

1 X 800 MW TSGENCO KOTHAGUDAM TPP


VOLUME – IIB

TECHNICAL SPECIFICATION FOR STEAM TRAPS

SPECIFICATION NO. PE-TS-410-100-M010



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

	PREAMBLE	SPECIFICATION NO. PE-SS-999-100-Q001	
		VOLUME	
		SECTION	
		REV. NO.	DATE: 26/08/2011
		SHEET	1 OF 1

1.0 The tender document contains three (3) volumes. The bidder shall meet the requirements of all the three volumes.

1.1 **Volume-I (CONDITIONS OF CONTRACT)**

This consists of four parts as below:-

- Volume-IA : This part contains instructions to bidders for making bids to BHEL.
- Volume-IB : This part contains general commercial conditions of the tender & includes provision that vendor is responsible for the quality of item supplied by their sub-vendors.
- Volume-IC : This part contains special conditions of contract.
- Volume-ID : This part contains commercial conditions for erection & commissioning site work, as applicable.

1.2 **Volume-II TECHNICAL SPECIFICATIONS**

Technical requirements are stipulated in Volume-II which comprises of :-

- Volume-IIA : General Technical Conditions
- Volume-IIB : Technical Specification including Drawings, if any.

1.2.1 **Volume-IIB**

This volume is sub-divided into following sections:-

- Section-A : This section outlines the scope of enquiry.
- Section-B : This section provides "Project Information".
- Section-C : This section indicates technical requirements specific to the contract, not covered in Section-D.
- Section-D : This section comprises of technical specifications of equipments complete with data sheet A, B and C.

Data Sheet - A Specifies data and other requirements pertaining to the Equipment.


Data Sheet - B Specifies data to be filled by the bidder (Data Sheet-B is contained in Volume-III).

Data Sheet -C Indicates data/documents to be furnished after the award of contract as per agreed schedule by the vendor (as applicable).

1.2.2 **Volume-III (TECHNICAL SCHEDULES)**


This volume contains technical schedules and Data Sheets-B, which are to be duly filled by the bidder and the same shall be furnished with the technical bid.

2.0 The requirements mentioned in Section-C / Data Sheets-A of section-D shall prevail and govern in case of conflict between the same and the corresponding requirements mentioned in the descriptive portion in Section-D

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SECTION-A

SCOPE OF ENQUIRY

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SCOPE OF ENQUIRY

1. SCOPE

This enquiry covers the Design, Manufacture, Inspection & Testing at vendor's and/or his sub-vendor's works, proper packing and delivery to site of steam traps complete with all accessories as per the requirements mentioned in different sections of the specification for 1 X 800 MW TSGENCO KOTHAGUDAM TPP.


2. GENERAL TECHNICAL INSTRUCTIONS

- a) It is not the intent to specify herein all the details of design and manufacture. However the equipment shall conform in all respects to high standards of design, engineering and workmanship, and shall be capable of performing the required duties in a manner acceptable to Engineer/ Owner, who will interpret the meaning of drawing and specifications, and shall be entitled to reject any component or material, which in his judgement is not in full accordance herewith.
- b) The omission of specific reference to any component/ accessories necessary for the proper performance of steam traps shall not relieve the bidder of the responsibility of providing such facilities to complete the supply of steam traps at quoted prices.
- c) Design/ drawings/ data sheets etc. shall be subject to approval of BHEL as per specification, in the event of order.
- d) BHEL's / customer's representative shall be given access to the shop in which the equipment are being manufactured or tested and all test records shall be made available to him.
- e) The equipment covered under this specification shall not be despatched unless the same have been finally inspected, accepted and shipping release issued by BHEL.

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SECTION-B


PROJECT INFORMATION

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PROJECT INFORMATION


INTRODUCTION The proposed 1x800 MW Kothagudem Thermal Power Station (KTPS), Stage-VII, Unit-12 would be set up by Telangana State Power Corporation Ltd. (TSGENCO) at Kothagudem, Telangana. The proposed Power Plant will be installed adjacent to the existing D colony of Kothagudem Thermal Power Station, at Kothagudem. The Bidder shall acquaint himself by a visit to the site, if felt necessary, with the conditions prevailing at site before submission of the bid. The information given here in under is for general guidance and shall not be contractually binding on the Owner.

APPROACH TO SITE: Site is located in the existing D Colony of Kothagudem Thermal Power Station, which is at a distance 30 km from temple town of Bhadrachalam and 300 km from Hyderabad by road. The Nearest railway station is Bhadrachalam Road (Known as Kothagudem) at a distance of 12 km. Kothagudem- Bhadrachalam National Highway branches off to the power station site near village Paloncha. 3.00.00

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SECTION-C

SPECIFIC TECHNICAL REQUIREMENTS

	SPECIFIC TECHNICAL REQUIREMENTS STEAM TRAPS 1 X 800 MW TSGENCO KOTHAGUDAM TPP	SPECIFICATION NO. PE-TS-410-100-M010	
		SECTION C	
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1. GENERAL

- 1.1 The steam traps shall meet the technical requirements and conform to the standard technical specifications, Data sheet A of Section D. In addition, the requirements of this Section-C shall also be complied with. However, wherever the details given in standard technical specification of Section-D and Data sheets A are different, the requirements of Data sheet A shall prevail. Similarly in the event of contradictions between Section –C & Section –D/ Data sheet A, Section –C will prevail.
- 1.2 The technical requirements for steam traps shall, in general, be as per the attached standard Technical specification for Air traps, and Data sheets A of Vol. II B Section D.

