


NPCIL KAIGA ATOMIC POWER PROJECT UNIT 5&6**BOQ FOR BELOW GROUND EARTHING (MS ROD)**

S.NO	ITEM DESCRIPTION	UNIT	ORDER QUANTITY	UNIT PRICE (Rs/MT)	TOTAL PRICE
1	40mm Dia. MS ROD	MT	165		

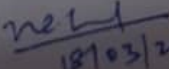
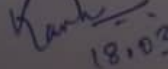
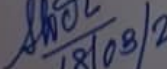
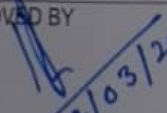
	NPCIL KAIGA ATOMIC POWER PROJECT, UNIT 5&6 PRE-QUALIFICATION REQUIREMENTS FOR MS ROD	PQR NO. PE-PQ-488-509-E001
		REVISION NO. 00 DATE 18.03.2024
		SHEET NO. 1 OF 1

SCOPE: Supply : YES; Erection & Commissioning : NO;

1	Vendor should have in-house manufacturing facility of MS Rod / bar greater than 30mm dia (as per IS: 2062 Grade designation E250 quality A or as per ASTM A 510M Grade No. 1010 (SAE No.1010)/1018 (SAE No.1018)/1020 (SAE No.1020) or as per IS 1875 designation 15C8 class 1A.
2	Vendor should be a manufacturer of MS Rod/ Bar. In case bidder is not the manufacturer, their offer shall be evaluated as per note no. 1 of PQR.
3	Vendor should have capability of manufacturing MS Rod /Bar of about 100 MT per month.
4	Vendor should have in-house capability to carry out all applicable tests as per relevant standards.
5	Manufactured & supplied at least 100 MT of MS rod in one or more orders and at least 30 MT in a single order.
6	Minimum two (2) nos. purchase orders for MS rod be submitted which should not be more than five (5) years old from date of techno-commercial bid opening (as applicable) for establishing continuity in business.

NOTES-

- In case Bidder is authorised dealers/ authorised Stockist/ Joint Bidders, then credentials of MS Rod/ bar manufacturer (OEM) can also be considered for meeting PQR above points 1 to 5 except for PQR criteria at sl. No.6 for which bidder's credentials shall be evaluated. Bidder to furnish the authorisation letter from the OEM along with the scope matrix (supply, logistics, testing, inspection, etc) along with the offer. For scope matrix Technical Specification shall be referred to.
Bidder to note that arrangement of the bidding w.r.t OEM, once offered to BHEL as part of bidding documents cannot be changed till the execution of the project.
- SAIL/RINL need not to furnish documents in support of above PQR criteria.
- Consideration of offer shall be subject to customer's approval of bidders, if applicable.
- 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.
- Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the bidder to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
- 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.

PREPARED BY  18/03/2024 NAME: HARI CHAND DESIGNATION: MGR	CHECKED BY  18.03.24 NAME: KANHAIYA KUMAR DESIGNATION: SR. MGR	REVIEWED BY  18/03/2024 NAME: SANDEEP LODH DESIGNATION: AGM	APPROVED BY  18/03/2024 NAME: DEBASISA RATH DESIGNATION: GM- ELECTRICAL
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NPCIL KAIGA ATOMIC POWER PROJECT UNIT 5&6

TECHNICAL SPECIFICATION FOR MS ROD FOR BELOW GROUND EARTHING

SPECIFICATION NO: PE-TS-488-509-E001 REV. - 00



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA – 201301**

177595/2024/PS-PEM-EL



TECHNICAL SPECIFICATION FOR
MS ROD FOR BELOW GROUND EARTHING

NPCIL KAIGA ATOMIC POWER PROJECT
UNIT 5&6

SPECIFICATION NO.

PE-TS-488-509-E001

REV NO. : 00 DATE : 18.03.2024

SHEET : 2 OF 10

STANDARD TECHNICAL REQUIREMENTS



**TECHNICAL SPECIFICATION FOR
MS ROD FOR BELOW GROUND EARTHING**

**NPCIL KAIGA ATOMIC POWER PROJECT
UNIT 5&6**

SPECIFICATION NO. PE-TS-488-509-E001	
REV NO. : 00	DATE : 18.03.2024
SHEET : 3 OF 10	

1.0 INTENT OF THE SPECIFICATION

1.1 This specification covers the design, manufacture, inspection & testing, packing at manufacturer's works and delivery to site of **MS ROD FOR BELOW GROUND EARTHING**.

