

FRAMEWORK AGREEMENT

TECHNICAL SPECIFICATION FOR STEAM TRAPS

SPECIFICATION No. PE-TS-020-100-M010

ISSUE NO. 00

REV NO. 00



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



TECHNICAL SPECIFICATION
STEAM TRAPS
FRAMEWORK AGREEMENT

PE-TS-020-100-M010

Issue No: 01

Rev. No. 00

Date : 21.03.2025

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PROJECT INFORMATION

SL.NO	DESCRIPTION	DETAILS
1	CUSTOMER	DETAILS SHALL BE INFORMED DURING PROJECT SPECIFIC PO PLACEMENT
2	CUSTOMER'S CONSULTANT	
3	LOCATION	
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SCOPE

SCOPE OF THIS PACKAGE COVERS THE FOLLOWING:

SL.NO	PARAMETERS	REQUIREMENT
1	Supply Including Design, Engineering, Manufacturing of	
a)	Main Supply	YES
2	Inspection & Testing	YES
3	Painting	YES
4	Packing	YES
5	Transportation & Delivery To Site	YES
6	Erection & Commissioning	NO
7	Supervision of Erection & Commissioning	NO
8	Mandatory Spares	YES
9	Performance Guarantee (PG) Test	NO
10	O & M Service	NO
11	O & M Spares	NO

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	GENERAL TECHNICAL REQUIREMENT	
1.0	Requirements: a) Thermostatic steam traps with integral strainer b) Inverted bucket steam traps with external Y-type strainer/integral strainer c) Ball float steam traps with external Y-type strainer d) External Y-type strainer	
2	Bidder shall ensure that the offered traps & strainers shall comply with all applicable statutory and regulatory requirements.	
3	In the event of any conflict between the requirements of two clauses of this specification, documents or requirements of different codes and standards specified, the more stringent requirement as per the interpretation of the BHEL shall apply.	
4	Drawing/document submission shall be through web based Document Management System(DMS) of BHEL. Bidder would be provided access to the DMS for drawing/document submission. Bidder to ensure internet connectivity of min speed of 2Mbps at their end.	
5	Drawings/ documents submitted by supplier at any stage shall be complete in all respects. Any incomplete drawing submitted shall be treated as non- submission with delays attributable to supplier.	
6	Latest codes and standards shall be applicable as on date of techno-commercial bid opening.	
7	The strainer shall have a screwed blow-off connection with a removable plug.	
8	Straining area of strainer shall be kept as minimum four times of the pipe cross-sectional area.	
9	The traps should be suitable for horizontal/vertical mounting with internals easily accessible and replaceable.	
10	Arrow showing inlet should be cast on the body of traps and strainers.	
11	The trap cover shall be such that it can be removed without breaking the inlet or discharge pipe.	
12	On line cleaning of the strainer element shall also be possible.	
13	Seat diameter for Inverted Bucket trap shall be selected based on the required maximum condensate flow rate & working pressure.	

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TECHNICAL DATA - 1 (THERMOSTATIC STEAM TRAPS WITH INTEGRAL STRAINER)			
SL.NO	DESCRIPTION		DETAIL
1.0	DESIGN CODES & STANDARDS		
1.1	Codes and Standards		Supplier's own proven design
1.2	End Connections for size > = 50NB		BW as per ANSI B16.25
1.2	End Connections for size < 50NB		SW as per ANSI B16.11
2.0	MATERIAL OF CONSTRUCTION		
2.1	Body		Carbon Steel (ASTM A 105)
2.2	Cover		Carbon Steel (ASTM A 105)
2.3	Therm ostatic	Stainless Steel (AISI 304) - Bimetallic	Stainless Steel (AISI 304) - Bimetallic
2.4	Valve seat		Stainless Steel (hardness min. 250BHN)
2.5	Gasket		Spiral wound SS and Graphite (Asbestos Free)
2.6	Strainer		Stainless Steel (Perforated)
2.7	Bolts/Nuts		ASTM A193 Gr.B7/ASTM A194 Gr.2H
2.8	Internals		Stainless Steel
2.9	Name plate (for trap & strainer tag no.)		SS 316 (minimum 2 mm thick)

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TECHNICAL DATA - 2 (INVERTED BUCKET STEAM TRAPS WITH EXTERNAL Y-TYPE STRAINER)			
SL.NO	DESCRIPTION	DETAIL	
1.0	DESIGN CODES & STANDARDS		
1.1	Codes and Standards	Supplier's own proven design	
1.2	End Connections	BW as per ANSI B16.25	
2.0	MATERIAL OF CONSTRUCTION		
2.1	Body	Cast Carbon Steel as per ASTM A216 Gr.WCB	
2.2	Cap/cover	Cast Carbon Steel as per ASTM A216 Gr.WCB	
2.3	Valve	AISI 420 (furnace hardened to minimum 40 RC). Differential hardness shall be maintained between	
2.4	Valve seat	AISI 420 (furnace hardened to minimum 40 RC). Differential hardness shall be maintained between	
2.5	Lever	AISI 304	
2.6	Bucket, Bucket clip	AISI 304	
2.7	Other internals	Stainless steel	
2.8	Bolts/Nuts	ASTM A193 Gr.B7/ASTM A194 Gr.2H	
2.9	Gasket	Non asbestos type	
2.1	Name plate (for trap tag no.)	SS 316 (minimum 2 mm thick)	