2. SCOPE OF SUPPLY

- 2.1 The steam traps along with strainer shall be supplied as per Data sheets A of Section D. For detail refer the same.
- 2.2 Commissioning spares, if any.
- 2.3 Mandatory spares as applicable depending upon the project requirement.
- 2.4 Various drawings, datasheets, operation and maintenance manuals etc. as specified in Data Sheet-C.

3 EXCLUSIONS:

Erection & Commissioning of equipment at site.

4 QUALITY ASSURANCE


The Quality Plans enclosed with this specification specify minimum quality control requirement. During contract stage vendor shall furnish these Quality Plans duly signed & stamped for their compliance. Quality plans shall be approved by BHEL and customer (If necessary). All inspection and testing shall be carried out by BHEL and CUSTOMER (if necessary). In case inspection is by both BHEL and CUSTOMER, then the inspection can be carried out jointly or separately, which will be informed later

5 PAINTING REQUIREMENT:

Surface preparation shall be as per SSPC-SP-3/ Power Tool Cleaning followed by 2 coat of Heat Resistance Aluminium paint to IS 13183 Gr. I or equivalent, paint shade Aluminium and total DFT of paint will be equal to 80 microns minimum.

6 PACKING INSTRUCTIONS:

- a) Each trap 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.
- b) The trap shall be dispatched in total assembled form.
- c) Body ends shall be suitably sealed to protect them against damage during transit and storage.

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- d) Trap Tag Nos. shall be incorporated in all the dispatch documents.
- e) Proper care shall be taken to avoid damage to the finished surface during transit.
- f) All the traps 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.

6 SPARES


- a) **Mandatory Spares:** These shall be as per Data Sheet-A.
- b) **Recommended Spares:** ~~List of recommended spares for 3 year reliable operation along with the unit price shall be indicated in the schedule of prices for recommended spares enclosed in Volume-III. Cost of Recommended spares shall not be included in the base price.~~
- c) Order for the spares may be placed simultaneously or otherwise at the option of purchaser.

7 DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

Bidder shall submit the following documents (enclosed in Vol III) duly filled, signed and stamped along with the bid:

- a) Compliance sheet
- b) Schedule of Deviations if any.
- c) Unpriced Schedules of Price indicating "Quoted/Not Quoted" against each item.
- d) Schedule of declaration.

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.

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SECTION-D

STANDARD TECHNICAL SPECIFICATION DATA SHEET – A QUALITY PLAN DATA SHEET – C


	TITLE: STANDARD SPECIFICATION FOR STEAM TRAPS	SPECIFICATION NO. PE-SS-999-555-M010	
		VOLUME . II B	
		SECTION D	
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1. GENERAL

This specification covers the design, materials, construction features, manufacture and testing of Steam Traps along with Integral/External Strainers at Vendor's or/ and sub-Vendor's works inclusive of painting and packing requirements.

2. DESIGN REQUIREMENTS AND CONSTRUCTION FEATURES

- 2.1 The traps covered in the specification shall be of Thermodynamic, Inverted Bucket and Ball float type with auto-drain arrangement conforming to supplier's own proven design.
- 2.2 All traps shall be with integral/external strainer designed suitably to prevent the internals of the trap from damage due to dirt etc.
- 2.3 Straining area of strainer shall be kept as minimum four times of the pipe cross-sectional area.
- 2.4 The traps should be suitable for horizontal/vertical mounting with internals easily accessible and replaceable.
- 2.5 Arrow showing inlet should be cast on the body of traps and strainers.
- 2.6 Wherever steam traps are coming under purview of IBR, the relevant stipulations of IBR shall be applicable for compliance.
- 2.7 The trap cover shall be such that it can be removed without breaking the inlet or discharge pipe.
- 2.8 On line cleaning of the strainer element shall also be possible.
- 2.9 All steam traps and strainers shall be with socket welded ends as per ANSI B16.11.
- 2.10 Ball Float type Steam Traps shall be provided with thermostatic air vent (pressure balance type).
- 2.11 Sizes of steam traps and strainers covered herein are from 15 mm Nb to 25mm NB with socket welded (SW) end connection. Seat diameter for Inverted Bucket & Ball Float trap shall be selected based on the required maximum condensate flow rate & working pressure which will be indicated at ordering stage.
- 2.12 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.

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3 MATERIALS

- 3.1 The materials of construction of main parts of traps shall be specified in Data sheet-A.
- 3.2 The materials of construction of the remaining parts shall be suitable for the service conditions shall be subject to approval of the purchaser.
- 3.3 Materials used in manufacture of traps shall be of tested quality.

4 INSPECTION AND TESTS:

- 4.1 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.
- 4.2 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.

5 SURFACE PREPARATION & PAINTING

- 5.1 The surface preparation of all exterior and interior surfaces of valves shall include the following:
- Removal of oil, grease and dirt.
 - Removal of rust and scale etc.
 - Sand blasting/ shot blasting.
- 5.2 All exterior surfaces of valves shall be painted with primer and finish coated with coating of min. 40 micron thickness. Color shade etc. shall be subject to BHEL/ Customer approval.

