUANTITY (Nos.) (MAIN)	MANDATORY SPARE QUANTITY (Nos.) (All internals required to complete one full assembly, except body)
1	ASV-103, 113, 143, 148, 175, 180, 185, 190, 195, 200, 205, 210, 118, 123, 128, 133,138, CRHV-107, 121, 128, EXV-107, 113 (EACH 1 NO.), CONTINGENCY-2 NOS	THERMODYNAMIC STEAM TRAP-LP	33.4	4.55	POWER CYCLE	INTERMITTENT	20	400	16	0.1 (VAC)/ATM	10	NOT LESS THAN 2	CS	SS	SW	YES	24	3
2	CRHV-114, CONTINGENCY-1 NO	THERMODYNAMIC STEAM TRAP-HP	33.4	4.55	POWER CYCLE	INTERMITTENT	66.3	360	57.2	0.1 (VAC)	10		CS/ EQUIVALENT OR HIGHER	SS	SW	YES	2	1
3	DRV-42	INVERTED TYPE	88.9	5.49	DRAIN LINE	CONTINUOUS	3.5/ VAC	110	0.95 (VAC)	0.1 (VAC)	500		CCS	SS	BW	NO	1	1
4	DRV-41	EXTERNAL Y-TYPE STRAINER	88.9	5.49	DRAIN LINE	CONTINUOUS	3.5/ VAC	110	0.95 (VAC)	0.1 (VAC)	500		CCS	SS	BW	NO	1	1
TOTAL																28	6	
NOTES:																		

NOTES:

- 1 Bidder to offer steam trap and strainer meeting the parameters mentioned in the above Datasheet-A.
- 2 For detailed material of construction refer pages 2 of this DataSheet-A.
- 3 Bidder to furnish trap/strainer size (NB) & MOC of trap & strainer in the offer in compliance sheet and same shall be binding.
- 4 For item no. 1 and 2, Bidder to offer Suitable matching pieces to match with connecting pipe size.
For item no. 3 and 4, strainer inlet & trap outlet shall be matched with connecting pipe size by bidder. Strainer outlet and trap inlet shall be matched through expander/reducer.
Bidder to consider all reducer/expander (as required) in their scope.
- 5 Painting: Heat resistant aluminium paint to IS-13183 Gr.I. TOTAL DFT-80 MICRONS (minimum). Refer clause 7.2 of Section-I of technical specification.
- 6 Socket Welding (SW) will be as per ASME-B16.11; Butt welding (BW) will be as per ASME B16.25.
- 7 CS:Carbon Steel, CCS-Cast carbon steel, VAC: Vacuum, ATM: Atmospheric
- 8 Equivalent/higher material is acceptable.
- 9 Mandatory spares for Steam traps and Y type strainers -All internals required to complete one full assembly, except body .

	DATA SHEET-A STEAM TRAPS 1x660 MW BHUSAWAL TPS UNIT-6	SPECIFICATION NO. PE-TS-415-100-M010	
		SECTION : II	
		REV. NO.: 00	
		Page 2 of 2	DATE: 18.01.2021

1. Thermodynamic type steam trap with integral strainer

MATERIAL OF CONSTRUCTION (THERMODYNAMIC STEAM TRAP)

S.NO.	PART NAME	MATERIAL REQUIRED
1	Body (Seat hardened)	Carbon Steel (ASTM A 105)
2	Cap and Plug	ASTM A 743 Gr CA 40
3	Trap Disc	AISI420 (Equi. CA 40) (Hardened to minimum 40 RC differential hardness shall be maintained for disc and body seats).
4	Gasket	Non asbestos type
5	Strainer Screen	AISI 316 (20 mesh screen)
6	Name plate	SS 316 (2 mm thick)

NOTE: Equivalent/higher material is acceptable and will be binding to bidders. Bidder to furnish detail MOC of the traps offered along with the offer.

2. Inverted bucket steam trap with external Y-type strainer

MATERIAL OF CONSTRUCTION (INVERTED BUCKET STEAM TRAP)

S.NO.	PART NAME	MATERIAL REQUIRED
1	Body and cap/cover	Cast Carbon Steel as per ASTM A216 Gr.WCB
2	Valve, Valve seat	AISI 420(furnace hardened to minimum 40 RC). Differential hardness Shall be maintained between seats
3	Valve lever, Bucket, Bucket clip	AISI 316
4	Bolts/Nuts	ASTM A193 Gr.B7/ASTM A194 Gr.2H
5	Gasket	Non asbestos type
6	Name plate	SS 316 (2 mm thick)
7	Other internals	Stainless steel

MATERIAL OF CONSTRUCTION (EXTERNAL Y-TYPE STRAINER)

S.NO.	PART NAME	MATERIAL REQUIRED
1	Body and Strainer cap/cover	Cast Carbon Steel as per ASTM A216 Gr.WCB
2	Strainer screen	SS 316 (20 mesh screen)
3	Gasket	Non asbestos type
4	Name plate	SS 316 (2 mm thick)

NOTE: Equivalent/higher material is acceptable and will be binding to bidders. Bidder to furnish detail MOC of the traps offered along with the offer.