1.2 The intent of specification is not to specify all details of design & construction of material. The material shall, however, conform in all aspects to high standard of design, engineering and workmanship and be capable of performing in continuous operation upto & after bidder's guarantee period in manner acceptable to purchaser who will interpret the drawings & specification and shall have power to reject any work or material which in his judgement is not in full accordance with this specification.

2.0 CODES & STANDARDS

2.1 The material shall comply with all currently applicable safety codes and statutory regulations of India as well as of the locality where the material is to be installed.

2.2 Applicable Standards (Latest amendment to be referred):-

- a) **IS 2062, Grade E250 Sub-quality A:** Hot Rolled Medium and High Tensile Structural Steel.
- b) **ASTM A 510M Grade SAE 1010/1018/1020:** Standard Specification for general requirements of wire rods and coarse round wire, carbon steel.
- c) **IS 1875, Designation 15C8 Class 1A:** Carbon Steel Billets, Blooms, Slabs and bars for forging – Specification.

3.0 TECHNICAL REQUIREMENTS

3.1 Straight lengths of MS rods of standard diameter of **40 mm in minimum length of 9 m** shall be supplied.

3.2 All finished MS rods for Below Ground Earthing shall be free from sharp edges, corners, burs & unevenness.

3.3 Bidder to supply order quantity indicated in the Technical Specification. Overall tolerance on total dispatched quantity shall be restricted to +/- 3% in line with IS 2062.

4.0 QUALITY / INSPECTION

4.1 The supplier shall perform all tests necessary to ensure that the material and workmanship conform to the relevant standards and comply with the requirements of this specification.

4.2 The tests shall be in accordance with relevant Indian/American standards. The extent of the tests to be performed by the supplier shall include but not be limited to the attached end customer approved reference QAP. Bidder to submit project specific QAP in the same format with change of project, bidder name, etc during contract stage for approval.


Necessary Test Certificates shall be submitted to BHEL for review before actual dispatch of material.

In absence of co-related TC, 5 nos. random test sample may be drawn from each lot and Physical & Chemical test to be performed.

5.0 PACKING

The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling.

177595/2024/PS-PEM-EL

	TECHNICAL SPECIFICATION FOR MS ROD FOR BELOW GROUND EARTHING NPCIL KAIGA ATOMIC POWER PROJECT UNIT 5&6	SPECIFICATION NO. PE-TS-488-509-E001
		REV NO. : 00 DATE : 18.03.2024
		SHEET : 4 OF 10

DOCUMENTATION REQUIREMENT

DRAWINGS & DOCUMENTS TO BE SUBMITTED AFTER AWARD OF CONTRACT:

BHEL Drawing No.	Drawing Title	Vendor submission (Days)*	BHEL & Customer comment/ approval (Days)
Primary Documents			
PE-V0-488-509-E901	QAP for Below Ground Earthing Material	5	5
NOTES:			
a) * 1st submission within indicated days from date of purchase order.			
DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT			
Sl. No.	DOCUMENT TITLE		
1	APPROVED QUALITY PLAN.		

	TECHNICAL SPECIFICATION FOR MS ROD FOR BELOW GROUND EARTHING NPCIL KAIGA ATOMIC POWER PROJECT UNIT 5&6	SPECIFICATION NO. PE-TS-488-509-E001
		REV NO. : 00 DATE : 18.03.2024
		SHEET : 5 OF 10

SCOPE MATRIX FOR MS ROD

Sr. No.	Activities	Manufacturer	Bidder/ Associate	Remarks
1.	Source of Supply	Material is to be dispatched directly from the place of manufacturer (works / storage yard) of MS Rod to the project sites without any transshipment.	-----	Consignors Name & address on dispatch documents shall be of Manufacturer (works / storage yard) from where the material is dispatched.
2.	Testing/ Inspection			
3.	Guarantee/ Warrantee			
4.	Transportation			

