






**Index**  
**For tender documents (Technical)**  
**Tender no B/4011/2014/5077V1**

<b>Content</b>	<b>Page no. of pdf file</b>
<b>Specification ST45008 Rev. 01</b>	<b>Pg. 2 to Pg. 7</b>
<b>QAP NO.: QA/BE/QP/326 rev 03</b>	<b>Pg. 8 to Pg. 10</b>

SIGN & DATE 27/10/10		उत्पाद मानक  <b>PRODUCT STANDARD</b>	<b>ST45008</b>  पृष्ठ 6 का 1 Page 1 of 6				
SUPERSEDES INVENTORY NO.	Based on standard : ASME PTC 6-2004						
इसकी पूरी सेवा के अधिकारिक द्वारा	<b>TECHNICAL SPECIFICATION FOR CALIBRATED FLOW NOZZLES</b>						
<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	<b>1.0 GENERAL</b> This specification calls for supply of calibrated long radius, low beta ratio throat tap flow nozzle assembly(ies) for the accurate determination of primary flow in the Performance Guaranteed test on the TG set of the project indicated in sheet-5.						
सार्वजनिक एवं गोपनीय इस दस्तावेज में कोई भी जानकारी को गोपनीय रूप में नहीं माना जायेगा, जो कि इस दस्तावेज के अंतर्गत है।	<b>2.0 SCOPE</b> Supply of calibrated flow nozzle assembly(ies) comprising primary flow element, flow straightener(s), end flanges, gaskets (including one extra set for future use), requisite zinc plated bolts, nuts, upstream and downstream pipe sections and suitable root valves for tap sets. Each of the four pressure tap sets shall be 90° apart and calibrated as per ASME PTC 6-2004.						
INVENTORY NO. P-6404	<b>3.0 TECHNICAL REQUIREMENTS</b> Long Radius, low beta ratio throat tap flow nozzle assembly is to be designed as per para 4.8.4 to 4.8.11 of "ASME PTC 6-2004", "ASME PTC 19.5 -Flow Measurement" alongwith data in Sheet No. 4. The overall dimensions of the flow meter(s) should match with those indicated in sketch in sheet No.5. Major technical requirements are reproduced as follows:						
	a) The flow nozzle(s) shall be designed, manufactured and calibrated as per ASME PTC 6-2004.						
	b) The supplier should calibrate the nozzle(s) preferably by Weigh tank method with Reynolds number, Water Temperature & other flow conditions as close to test conditions as possible. When it is not possible to calibrate at the test Reynolds number, the calibration Reynolds number should be obtained in accordance with para 4.8.16 of ASME PTC 6-2004. While calibrating, the transition region from 1.0 million to 4.0 million should be established .It is recommended that the value of the coefficient be established at the highest Reynolds No. possible, to minimize the effects of the transition region (in accordance with para 4.8.13 of ASME PTC 6-2004). It is recommended that nozzles be sized to produce throat Reynolds Nos. beyond this range if possible to avoid effects of the Transition region as described in para 4.8.17, pg.37 of ASME PTC 6-2004.						
	c) The supplier should get the flow nozzle calibrated only at a recognized facility having international repute. Calibration should be conducted on all the pairs of taps & preferably consist of at least 20 acceptable points over a wide range of Reynolds Nos. For each set of selected taps, the calibration curve shall be within 0.25% of the reference curve and shall have the same slope. The reference curve is given in fig. 4.10 & table 4.2 on pg. 37 of ASME PTC 6-2004. The calibration of the flow nozzle shall comply with the conditions listed in clause 4-8.14 and 4-8.15 on pg. 36 & 37 of ASME PTC 6-2004.						
INVENTORY NO. P-6404							
	TSX	BINARI CHAUDHARY	अनुवादक TRANSLATED BY	-	-	-	-
	MEMBER-PSC	VIRENDRA KUMAR	निर्माणकर्ता DRAWN BY	-	-	-	-
	QAX	S.K. CHAUHAN	जांचकर्ता WORKED BY	PREETAM SINGH	-	-	-
	सहमत विभाग AGREED DEPT.	नाम NAME	दिनांक एवं हस्ताक्षर DATE & SIGNATURE	पर्यवेक्षणकर्ता CHECKED BY	PRABHAT SINGH	-	-
			स्वीकृति APPROVED :	S. BHATTACHARYA DGM (STE)		OP No.	2.83
	REV.NO.	09/05/11	निर्माण PREPARED :	STE	जारी ISSUED :	STE -TC	दिनांक DATE :
							07.10.2010