	MANUFACTURER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN				SPEC. NO : PE-TS-415-100-M010 REV-00		DATE: 18.01.2021		
							CUSTOMER : M/S MAHAGENCO		QP NO.: PE-QP-415-142-M002 REV-00		DATE: 18.01.2021
							PROJECT: 1x660 MW BHUSAWAL TPS UNIT-6		PO NO.:		DATE:
							ITEM: STEAM TRAP (THERMODYNAMIC)		SYSTEM: POWER PIPING		SHEET 1 OF 4
							SECTION: II				

Sl No.	Component & Operations	Characteristics	Class	Type of Check	Quantum of Check		Reference Document	Acceptance Norms	Format of Record		Agency			Remarks
					M	C/N			9	*	D	M	C	
1	2	3	4	5	6		7	8			**			

1.0 Raw Material

1.1	Body, Cap/cover, Disc & Plug	1. Physical & Chemical Properties	MA	Physical & Chemical Analysis	1 per Heat / 1 per Batch	-	-	Approved DRG/ Relevant standard	Approved DRG/ Relevant standard	Mill Test Certificate	✓	P/W	V	-	Correlation Required for Body and cap/cover with Mill test Certificate.	
		2. Surface Defects	MA	Visual Examination	100%	-	-	MSS-SP-55	MSS-SP-55	Inspection Report	✓	P/W	V	-		
		3. Dimensions	MA	Measurement	100%	-	-	Approved DRG	Approved DRG	Inspection Report	✓	P/W	-	-		
		1.Chemical Properties	MA	Chemical Test	1 per Sheet/ 1 per Batch	-	-	Approved DRG/ Relevant standard	Approved DRG/ Relevant standard	Test Certificate	✓	P/W	V	-		
1.2	Screen	2.Mesh Size/ Perforation dia	MA	Measurement	-	-	-	Approved DRG	Approved DRG	Inspection Report	✓	P/W	V	-		

2.0 In-Process Machining

2.1	All Components	1.Dimensions	MA	Measurement	100%	-	-	Approved DRG	Approved DRG	Inspection Report	✓	P/W	-	-		
		2. Surface Defects	MA	Visual	100%	-	-	MSS-SP-55	MSS-SP-55	Inspection Report	✓	P/W	V	-		
2.2	Body seat & Disc	1. Hardness of disc	CR	Hardness Test	100%	-	-	Approved DRG	Approved DRG	Test Certificate	✓	P/W	V	-		
		2. Surface defect	CR	PT	100%	-	-	ASTM E165	No Defects	Inspection Report	✓	P/W	V	-		
		3. Surface finish	CR	Blue matching	100%	-	-	Manufacturer's standard	Uniform metal to metal contact	Inspection Report	✓	P/W	V	-		

BHEL

ENGINEERING				QUALITY			
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name	Seal	
Reviewed by:	Prince Malik	Anuj Awasthi	Reviewed by:	Ritesh Kumar Jaiswal	Ashish Panigrahi		

BIDDER/VENDOR

Sign & Date	Seal

FOR CUSTOMER REVIEW & APPROVAL

Doc No:	Sign & Date	Name	Seal
Reviewed by:			
Approved by:			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN			SPEC. NO : PE-TS-415-100-M010 REV-00		DATE: 18.01.2021		
						CUSTOMER : M/S MAHAGENCO		QP NO.: PE-QP-415-142-M002 REV-00		DATE: 18.01.2021
						PROJECT: 1x660 MW BHUSAWAL TPS UNIT-6		PO NO.:		DATE:
						ITEM: STEAM TRAP (THERMODYNAMIC)		SYSTEM: POWER PIPING SECTION: II		SHEET 2 OF 4

