

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



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

SUB VENDOR: N/A

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



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

DOCUMENT NO.: **BHEL / NPCIL / 30599 /ALLOY STEEL FASTENERS/
CDE-19-3435**

TECHNICAL PURCHASE SPECIFICATION FOR ALLOY STEEL FASTENERS AS PER 20 NiCrMo-14.5 & 34 Cr Ni Mo 6

APPROVAL SHEET FOR SUPPLIER

APPROVED AS PER 20 NCR Mo 14.5 & 34

Nuclear Power Corporation of India Limited

☒ अनुमोदित / APPROVED

☒ विषयी के अनुसार अनुमोदित / APPROVED AS NOTED

☐ संविचन को आगे बढ़ाएं / रोके /
PROCEED WITH / HOLD FABRICATION

☐ अंतिम ट्रांसपैरेंसी एवं प्रतियाँ भेजें /
SEND FINAL TRANSPARENCIES & PRINTS

☒ संशोधन करें एवं अनुमोदन के लिए पुनः प्रस्तुत करें
REVISE & SUBMIT FOR APPROVAL

जाँचकर्ता / CHECKED BY	समीक्षाकर्ता / REVIEWED BY	अनुमोदन कर्ता / APPROVED BY
<i>[Signature]</i> 11/2-2020	<i>[Signature]</i> 11/2/2020	<i>[Signature]</i> 11/2/2020

किए जानेवाले कार्य का अनुमोदन आपूर्तिकर्ता संविदाकार को विनिर्देशनों के अनुसार आपूर्ति करने के उद्देश्यविषय 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 specifications.

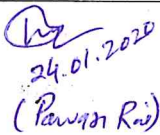
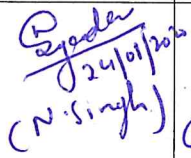
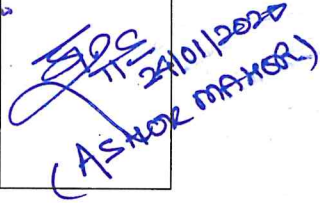
Page 1 of 5

02	24.01.2020	2+3=5	<i>ing</i> 24.01.2020	<i>B. S. S.</i> 24/01/2020	<i>3/20</i> 24/01/2020
01	23.07.2019	2+2=4	Sd/PR	Sd/NS	Sd/AKM
00	15.06.2019	2+2 = 4	Sd/DKA	Sd/NS	Sd/AKM
REV NO.	DATE	PAGES	PREPARED BY	CHECKED BY	APPROVED BY

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	CONDENSER & HEAT EXCHANGER ENGG. DIVISION BHEL BHOPAL	Document No.
		BHEL / NPCIL / 30599 / ALLOY STEEL FASTENERS / CDE-19-3435
TECHNICAL PURCHASE SPECIFICATION FOR ALLOY STEEL FASTENERS AS PER 20 Ni Cr Mo 14.5, 34 Cr Ni Mo 6		

REVISION CONTROL SHEET

BHEL					
REV. No Date	PAGES	Description of Revision	Prepared By	Checked By	Approved By
00, 15.06.2019	2+2=4	Original submission.	Sd/DKA	Sd/NS	Sd/AKM
01, 23.07.2019	2+2=4	Revised to change material to DIN standard in line with discussion held in meeting dtd 20-21 June 2019	Sd/PA	Sd/NS	Sd/AKM
02, 24.01.2020	2+3=5	Testing matrix added at cl. 13. Document revised as marked 	 24.01.2020 (Pawan R. Singh)	 24/01/2020 (N. Singh)	 24/01/2020 (ASHOK MAHOR)

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TECHNICAL PURCHASE SPECIFICATION FOR ALLOY STEEL FASTENERS AS PER 20 Ni Cr Mo 14.5, 34 Cr Ni Mo 6