	उत्पाद मानक <b>PRODUCT STANDARD</b>		<b>ST45008</b>		
			पृष्ठ 6 का 2 Page 2 of 6		
SUPERVISOR INSPECTION	DESIGNER	CHECKER	<p>d) The flow nozzle(s) shall be made from corrosion resistant material with known thermal expansion coefficient. Its surface should be hydraulically smooth and shall be free from all burrs, scratches, imperfections or ripples. For additional requirements on the design and manufacture of the nozzle(s) and its pressure taps, refer paras. 5.1, 5.2, 5.3, 5.4 of ASME PTC 19.5-2004 Flow Measurement &amp; paras 4.8.6 &amp; 4.8.7 of ASME PTC 6-2004.</p>		
			<p>e) The flow straightener shall be of Perforated or tubed plate design with non uniform hole distribution (<i>also called Gallagher Straightener</i>) as shown in Fig 4.5 &amp; described in Para 4.8.4 &amp; Table 4.1 on Pg. 30 &amp; 32 of ASME PTC 6-2004.</p>		
COPYRIGHT AND CONSENT, IAI <small>I hereby certify that the design is original and the same has not been previously published or used in any form without the written consent of the manufacturer.</small>			<p>f) The bidder should confirm that in case the calibration curves are not within the limits prescribed in ASME PTC 6, they will manufacture fresh flow nozzle(s) and calibrate it to achieve the calibration regimes of ASME PTC 6 and supply the new piece(s) without any price / delivery implications.</p>		
			<p>g) The total length of the flow assembly including flow straighteners; upstream &amp; downstream machined pipe length; flanges of size Nb450 CL400 RF Weld neck type as per ANSI B16.5 etc. is to be exactly as indicated in the sketch in sheet No.6 of this document. For ease of transportation and installation, it is proposed to provide an interlocking flange joint near the center of assembly. This joint to be opened for shipping after calibration.</p>		
APPROVED BY S.A. / B.1			<p>h) The external surfaces of the assembly shall be suitably painted to avoid rusting due to sea transportation (if applicable) and storage. <b>The end faces shall be provided with suitable covers and conservation shall be done by filling Nitrogen and blanking the nozzle at the ends to avoid rusting/damage of the pipe internals. The nozzle shall remain filled with nitrogen until installation for Performance Test.</b> Open ends of upstream and downstream taps should be sealed with covers to prevent damages to thread. The nozzles shall be packed in suitable seaworthy crates to avoid damage during transport and temporary storage before use at site.</p>		
			<p>i) Serial No. of the nozzle, tag <b>FP01</b> should be clearly indicated on a name plate permanently affixed to the assembly. Tap set identification mark(s) shall also be punched as well as painted on the assembly so that they can be easily identified by the customer at site. <b>These should also be clearly indicated in the assembly drawing.</b></p>		
INVESTIGATOR P. 6401			<p>j) The nozzle should be placed in box with name plate facing upward. The box should have arrow mark indicating upper direction and should atleast carry name of supplier, S.No. Of nozzle, name of the project, package size, gross weight and net weight.</p>		
REV. NO. 01			जांचकर्ता WORKED BY <b>PREETAM SINGH</b>	 09/05/11	
			परीक्षणकर्ता CHECKED BY <b>PRABHAT SINGH</b>	 09/05/11	