Bidder to furnished duly filled in signed & stamped copy of scope matrix for broad activities

Approved

NUCLEAR POWER CORPORATION OF INDIA LIMITED

QUALITY ASSURANCE PLAN

BHEL P.O. No. on SUB VENDOR: GEMC-511687702303389 Date: 07.03.2023		QAP NO.: GHAVP-1&2/QAP/53200/00022	
PROJECT: GHAVP -1 &2		ITEM: MS ROD Safety class: NINS	REV. NO. R 0 DATE: 23.03.2023
NAME OF PACKAGE: TURBINE ISLAND PACKAGE PO NO. (NPCIL): CMM/ETM/00-40-11-005/PO/48571		NPCIL QA Ref. No.- 2230264	
NAME OF PACKAGE CONTRACTOR/MAIN CONTRACTOR AND ADDRESS BHARAT HEAVY ELECTRICALS LTD, NEW DELHI		NAME OF VENDOR/SUB VENDOR AND ADDRESS BHARAT HEAVY ELECTRICALS LTD, PS-PEM PLOT NO. 25, Sector-16A, NOIDA U.P-201301	
DATA SHEET/VSS NO./DRG NO.	ITEM MS ROD FOR BELOW GROUND EARTHING	BRIEF DESCRIPTION 40MM DIA MS ROD	DESIGN CODE/SPEC. NO. QAP
FOR PACKAGE/MAIN CONTRACTOR 1.) All the requirements of PO, Specification, Drawing, Datasheet, are incorporated in this QAP. 2.) Stage wise inspection documents shall be concluded/completed with signature of inspection agency including NPCIL QS before taking up and presenting the next stage of inspection.			
CHECKED BY Ashish Panigrahi <small>Digitally signed by Ashish Panigrahi, DN: cn=Ashish Panigrahi, o=BHEL PEM, ou=Quality & BE, email=ashishpanigrahi@npcil.com, c=IN</small> Date: 2023.03.23.16:35:19 +05'30'		APPROVED BY Vinod Kumar <small>Digitally signed by Vinod Kumar, DN: cn=Vinod Kumar, o=BHEL, ou=Quality & BE, email=vinodkumar@npcil.com, c=IN</small> Date: 2023.03.23.16:35:19 +05'30'	
SIGNATURE Ashish Panigrahi	REVIEWED BY Harish Kumar <small>Digitally signed by Harish Kumar, DN: cn=Harish Kumar, o=BHEL, ou=Quality & BE, email=harishkumar@npcil.com, c=IN</small> Date: 2023.03.23.16:35:19 +05'30'	APPROVED BY Vinod Kumar	APPROVED BY Vinod Kumar
NAME Ashish Panigrahi	NAME Harish Kumar	NAME Vinod Kumar	NAME Vinod Kumar
DATE 23.03.2023	DATE 23.03.2023	DATE 23.03.2023	DATE 23.03.2023

FOR VENDOR/SUB VENDOR

PREPARED BY [Signature]	CHECKED/REVIEWED BY [Signature]	APPROVED BY [Signature]
SIGNATURE AKASH GAJBHANE	SIGNATURE Rajesh Brahmankar	SIGNATURE Rajesh Brahmankar
NAME AKASH GAJBHANE	NAME Rajesh Brahmankar	NAME Rajesh Brahmankar
DATE 23/03/2023	DATE 28/3/2023	DATE 28/3/2023

FOR NPCIL

CHECKED BY [Signature]	REVIEWED BY [Signature]	APPROVED BY [Signature]
SIGNATURE Karmveer Singh	SIGNATURE D P Singh	SIGNATURE S. Ghosh
NAME Karmveer Singh	NAME D P Singh	NAME S. Ghosh
DATE 24-03-2023	DATE 24/03/2023	DATE 24.03.2023

