

Pre-Qualification requirements for GAS TYPE DIAL THERMOMETER as per specification TG60745

Description:

Gas actuated dial thermometer is used for measuring temperature in primary water and seal oil system of turbo generator. It comprises of bourdon tube, bezel ring, glass, shank and dial. It should be of very reliable and proven design to measure the temperature in all operating conditions.

- 1.0** The vendor should be a regular manufacturer of such dial thermometer with following requirements-

Sr. No.	Parameter	Value
(i)	Dial size (mm)	100 (minimum)
(ii)	Scale	Degree C
(iii)	Range	0 to 50 (minimum)
(iv)	Accuracy	±1 % of Full Scale Deflection

- 2.0** In support of above sl. no. 1, vendor shall furnish technical details in below mentioned format for at least five (5) nos. of dial thermometer for the P.O. executed in past 5 years (from date of enquiry) along with P.O. copies.

S. No.	Brief technical details	Application	Name & address of customer	Date of supply
	- Application fluid - Working pressure and temperature - Dial size - Measuring range, scale, accuracy - Material of case/bourdon tube/ bezel ring etc.	De-mineralized water, oil & gas		

- 3.0** Vendor to furnish the test certificate for accuracy, calibration test and type test as per EN13190 against any one of the P.O. submitted as per clause 2. Test certificates must be clearly correlated with P.O.
- 4.0** Vendor to furnish acceptance certificate from one of the end users of dial thermometer against any one of the P.O. submitted as per clause 2. (Original Certificate or through e-mail directly from the customer). Acceptance certificate should contain information like item details and its application or correlation with P.O.

Note: BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.

Annexure- B

Framework Confidentiality Agreement (FCA)

Framework Confidentiality Agreement cum Undertaking

This Agreement made on this the _____ day of (month) _____ 20____ (“Effective Date”) by and between
M/s BHARAT HEAVY ELECTRICALS LIMITED, having registered office at “BHEL House”, Siri Fort, New Delhi – 110049 (India), acting through its _____ Unit (hereinafter may be referred to as “BHEL” or “the Company”).

And

M/s _____ (address) _____
represented by authorized representative Sri _____ (herein after referred to as the “Supplier”).

The Supplier and the Company may, unless the context otherwise requires, hereinafter be collectively referred to as “Parties” or singly as the “Party”.

RECITALS

Whereas, BHEL is engaged in the design, engineering, manufacturing, construction, testing, commissioning and servicing of a wide range of products, systems and services for the core sectors of the economy, viz. Power, Transmission, Industry, Transportation, Renewable energy, Oil & Gas and Defence and providing associated services to varied customers in relation to which BHEL/its affiliates own valuable information of a secret and confidential nature.

Whereas the Company may, in connection with Contract(s) (as defined hereunder) placed or to be placed upon the Supplier, or otherwise, from time to time, make available, Technical Information as is defined hereunder.

And Whereas BHEL is willing to provide such Technical Information to the Supplier from time to time and the Supplier understands and acknowledges that such Technical Information is valuable for the Company and as such is willing to protect confidentiality of such information, subject to the terms and conditions set out hereunder.

Now therefore, in view of the foregoing premises and in consideration of the mutual covenants and agreements hereinafter set forth, the Parties agree as under:

1. Definitions:

Unless the context so requires, in this Agreement, the following terms will bear the meaning ascribed to the said term in this clause.

- A. **“Contract”** means the Contract entered into with a Supplier and includes a Purchase Order, or a Work Order for procurement of any goods or for provision of any services.
- B. **“Effective Date”** means the date of this Agreement as mentioned in the preamble of this Agreement.

- C. **“Supplier”** includes a Contractor or a Vendor of the Company whether for supplying of goods or for providing any services under a Contract or both.
 - D. **“Technical Information”** includes Drawings, and/or Product Standards and/or Specifications and/or Corporate / Plant Specifications and/or Technological Process Sheets and/or Technical Data Sheets and/or Jigs & Fixtures and/or Pattern & Dies and/or Special Gauges and/or Tools etc. belonging to or wherein the Company has acquired from a third party a right of user and includes any improvement thereto from time to time whether carried out by the Company or by the Supplier.
 - E. **“Intended Purpose”** means the purpose for which the Technical Information is provided to the Supplier under or in connection with a Contract.
 - F. **“Improvement”** includes any modification made to, or adaptation of, the Technical Information which enhances or is calculated to enhance the performance (whether in terms of effectiveness or in terms of efficiency or both) of the product and/or the service to be provided by the Supplier under a Contract.
2. This Agreement shall come into force/deemed to have come into force, as the case may be, on the Effective Date; or, on the first date when the Technical Information or any part thereof is provided by BHEL to the Supplier; whichever is earlier.
3. **Agreement deemed to be incorporated in each Contract:** Unless and to the extent otherwise stipulated in the Contract, the conditions of this Agreement are deemed to be incorporated in all Contracts which may be entered into between the Company and the Supplier. Further, unless otherwise stipulated, the obligations under this Agreement are and will be independent of the obligations under the Contracts and such obligations of the Supplier hereunder will remain of full effect and validity notwithstanding that the period of validity of the Contracts has expired by efflux of time stipulated therein; or, the contract has been discharged by performance or breach; or, the termination of the Contracts for any reason whatsoever.
4. **Ownership:**
- 4.1 The Company may, from time to time, make available to the Supplier, Technical Information on a non-exclusive basis by way of loan.
 - 4.2 The Supplier acknowledges and agrees that all Technical Information and copies thereof that are or may be provided by the Company to the Supplier, are and shall remain the property of BHEL or that of the concerned entity from whom BHEL has obtained the Technical Information and such Technical Information are and shall constitute trade secrets of the BHEL. Nothing in this Agreement or in any disclosures made hereunder by or on behalf of the Company shall be construed as granting upon the Supplier any patent, copyright or design or any other intellectual property rights of whatsoever description that subsists or may hereinafter exist in the Technical Information. Furthermore, nothing in this Agreement or in any disclosures made hereunder by or on behalf of the Company shall be construed as granting upon the Supplier any license or rights of use of such patent, copyright or design or any other