दिनांक व हस्ताक्षर SIGN & DATE		उत्पाद मानक  <b>PRODUCT STANDARD</b>	<b>ST45008</b>  पृष्ठ 6 का 3 Page 3 of 6
SUPERSTRESS INVENTORY NO	<b>4.0 DOCUMENTS TO BE SUBMITTED WITH OFFER</b>		
संपूर्ण सूची संख्या व अधिकारिता संख्या	1) A copy of the design calculation for the nozzle(s) indicating clearly the calculation formula & the various correction factors like Buoyancy factor, Density correction, scale expansion etc. the bidder intends to apply in the calculations. 2) A typical flow calibration curve for a flow nozzle supplied earlier as per ASME PTC 6 3) Preliminary drawing of nozzle assembly and nozzle cross sectional drawing. 4) A quality plan on prescribed format. 5) Details of Manufacturing, testing & calibration facilities. 6) Experience list of supply of flow nozzle for similar rating supercritical thermal sets.		
<b>COPYRIGHT AND CONFIDENTIAL</b> The information in this document is the property of Bharat Heavy Electrical Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.	<b>5.0 DOCUMENTS TO BE SUBMITTED FOR DESIGN APPROVAL (after Placement of order)</b>		
स्वामित्व और गोपनीय इस दस्तावेज में दी गई सूचना केवल ही उपयोग के लिए है। इसका प्रयोग अन्य किसी भी उद्देश्य के लिए नहीं किया जाना चाहिए।	1) Drawings of the flow section with details of different components, material details and dimensions. 2) Final flow calculation as per ASME PTC 6. 3) An assembly drawing showing the location and assembly of all major components including the location of the marks showing tap set Nos. 4) Quality plan.		
दिनांक व हस्ताक्षर SIGN & DATE 11/10/10	<b>5.1 INSPECTION &amp; TEST CERTIFICATES</b>		
संपूर्ण सूची संख्या INVENTORY NO. P-6401	REV. NO. 01 09/05/11		कार्यकर्ता WORKED BY PREETAM SINGH <i>Preetam Singh</i> 07/10/10  परीक्षणकर्ता CHECKED BY PRABHAT SINGH <i>Prabhat Singh</i> 07/10/10

**PRESCRIBED FORMAT FOR QUALITY PLAN**

S. No	COMPONENT OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY P/W/V			REMARKS
									10	11	12	
1	2	3	4	5	6	7	8	9				

**COPYRIGHT AND CONFIDENTIAL**  
 The information contained herein is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way without the written consent of the company.

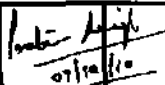
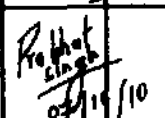
**INSTRUCTIONS FOR FILLING QUALITY PLAN**

The quality plan shall include all the quality control measures and check adopted by the vendor to ensure that the material/ components/ assembly/ services supplied by the vendor meet /will meet the requirements as per specifications and good practices. They shall include all stages of operation such as materials, process, assembly, packing & dispatch. The following guidelines for filling the Quality plan may be noted:


- Column 1- Serial Number
- Column 2- Component / operation. The component and / or operation being checked shall be given here.
- Column 3-Characteristics - The characteristic being checked shall be given here (e.g.) Chemical composition, mechanical properties, leak tightness, surface defects, etc.
- Column 4- Category CR stands for critical characteristic affecting the safety of equipment and personnel. MA stands for major characteristic affecting performance, reduction in life, large down time.MI stands for minor characteristic affecting appearance.
- Column 5-Type of check: like chemical analysis, tensile testing, hydraulic test, visual examination, radiography, etc.
- Column 6- Quantum of check such as 100%, 10%, 1 per Heat, etc.
- Column 7- Reference documents - Documents such as Technical specifications, drawings, standard specifications (BS, ANSI, ASME, DIN, IS, etc.), procedure etc. according to which the checks are done.
- Column 8- Acceptance norms-Standards etc. according to which the acceptability or otherwise of the characteristics being checked is decided.
- Column 9- Format of Records - Formats, log sheets, reports, etc. in which the observations are recorded. Standard log sheets, reports, format, etc. of the vendor shall be numbered and such reference numbers shall be included here.
- Column 10-12 -Agency - The agency which performs the test/inspection shall be written in the sub-column P. The agency which witnesses the tests shall be written in the sub-column W & the agency which verifies the tests certificates/inspection records shall be written in the sub-column V.