6 PROTECTION FOR DESPATCH

- 6.1 Traps shall be protected from external damage and sealed against the ingress of dirt.
- 6.2 Ends of the traps shall be protected by means of polythene caps/rubber end protectors.
- 6.3 All the traps shall be suitably packed in wooden cases in order to avoid damage during transit and also during storage at site.
- 7 Trap Tag Nos. shall also be incorporated in all the despatch documents.



**DATASHEET - A
REQUIREMENT OF STEAM TRAPS
1 X 800 MW TSGENCO KOTHAGUDAM TPP**

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SL. NO.	TAG NOS	TYPE	SIZE (NB)	SERVICE DESCRIPTION	SERVICE	DESIGN PRESSURE (KG/CM ² (g))	DESIGN TEMP(deg C)	OPERATING PRESSURE AT INLET OF TRAP (Kg/cm ²) (A)	OPERATING PRESSURE AT D/S OF TRAP (Kg/cm ²) (A)	MAX. CONDESATE RATE (KG/HR)	BODY	MATERIAL BODY INTERNALS	PIPE OD (MM)	PIPE THICKNESS (MM)	END CONN	BLOW OFF CONNECTION	IBR REQUIRED	TOTAL QUANTITY	MANDATORY SPARES (QTY) REFER NOTE NO.6
1	ASV-102, ASV-107	THERMODYNAMIC STEAM TRAP	15	POWER CYCLE	INTERMITTENT	20	320	16	0.1 (VAC)	10	SS	SS	33.4	4.55	SW	YES-PLUGGED	YES	2	3
2	ASV-113, ASV-118, ASV-123, ASV-128, ASV-133, ASV-138, ASV-143 & CONTIGENCY 4 NOS	THERMODYNAMIC STEAM TRAP	15	POWER CYCLE	INTERMITTENT	20	320	16	ATM	10	SS	SS	33.4	4.55	SW	YES-PLUGGED	YES	11	
3	CRHV-127, CRHV-133, CRHV-139, CRHV-145, CRHV-151, EXV-150, EXV-132 & CONTINGENCY 01 NO.	THERMODYNAMIC STEAM TRAP	15	POWER CYCLE	INTERMITTENT	20	395	12.5	0.1 (VAC)	10	SS	SS	33.4	4.55	SW	YES-PLUGGED	YES	8	
4	CRHV-107, CRHV-114, CRHV-121	THERMODYNAMIC STEAM TRAP	\$	POWER CYCLE	INTERMITTENT	73.5	380	66	0.1 (VAC)	10	AS	SS	33.4	4.55	SW	YES-PLUGGED	YES	3	2
5	DRV-67	INVERTED BUCKET STEAM TRAP	25	DRAIN LINE	CONTINUOUS	7/ VAC	110	0.95 (VAC)	0.1 (VAC)	700	CS	SS	88	5.49	SW	YES-PLUGGED	NO	1	2
6	DRV-66	EXTERNAL Y-TYPE STRAINER	25	DRAIN LINE	CONTINUOUS	7/ VAC	110	0.95 (VAC)	0.1 (VAC)	700	CS	CS	33.4	4.55	SW	YES-PLUGGED	NO	1	2
TOTAL																		26	9

NOTES:

- For detailed material of construction refer pages 2 and 3 of this DataSheet-A.
- \$ - Bidders to offer minimum size of thermodynamic steam trap meeting the parameters mentioned in the above Datasheet-A. Bidder to offer Suitable matching pieces to match with connecting pipe size.
- Painting: Heat resistant aluminium paint to IS-13183 Gr.I. TOTAL DFT-80 MICRONS.
- Socket Welding (SW) will be as per ASME-B16.11.
- CS: Carbon Steel, AS: Alloy Steel, SS- STAINLESS STEEL
- Mandatory spares are complete traps (including all the accessories and are identical to main traps) as per SNO 4 OF CL IV OF MECHANICAL LIST A OF MANDATORY SPARES LIST
- Factor of Safety- to be decided by bidder. However, factor of safety should not be less than two (2) in any case.

	DATA SHEET-A STEAM TRAPS 1 X 800 MW TSGENCO KOTHAGUDAM TPP	SPECIFICATION NO. PE-TS-410-100-M010	
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1. Thermodynamic type steam trap with integral strainer (Variant-I)

Maximum Working Pressure: 55 kg/cm² and Vacuum

Maximum Working Temperature: 427°C

Hydraulic Test Pressure: 110 kg/cm²

Whether Governed by IBR: Yes

MATERIAL OF CONSTRUCTION (SS THERMODYNAMIC STEAM TRAP)

S.NO.	PART NAME	MATERIAL REQUIRED
1	Body	Stainless Steel ASTM A 743 Gr CA 40(hardened)
2	Cap and Plug	ASTM A 743 Gr CA 40
3	Trap Disc	AISI420 (Equi. CA 40) (Hardened to 40 RC differential hardness shall be maintained for disc and body seats).
4	Body seat	Stainless Steel ASTM A 743 Gr. CA 40
5	Gasket	Non asbestos fiber
6	Strainer	SS 304 (20 mesh screen)
7	Name plate	SS 316 (2 mm thick)