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TECHNICAL DATA - 3 (BALL FLOAT STEAM TRAPS WITH EXTERNAL Y-TYPE STRAINER)			
SL.NO	DESCRIPTION	DETAIL	
1.0	DESIGN CODES & STANDARDS		
1.1	Codes and Standards	Supplier's own proven design	
1.2	End Connections	BW as per ANSI B16.25	
2.0	CONSTRUCTION FEATURES		
2.1	Body	Cast Carbon Steel as per ASTM A216 Gr.WCB	
2.2	Cover	Cast Carbon Steel as per ASTM A216 Gr.WCB	
2.3	Valve	AISI 420 (furnace hardened to 50 RC). Differential hardness shall be maintained between seats.	
2.4	Valve seat	AISI 420 (furnace hardened to 50 RC). Differential hardness shall be maintained between seats.	
2.5	Float	AISI 304	
2.6	Other Internals	AISI 304	
2.7	Bolts/Nuts	ASTM A193 Gr.B7/ASTM A194 Gr.2H	
2.8	Gasket	Non asbestos type	
2.9	Name plate (for trap tag no.)	SS 316 (minimum 2 mm thick)	

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TECHNICAL DATA - 4 (EXTERNAL Y-TYPE STRAINER)		
SL.NO	DESCRIPTION	DETAIL
1.0	DESIGN CODES & STANDARDS	
1.1	Codes and Standards	Supplier's own proven design
1.2	End Connections	BW as per ANSI B16.25
2.0	CONSTRUCTION FEATURES	
2.1	Body and Strainer cap/cover	Cast Carbon Steel as per ASTM A216 Gr.WCB
2.2	Strainer screen	AISI 420 (furnace hardened to 50 RC) Differential hardness shall be maintained between seats. 0.8 mm perforated with 20 mesh screen
2.3	Gasket	AISI 304
2.4	Name plate (for strainer tag no.)	SS 316 (minimum 2 mm thick)

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QUALITY PLAN

 MANUFACTURER/BIDDER/VENDOR NAME & ADDRESS		QUALITY PLAN										SPEC. NO.: PE-TS-020-100-M010		DATE: 21.03.2025	
CUSTOMER: LATER PROJECT: FRAMEWORK AGREEMENT		CUSTOMER: LATER										QP NO.: PE-QP-020-100-M010A		DATE: 21.03.2025	
		PROJECT: FRAMEWORK AGREEMENT										PO NO.: LATER		DATE:	
		ITEM: STEAM TRAPS (THERMOSTATIC)					SYSTEM: POWER PIPING					SECTION: II		PAGE 1 OF 2	
SL NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	Mech. / Chemical Tests	One / Heat	---	Appd. Drg./ Material Std.	Appd. Drg./ Material Std.	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS		
1	2	3	4	5	6	B/C	7	8	9	10	M	B	C	11	
1.0 RAW MATERIAL INSPECTION															
1.1	Body, Cap/Cover Thermostatic; Bimetallic Assembly, Valve, Valve Seat, Plug	Mechanical Properties & Chemical Composition	MA	Visual	100%	One / Sheet	---	MSS-SP-55	MSS-SP-55	IR	TC	IR	IR	Body & Cap/Cover should carry Heat Marks for co-relation with Mill Test Certificates	
1.2	Screen (Strainer)	Chemical Properties	MA	Chemical Test	100%	One / Sheet	---	Appd. Drg./ Rel. Std.	Appd. Drg./ Rel. Std.	TC	IR	IR	IR		
2.0 IN-PROCESS INSPECTION															
2.1	All Components (After Machining)	Dimensions	MA	Measurement	100%	100%	---	Mfg. Drg.	Mfg. Drg.	Log Book	Log Book	Log Book	Log Book		
2.2	Thermostatic Valve & Valve Seat	Surface Defects	MA	Visual	100%	100%	---	Free from Defects	Free from Defects	Log Book	Log Book	Log Book	Log Book		
2.2	Thermostatic Valve & Valve Seat	Hardness of Disc	CR	Hardness Test	100%	100%	---	Appd. Drg./ Rel. Std.	Appd. Drg./ Rel. Std.	TC	TC	TC	TC		
2.2	Thermostatic Valve & Valve Seat	Surface Defect	CR	LPT	100%	100%	---	ASTM E165	No Defects	NDT Report	NDT Report	NDT Report	NDT Report		
2.3	End Connection	Surface Finish	CR	Blue Matching	100%	100%	---	Uniform Metal to Metal Contact	No Defects	IR	IR	IR	IR		
2.3	End Connection	Surface Defects	CR	LPT	100%	100%	---	ASTM E165	No Defects	NDT Report	NDT Report	NDT Report	NDT Report		
3.0 TESTING															
3.1	Cap/Cover	Alignment	MA	Visual	100%	100%	---	Manufacturer's Std.	Proper Fitting	Log Book	Log Book	Log Book	Log Book		
3.2	Valve & Valve Seat (Thermostatic only)	Leak Tightness	CR	Pneumatic/ Hydraulic	100%	100%	---	Appd. Drg.	Appd. Drg.	TR	TR	TR	TR		
3.3	Complete Assembly	Leak Tightness of Body	CR	Hydraulic	100%	100%	Refer Note '1'	Appd. Drg.	No Leakage	TC/ IBR Cert.	TC/ IBR Cert.	TC/ IBR Cert.	TC/ IBR Cert.	# If IBR is applicable, in addition to witness, IBR certificate to be verified.	
		Function of Trap	CR	Performance Test*	100%	100%	Refer Note '1'	Manufacturer's Test procedure	Smooth & Effective Operation	TR	TR	TR	TR	*Performance testing in simulated condition as per test procedure	
		Condensate Discharge (Flow Capacity of Trap)	CR	Discharge Flow	1 per Pr. Rating & Orifice Size	1 per Pr. Rating & Orifice Size	---	Flow Capacity Charts/ Type Test Reports	Design Flow Capacity	Compliance Report/ Certificate	Compliance Report/ Certificate	Compliance Report/ Certificate	Compliance Report/ Certificate		
4.0 FINAL INSPECTION															
FOR CUSTOMER REVIEW & APPROVAL															
Doc No:															
Reviewed by:															
Approved by:															
Sign & Date															
Seal															