AFFIX VENDOR STAMP

SR. NO.		COMPONENT / OPERATION	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY				REMARKS	NAME AND SIGNATURE WITH DATE			
										P	W	R	H		1	2	3	4
1		PROJECT: GORAKHPUR HARYANA ANU VIDYUT PARIYOJNA-1&2													NAME OF THE PACKAGE AND MAIN CONTRACTOR:			
2		SUB VENDOR/ SUB CONTRACTOR/ MANUFACTURERS NAME AND ADDRESS													TURBINE ISLAND PACKAGE BHARAT HEAVY ELECTRICALS LTD, NEW DELHI Unit: BHEL PS-PEM, Noida			
3		ITEM													MS ROD FOR BELOW GROUND EARTHING			
4		QAP No. / REV No. / DATE													GHAVP-1&2/QAP/53200/00022/0 Date-23.03.2023			
5		NO. OF PAGES													5			
6		QUANTUM OF CHECK													IS 2830			
7		TYPE OF CHECK													Review of Mill TC			
8		CLASS													Major			
9		CHARACTERISTICS													Physical & Chemical			
10		Raw Material													1.0			
11		Raw Material													1.1			
12		Casting/ Structural steel (Finished Product)													1.2			
13		Dimensional Checks & Visual Insp.													1.3			
14		FINAL DOCUMENTATION / HISTORY DOCKET / SHIPPING RELEASE													2.0			
15		Verification of final documents & stamping													2.1			
16		Inspection Release Note													2.2			
17		History/Docket													2.3			
18		Shipping Release													2.4			
19		SEAL AND SIGNATURE WITH DATE													1			

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General Requirements for Quality Assurance Plans of Turbine Island Package for GHAVP-1&2

Legends used in Quality Assurance Plan:

W: Witness, not hold, BHEL to give advance notice to customer to associate during checks/tests but work shall proceed.

R: Review of records (by customer as indicated under column 'C').

H / CHP: Customer Hold Point

MTC: Material Test Certificate

Obs. Sheet: Observation Sheet

L.S: Log Sheet

COC: Certificate of Compliance

Abbreviations:

CRITICAL:- The characteristic of a component, process or operation failure of which will surely cause operating failure or intermittent troubles which is difficult to rectify at site or render the unit unfit for use or cause safety hazards.

MAJOR :- The characteristic of a component, process or operation whose failure may cause operation failure which cannot be readily corrected at site or cause substandard performance, increased erection and maintenance cost, reduce life or seriously affect aesthetics.

MINOR :- The characteristic of a component, process or operation whose failure neither materially reduce the use ability of the product in operation nor does it affect the aesthetic aspects

1. H / CHP - Customer Hold Point: NPCIL QS witness/clearance is mandatory before proceeding with further activities. This activity shall be kept under hold till inspection clearance or written waiver is obtained from the agency responsible for this stage (NPCIL QS/their authorized representative).
2. W-Witness point: Witness points are critical steps in manufacturing and examination/inspection/testing where the supplier is obliged to notify NPCIL QS sufficiently in advance (at least 7 days) the start of the operation / test so that the same may be witnessed. The above notice periods are for BHEL shop Manufactured items only. For Sub-Contracted Items notice period for "W" shall be 15 days. The supplier may proceed with the work past a witness point in consultation with NPCIL. QS or their authorised representative.
3. All test reports, test certificates & Quality control records shall be reviewed & accepted by BHEL before submitting the same for the review of NPCIL QS.

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4. Castings shall be procured from NPCIL/BHEL approved Foundries. Pouring for casting (Body & Disc) shall be done along with test bar. First pouring of casting will be witnessed by the supplier/NPCIL approved TPIA & sub vendor (as applicable). SS casting and forging shall be received in pickled & passivated condition.
5. Raw-material on the basis of co-related original material test certificate (MTC) from NPCIL/BHEL approved material manufacturer is acceptable. In absence of co-related material test certificate, all items will be PMI tested for establishing no. of heat/lot. And subsequent further tests as per material standard to be conducted on sample basis. Sampling will be decided on the basis of PMI. The samples for chemical and mechanical tests shall be drawn and witnessed by BHEL/NPCIL. Approved TPI/NPCIL. Chemical and mechanical tests shall be conducted in NPCIL/NABL approved laboratory only. BHEL QS shall submit all, MTC's and test reports after their review & acceptance to NPCIL, QS for final review and clearance. This review/verification & clearance by NPCIL QS is CHIP. Stamping of raw material and stamp transfer shall be done by BHEL QS/NPCIL QS.
6. Wherever Customer Hold Point (CHP) is indicated, the supplier is to notify NPCIL QS or its authorised representative at least 7 days in advance. The above notice periods are BHEL shop Manufactured items only. For Sub-Contracted Items notice period for "CHIP" shall be 15 days.
7. Sample selection, for random witnessing of the inspection, examination, testing shall be done by NPCIL QS. Sampling plan, unless otherwise indicated, should generally be in accordance with IS 2500, Part-I, AQL:1%, Normal Level-II. (Refer - QAD/MISC/PROC/SAMP/ING/001 Rev.: 0).
8. All the procedures mentioned in the QAP like NDE procedures, hydro test, WPS etc, shall be checked, reviewed and approved by BHEL before submitting to NPCIL for approval. All NDE procedures shall have approval of Level III qualified personnel and prepared by Level-II person of BHEL/Sub-vendor.
9. The heat treatment furnaces shall have temperature recorder and valid calibration report. Calibration shall be done as per national standard/international standard/ as per NPCIL specification, if specified. All the calibration report will be checked by the NPCIL QS.
10. Calibrated instruments/gauges/thermocouples etc, shall be used during inspection and testing.
11. All NDI shall be carried out by Level-I/Level-II/Level-III & evaluated by Level-II/Level-III qualified person from ISNT/ASNT.
12. Chemicals used for LPT and MPF shall be from NPCIL approved brands only. BHEL will review IC's and reports before submitting to NPCIL.
13. Welding consumables shall be from NPCIL approved brand list. All batches of electrodes shall be tested as per referencing document.
14. Supplier can prepare their own NDE procedures meeting requirement of NPCIL specification and submit for approval. Alternatively, NPCIL procedure can be adopted by the supplier. The supplier shall submit the same and technique sheet along with modification, if any, for approval.
15. Inspection stages in the QAP are considering suppliers are from India based on past experience. In case of foreign suppliers, the QAP remains same, but the stage inspection extent (witness and hold points) may change, based on the type and strength of supplier to be

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NPCIL

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finalized after mutual discussion. Change in inspection extent will depend upon the participation of BHEL during manufacturing of items in foreign countries. It is expected that the participation of BHEL will be same or more as indicated in the QAP.

- 16. Spares shall undergo same testing/inspection requirements as per original items.
- 17. All items shall be stamped by vendor's name/monogram apart from item description, size, serial no., class, material code, rating, grade, etc. and meeting MSS-SP-25 and NPCIL specification.
- 18. Certified material test report (indicating material, size, item description, lot no., heat no., NDE report nos., check test certificate, vendors final certificate nos., etc.) shall be submitted.
- 19. The contractor / manufacturer shall prepare "History Docket" for the items supplied, compiling various inspection / test reports and also other relevant documents as per the tender specification/NPCIL procedure, and submit to NPCIL QS prior to issue of complete/ final Shipping Release (SR) (on completion of entire PO/SPO). As the final SR will be a part of History Docket, issuance of final SR & review of History Docket by NPCIL, QA shall be done simultaneously.
- 20. Bevel end/ SW ends shall be suitably protected from any damage.
- 21. In case of material/item acceptable to NPCIL on the basis of compliance certificate, the same to be provided by OEM and shall be certified by the BHEL.
- 22. Reference documents as mentioned in Quality Assurance Plan shall be shown to Customer at the time of inspection for BHEL shop manufactured items.
- 23. Brazer and Brazing Procedure Qualification shall be NPCIL approved. Brazer and Brazing Procedure Qualification shall be done in the presence of NPCIL QA representative. Only approved Brazer by NPCIL shall perform NPCIL jobs.
- 24. During manufacturing, only latest revision of drawings/specifications/procedures/code shall be used.
- 25. Whenever witnessing (W) by NPCIL is specified, BHEL's representative shall also witness the test.
- 26. Inspection call should be raised such that there is optimisation of visits and inspection activities.

Brij Bhushan
 C.B. B. Tripathy
 BHEL HWR

(Arvind Swami)
 (Arvind Swami)
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10/10/2022
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