2. Thermodynamic type steam trap with integral strainer (Variant-II)

Maximum Working Pressure: 250 kg/cm²


Maximum Working Temperature: 510°C

Hydraulic Test Pressure: 500 kg/cm²

Whether Governed by IBR: Yes

MATERIAL OF CONSTRUCTION (AS THERMODYNAMIC STEAM TRAP)

S.NO.	PART NAME	MATERIAL REQUIRED
1	Body, Seat/Disc Cover and Strainer cover	ASTM A 182 Gr. F22 CL.3
2	Disc seat and Disc	ASTM A 681 Gr.D2+Stellited
3	Gasket	SWG SS304 with Graphite
4	Strainer	SS 304 (20 mesh screen)
5	Bolts/Nuts	ASTM A193 Gr.B7/ASTM A194 Gr.2H
6	Name plate	SS 316 (2 mm thick)

	DATA SHEET-A STEAM TRAPS 1 X 800 MW TSGENCO KOTHAGUDAM TPP	SPECIFICATION NO. PE-TS-410-100-M010	
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3. Inverted bucket steam trap with external Y-type strainer

Maximum Working Pressure: 22 kg/cm² (maximum) and Vacuum

Maximum Working Temperature: 427°C

Hydraulic Test Pressure: 44 kg/cm²


Whether Governed by IBR: No

MATERIAL OF CONSTRUCTION (INVERTED BUCKET STEAM TRAP)

S.NO.	PART NAME	MATERIAL REQUIRED
1	Body and cover	Cast Carbon Steel as per ASTM A216 Gr.WCB
2	Valve, Valve seat	AISI 420(furnace hardened to 50 RC). Differential hardness Shall be maintained between seats
3	Valve lever, Bucket, Bucket clip	AISI 304
4	Bolts/Nuts	ASTM A193 Gr.B7/ASTM A194 Gr.2H
5	Gasket	Non asbestos fiber
6	Name plate	SS 316 (2 mm thick)


MATERIAL OF CONSTRUCTION (EXTERNAL Y-TYPE STRAINER)

S.NO.	PART NAME	MATERIAL REQUIRED
1	Body and Strainer cap	ASTM A216 Gr.WCB
2	Strainer	SS 304 (0.8 mm perforated with 20 mesh screen)
3	Gasket	Non asbestos fiber
4	Name plate	SS 316 (2 mm thick)

	QUALITY PLAN		CUSTOMER: TSGENCO			PROJECT: 1X800 MW TSGENCO KOTHAGUDAM TPP			SPEC. NO: PE-SS-999-142-M010			
			BIDDER/VENDOR:			QP NO. PE-QP-410-142-M002		REV.00 DT: 25.05.2016		SPEC. TITLE: STEAM TRAPS		
	SHEET 1 OF 2		SYSTEM: POWER CYCLE			ITEM: THERMODYNAMIC STEAM TRAPS			SECTION: D		VOLUME: IIB	
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	P	AGENCY W	V	REMARKS

1.0	RAW- MATERIAL											
1.1	BODY,CAP,DISC AND PLUG	1. PHYSICAL, CHEMICAL PROPERTIES	MA	PHYS. CHEM. ANALYSIS	ONE/HEAT /BATCH	APPD. DRG./ TECH. SPEC.	APPD. DRG./ TECH. SPEC.	TEST CERT.	3/2	2	1	CORRELATION REQD (except disc & plug)
		2. SURFACE DEFECTS	MA	VISUAL	100%	MSS-SP-55	MSS-SP-55	INSPN. REPORT	3/2	2	1	
		3. DIMENSIONS	MA	MEASUREMENT	100%	APPD. DRG./ TECH. SPEC.	APPD. DRG./ TECH. SPEC.	-DO-	3/2	-	-	
1.2	SCREEN	1.CHEMICAL PROPERTIES AND MESH SIZE	MA	CHEMICAL TEST & MEASUREMENT	ONE PER LOT	APPD. DRGS./ DATA SHEET	APPD. DRGS./ DATA SHEET	LAB REPORT/ INSP. REPORT	3/2	2	1	MESH SIZE AND MESH PERFORATION DIA. SHALL ALSO BE CHECKED.
2.0	MACHINING											
2.1	ALL COMPONENTS	1. DIMENSIONS	MA	MEASUREMENT	100%	-DO-	-DO-	INSP. REPORT	3/2	2	-	
		2. SURFACE DEFECTS	MA	VISUAL EXAM.	100%	MSS-SP-55	MSS-SP-55	-DO-	3/2	2	1	
		3. HARDNESS OF DISC	CR	HARDNESS TEST	100%	APPD. DRGS./ DATA SHEET	APPD. DRGS./ DATA SHEET	-DO-	3/2	2	1	
		4. DISC SEAT & BODY SEAT	CR	SURFACE DEFECT	100%	ASTM E165	NO DEFECTS	-DO-	3/2	2	1	
		5. CONTACT SURFACE BETWEEN BODY SEAT AND DISC	CR	BLUE MATCHING	100%	-DO-	UNIFORM METAL TO METAL CONTACT	INSP REPORT	3/2	2	1	BATCH WISE
3.0	ASSEMBLY INSPECTION	1. CLEANING & DEBURING	MA	VISUAL	100%	TECH SPEC.	TECH SPEC	LOG BOOK	3/2	2	1	
		2. DIMENSIONS	CR	MEASUREMENT	100%	-DO-	APPD. DRGS./ DATA SHEET	INSP. REPORT	3/2	2,1	1	
		3. LEAK TIGHTNESS OF BODY	CR	HYDRAULIC TEST	100%	APPD. DRG./ TECH. SPEC./	NO LEAKAGE	TC/IBR FORMAT	3/2	2,1	--	