SI No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	Format of RECORD	Agency			REMARKS
1	2	3	4	5	6	C/N	7	8	9	*	M	C	N
										D			
3.0 Sub-Assembly													
3.1	Cap/Cover	Alignment	MA	Visual	100%	-	Manufacturer's standard	Proper fitting	Log Book	-	P/W	-	-
4.0 Testing													
4.1	Complete Assembly	1. Cleaning & Deburring	MA	Visual	100%	-	Approved DRG/ Relevant standard	Approved DRG/ Relevant standard	Inspection Report	✓	P/W	V	-
		2. Dimensions	CR	Measurement	100%	REF. NOTE 2	Approved DRG	Approved DRG	Inspection Report	✓	P/W	W	-
		3. Leak tightness of Body	CR	Hydraulic test	100%	REF. NOTE2	Approved DRG/ Relevant standard	No leakage	TC/IBR format	✓	P/W	W#	-
		4. Function of Trap	CR	Performance Test*	100%	REF. NOTE 2	Manufacturer's Test procedure	Smooth & effective operation	Test certificate	✓	P/W	W	-
4.2	Flow Capacity Test (Type test)	Condensate Discharge	CR	Discharge Flow	1 per pressure rating & orifice size trap	-	Flow Capacity charts/type test reports	Design flow capacity	Type test certificate	✓	P/W	V	-
4.3	End connection	1. Dimensions	CR	Measurement	100%	REF. NOTE 2	Approved DRG	Approved DRG	Inspection . Report	✓	P/W	W	-
		2. Surface Defects	CR	PT	100%	-	ASTM E165	No Defects	Inspection . Report	✓	P/W	V	-
FOR CUSTOMER REVIEW & APPROVAL													
BIDDER/VENDOR													
BHEL													
ENGINEERING													
QUALITY													
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name								
Reviewed by:	Prince Malik	Anuj Awasthi	Reviewed by:	Ashish Panigrahi	Ashish Panigrahi								

	MANUFACTURER/ SUPPLIER NAME & ADDRESS BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN				SPEC. NO : PE-TS-415-100-M010 REV-00		DATE: 18.01.2021	
							CUSTOMER : M/S MAHAGENCO		QP NO.: PE-QP-415-142-M002 REV-00	
			PROJECT: 1x660 MW BHUSAWAL TPS UNIT-6				PO NO.:		DATE:	
			ITEM: STEAM TRAP (THERMODYNAMIC)				SYSTEM: POWER PIPING SECTION: II		SHEET 3 OF 4	

Sl No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	Format of RECORD	Agency	REMARKS
1	2	3	4	5	6 M C/N	7	8	9	** M C N	
4.4	Final Inspection	Completeness & cleanliness	MA	Visual	100% REF. NOTE 2	Approved DRG	Approved DRG	Inspection Report	PW W	-
5.0	Painting	Surface preparation & Painting	MA	Visual	100%	Approved DRG/ Relevant standard	Approved DRG/ Relevant standard	Inspection Report	PW V	-
6.0	Packing	Packing Soundness	MA	Visual	100%	Approved DRG / Packing procedure (if applicable)	Approved DRG / Packing procedure (if applicable)	Inspection Report	PW W	-
										Refer Note no.3

BHEL				BIDDER/VENDOR				FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING		QUALITY		Sign & Date		Sign & Date		Doc No:		Sign & Date	
Prepared by:	ANUJ AWASTHI	Name	Anuj Awasthi	Sign & Date	Ashish Panigrahi	Seal		Reviewed by:		Name	Seal
Reviewed by:	Prince Malik	Checked by:	Prince Malik	Reviewed by:	Ritesh Kumar Jaiswal			Approved by:			

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN				SPEC. NO : PE-TS-415-100-M010 REV-00	DATE: 18.01.2021
			CUSTOMER : M/S MAHAGENCO				QP NO.: PE-QP-415-142-M003 REV-00	DATE: 18.01.2021
			PROJECT: 1x660 MW BHUSAWAL TPS UNIT-6				PO NO.:	DATE:
			ITEM: Y-TYPE STEAM STRAINER				SYSTEM: POWER PIPING	

SI No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	Format of RECORD		Agency			REMARKS
					M	C/N			9	*	M	C	N	
1	2	3	4	5	6		7	8	9	*				

1.0 Raw Material

1.1	Body, Cap/Cover	1. Physical & Chemical Properties	MA	Physical & Chemical properties	-	1 per Heat / 1 per Batch	Approved DRG/ Relevant standard	Approved DRG/ Relevant standard	Mill Test Certificate	✓	PW	V	-	Correlation Required for Body and cap/cover with Mill test Certificate.		
		2. Surface Defects	MA	Visual Examination	100%		MSS-SP-55	MSS-SP-55	Inspection Report	✓	PW	V	-			
		3. Dimensions	MA	Measurement	100%		Approved DRG	Approved DRG	Inspection Report	✓	PW	-	-			
1.2	Screen	1. Chemical Properties	MA	Chemical Test	1 per Sheet/ 1 per Batch		Approved DRG/ Relevant standard	Approved DRG /Relevant standard	Test Certificate	✓	PW	V	-			
		2. Mesh Size / Perforation Dia	MA	Measurement			Approved DRG	Approved DRG	Inspection Report	✓	PW	V	-			