ALLOY STEEL FASTNERS

1. **Material Specification:**
 - Studs/Bolts: 20 Ni Cr Mo 14.5
 - Nuts/spherical washer: 34 Cr Ni Mo 6
2. **Quantity / Size:** As per approved Drawing / Purchase Order. 02
3. **Condition:** The material shall be supplied in hot rolled or hot forged condition.
4. **Dimensions and Tolerances:**
 - Dimensional Tolerances shall be as per respective material specification/ approved Drawing. 02
5. **Chemical composition:** - Chemical composition as per respective material specification.
6. **Heat Treatment:** - All fasteners shall be in quenched and tempered condition as per material specification.
7. **Hardness Requirement:**
 - Hardness shall be as per Material Specification.
8. **Mechanical Testing:** 02
 - 8.1 **Tensile Testing:** Tensile testing to be done at room temp & at 350 Deg C as per Material specification.
 - 8.2 **Microstructure Examination:** Grain size to be reported in TC as per ASTM-E112 at X 100 magnification and Microstructure to be examined at X 200 and photograph to be included in TC.
 - 8.3 **Impact Test Requirement:**
 - In addition to Impact test as per material specification, All Material shall be Charpy V-Notched Impact tested at 18°C as per ASME SEC.III, DIV.1 ED 2017; SUB SEC. – NB-2333.
 - Location and Orientation of Impact test specimens shall be as per ASME SEC.III, DIV.1 ED 2017; SUB SEC. NB-2322.
 - No. of test shall be carried out as per ASME SEC.III, DIV.1 ED 2017, SUB SEC. NB-2345.
9. **Making:** Product marking shall be material specification and shall co-relate with test certificate provided.
10. **Test Report Required:**
 - a) MTR shall comply with the material specification.

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FASTENERS AS PER 20 Ni Cr Mo 14.5, 34 Cr Ni Mo 6**

11. Addition Requirement:

- a) Studs shall be threaded as per approved drg & Nuts shall be of heavy series. Other requirement shall be carried out as per material specification.
- b) The areas of threads, shanks, heads of final machined parts shall be visually examined. Harmful discontinuities such as laps, seams or cracks that would be detrimental to the intended service shall be unacceptable.
- c) MT/PT as per testing Matrix. 02
- d) All fasteners greater than 2 inch (M 48) but not over 4 inch(M100) shall be UT tested as per ASME SEC.III, DIV.1; Ed 2017- SUB SEC. –NB-2585.
- e) Deleted. 02
- f) Time of Examination shall be as per ASME SEC. III, DIV.1 Ed 2017- SUB SEC. – NB-2587.
- g) Product Analysis shall be carried out & shall comply with the material specification.

12. Inspection at source:

- a) Vendor has to submit fastener manufacturing QAP and NDE procedure for Approval.
- b) Material shall be inspected by NPCIL /BHEL as per Approved QAP and NDE procedure

13. Testing Matrix													
PRODUCT	MAT. GRADES	SUPPLY CONDITION	CHEMICAL (HEAT & PRODUCT)	TENSILE	HARDNESS	MICROSTRUCTURE TESTING	IGC	IMPACT	ADDITIONAL TESTING AS PER SECTION-III NB/ NPCIL'S SPEC				SIMULATION
									FRACTURE TOUGHNESS (RTNDT)	UT	MT OR PT		
FASTENERS	20 Ni Cr Mo 14.5	As per DIN 1.6772	As per clause 8.2 of BHEL/NPCIL/30599/Alloy steel fasteners/ CDE-19-3435			As per clause 8.3 of BHEL/NPCIL/30599/Alloy steel fasteners/ CDE-19-3435		As per clause 8.3 of BHEL/NPCIL/30599/Alloy steel fasteners/ CDE-19-3435	FOR DIA>25MM- AS PER NB 2300 (RTNDTs-15°C)	As per clause 11 d) of BHEL/NPCIL/30599/Alloy steel fasteners/ CDE-19-3435	FOR DIA >25MM AS PER NB 2583	FOR DIA >25MM AS PER NB 2584	
	34 Cr Ni Mo 6								FOR DIA>25MM- AS PER NB 2300 (RTNDTs-15°C)	As per clause 11 d) of BHEL/NPCIL/30599/Alloy steel fasteners/ CDE-19-3435	FOR DIA >25MM AS PER NB 2583	FOR DIA >25MM AS PER NB 2584	