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

		QUALITY PLAN				CUSTOMER: TSGENCO			PROJECT: 1X800 MW TSGENCO KOTHAGUDAM TPP			SPEC. NO: PE-SS-999-142-M010		
						BIDDER/VENDOR:			QP NO. PE-QP-410 -142-M002		REV.00 DT: 25.05.2016		SPEC. TITLE: STEAM TRAPS	
		SHEET 2 OF 2		SYSTEM: POWER CYCLE				ITEM: THERMODYNAMIC STEAM TRAPS			SECTION: D		VOLUME: IIB	
S.NO.	COMPONENT/ OPERATION	CHARACTERISTICS CHECKED	CATE- GORY	TYPE/METHOD OF CHECK	EXTENT OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	P	AGENCY W	V	REMARKS		

												DATA SHEET
3.0	ASSEMBLY INSPECTION CONTD.(-----)	4. FUNCTION OF TRAP	CR	PERFORMANCE TESTING IN SIMULATED CONDITIONS	10% OR MIN. 2 NOS (RANDOM)	APPD. DRG./ TECH. SPEC./ TEST PROCEDURE	APPD. DRG./ TECH. SPEC./ TEST PROCEDURE	TEST CERT.	2	2,1	1	REFER NOTE FOR TEST PROCEDURE (TO BE CARRIED OUT IF TOTAL QTY. IS MORE THAN 5)
4.0	SOCKET WELD ENDS	1.DIMENSIONS	CR	TEMPLATE	100%	APPD. DRG./ TECH. SPEC.	APPD. DRG./TECH. SPEC.	INSP. REPORT	2	2,1	-	
		2. SURFACE DEFECTS	CR	PT	100%	ASTME 165	NO SURFACE DEFECTS	-DO-	2	2	1	
5.0	PAINING	SURFACE PREPARATION AND PAINTING	MA	VISUAL	100%	APPD DRG	APPD DRG	-DO-	2	2	1	
6.0	PROVISION OF NAME PLATE WITH PURCHASER'S TRAP TAG NOS. & PACKING IN WOODEN CASES	AS PER TECH. SPEC.	MA	VISUAL	100%	APPD DRG./ TECH. SPEC.	APPD DRG./ TECH. SPEC.	COMPLIAN-CE REPORT & PHOTOGR-APHS	3/2	2	1	PO No(s). WRITTEN WITH PAINT SHALL APPEAR IN THE PHOTOGRAPHS OF WOODEN CASES.

ABBREVIATIONS

CR = CRITICAL CHARACTERISTIC P = PERFORMED BY,

W = WITNESSED BY V = VERIFIED BY


MA = MAJOR CHARACTERISTIC, 1 = PURCHASER (BHEL)/CUSTOMER

2 = VENDOR

3 = SUB VENDOR OF THE VENDOR


NOTE: SUCCESSFUL VENDOR SHALL SUBMIT FUNCTIONAL TEST PROCEDURE OF TRAP FOR APPROVAL IMMEDIATELY AFTER ORDER IS PLACED.

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

	QUALITY PLAN		CUSTOMER: TSGENCO			PROJECT 1 X 800 MW TSGENCO KOTHAGUDAM TPP			SPEC. NO : PE-SSS-999-142-M010			
			BIDDER/VENDOR : LATER			QP NO: PE-QP-410-142-M015		REV:00 DT:25.05.2016		SPEC.TITLE :STEAM TRAP		
SHEET 1 OF 3			SYSTEM : POWER CYCLE			ITEM : INVERTED BUCKET STEAM TRAPS			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