BHEL			
ENGINEERING		QUALITY	
Checked by:	Sign & Date	Checked by:	Sign & Date
Lakhan Pal	Lakhan Pal	Ashish Panigrahi	Ashish Panigrahi
Reviewed by:	Reviewed by:	Reviewed by:	Reviewed by:
Prince Malik	Prince Malik	Harish Kumar	Harish Kumar

BIDDER/SUPPLIER	
Sign & Date	
Seal	

 MANUFACTURER/BIDDER/VENDOR NAME & ADDRESS		QUALITY PLAN										SPEC. NO.: PE-TS-020-100-M010		DATE: 21.03.2025	
		CUSTOMER: LATER										QP NO.: PE-QP-020-100-M010A		DATE: 21.03.2025	
		PROJECT: FRAMEWORK AGREEMENT										PO NO.: LATER		DATE:	
		ITEM: STEAM TRAPS (THERMOSTATIC)					SYSTEM: POWER PIPING					SECTION: II		PAGE 2 OF 2	
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	B/C	7	8	9	D	M	B	C	11	
4.1	Complete Trap	End Connection & Overall Dimensions, Fixing of Nameplate with Tag Nos.	CR	Measurement, Visual	100%	Refer Note '1'	Appd. Drg.	Appd. Drg.	IR	✓	P	W	-		
4.2	Painting	Surface Preparation & Paint Thickness (DFT)	MA	Visual, Measurement	100%	---	Appd. Drg.	Appd. Drg.	IR	✓	P	V	-		
4.3	Packing	Packing Soundness	MA	Visual	100%	---	Manufacturer's Std. / Appd. Packing Procedure	Manufacturer's Std. / Appd. Packing Procedure	IR	✓	P	V	-		

NOTES:

- 10% or min. 2 nos. at random, whichever is higher, by BHEL/Customer for each type, size & rating.
- Welding and Impregnation of casting are not permitted.
- The latest revision/year of issue of all the standard indicated in the QP shall be referred.

Legends:

D: Documentation; Records identified with "Tick"(✓), shall be essentially included by supplier in QA Documentation
M: Supplier/ Manufacturer/ Sub-Supplier
B: Main Supplier/BHEL/ Third Party Inspection agency
C: Customer
TPIA: Third Party Inspection Agency
DFT: Dry Film Thickness

P: Perform
W: Witness
V: Verification
IR: Inspection Report
ADS: Actuator Data Sheet

HT: Heat Treatment
LPT: Liquid Penetrant Test
UT: Ultrasonic Test
RT: Radiography Test
MPI: Magnetic Particle Inspection

BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL			
ENGINEERING		QUALITY	
Checked by:	Checked by:	Sign & Date	Name
Lakhan Pal	Ashish Panigrahi		Ashish Panigrahi
Reviewed by:	Reviewed by:		Harish Kumar
Prince Malik	Prince Malik		

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

	MANUFACTURER/BIDDER/VENDOR NAME & ADDRESS				QUALITY PLAN						SPEC. NO.: PE-TS-020-100-M010			DATE: 21.03.2025		
	PROJECT: FRAMEWORK AGREEMENT				CUSTOMER: LATER						QP NO.: PE-QP-020-100-M010B			DATE: 21.03.2025		
					ITEM: STEAM TRAPS (INVERTED BUCKET) & Y-TYPE STEAM STRAINER						PO NO.: LATER			DATE:		
					SYSTEM: POWER PIPING						SECTION: II			PAGE 1 OF 2		
SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	Mech., Chemical Tests	One / Heat	---	Appd. Drg./ Material Std.	MTC	✓	V	V	-	Body & Cap/Cover should carry Heat Marks for co-relation with Mill Test Certificates		
1	2	3	4	5	6	M	B/C	7	8	9	D	M	B	C	11	