The information contained herein is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way without the written consent of the company.

REV. NO. 01  
 09/05/11

REV. NO. 01 09/05/11		जांचकर्ता WORKED BY <b>PREETAM SINGH</b>	 07/11/10
		परीक्षक/प्रकृतो CHECKED BY <b>PRABHAT SINGH</b>	 07/11/10

4

दिनांक व हस्ताक्षर SIGN & DATE		उत्पाद मानक <b>PRODUCT STANDARD</b>	<b>ST45008</b>
			पृष्ठ 6 का 5 Page 5 of 6

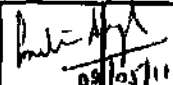
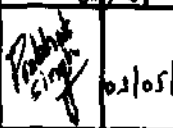
**DATA SHEET FOR FLOW MEASURING DEVICE**  
**660 MW THERMAL POWER PLANT**

- 1) SERVICE : CONDENSATE FLOW TO DEAERATOR
- 2) TAG NO. : FP01
- 3) QUANTITY : 1 NO.
- 4) LINE FLUID : CONDENSATE (DM WATER)
- 5) OPERATING DATA

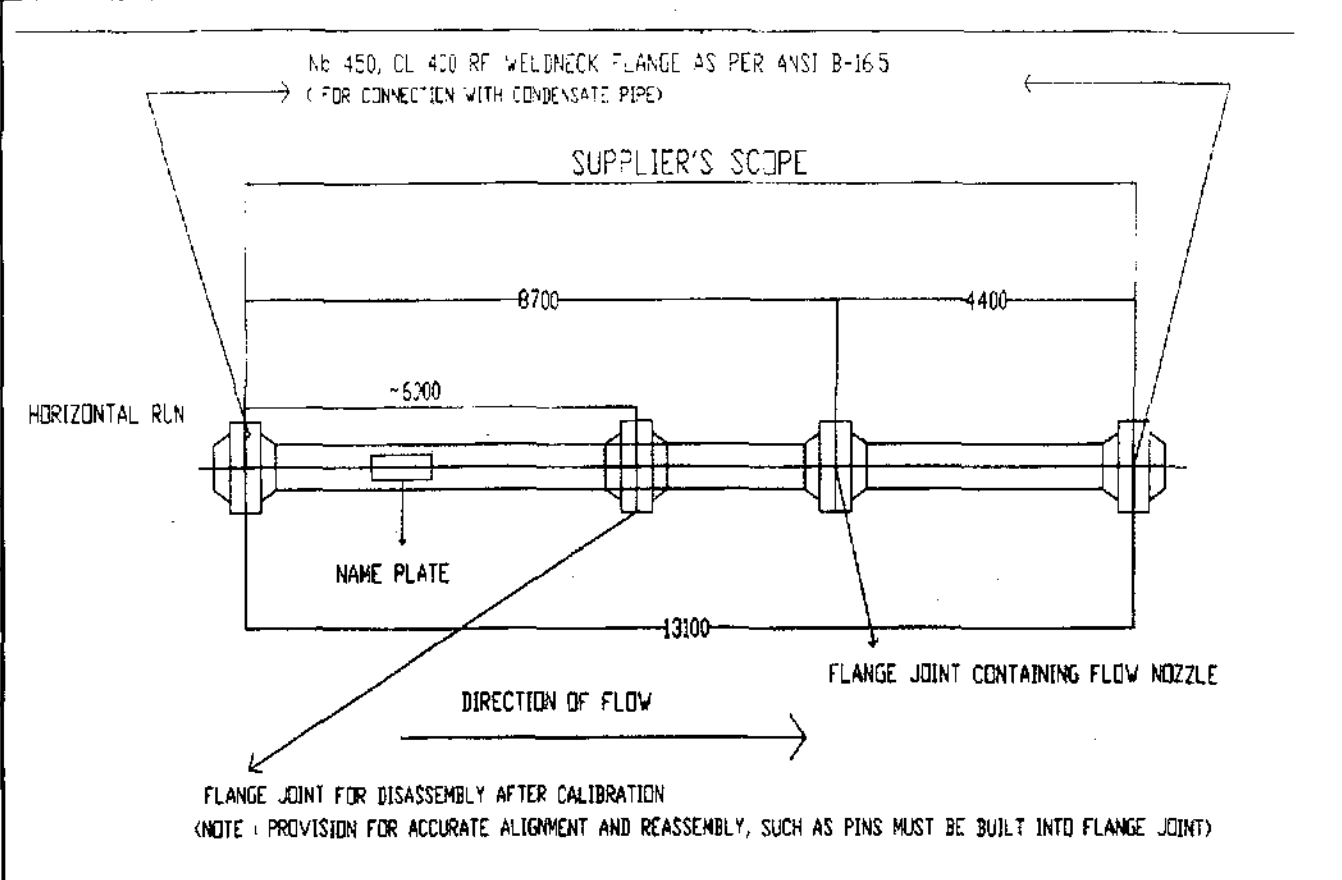
	100 % LOAD (Design Point)	80 % LOAD	MAXIMUM LOAD
FLOW ( T /Hr )	1463.661	1182.861	1610.982
PRESSURE(Kg/cm <sup>2</sup> abs)	12.11	10.03	12.45
TEMPERATURE (°C)	153.8	147.1	154.8