1.	MATERIALS											
1.1	BODY, COVER, VALVE, VALVE SEAT, BUCKET, VALVE LEVER, BUCKET CLIP & WEIGHT	1.PHYSICAL, CHEMICAL PROPERTIES	MA	PHYS., CHEM. PROPS	ONE /HEAT / HT BATCH	APPROVED DRAWING/ TECH. SPECIFICATION/DATA SHEET	APPROVED DRAWING/ RELEVANT MATERIAL SPECIFICATION	TEST CERTIFICATE	3/2	2	1	
		2.SURFACE DEFECTS	MA	VISUAL	100%	MSS-SP-55	MSS-SP-55	INSPN .REPORT	3	2	1	
1.2	INTEGRAL STRAINER (IF APPLICABLE)	CHEM PROPERTIES & MESH SIZE/ PERFORATION DIA.	MA	CHEM. TESTS & MEASUREMENT	1/SHEET SAMPLE PIECE	APPD. DATA SHT. &TECH SPEC.	APPD. DATA SHT. &TECH SPEC.	TEST CERT. /INSP. REPORT	3	2	1	
2.0	IN-PROCESS											
2.1	ALL COMPONENTS	1.DIMENSIONS	MA	MEASUREMENT	100%	MFG. DRAWING	MFG. DRAWING	LOG BOOK	3/2	-	-	
		2.SURFACE DEFECTS	MA	VISUAL	100%	--DO--	---DO---	-DO-	3/2	-	-	
2.2	VALVE, VALVE SEAT	1.SURFACE DEFECTS	CR	PENTRANT TEST	100%	ASTME-165	NO DEFECTS	INSPN. REPORT	3/2	-	2,1	
		2. HARDNESS	MA	TESTING	100%	APPD. DRG.	APPD. DRG.	INSPN REPORT	3/2	-	2,1	
		3. LAPPING	MA	BLUE MATCHING	100%	SEATING SURFACES SHALL HAVE UNIFORM METAL TO METAL CONTACT		INSPN REPORT	3/2	--	1	
3/0	SUB- ASSEMBLY											
3.1	VALVE & VALVE SEAT	1. LEAK TIGHTNESS	CR	HYDRO/AIR TEST	100%	APPD. DRG	APPD. DRG.	TEST. CERT.	3/2	-	2,1	
3.2	COVER	1. ALIGNMENT	MA	VISUAL	100%	--DO--	PROPER FITTING	LOG BOOK	3/2	-	-	

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

	QUALITY PLAN		CUSTOMER: TSGENCO			PROJECT 1 X 800 MW TSGENCO KOTHAGUDAM TPP			SPEC. NO : PE-SSS-999-142-M010			
			BIDDER/VENDOR : LATER			QP NO: PE-QP-410-142-M015		REV:00 DT:25.05.2016		SPEC.TITLE :STEAM TRAP		
SHEET 2 OF 3			SYSTEM : POWER CYCLE			ITEM : INVERTED BUCKET STEAM TRAPS			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	

4.0	ASSEMBLY											
4.1	COMPLETE ASSEMBLY	1.CLEANLINESS& COMPLETNESS, DIMENSIONS, SOCKET WELD ENDS, ARROW MARKING ETC.	MA	VISUAL & MEASUREMENT	100%	APPROVED DRAWING	APPROVED DRAWING	INSPN .REPORT	3/2	2,1	-	
		2.LEAK TIGHTNESS OF BODY	CR	HYDRO. TEST	100%	APPD. DRG./TECH. SPEC./DATA SHEET	NO LEAKAGE	TEST CERT	3/2	2,1	-	IBR CERTIFICATE IF REQD. TO BE FURNISHED
		3.PERFORMANCE	CR	PERFORMANCE TEST UNDER SIMULATED CONDITION	100%	TEST CHART	SMOOTH AND EFFECTIVE OPERATION OF TRAP	TEST CERT.	3/2	2,1	1*	REMARKS "A"/ AS PER MANUFACTURER TEST PROCEDURE
4.2	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 certificate	3/2	2	1	
5.0	SOCKET WELD ENDS	1.DIMENSIONS	CR	TEMPLATE	100%	APPD. DRG./TECH. SPEC.	APPD. DRG.	INSPN REPORT	2	2,1	1	
		2. SURFACE DEFECTS	CR	PT	100%	ASTM E 165	NO SURFACE DEFECTS	INSP. REPORT	2	2	1	
6.0	PAINTING	1. SURFACE PREPARATION & PAINTING	MA	VISUAL	100%	TECH. SPEC.	TECH. SPEC.	INSPN REPORT	3/2	2	1	
7.0	VERIFICATION OF ALL PREVIOUS TEST CERTIFICATES/ INSPN REPORTS	1. REVIEW OF ALL TEST CERTIFICATES/ INSPN. REPORTS OF PREVIOUS STAGES	MA	VISUAL	100%	TECH. SPEC.	TECH. SPEC.	INSPN REPORT	3/2	-	2,1	

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

	QUALITY PLAN			CUSTOMER: TSGENCO			PROJECT 1 X 800 MW TSGENCO KOTHAGUDAM TPP			SPEC. NO : PE-SSS-999-142-M010		
				BIDDER/VENDOR : LATER			QP NO: PE-QP-410-142-M015			REV:00 DT:25.05.2016		
SHEET 3 OF 3			SYSTEM : POWER CYCLE			ITEM : INVERTED BUCKET STEAM TRAPS			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	

8.0	PROVISION OF NAME PLATE & PACKING IN WOODEN BOXES	AS PER TECHNICAL SPECIFICATION	MA	VISUAL	100%	TECH. SPEC./APPD. DRG.	TECH. SPEC./APPD. DRG.	INSPN REPORT	3/2	-	-	PO No(s). WRITTEN WITH PAINT SHALL APPEAR IN THE PHOTOGRAPHS OF WOODEN CASES.
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REMARK 'A' :- THE TRAP IS FILLED WITH WATER AT A PRESSURE MUCH HIGHER THAN THE RATED PRESSURE AND THE PRESSURE IS SLOWLY RELEASED. THE PRESSURE AT WHICH THE TRAP FIRES IS CHECKED.

-A GOOD PERFORMING TRAP DRAINS OUT ONLY CONDENSATE AND RETAINS STEAM BACK IN THE TRAP.