1.0 RAW MATERIAL INSPECTION															
1.1	Body, Cap/Cover Applicable for Traps only: Valve, Valve Seat, Bucket, Valve Lever, Bucket Clip & Weight	Mechanical Properties & Chemical Composition	MA	Mech., Chemical Tests	One / Heat	---	Appd. Drg./ Material Std.	MTC	✓	V	V	-	Body & Cap/Cover should carry Heat Marks for co-relation with Mill Test Certificates		
		Casting Defects	MA	Visual	100%	---	MSS-SP-55	IR	✓	P	V	-			
1.2		Chemical Properties	MA	Chemical Test	One / Sheet	---	Appd. Drg./ Rel. Std.	TC	✓	P	V	-			
		Mesh Size / Perforation Dia.	MA	Measurement		---	Appd. Drg.	IR	✓	P	V	-			
2.0 IN-PROCESS INSPECTION															
2.1	All Components (After Machining)	Dimensions	MA	Measurement	100%	---	Mfg. Drg.	Log Book	-	P	V	-			
		Surface Defects	MA	Visual	100%	---	-	Log Book	-	P	V	-			
		Hardness	CR	Hardness Test	100%	---	Appd. Drg./ Rel. Std.	TC	✓	P	V	-			
2.2	Valve, Valve Seat of Traps	Surface Defect	CR	LPT	100%	---	ASTM E165	NDT Report	✓	P	V	-			
		Surface Finish	CR	Blue Matching	100%	---	Uniform Metal to Metal Contact	IR	✓	P	V	-			
		Surface Defects	CR	LPT	100%	---	ASTM E165	NDT Report	✓	P	V	-			
2.3	End Connection														

3.0 TESTING															
3.1	Cap/Cover	Alignment	MA	Visual	100%	---	Manufacturer's Std.	Log Book	-	P	V	-	# If IBR is applicable, in addition to witness, IBR certificate to be verified.		
3.2	Valve, Valve Seat of Traps	Leak Tightness	CR	Pneumatic/ Hydraulic	100%	---	Appd. Drg.	TR	✓	P	V	-			
	Complete Assembly	Leak Tightness of Body (Trap, Strainer)	CR	Hydraulic	100%	Refer Note '1'	Appd. Drg.	TC/ IBR Cert.	✓	P	W#	-			
		Function of Trap	CR	Performance Test*	100%	Refer Note '1'	Manufacturer's Test procedure	TR	✓	P	W	-	*Performance testing in simulated condition as per test procedure		
		Condensate Discharge (Flow Capacity of Trap)	CR	Discharge Flow	1 per Pr. Rating & Orifice Size	---	Flow Capacity Charts/ Type Test Reports	Compliance Report/ Certificate	✓	P	V	-			

BIDDER/SUPPLIER				BHEL				FOR CUSTOMER REVIEW & APPROVAL							
Sign & Date				ENGINEERING		QUALITY		Doc No:		Sign & Date		Name		Seal	
Seal		Checked by:	Lakhan Pal	Checked by:	Lakhan Pal	Checked by:	Ashish Panigrahi	Reviewed by:		Reviewed by:					
		Reviewed by:	Prince Malik	Reviewed by:	Prince Malik	Reviewed by:	HARISH KUMAR	Approved by:							

	MANUFACTURER/BIDDER/VENDOR NAME & ADDRESS				QUALITY PLAN					SPEC. NO.: PE-TS-020-100-M010		DATE: 21.03.2025	
					CUSTOMER: LATER					QP NO.: PE-QP-020-100-M010B		DATE: 21.03.2025	
					PROJECT: FRAMEWORK AGREEMENT					PO NO.: LATER		DATE:	
					ITEM: STEAM TRAPS (INVERTED BUCKET) & Y-TYPE STEAM STRAINER		SYSTEM: POWER PIPING			SECTION: II		PAGE 2 OF 2	
SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	MEASUREMENT, Visual	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY	REMARKS		
1	2	3	4	5	6	7	8	9	10	11			
4.0 FINAL INSPECTION													
4.1	Complete Trap & Strainer	End Connection & Overall Dimensions, Fixing of Nameplate with Tag Nos.	CR	Measurement, Visual	100%	Refer Note 'I'	Appd. Drg.	Appd. Drg.	IR	✓	P	W	-
4.2	Painting	Surface Preparation & Paint Thickness (DFT)	MA	Visual, Measurement	100%	---	Appd. Drg.	Appd. Drg.	IR	✓	P	V	-
4.3	Packing	Packing Soundness	MA	Visual	100%	---	Manufacturer's Std. / Appd. Packing Procedure	Manufacturer's Std. / Appd. Packing Procedure	IR	✓	P	V	-

NOTES:

- 1. 10% or min. 2 nos. at random, whichever is higher, by BHEL/ Customer for each type, size & rating.
- 2. Welding and Impregnation of casting are not permitted.
- 3. The latest revision/year of issue of all the standard indicated in the QP shall be referred.