- 6) PIPE SIZE : O.D. = 457.00 mm  
: I.D. = 431.60 mm  
: Thickness = 12.70 mm
- 7) PIPE MATERIAL : SA106 Gr C.
- 8) PIPE STANDARD : ANSI B 36.10
- 9) TYPE OF FLOW ELEMENT : LOW BETA RATIO THROAT TAP NOZZLE
- 10) MATERIAL OF FLOW ELEMENT : 321 SS or Equivalent
- 11) TYPE OF MOUNTING : Flanged
- 12) TYPE OF TAPPING : Throat Taps
- 13) NO OF TAPPING POINTS : FOUR Pairs
- 14) TYPE OF FLOW STRAIGHTENER : Perforated or Tubed plate  
(As per Fig. 4.5, ASME PTC-6-2004)
- 15) GRADIENT : Horizontal.
- 16) ALLOWABLE PRESSURE LOSS : Approx 1.0 Kg/cm<sup>2</sup> at 100 % load
- 17) DESIGN & CALCULATIONS : As per ASME PTC-6-2004 & ASME PTC 19.5-2004 Flow Measurement
- 18) CALIBRATION CURVES & DATA : Required for each pair of tapings. Data indicating Cd<sub>theo</sub> & Cd<sub>practical</sub> to be furnished.
- 19) DIFFERENTIAL AT 100% LOAD : Preferably 1.5 Kg/cm<sup>2</sup>
- 20) INSTRUMENT RANGE : 0-2.5 Kg/cm<sup>2</sup> Dp transmitter

SUPERSEDES INVENTORY NO.  
 श्रेणी की संख्या व संशोधन क्रमांक  
 COPYRIGHT AND CONFIDENTIAL  
 The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in any way detrimental to the interest of the company.  
 संस्थापक व अधिकारी  
 दिनांक व हस्ताक्षर  
 SIGN & DATE  
 23/5/11