2.0 In-Process machining

2.1	All Components	1. Dimensions	MA	Measurement	100%		Approved DRG	Approved DRG	Inspection	✓	PW	-	-			
		2. Surface Defects	MA	Visual	100%		MSS-SP-55	MSS-SP-55	Report	✓	PW	V	-			

3.0 Sub-Assembly

3.1	Cap/Cover	Alignment	MA	Visual examination	100%		Manufacturer's standard	Proper Fitting	Log Book	-	PW	-	-			
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BHEL				BIDDER/VENDOR				FOR CUSTOMER REVIEW & APPROVAL					
ENGINEERING		QUALITY		Sign & Date		Doc No:		Sign & Date		Name		Seal	
Prepared by:	ANUJ AWASTHI	Name	Anuj Awasthi	Sign & Date	Ashish Panigrahi	Seal		Reviewed by:		Name		Seal	
Reviewed by:	Prince Malik	Checked by:	Prince Malik	Reviewed by:	Ritesh Kumar Jaiswal	Seal		Approved by:		Name		Seal	

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN				SPEC. NO : PE-TS-415-100-M010 REV-00		DATE: 18.01.2021
							Q P NO.: PE-QP-415-142-M015 REV-00		DATE: 18.01.2021
			PROJECT: 1x660 MW BHUSAWAL TPS UNIT-6		PO NO.:		DATE:		
			ITEM: STEAM TRAP (INVERTED BUCKET)		SYSTEM: POWER PIPING		SECTION: II		SHEET 2 OF 4

Sl No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	Format of RECORD	Agency	REMARKS
1	2	3	4	5	6 M C/N	7	8	9	** M C N	
		3. Surface finish	CR	Blue Matching	100% -	Manufacturer's standard	Uniform Metal to Metal Contact	Inspection Report	PW V -	

3.0 Sub-Assembly

3.1	Valve & Valve Seat	Leak Tightness	CR	Air/Hydro test	100% -	Approved DRG/ Relevant standard	Approved DRG/ Relevant standard	Inspection report	PW V -	
3.2	Cap/Cover	Alignment	MA	Visual	100% -	Manufacturer's standard	Proper Fitting	Log Book	PW -	

4.0 Testing

4.1	Complete Assembly	1.Cleanliness & Completeness	MA	Visual	100% -	Approved DRG/ Relevant standard	Approved DRG/ Relevant standard	Inspection Report	PW V -	
		2.Dimensions	CR	Measurement	100% REF. NOTE 2	Approved DRG	Approved DRG	Inspection Report	PW W -	
		3.Leak Tightness of Body	CR	Hydraulic Test	100% REF. NOTE 2	Approved DRG/ Relevant standard	No Leakage	TC/IBR format	PW #W -	# If IBR is applicable, in addition to witness, IBR certificate to be verified.
		4.Function of Trap	CR	Performance Test *	100% REF. NOTE 2	Manufacturer's Test procedure	Smooth and Effective Operation	Test Certificate	PW W -	*Performance testing in simulated conditions as per test procedure.

BHEL			
ENGINEERING		QUALITY	
Prepared by:	ANUJ AWASTHI	Sign & Date	Sign & Date
Reviewed by:	Prince Malik	Checked by:	Ashish Panigrahi
		Reviewed by:	Ritesh Kumar Jaiswal
		Reviewed by:	RK Jaiswal

BIDDER/VENDOR	
Sign & Date	Sign & Date
Seal	Seal

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

	MANUFACTURER/ BIDDER/ SUPPLIER NAME & ADDRESS		QUALITY PLAN		SPEC. NO : PE-TS-415-100-M010 REV-00	DATE: 18.01.2021
	CUSTOMER : M/S MAHAGENCO				QP NO.: PE-QP-415-142-M015 REV-00	DATE: 18.01.2021
	PROJECT: 1x660 MW BHUSAWAL TPS UNIT-6				PO NO.:	DATE:
	ITEM: STEAM TRAP (INVERTED BUCKET)		SYSTEM: POWER PIPING		SECTION: II	SHEET 3 OF 4