Legends:

- D:** Documentation; Records identified with "Tick"(✓), shall be essentially included by supplier in QA Documentation

M: Supplier/ Manufacturer/ Sub-Supplier

B: Main Supplier/BHEL/ Third Party Inspection agency

C: Customer

TPIA: Third Party Inspection Agency

DFT: Dry Film Thickness
- P:** Perform

W: Witness

V: Verification

IR: Inspection Report

ADS: Actuator Data Sheet
- HT:** Heat Treatment

LPT: Liquid Penetrant Test

UT: Ultrasonic Test

RT: Radiography Test

MPI: Magnetic Particle Inspection

BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL			
ENGINEERING		QUALITY	
Checked by:	Checked by:	Sign & Date	Name
Lakhan Pal	Ashish Panigrahi		Ashish Panigrahi
Reviewed by:	Reviewed by:		Harish Kumar
Prince Malik	Harish Kumar		

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

	MANUFACTURER/BIDDER/VENDOR NAME & ADDRESS				QUALITY PLAN					SPEC. NO.: PE-TS-020-100-M010			DATE: 21.03.2025		
	PROJECT: FRAMEWORK AGREEMENT				CUSTOMER: LATER					QP NO.: PE-QP-020-100-M010C			DATE: 21.03.2025		
					ITEM: BALL FLOAT STEAM TRAPS WITH THERMOSTATIC AIR VENT & Y-TYPE STEAM STRAINER					PO NO.: LATER			DATE:		
					SYSTEM: POWER PIPING					SECTION: II			PAGE 1 OF 2		
	SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	Mech., Chemical Tests	MA	One / Heat	---	Appd. Drg./ Material Std.	MTC	✓	V	V	-
1	2	3	4	5	6	M	B/C	7	8	9	D	M	B	C	11

1.0 RAW MATERIAL INSPECTION															
1.1	Body, Cap/Cover	Mechanical Properties & Chemical Composition	MA	Mech., Chemical Tests	One / Heat	---	Appd. Drg./ Material Std.	MTC	✓	V	V	-	Body & Cap/Cover should carry Heat Marks for co-relation with Mill Test Certificates		
1.2	Ball float with Lever, valve, Valve seat, Pivot Frame, Support Frame, Pivot Pin, valve seat Gasket	Heat treatment	MA	Review of HT Chart	100%	---	Appd. Drg./ Rel. Std.	TC	✓	V	V	-			
		Surface Defects	MA	Visual	100%	---	MSS-SP-55	IR	✓	P	V	-			
		Chemical Properties	MA	Chemical Test	One / Heat	---	Appd. Drg./ Rel. Std.	TC	✓	P	V	-			
1.3	Screen (Y-Type Strainer)	Surface Defects	MA	Visual	100%	---	MSS-SP-55	IR	✓	P	V	-			
		Chemical Properties	MA	Chemical Test	One / Sheet	---	Appd. Drg./ Rel. Std.	TC	✓	P	V	-			
		Mesh Size / Perforation Dia.	MA	Measurement	---	---	Appd. Drg.	IR	✓	P	V	-			
1.4	Thermostatic air vent	Materials	MA	Review of all TC/MTC	100%	---	Mfg. Drg./ Mfg Spec	IR	✓	P	V	-			
1.5	Fasteners	Mechanical Properties & Chemical Composition	MA	Mech., Chemical Tests	One / Type	---	Appd. Drg./ Rel. Std.	Appd. Drg.	✓	P	V	-			

2.0 IN-PROCESS INSPECTION															
2.1	All Components (After Machining)	Dimensions	MA	Measurement	100%	---	Mfg. Drg.	Mfg. Drg.	-	P	V	-			
2.2	Valve, Valve Seat	Surface Defects	MA	Visual	100%	---	-	Free from Defects	-	P	V	-			
		Surface Defect	CR	LPT	100%	---	ASTM E165	No Defects	✓	P	V	-			
		Lapping /Surface Finish	MA	Blue Matching	100%	---	Uniform Metal to Metal Contact	Report IR	✓	P	V	-			

3.0 TESTING															
3.1	Cap/Cover	Alignment	MA	Visual	100%	---	Manufacturer's Std.	Proper Fitting	-	P	V	-			
3.2	Valve, Valve Seat of Traps	Leak Tightness	CR	Pneumatic/ Hydraulic	100%	---	Appd. Drg	Appd. Drg.	✓	P	V	-			

BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL			
ENGINEERING		QUALITY	
Checked by:	Prince Lakhani	Checked by:	Ashish Panigrahi
Reviewed by:	Prince Malik	Reviewed by:	Harish Kumar