NOTE:-

CR- MEANS CRITICAL ACTIVITY
P - PERFORMED BY
3 - SUB-VENDOR

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


V - VERIFIED BY
1 - BHEL

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

	QUALITY PLAN			CUSTOMER: TSGENCO			PROJECT: 1X800 MW TSGENCO KOTHAGUDAM TPP			SPEC. NO :PE-SSS-999-142-M010		
				BIDDER/VENDOR:			QP NO: PE-QP-410-142-M003		REV:00 DT:25.05.2016		SPEC. TITLE: STEAM TRAPS	
	SHEET 1 OF 2			SYSTEM: STEAM DRAINS			ITEM: Y-TYPE STEAM STRAINERS			SECTION: D VOLUME: II B		
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 & LOCK RING	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 FOR BODY CAP ONLY
		2. SURFACE DEFECTS	MA	VISUAL	100%	MSS-SP-55	MSS-SP-55	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	3/2	-	-	
		2.DIMENSIONS	MA	MEASUREMENT	100%	MFG DRG	MFG DRG	INSP REPORT	3/2	-	-	
3.0	ASSEMBLY CONTROL											
3.1	COMPLETE STRAINER	1. WORKMANSHIP AND FINISH	MA	VISUAL	100%	APPD.DRG	APPD.DRG	INSPN. REPORT	2	2	-	
		2. OVERALL DIMENSIONS	MA	MEASUREMENT	100%	---DO---	DO---	--DO--	2	2,1	1	
		3. LEAK TIGHTNESS	CR	HYDROTEST AT 2 TIMES THE DESIGN PRESSURE	100%	APPD.DRG/T ECH. SPEC	NO LEAKAGE	I.B.R. T.C.	2	2,1	1	

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


	QUALITY PLAN			CUSTOMER: TSGENCO			PROJECT: 1X800 MW TSGENCO KOTHAGUDAM TPP			SPEC. NO :PE-SSS-999-142-M010		
				BIDDER/VENDOR:			QP NO: PE-QP-410-142-M003		REV:00 DT:25.05.2016		SPEC. TITLE: STEAM TRAPS	
	SHEET 2 OF 2			SYSTEM: STEAM DRAINS			ITEM: Y-TYPE STEAM STRAINERS			SECTION: D VOLUME: II B		
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	

4.0	SOCKET WELDED ENDS	1. DIMENSIONS	CR	TEMPLATE	100%	APPD DRG/ TECH SPEC.	APPD DRG	INSPN REPORT	2	2,1	-	
		2. SURFACE DEFECTS	CR	PT	100%	ASTM E165	NO SURFACE DEFECTS	INSPN REPORT	2	2	1	
5.0	PAINTING	1.SURFACE PREPARATION	MA	VISUAL	100%	TECH SPEC	TECH SPEC	INSPN REPORT	3/2	2	1	
		2.PAINTING	MA	VISUAL	100%	APPD DRG/ TECH SPEC	APPD DRG/ TECH SPEC	INSPN REPORT	3/2	2	1	
6.0	VERIFICATION OF ALL PREVIOUS TEST CERTIFICATES/ INSPN REPORTS	REVIEW OF ALL TEST CERTIFICATES/ INSPN. REPORTS OF PREVIOUS STAGES	MA	VISUAL	100%	TECH SPEC	TECH SPEC	INSPN REPORT	2	2	1	
7.0	PROVISION OF NAME PLATE WITH PURCHASER'S TRAP TAG NOS. & PACKING IN WOODEN CASES	AS PER TECH. SPEC.	MA	VISUAL	100%	TECH. SPEC	TECH. SPEC	COMPLIANCE REPORT & PHOTOGRAPHS	3/2	2	1	

ABBREVIATIONS

CR = CRITICAL CHARACTERISTIC P = PERFORMED BY W = WITNESSED BY V = VERIFIED BY
MA = MAJOR CHARACTERISTIC, 1 = PURCHASER (BHEL) /CUSTOMER 2 = VENDOR 3 = SUB VENDOR OF THE VENDOR

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

	DATASHEET-C STEAM TRAPS 1 X 800 MW TSGENCO KOTHAGUDAM TPP	SPECIFICATION NO. PE-TS-410-100-M010	
		VOLUME : IIB	
		SECTION: D	
		REV. NO.: 00	DATE: 20/05/2016
		SHEET 1 OF 1	

DATA SHEET - C

Drawings/documents distribution schedule to be followed by the successful bidder:

1.0 The successful bidder shall submit the following drawings/documents within two weeks after award of contact.

1.1 Relevant drawings/leaflets for the traps showing following information.

- i) Complete cross sectional arrangement of the traps.
- ii) Binding dimensions, dismantling clearances & weights.
- iii) Bill of material incorporating all the materials of construction of various parts along with BS/ASTM/IS standards to which the materials conform to.
- iv) Special features, if any, as called for in the specific requirement
- v) Type of oil/Grease wherever required and its annual consumption.

1.2 Quality Plan duly signed & stamped with bidder's seal.

2.0 Within the stipulated time period as per vendor's drawings/ documents schedule, the following shall be submitted but not later than one month before first dispatch.