श्रेणी की संख्या INVENTORY NO. <b>P-6401</b>	REV. NO. 01	कार्यकर्ता WORKED BY <b>PREETAM SINGH</b>	 09/05/11
		परीक्षणकर्ता CHECKED BY <b>PRABHAT SINGH</b>	 09/05/11

**REV. NO. 01**



WORKED BY  
CHECKED BY

**PREETAM SINGH**  
**PRABHAT SINGH**

09/05/11

DESIGN DATA						
PIPE I.D.	PIPE THICKNESS	PIPE MATERIAL	DESIGN PRESSURE	TEST PRESSURE	DESIGN TEMP.	DESIGN CODE
457.00	12.70	SA 106 GrC	48 Kg/cm <sup>2</sup>	720 Kg/cm <sup>2</sup>	160 Deg C	ANSI B36.1

All Dimensions in mm

**3-rod flange**

**PRODUCT STANDARD**

**ST45008**

Page 6 of 6

MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
BHEL	VENDOR'S NAME	ITEM	CALIBRATED FLOW NOZZLE		QP.. NO.:	QA/BE/QP/326						
				REV. NO.:	03							
		DRG. NO.	As Per PO									
		REV. NO.:	As Per PO									
		SPEC NO.:	As Per PO									
		REV. NO.:	As Per PO	Page 1 of 3								
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLAS S	TYPE OF CHECK	QUANTU M OF CHECK	REFERENCE DOCUMENT	ACCEPTANC E NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									M	B	N	
1	2	3	4	5	6	7	8	9	D	10		11

<b>1.0 In Coming Raw Material Inspection:</b>													
1.1	Flow Nozzle & Flange Adaptors	Chemical & Mechanical Properties	Major	Chemical & Mechanical	100%	BHEL Specification	BHEL Specification / Approved Data Sheet	MTC	√	P/V	V	-	Correlated Manufacturer Test Certificate (MTC) to be Submitted
1.2	Forgings	Chemical & Mechanical Properties	Major	Chemical & Mechanical	100%	BHEL Specification	BHEL Specification / Approved Data Sheet	Test Certificate	√	P/V	V	-	
1.3	Stud & Nuts ( Zinc plated)	Make & Proove Chemical & Mechanical Properties	Major	Chemical & Mechanical & Zinc coating	100%	BHEL Specification	BHEL Specification / Approved Data Sheet	MTC	√	P	V	-	
1.4	Branches Pipes	Chemical, Mechanical Properties & Hydraulic test	Major	Chemical, Mechanical & Leakage	100%	BHEL Specification	BHEL Specification / Approved Data Sheet	MTC	√	P/V	V	-	Correlated Manufacturer Test Certificate (MTC) to be Submitted
<b>2.0 In Process Inspection:</b>													
2.1	Machining	Visual & Dimensions	Major	Visual & Measurement	100%	Approved Drawing	Approved Drawing	Inspection Report	√	P	V	-	
2.2	Welding	WPS/ PQR/ WPQ	Major	Records	100%	ASME SEC IX	ASME SEC IX	Records	√	P	V	-	
2.2	Welding	NDT Examination	Major	Radiography	100% (On All Butt Weld Joints)	ASME SEC - V	ASME SEC - VIII, DIV - 1 APPENDIX- 4	RT Report	√	P	V	-	Radiographs will be Reviewed
2.3	Welding	NDT Examination	Major	DPT	All Weld Joints	ASME SEC - V	ASME SEC III, DIV - 1 APPENDIX - 8	LPT Report	√	P	W	-	LPT to be Witnessed

MANUFACTURER/SUBCONTRACTOR	LEGEND: ! RECORDS IDENTIFIED WITH 'TICK'(√) SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE
		APPROVED BY