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

 MANUFACTURER/BIDDER/VENDOR NAME & ADDRESS		QUALITY PLAN										SPEC. NO.: PE-TS-020-100-M010		DATE: 21.03.2025		
		CUSTOMER: LATER										QP NO.: PE-QP-020-100-M010C		DATE: 21.03.2025		
		PROJECT: FRAMEWORK AGREEMENT										PO NO.: LATER		DATE:		
		ITEM: BALL FLOAT STEAM TRAPS WITH THERMOSTATIC AIR VENT & Y-TYPE STEAM STRAINER					SYSTEM: POWER PIPING					SECTION: II		PAGE 2 OF 2		
SL NO.	COMPONENT & OPERATIONS	CHARACTERIST-ICS	CLASS	TYPE OF CHECK	5	QUANTUM OF CHECK	6	REFERENCE DOCUMENT	7	ACCEPTANCE NORMS	8	FORMAT OF RECORD	9	AGENCY	10	REMARKS
1	2	3	4				M	B/C								
3.2	Complete Assembly	Leak Tightness of Body (Trap, Strainer)	CR	Hydraulic		100%	Refer Note '1'	Appd. Drg.		No Leakage		TC/ IBR Cert.	✓	P	W#	-
		Function of Trap	CR	Performance Test*		100%	Refer Note '1'	Manufacturer's Test procedure		Smooth & Effective Operation		TR	✓	P	W	-
		Condensate Discharge (Flow Capacity of Trap)	CR	Discharge Flow		1 per Pr. Rating & Orifice Size	---	Flow Capacity Charts/ Type Test Reports		Design Flow Capacity		Compliance Report/ Certificate	✓	P	V	-
4.0 FINAL INSPECTION																
4.1	Complete Trap & Strainer	End Connection & Overall Dimensions, Fixing of Nameplate with Tag Nos.	CR	Measurement, Visual		100%	Refer Note '1'	Appd. Drg.		Appd. Drg.		IR	✓	P	W	-
4.2	Painting	Surface Preparation, Paint Thickness (DFT) & Paint Shade	MA	Visual, Measurement		100%	---	Appd. Drg.		Appd. Drg.		IR	✓	P	V	-
4.3	Packing	Packing Soundness	MA	Visual		100%	---	Manufacturer's Std. / Appd. Packing Procedure		Manufacturer's Std. / Appd. Packing Procedure		IR	✓	P	V	-

- NOTES:**
- 10% or min. 2 nos. at random, whichever is higher, by BHEL/Customer for each type, size & rating.
 - Welding and Impregnation of casting are not permitted.
 - The latest revision/year of issue of all the standard indicated in the QP shall be referred.

Legends:

M: Supplier/ Manufacturer/ Sub-Supplier

B: Main Supplier/BHEL/ Third Party Inspection agency

C: Customer

TPIA: Third Party Inspection Agency

DFT: Dry Film Thickness

P: Perform

W: Witness

V: Verification

IR: Inspection Report

ADS: Actuator Data Sheet

HT: Heat Treatment

LPT: Liquid Penetrant Test

UT: Ultrasonic Test

RT: Radiography Test

MPI: Magnetic Particle Inspection

BIDDER/SUPPLIER	
Sign & Date	
Seal	

BHEL			
ENGINEERING		QUALITY	
Checked by:	Sign & Date	Checked by:	Sign & Date
Lakhan Pal	Lakhan Pal	Ashish Panigrahi	Ashish Panigrahi
Reviewed by:	Prince Malik	Reviewed by:	Harish Kumar

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

	TECHNICAL SPECIFICATION STEAM TRAPS FRAMEWORK AGREEMENT	PE-TS-020-100-M010
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		Rev. No. 00
		Date : 21.03.2025

PAINING REQUIREMENT

Package	Condition	Surface Preparation	Primer Coat	No. of Coats	DFT (in Microns)	Intermediate Coat (in Microns)	No. of Coats	DFT (in Microns)	Final Coat	No. of Coats	DFT (in Microns)	Total DFT
Steam Traps	Plain Area	Surface preparation shall be done by Solvent Cleaning (SP1), Application of rust converter (Ruskil or equivalent grade) (SP2) and Power Tool Cleaning (SP3).	Heat Resistance Aluminium Paint 2 to IS:13183 Gr.-I		40	-	-	-	Paint shade Aluminium	2	40	80

Notes

1	For Stainless Steel traps & strainers: No painting needs to be done.
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PACKING REQUIREMENT

Sl.no	DESCRIPTION
1	Type of Packing:
1.1	The traps & strainers shall be dispatched in total assembled form.
1.2	Body ends shall be suitably sealed to protect them against damage during transit and storage.
1.3	Traps & strainers with butt welding & socket welding ends shall be protected by means of polythene caps/ rubber and protectors to prevent damage of ends & also to avoid foreign material entering the valve while shipment & storage.
1.4	All the traps & strainers shall be packed suitably in wooden box in order to avoid damage during transit and also during storage at site.
3	Cushioning material and moisture absorber:
3.1	Suitable cushioning shall be provided by rubberized coir/ thermocol / expanded soft polyethylene foam.
3.2	Adequate quantity of packed desiccant shall be suitably placed inside the packing box.
4	Packing slip & holder:
4.1	Packing slip kept in polyethylene bag shall be placed inside the wooden box at appropriate place.
4.2	One copy of packing slip wrapped in polyethylene bag covered in galvanized iron tin sheet/ aluminium packing slip holder shall be fixed on the external surface of the packing box.