intellectual property rights of whatsoever description which may now or hereafter exist in the Technical Information except for use of the Technical Information strictly in accordance with this Agreement and the Contract and/or as directed in writing by the Company, solely for the Intended Purpose under the Contract.

- 4.3 Neither Party is obligated by or under this Agreement to purchase from or provide to the other Party any service or product and that any such purchase/sale of any product and/or service by one Party to the other Party will be governed by the Contract if any, that may be entered into by and between the Company and the Supplier.
- 4.4 The Supplier is/has been made well aware and acknowledges that the Technical Information being/which may be shared with it by the Company has been either generated by the Company by incurring huge investment and cost or obtained from foreign collaborators under Technical Collaboration Agreement (TCA) with stringent confidentiality conditions.
- 4.5 The Supplier agrees and undertakes to adhere to confidentiality requirements as applicable to BHEL under a TCA and also ensure that the confidentiality requirements are adhered to by all its concerned employees or sub-contractors/suppliers (where permitted to be engaged by BHEL). Any damages, losses, expenses of any description whatsoever, arising out of or in connection with a breach of the confidentiality requirements under a TCA owing to any act or omission on the part of the Supplier or its employees or sub-contractors/suppliers that is claimed by a foreign collaborator from the Company shall be wholly borne by the Supplier and it shall keep BHEL fully indemnified in this behalf. The demand by the Company shall be conclusive upon the Supplier who shall thereupon forthwith pay to the Company without demur, dispute or delay the amount as demanded without demanding any further proof thereof.
- 4.6 The Supplier agrees and undertakes that unless so decided and advised by the Company in writing all rights/title to any Improvement to the Technical Information shall vest in the Company. The Supplier undertakes and agrees to inform forthwith to the Company of any such Improvement made to the Technical Information and transfer all drawings/documents or other materials connected with such Improvement to the Company and also agrees to fully cooperate with the Company for protecting the Company's interests in such Improvement in the Technical Information including but not limited to obtaining necessary protection for the intellectual property rights in such improvement, if so desired by the Company. If a question arises whether a modification amounts to Improvement to the Technical Information, the same shall be decided by the Company and such decision shall be final and binding upon the Supplier.

5. Use and Non-Disclosure:

- 5.1 Unless otherwise stipulated by the Company, all Technical Information made available to the Supplier, by the Company shall be treated as Confidential irrespective of whether the same is marked or otherwise denoted to be Confidential or not.

- 5.2 The Supplier undertakes and agrees that the Technical Information in its possession shall be held in strict confidence and will be used strictly in accordance with this Agreement and solely for the Intended Purpose under the Contract. Use of the Technical Information for any other purpose other than Intended Purpose is prohibited.
- 5.3 In particular, the Supplier shall not use Technical Information or any Improvement in its possession for the manufacture or procurement of the Product(s) or components or parts thereof or use the Technical Information or any portion thereof or any modification or adaptation thereof in any form to provide any product and/or service to any third party, without the prior written consent of the Company.
- 5.4 The Supplier shall not disclose any of such Technical Information to any third party without the prior written consent of the Company. The Supplier agrees that without prior written consent of the Company, the Supplier shall not disclose to a third party about the existence of this Agreement, or of the fact that it is/was in possession of or has experience in the use of any Technical Information nor shall the Supplier share in any manner whatsoever, with a third party, the name or details of any Contract(s) awarded by the Company to it or performed by the Supplier or the scope of work thereof or share any document or correspondence by and between the Company and the Supplier in or in connection with this Agreement or such Contract(s). Notwithstanding what is stated elsewhere, the overall responsibility of any breach of the confidentiality provisions under this Agreement shall rest with the Supplier.
- 5.5 The Supplier undertakes and agrees not to make copies or extracts of and not to disclose to others any or all of the Technical Information in its possession, except as follows:
- (a) The Supplier may disclose the Technical Information to such of its officers and employees strictly to the extent as is necessary for such officer or employee for the Intended Purpose, provided that the Confidential Information (or copies thereof) disclosed shall be marked clearly as the confidential and proprietary information of Company and that such officers and employees shall similarly be bound by undertakings of confidence, restricted use and non-disclosure in respect of the Technical Information. The Supplier shall be responsible for any breach of such confidentiality provisions by such officers and employees.
 - (b) With the prior written consent of Company, the Supplier may disclose for the Intended Purpose such Technical Information as is provided for in such consent to such of its professional advisers: consultants, insurers and subcontractors who shall be similarly bound by undertakings of confidence, restricted use and non-disclosure in respect of such Technical Information.
 - (c) The Supplier shall not be prevented to make any disclosure required by (i) order of a court of competent jurisdiction or (ii) any competent regulatory authority or agency where such disclosure is required by law, provided that where the Supplier