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
BHEL	VENDOR'S NAME	ITEM	CALIBRATED FLOW NOZZLE		QP.. NO.:	QA/BE/QP/326						
				REV. NO.:	03							
		DRG. NO.	As Per PO									
		REV. NO.:	As Per PO									
		SPEC NO.:	As Per PO									
		REV. NO.:	As Per PO		Page 2 of 3							
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLAS S	TYPE OF CHECK	QUANTU M OF CHECK	REFERENCE DOCUMENT	ACCEPTANC E NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									M	B	N	
1	2	3	4	5	6	7	8	9	D	10		11

<b>3.0</b>	<b>Final Inspection on Assembly, Identification, Marking &amp; Packing:</b>												
3.1		Visual & Surface Finish of Flow nozzle	Major	Visual & Measurement	100%	BHEL Specification	BHEL Specification	Inspection Report	√	P	W	-	
3.2		Checking of internal machining of bore of upstream & downstream pipe as per ASME	Major	Measurement	100%	BHEL Specification / ASME PTC-6	Approved Drawing / ASME PTC-6	Inspection Report	√	P	W	-	
3.3		Checking of dimensional measurement of Upstream pipe, downstream pipe and flow nozzle at various locations as per ASME .	Major	Measurement	100%	BHEL Specification / ASME PTC-6	Approved Drawing / ASME PTC-6	Inspection Report	√	P	W	-	
3.4		Hydro Test	Major	Hydraulic	100%	BHEL Specification	No Leakage Allowed	Hydro Test Certificate	√	P	W	-	Hydro test will be Carried Out at 1.5 times of design Pressure for Min. 30 Minutes
3.5		Fixing of Name Plate Stamping of Tap No, Flow Direction	Major	Visual	100%	BHEL Specification	BHEL Specification	Inspection Report	√	P	W	-	
3.6		Painting of Flow Nozzle assembly	Major	Visual	100%	BHEL Specification	BHEL Specification	Inspection Report	√	P	W	-	
3.7		Workmanship	Major	Visual	100%	BHEL Specification	BHEL Specification	Inspection Report	√	P	W	-	

MANUFACTURER/SUBCONTRACTOR	LEGEND: ! RECORDS IDENTIFIED WITH 'TICK'(√) SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE
		APPROVED BY

MANUFACTURER'S NAME AND ADDRESS			STANDARD QUALITY PLAN				TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
BHEL	VENDOR'S NAME	ITEM	CALIBRATED FLOW NOZZLE		QP.. NO.:	QA/BE/QP/326						
				REV. NO.:	03							
		DRG. NO.	As Per PO									
		REV. NO.:	As Per PO									
		SPEC NO.:	As Per PO									
		REV. NO.:	As Per PO		Page 3 of 3							
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLAS S	TYPE OF CHECK	QUANTU M OF CHECK	REFERENCE DOCUMENT	ACCEPTANC E NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									M	B	N	
1	2	3	4	5	6	7	8	9	D	10		11

3.8		Calibration & Accuracy	Major	Wet Calibrated	100%	ASME PTC-6	ASME PTC-6	Calibration Certificate	√	P	W	-	Calibration at FCRI Palghat
3.9		Final Check	Major	Visual	100%	BHEL Specification	BHEL Specification	Inspection Report	√	P	W	-	
3.10		Preservation after Assembly & Calibration	Major	Visual	100%	BHEL Specification	BHEL Specification	Inspection Report	√	P	W	-	
3.11		Packing of Flow Nozzle Assembly, Root Valves and Gaskets	Major	Visual	100%	BHEL Specification	BHEL Specification	Inspection Report	√	P	W	-	

**Note:** Calibrated instruments shall be used for measurements & testing.

MANUFACTURER/SUBCONTRACTOR	LEGEND:	FOR CUSTOMER USE	APPROVED BY
	! RECORDS IDENTIFIED WITH 'TICK'(√) SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION.		
	M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOM. INSPECTION AGENCY N: CUSTOMER INDICATE 'P' PERFORM 'W' WITNESS AND 'V' VERIFICATION ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER		