

MAIN SUPPLIER'S NAME:

BHARAT HEAVY ELECTRICALS LIMITED, BHOPAL
(A GOVERNMENT OF INDIA UNDERTAKING)



NAME OF SUB-VENDOR: N/A

NPCIL PO NO.: CMM/FTP/10-33-1-1149/e-PO/30599, DTD: 25.01.19

QA REF. NOS.:

MAIN VENDOR: 2190190

SUB VENDOR: N/A

CUSTOMER:

NUCLEAR POWER CORPORATION OF INDIA LIMITED
(A GOVERNMENT OF INDIA ENTERPRISE)



PROJECT:

2x700MW GORAKHPUR HARYANA ANU VIDYUT PARIYOJANA
(UNIT 1&2)

EQUIPMENT: D2O HEAT EXCHANGERS

DOCUMENT NO.: BHEL / NPCIL / 30599 / SS TUBES FOR SPACER/ CDE-19-3433

TITLE:

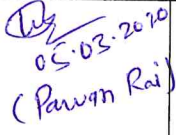
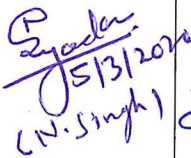
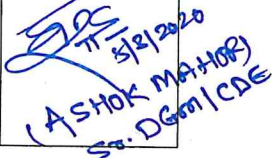
TECHNICAL PURCHASE SPECIFICATION OF
SS TUBES FOR SPACER

न्यूक्लियर पावर कॉर्पोरेशन ऑफ इंडिया लिमिटेड Nuclear Power Corporation of India Limited		
☒ अनुमोदित / APPROVED ☐ दिएगी के अनुसार अनुमोदित / APPROVED AS NOTED ☐ संविरचन को आगे बढ़ाए / रोके / PROCEED WITH / HOLD FABRICATION ☐ अंतिम ट्रांसपेरेंसी एवं प्रिंट्स भेजे / SEND FINAL TRANSPARENCIES & PRINTS ☐ संशोधन करें एवं अनुमोदन के लिए पुनः प्रस्तुत करें REVISE & RESUBMIT FOR APPROVAL		
जाँचकर्ता / CHECKED BY	समीक्षकर्ता / REVIEWED BY	अनुमोदन कर्ता / APPROVED BY
 11.3.2020	 11/3/2020	 12/3/2020
किए जानेवाले कार्य का अनुमोदन आपूर्तिकर्ता संविदाकार को विनिर्देशनों के अनुसार आपूर्ति करने के उत्तरदायित्व से मुक्त नहीं करता है। This approval of the work to be done does not relieve the supplier of the responsibility of supply according to specification.		

03	05.03.20	2+2=4	 05.03.2020 (Pawan Rai)	 05/3/2020 (G. M. Singh)	 05/3/2020 (ASHOK KUMAR)
02	18.09.19	2+2=4	-Sd-	-Sd-	-Sd-
01	23.07.2019	2+1 = 3	-Sd-	-Sd-	-Sd-
00	14.06.2019	2+1 = 3	Sd-	Sd-	Sd-
REV NO.	DATE	PAGES	PREPARED BY	CHECKED BY	APPROVED BY

	CONDENSER & HEAT EXCHANGER ENGG. DIVISION BHEL BHOPAL	Document No.
		BHEL / NPCIL / 30599 / SS TUBES FOR SPACER/ CDE-19-3433
TECHNICAL PURCHASE SPECIFICATION OF SS TUBES FOR SPACER		

REVISION CONTROL SHEET

BHEL					
REV. No Date	PAGES	Description of Revision	Prepared By	Checked By	Approved By
00, 14.06.2019	2+1=3	Original submission	-Sd-	Sd-	Sd-
01, 23.07.2019	2+1=3	Revised Based on NPCIL comments dtd 18.06.2019 Sr. no 1 a,b,c&d , 7d	-Sd-	-Sd-	-Sd-
02 18.09.2019	2+2=4	Revised Based on NPCIL comments dtd 14.08.2019 Point 7a corrected, point 10 testing matrix added.	-Sd-	-Sd-	-Sd-
03 05.03.2020	2+2=4	-Flange Test is not applicable for seamless SS tubes. Hence deleted from testing matrix. -Clause 3, 6, 7 c & 10 modified.	 05.03.2020 (Parvati Rai)	 5/3/2020 (N. Singh)	 5/3/2020 (ASHOK MAHAPATRA) Sr. DGM/CAE

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TECHNICAL PURCHASE SPECIFICATION OF SS TUBES FOR SPACER

01

1. Material specification:

- For RGCL: Material Specification Shall be as per SA 213 TP 304L with Carbon & Cobalt limitation of 0.03 % max.
- For all others, Material Specification Shall be as per SA 213 TP 304L.
- General requirements as per SA 1016.
- Also refer purchase indent/Enquiry/PO.