SI No.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	Format of RECORD	Agency			REMARKS	
1	2	3	4	5	M	C/N	6	7	8	9	**			
									*	D	M	C	N	
4.2	Flow Capacity Test (Type Test)	Condensate Discharge	CR	Discharge Flow	1 Per Pressure Rating & Orifice Size Trap	-	Flow Capacity charts/type test reports	Design flow capacity	Type Test Certificate	✓	P/W	V	-	
4.3	End connection	1.Dimensions	CR	Measurement	100% REF. NOTE 2		Approved DRG	Approved DRG	Inspection Report	✓	P/W	W	-	
		2.Surface Defects	CR	PT	100% -		ASTM E165	No Defects	Inspection Report	✓	P/W	V	-	
4.4	Final Inspection	Completeness & cleanliness	MA	Visual	100% REF. NOTE 2		Approved DRG	Approved DRG	Inspection Report	✓	P/W	W	-	
5.0	Painting	Surface Preparation & Painting	MA	Visual	100% -		Approved DRG/ Relevant standard	Approved DRG/ Relevant standard	Inspection Report	✓	P/W	V	-	
6.0	Packing	Soundness of Packing	MA	Visual	100%	100%	Approved DRG / Packing procedure (if applicable)	Approved DRG / Packing procedure (if applicable)	Inspection Report	✓	P/W	W	-	Refer Note no.3

BHEL					BIDDER/VENDOR			FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING		QUALITY			Sign & Date	Seal	Doc No:				
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name	Seal		Sign & Date	Name	Seal	
Reviewed by:	Prince Malik	Anuj Awasthi	Reviewed by:	Ashish Panigrahi	Ashish Panigrahi		Reviewed by:				
	Prince Malik	Prince Malik	Reviewed by:	Ritesh Kumar Jaiswal	RK Jaiswal		Approved by:				

	MANUFACTURER/ SUPPLIER NAME & ADDRESS	QUALITY PLAN		SPEC. NO : PE-TS-415-100-M010 REV-00	DATE: 18.01.2021
		CUSTOMER : M/S MAHAGENCO		QP NO.: PE-QP-415-142-M015 REV-00	DATE: 18.01.2021
		PROJECT: 1x660 MW BHUSAWAL TPS UNIT-6		PO NO.:	DATE:
		ITEM: STEAM TRAP (INVERTED BUCKET)	SYSTEM: POWER PIPING	SECTION: II	SHEET 4 OF 4

NOTE:

- In case of foreign supplier, all test certificates shall be furnished by the supplier, duly witnessed/verified by supplier's TPI.
- The Quantum of check to be witnessed (W) is 10% of quantity or Min. 2 Nos. at random by BHEL/Customer & 100 % by Vendor 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 (with LR No.) to be provided just before dispatch for information to PEM.
- The latest revisions/year of issue of all the standard indicated in the QP shall be referred.
- Welding and Impregnation of casting are not permitted.
- All materials shall be as per Approved drgs/ Data sheet for steam traps.
- 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 (TPI);
 N: CUSTOMER

P: perform, W: witness, V: verification as appropriate, D: Documentation
 MA: MAJOR, MI: MINOR, CR: CRITICAL

BHEL					
ENGINEERING			QUALITY		
Prepared by:	Sign & Date	Name	Checked by:	Sign & Date	Name
Prince Malik		Anuj Awasthi	Ashish Panigrahi		Ashish Panigrahi
Reviewed by:	Sign & Date	Name	Reviewed by:	Sign & Date	Name
Prince Malik		Prince Malik	Ritesh Kumar Jaiswal		RK Jaiswal

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

	COMPLIANCE SHEET STEAM TRAPS 1x660 MW BHUSAWAL TPS UNIT-6		SPECIFICATION NO. PE-TS-415-100-M010	
			SECTION : II	
			REV. NO.: 00	DATE: 18.01.2021
			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.

B. Specify NB & MOC of trap & strainer offered. (as applicable).

Sl.No. (As per Data Sheet- A)	Type (As per Data Sheet-A)	Trap Size (NB) (To be filled by Bidder)	MOC (To be filled by Bidder)	Material Grade (To be filled by Bidder)
1	THERMODYNAMIC STEAM TRAP-LP (Sl. No.1 of Datasheet-A)			
2	THERMODYNAMIC STEAM TRAP-HP (Sl. No.2 of Datasheet-A)			
3	INVERTED BUCKET STEAM TRAP (Sl. No.3 of Datasheet-A)			
4	EXTERNAL Y-TYPE STRAINER (Sl. No.4 of Datasheet-A)			

Name of Bidder / Authorized Representative :-

Designation :-

Signature:-

Company Seal :-

Date :-