- a) Drawings of components & details as deemed necessary.
- b) Instruction manual for erection, operation and maintenance.
- c) Storage instructions.

3.0 Before dispatch of the equipment the vendor shall furnish the following.

- a) Material Test certificates.
- b) Shop test reports and certificates.

4.0 Distribution of drawings / documents for all projects:

After award of the contract the successful bidder shall furnish drawings/ documents as per following distribution schedule.

Sl. No.	Type of Document	No of Hard copies	No. of Soft copies
1	Documents submitted for Approval	2 Nos.	1 Nos.
2	Final Distribution(Approved Documents)	12 Nos.	1 Nos.
3	O&M Manuals	12 Nos.	2 Nos.

1 X 800 MW TSGENCO KOTHAGUDAM TPP

VOLUME – III

TECHNICAL SCHEDULES


FOR

STEAM TRAPS

SPECIFICATION NO. PE-TS-410-100-M010



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

	STEAM TRAPS 1 X 800 MW TSGENCO KOTHAGUDAM TPP	SPECIFICATION NO. PE-TS-410-100-M010	
		VOLUME : III	
		SECTION:	
		REV. NO.: 00	DATE: 20/05/2016
		SHEET 1 OF 1	

CONTENTS

SL.NO	TITLE
1	COMPLIANCE SHEET
2	SCHEDULE OF DEVIATIONS
3	SCHEDULE OF DECLARATIONS

	COMPLIANCE SHEET STEAM TRAPS 1 X 800 MW TSGENCO KOTHAGUDAM TPP	SPECIFICATION NO.:PE-TS-410-100-M010	
		VOLUME : III	
		SECTION:	
		REV. NO. 00	DATE : 20/05/2016
		SHEET 1 OF 2	


The bidder shall sign and return a copy of this compliance sheet along with his offer, indicating his compliance to the points specified herein:

A) Technical Details: Bidder to tick whichever is applicable.

1.	Technical requirements as per Data sheet-A & Standard Technical Specification of Vol IIB Section-D	Accepted	Not Accepted
2.	Quality Plan	Accepted	Not Accepted
3.	Specific Technical requirements of Vol IIB Section-C	Accepted	Not Accepted
4.	Documentation requirement as per Data sheet-C of Vol IIB Section-D	Accepted	Not Accepted

- B) Deviations to the technical specification are not acceptable. However, if there are any deviations due to unavoidable reasons then the same to be clearly specified in the schedule of deviation. In case of no deviations, schedule of deviations to be filled as NIL by bidder.
- C) The offered materials should be either equivalent or superior to those specified. Also for components where material is not specified, the material used shall be suitable for intended duty.
- D) QP/ test procedures shall be submitted in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/Customer approval in the event of order & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. All Inspection/ testing shall be as per approved QP. The charges for 3rd party inspection (Lloyds, TUV or equivalent) for foreign bidders shall be included in the base price of the equipment by the bidder. This 3rd party inspection agency shall be approved by BHEL and will be decided in contract stage.
- E) All drawings/data – sheets etc. to be submitted during contract shall be subject to BHEL/Customer review/ approval.
- F) GA drawings, as submitted with offer at tender stage are for reference purpose only and shall be subject to approval during contract stage.
- G) The commissioning spares (if any) are supplied on ‘As Required Basis’ & prices for same shall be quoted in the price bid format. If the bidder has not quoted for commissioning spares at tender stage and if the same are actually required during commissioning, then the same shall be supplied by bidder without any cost to BHEL.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	COMPANY SEAL

	COMPLIANCE SHEET STEAM TRAPS 1 X 800 MW TSGENCO KOTHAGUDAM TPP	SPECIFICATION NO.:PE-TS-410-100-M010	
		VOLUME : III	
		SECTION:	
		REV. NO. 00	DATE : 20/05/2016
		SHEET 2 OF 2	

- H) All drawings/documents in soft as well as hard copy shall be submitted within 2 weeks from placement of Purchase orders in the event of order. A technical representative of bidder shall come for meeting with BHEL along with revised documents within one week of receipt of BHEL comments to resolve all issues and incorporate all comments in the soft copy for further submission to customer if required. Further, on receipt of customer comments on the documents a technical representative from bidder shall come for meeting to resolve all issues and incorporate all comments in the soft copy at BHEL and resubmit the drawings /documents for CAT I approval and shall visit customer/customer's consultant if required for across the table approval of documents.
- I) Any special tools & tackles, if required, shall be in bidder's scope.
- J) Prices for recommended spares (if any) for three year operation shall be furnished separately and not to be included in the base price.
- K) The offered model design should be of bidder's proven model and they should have designed, manufactured, supplied and tested the equipment of similar type and rating in at least Two (2) projects and be in satisfactory operation for last two (2) years.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				
NAME	DESIGNATION	SIGNATURE	DATE	
				COMPANY SEAL



TITLE
*** SCHEDULE OF DEVIATIONS**
() From Technical Specifications (Volume –II B)

SPECIFICATION NO
PE-TS-410-100-M010

VOL III

SHEET..... OF.....

We the undersigned hereby certify that the above mentioned are the only deviations.

PARTICULARS OF BIDDER / AUTHORISED REPRESENTATIVE				COMPANY SEAL
NAME	DESIGNATION	SIGNATURE	DATE	