2. Quantity/ Size: As per NPCIL Approved drawing/ Bill of Material(BOM)/Purchase Order.

3. Manufacture: All tubes Shall be seamless and Cold Finished.

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4. Marking: Tubes shall be Properly Marked as per specification and must be co-related with the test certificates Provided.

5. Testing: All tubes Shall be Hydrostatically tested as per Material Specification.

6. Heat treatment: All tubes shall be in bright annealed and passivated/ solution Annealed pickled and passivated condition as per Material Specification.

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7. Test certificate Required:

- Test certificate Shall be in accordance with material specification. Material Supplied to this Specification shall confirm to applicable Requirements of specification SA 1016 of ASME Sec.II-part A (Edition 2017)
- Mechanical properties & Chemical composition shall be as per Material Specification

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- Hardness of tubes shall be < 90 HRB/190 BHN
- Grain size, flattening test, Flaring test as per material specification.

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8. Additional Requirement:

- Test certificate shall be provided.
- Finished tubes shall be reasonably straight with smooth ends. Surface defects like any sign of cracks, lappings, pitting etc. are not acceptable. Repair by welding is not Permitted.
- Material shall be IGC tested as per ASTM A-262 Practice-E.

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9. Vendor List: Material meeting the technical specification requirements shall be procured from BHEL Approved Vendors Only.

10. Testing Matrix: vendor to carry out all the tests in NPCIL approved labs in line with testing matrix attached as annexure -I, in presence of NPCIL QS

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PRODUCT - SS SPACER TUBE																				
SR.NO.	EQUIPMENT	MATERIAL GRADES	SUPPLY CONDITION	TESTING AS PER SECTION II-A											ADDITIONAL TESTING AS PESECTION - III N.B					
				CHEMICAL (HEAT & PRODUCT)	TENSILE	HARDNESS	GRAIN SIZE	IGC	IMPACT	BEND TEST	REVERSE BEND TEST	FLATTENING TEST	REVERSE FLATTENING TEST	FLARING TEST	FLANGE TEST	HYDRO TEST (OR NDE I.E. UT, ET OR FLE)	FRACTURE TOUGHNESS	UT	MT OR PT	SIMULATION
1.	RGCL	SA 213 TP 304L	AS PER CL 6.1 & 6.2	AS PER TABLE-2	AS PER TABLE 4	AS PER TABLE 4	AS PER TABLE -3	AS PER ASTM A 262 PRACTICE E	-	-	-	AS PER CLAUSE 9.3 (ALSO REFER CL 19 OF SA-1016)	-	AS PER CLAUSE 9.4 (ALSO REFER CL 22 OF SA-1016)	-	AS PER SA- 1016	-	FOR OD > 25MM- AS PER NB 2552	-	-
2.	IARS	SA 213 TP 304L	AS PER CL 6.1 & 6.2	AS PER TABLE-2	AS PER TABLE 4	AS PER TABLE 4	AS PER TABLE -3	AS PER ASTM A 262 PRACTICE E	-	-	-	AS PER CLAUSE 9.3 (ALSO REFER CL 19 OF SA-1016)	-	AS PER CLAUSE 9.4 (ALSO REFER CL 22 OF SA-1016)	-	AS PER SA- 1016	-	-	-	-
3.	FMRC	SA 213 TP 304L	AS PER CL 6.1 & 6.2	AS PER TABLE-2	AS PER TABLE 4	AS PER TABLE 4	AS PER TABLE -3	AS PER ASTM A 262 PRACTICE E	-	-	-	AS PER CLAUSE 9.3 (ALSO REFER CL 19 OF SA-1016)	-	AS PER CLAUSE 9.4 (ALSO REFER CL 22 OF SA-1016)	-	AS PER SA- 1016	-	-	-	-
4.	BCL	SA 213 TP 304L	AS PER CL 6.1 & 6.2	AS PER TABLE-2	AS PER TABLE 4	AS PER TABLE 4	AS PER TABLE -3	AS PER ASTM A 262 PRACTICE E	-	-	-	AS PER CLAUSE 9.3 (ALSO REFER CL 19 OF SA-1016)	-	AS PER CLAUSE 9.4 (ALSO REFER CL 22 OF SA-1016)	-	AS PER SA- 1016	-	-	-	-
5.	SDC	SA 213 TP 304L	AS PER CL 6.1 & 6.2	AS PER TABLE-2	AS PER TABLE 4	AS PER TABLE 4	AS PER TABLE -3	AS PER ASTM A 262 PRACTICE E	-	-	-	AS PER CLAUSE 9.3 (ALSO REFER CL 19 OF SA-1016)	-	AS PER CLAUSE 9.4 (ALSO REFER CL 22 OF SA-1016)	-	AS PER SA- 1016	-	-	-	-