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For tender documents (Technical)
Tender no B/4011/2015/3225V1

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उत्पाद मानक

ST45004



पृष्ठ 6 का 1
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PRODUCT STANDARD

Based on standard : ASME PTC 6 2004

TECHNICAL SPECIFICATION FOR CALIBRATED FLOW NOZZLES

1.0 GENERAL

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 Guarantee test on the TG set of the project indicated in sheet-5

2.0 SCOPE

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.

3.0 TECHNICAL REQUIREMENTS

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" along with data in Sheet No.5. The overall dimensions of the flow meter(s) should match with those indicated in sketch in sheet No.6. 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

SUPERSEDES INVENTORY NO.
 मशीन नं. व/वा अथवा मशीन नं. व/वा
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 स्वामित्विकार एवं गोपनीय
 इस दस्तावेज में दी गई जानकारी भारत भारती इलेक्ट्रिकल्स लिमिटेड की संपत्ति है। इसका प्रयोग केवल केवल के लिए ही किया जा सकता है। इसकी जानकारी को किसी भी रूप में बिना अनुमति के किसी अन्य व्यक्ति को देना गैर-मंजूर है।
 SIGN & DATE
 29/5/09
 INVENTORY NO.
 P-6182

नाम NAME	सिग्नेचर व/वा तारीख SIGNATURE & DATE
MEMBER-PSC	VK Chandra 29/5/09
QAX	S.K. CHAUHAN 29/5/09
TSX	A.K. CHATURVEDI 29/5/09
AGREED DEPTT.	NAME DATE & SIGNATURE
APPROVED :	(G C MISRA) AGM (STE) 2.5.09
REV.NO. 02	
Dt. 11.05.09	
PREPARED :	STE
ISSUED :	STE -TC
DATE :	30.07.99

उत्पाद मानक

PRODUCT STANDARD

पृष्ठ ४ का ४
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REVISED BY
SIGN & DATE



STANDARD NO.
INVENTORY NO.

PRESCRIBED FORMAT FOR QUALITY PLAN

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

INSTRUCTIONS FOR FILLING QUALITY PLAN

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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 the requirements as per specifications and good practices. They shall include all stages of production 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, stop 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.

संशोधन एवं गणना
एन एच ई लि. के स्वामित्व में है। इस दस्तावेज़ को बिना अनुमति के प्रसारित नहीं किया जा सकता है।

REVISED BY
SIGN & DATE

INVENTORY NO.
REV. NO. 02

WORKED BY	PRABHAT SINGH	
CHECKED BY	S. BHATTACHARYA	

ST45004

पृष्ठ 6 का 5
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उत्पाद मानक

PRODUCT STANDARD



क्रमांक
SIGN & DATE

SUPPLIER'S
INVENTORY NO.

वस्तु का नाम
आवृत्ति संख्या

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वस्तु का नाम
आवृत्ति संख्या

क्रमांक
SIGN & DATE

क्रमांक
INVENTORY NO.

DATA SHEET FOR FLOW MEASURING DEVICE
500 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)	1177.636	957.063	1242.442
PRESSURE(Kg/cm ² abs)	7.94	6.88	8.14
TEMPERATURE (°C)	124.10	118.50	125.60

- 6) PIPE SIZE : O.D. = 406.40 mm
: I.D. = 381.00 mm
: Thickness = 12.70 mm
- 7) PIPE MATERIAL : SA106 Gr B.
- 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 : As indicated in Annexure
- 16) ALLOWABLE PRESSURE LOSS : Approx 1.0 Kg/cm² 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_{theo} & Cd_{practical} to be furnished.
- 19) DIFFERENTIAL AT 100% LOAD : Preferably 1.5 Kg/cm²
- 20) INSTRUMENT RANGE : 0-2.5 Kg/cm² Dp transmitter

REV. NO. 02

निर्मितकर्ता WORKED BY	PRABHAT SINGH	<i>Prabhat Singh</i>	01/05/04
जाँचकर्ता CHECKED BY	S. BHATTACHARYA	<i>S. Bhattacharya</i>	01/05/04



उत्पाद मानक

PRODUCT STANDARD

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आपके पत्र पर
SIGN & DATE

SUPERVISOR'S
INVENTORY NO.

वर्क ऑर्डर का
संख्या और
दिनांक

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संरक्षित एवं गोपनीय
यह दस्तावेज़ कंपनी की संपत्ति है। इसमें दी गई जानकारी को बिना अनुमति के किसी भी प्रकार से प्रसारित करना या इसका उपयोग किसी भी उद्देश्य के लिए करना वर्जित है।

आपके पत्र पर
SIGN & DATE

वर्क ऑर्डर का
INVENTORY NO.

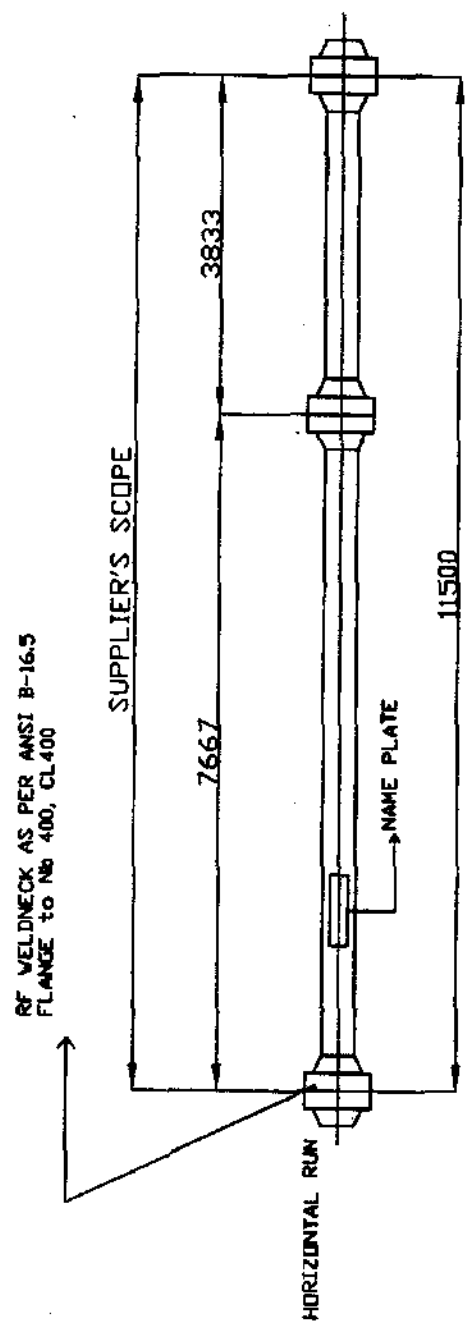
REV. NO. 02

करिये
WORKED BY

PRABHAT SINGH

जांचा
CHECKED BY

S. BHATTACHARYA



DESIGN DATA

PIPE O.D.	PIPE THICKNESS	PIPE MATERIAL	FLANGE MATERIAL	FLANGE CLASS	FLANGE CL	WELDING PROC.
406.4 mm	12.7 mm	SA 105	SA 105	400	CL 400	RF

All dimensions in mm