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BILL OF QUANTITY

Bill of Quantity Steam Traps For Framework Agreement Specification No.: PE-TS-026-100-M010 Issue: 00 Rev: 00 Date: 21.03.2025																																	
Sl. No.	Type	Connecting Pipe Size (NB)	Pipe Thickness (MM)	Service Description	Service	Design Pressure (kg/cm2)	Design Temp (deg C)	Operating Pressure at Inlet of Trap (kg/cm2) (A)	Operating Pressure at Max. Condensate Rate (kg/hr)	Factor of Safety	Body	Materials	End Conn	BR Required	ZX800MW Lara	ZX800MW Singrauli	ZX800MW Koderna	ZX800MW APL Mahan Ph-II	ZX800MW APL Raigarh	ZX800MW APL Mirzapur	ZX800MW APL Kawai Ph-II	ZX800MW APL Kawai Ph-III	ZX800MW APL Mahan Ph-III	1X800MW YamunaNagar	1X800MW Sipat	1X800MW Durgam-Chilli	2X800MW Talbira	2X800MW Talcher	Talanganra	Main	Mandatory	Total Quantity	
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16																	
1	THERMOSTATIC STEAM TRAP-LP	33.4	4.55	POWER CYCLE	INTERMITTENT	20		16	0.22 (VAC)/ 0.1(VAC)	10			CS/SS	SS	SW	YES	105	105	61	61	61	61	61	61	61	70	67	90	50	105	1050	135	1185
2	THERMOSTATIC STEAM TRAP-HP	33.4	4.55	POWER CYCLE	INTERMITTENT	76.2/ 73.1/ 76.7	387/ 380/ 392	66.95/ 30/ 39.76	0.22 (VAC)/ 0.1(VAC)	10			CS/SS/ EQUIVALENT OR HIGHER	SS	SW	YES	24	24	2	2	2	2	2	2	2	2	12	16	24	36	48	130	178
3	INVERTED BUCKET TRAP	88.9	5.49	DRAIN LINE	CONTINUOUS	3.5/ VAC	105/ 110/ 115	1.03 (VAC)	0.22 (VAC)/ 0.1(VAC)	800/ 900			CS/SS	SS	BW	NO	6	6	6	2	2	2	2	2	2	1	3	5	6	9	32	26	58
4	EXTERNAL Y-TYPE STRAINER	88.9	5.49	DRAIN LINE	CONTINUOUS	3.5/ VAC	105/ 110/ 115	1.03 (VAC)	0.22 (VAC)/ 0.1(VAC)	800/ 900			CS/SS	SS	BW	NO	6	6	6	2	2	2	2	2	2	1	3	5	6	9	32	26	58
5	BALL FLOAT STEAM TRAP	114.3	6.02	SEAL WATER OUTLET FROM BFP	CONTINUOUS	3.5/ VAC	150	2.5	0.1 (VAC)	24000			CS/SS	SS	BW	NO	8	8	8	4	4	4	4	4	4	2	0	0	0	12	52	18	70
6	EXTERNAL Y-TYPE STRAINER	114.3	6.02	SEAL WATER OUTLET FROM BFP	CONTINUOUS	3.5/ VAC	150	2.5	0.1 (VAC)	24000			CS/SS	SS	BW	NO	8	8	8	4	4	4	4	4	4	2	0	0	0	12	52	18	70
NOTES:																157	157	157	75	75	75	75	75	75	78	85	116	86	183	1266	353	1619	
1. For item no. 1 & 2 Bidder to supply Suitable matching pieces to match with connecting pipe size. For item no. 3, 4, 5 & 6, strainer outlet & trap outlet shall be matched through expander/reducer. Bidder to consider all reducer/expander as required in the strainer in their scope. 2. For item no. 3, 4, 5 & 6, Bidder to supply Suitable matching pieces to match with connecting pipe size. For item no. 3, 4, 5 & 6, strainer outlet & trap outlet shall be matched through expander/reducer. Bidder to consider all reducer/expander as required in the strainer in their scope. 3. Socket Welding (SW) will be as per ASME-B16.1. But Welding will be as per ANSI B 16.25. 4. CS Carbon Steel, SS-STAINLESS STEEL VAC- Vacuum, ATM- Atmospheric																																	

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				Issue No. 01
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DOCUMENTATION REQUIREMENT				
DRAWINGS & DOCUMENTS TO BE SUBMITTED BY ALL THE BIDDERS ALONG WITH THE BID				
	SI. No.	DOCUMENT TITLE		
	1	PQR CREDENTIALS		
	2	COMPLIANCE SHEET (DULY SIGNED & STAMPED)		
DRAWINGS & DOCUMENTS TO BE SUBMITTED BY SUCCESSFUL BIDDER AFTER AWARD OF CONTRACT FOR FRAMEWORK AGREEMENT ALONG WITH SUBMISSION SCHEDULE (The below drawings/ documents will be considered as reference documents for different projects PO which will be placed later)				
	SI. No.	DOCUMENT TITLE	SUBMISSION SCHEDULE	
	1	GA DRAWING	Within 15 days from PO	
	2	QUALITY PLAN DULY SIGNED & STAMPED	Within 15 days from PO	
BHEL/Customer comments/approval and SUPPLIER Re-submission schedule after project specific purchase order placement				
	Supplier Submission of project specific GA drawing, Quality plan		Within 7 days from project specfic PO	
	BHEL/Customer comments/approval		Within 18 days of SUPPLIER submission.	
	SUPPLIER Re-submission		Within 5 days of BHEL / Customer comments.	
DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT AGAINST PROJECT SPECIFIC PURCHASE ORDER (To be furnished before final project specific billing)				
	SI. No.	DOCUMENT TITLE		
	1	APPROVED DOCUMENTS		
	2	O&M MANUAL		



TECHNICAL SPECIFICATION
STEAM TRAPS
FRAMEWORK AGREEMENT

PE-TS-020-100-M010

Issue No. 01

Rev. No. 00

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COMPLIANCE CERTIFICATE

1	It is hereby confirmed that the technical specification (sheet 1 to) has been read and understood. We confirm compliance to the tender specification including any prebid clarification and amendments issued prior to techno-commercial bid opening without any deviation.
2	It is hereby declared that any technical submittals which was not specifically asked by BHEL in NIT shall not to be considered as part of bid and shall not be evaluated by BHEL.

Signature of authorised Representative

Name and Designation :

Name & Address of the Bidder

Date

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PRE QUALIFICATION REQUIREMENT (TECHNICAL)



PRE - QUALIFYING REQUIREMENTS

DOCUMENT No: PE-TS-020-000-M056

REVISION No:00 DATE:21.03.2025

SHEET: 1 of 3

Project: FRAMEWORK AGREEMENT

Package: Steam Traps

CRITERIA FOR EVALUATION (TECHNICAL):

1. Technical Pre-Qualifying Requirements:

1.1 The bidder should have designed, in-house manufactured, tested, inspected and supplied traps & strainers (as mentioned below) for use in a power plant or for similar application.

CS/SS/AS thermostatic steam traps of min. 15NB size (with integral strainer);

CS/SS/AS Inverted bucket / Ball float steam traps of min. 20NB size (with external 'Y' type strainer)

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 through supporting documents:

- (i) One (1) Performance certificate along with correlated purchase order from End-user having the item(s) performing successfully for atleast one (1) year from date of commissioning. The one-year period should have been completed prior to the date of bid submission as defined by BHEL-PEM in NIT.

Documents Required:

Performance certificate from End-user (duly signed & dated) specifying that the product is performing successfully for one (1) year from date of commissioning (also to be mentioned in certificate) along with correlated purchase order.

Or

- (ii) One (1) repeat contract from a purchaser (i.e. 2 Nos of Purchase orders from one 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 date of placement of first contract. The contracts should have been placed prior to the date of bid submission as defined by BHEL-PEM in NIT.

Documents Required:

Purchase order(s) and supply details like Material dispatch clearance certificate (MDCC)/ Material receipt certificate (MRC)/Lorry receipt (LR)/ Invoice of first Purchase order.



PRE - QUALIFYING REQUIREMENTS

DOCUMENT No: PE-TS-020-000-M056

REVISION No:00 DATE:21.03.2025

SHEET: 2 of 3

Note:

All the documents as mentioned at CLAUSE 1.2(i) & (ii) shall be within 15 years from date of bid submission as defined by BHEL-PEM in NIT.

1.3 In addition to above, bidder should have the following facilities for all type/size/material of traps & strainers meeting BHEL requirement as mentioned in Data sheet-A of technical specification:

- a) Capability of designing and manufacturing of the item(s).

Documents required:

Purchase order (s) / Certificate indicating capacity and details of manufacturing facilities

- 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.

Documents required:

Details of testing facilities.

1.4 To establish business continuity, bidder is required to submit at least One (1) Purchase orders for any type of traps (thermodynamic/thermostatic/inverted bucket/ball float) and 'Y' type- strainer in last 3 (three) years prior to the date of bid submission defined by BHEL-PEM.

2. 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:

- a) If bidder happens to be an Indian subsidiary of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR.
- b) If bidder happens to be the Joint Venture Company, then the credentials of any of JV partners can be also considered for meeting PQR.
- c) 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.



PRE - QUALIFYING REQUIREMENTS

DOCUMENT No: PE-TS-020-000-M056

REVISION No:00 DATE:21.03.2025

SHEET: 3 of 3

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

2.6 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.

2.7 Attached annexure (**Annexure-1: SUB-VENDOR QUESTIONNAIRE**) to be filled by the bidders (i.e. Sub-vendors of Main Contactor) on quality & general terms. Requisite Documents (like factory registration certificate, R&D set-up details etc.) asked in the Annexure-1, shall also be attached as Annexure-F2.1 to Annexure F2.17 along with the filled response in the Annexure-1.

2.8 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.