intends to make such disclosure, it shall first consult Company and take all reasonable steps requested by it to minimize the extent of the Technical Information disclosed and to make such disclosure in confidence and also shall cooperate with the Company in seeking any protective order or any other remedy from proper authority in this matter.

6. Exceptions:

The obligations of the Supplier pursuant to the provisions of this agreement shall not apply to any Confidential Information that:

- a) was/is known to, or in the possession of the Supplier prior to disclosure thereof by the Company;
- b) is or becomes publicly known, otherwise than as a result of a breach of this agreement by the Supplier.
- c) is developed independently of the Disclosing Party by the Supplier in circumstances that do not amount to a breach of the provisions of this Agreement or the Contract;
- d) is received from a third party in circumstances that do not result in a breach of the provisions of this Agreement.

7. The obligation of maintaining confidentiality of the Technical Information on each occasion, shall subsist for the entire duration during which the Technical Information / equipment is in possession of the Supplier and shall thereafter subsist for a further period of --- years from the date when the complete Technical Information has been returned to the Company and if Technical Information has been returned in portions on different dates then, the period of ---- years will be reckoned from the date when the last portion of the Technical Information has been returned. Notwithstanding the expiry of the confidentiality obligation, the obligation of the Supplier under clause 5.4 shall continue to subsist for a further period of ----- years.

8. Warranties & Undertakings:

a) The Supplier undertakes to ensure the due observance of the undertakings of confidence, restricted use and non-disclosure by its persons to whom it discloses or releases copies or extracts of the Technical Information.

b) The Supplier shall keep the Technical Information or improvement made therein properly segregated and not mix up the same with any other material/documents belonging to him/it or to any other third party.

c) The Supplier further undertakes that he/it shall not hypothecate or give on lease or otherwise alienate or do away with any of the Technical Information and/or equipment of the Company, made available to him/it, and undertakes that he/it shall hold the same as a trustee, in capacity of custodian thereof and use/utilise the same solely for the purpose of executing the Contract awarded by the Company.

d) The Supplier further undertakes that he/it shall return all the equipment and/or Technical Information as far as practicable in the same condition in which the same was made available to him/it by the Company together with any Improvement thereon and the documents connected with such Improvement, to the Company forthwith upon completion of the scope

of work or Contract for which such Technical Information was provided by the Company to it or as directed by the Company together with a confirmation by way of an affidavit or in such manner as directed by the Company that it has not retained any equipment and/or Technical Information/Improvement thereof. In case any such equipment and/or Technical Information or Improvement thereof shall remain in his possession or is not capable of being returned, the retention and use of such Technical Information or Improvement thereto shall continue to be governed by this Agreement.

e) The Supplier undertakes to indemnify the Company for all the direct, indirect and/or consequential losses, damages, expenses whatsoever including any consequential loss of business, profits suffered by the Company owing to breach by the Supplier of its obligations under this Agreement and/or the confidentiality requirements, if any, contained in the Contract and that the Supplier hereby agrees that the decision of the Company in all such or any such matter/s shall be final and binding on the Supplier. On mere written demand of the Company, the Supplier shall forthwith and without demur or delay pay to the Company any such sum as determined by the Company as the amount of loss or damage or expense which has been suffered by the Company. The Supplier agrees that the Company shall be entitled to withhold and appropriate any amount payable to the Supplier under any Contract then existing between the Company and the Supplier, in case the Supplier fails to make payment, in terms of the written demand, within 7 days thereof. Without prejudice to the foregoing actions, in respect to any breach of this Agreement, the Company shall be entitled to take any other action against the Supplier as per applicable laws, the Contract, Company's applicable policies, guidelines rules, procedures, etc.

9. Without prejudice to any other mode of recovery as may be available to the Company for recovery of the amount determined as due as per Clause 8(e) hereinabove, the Company shall have a right to withhold, recover and appropriate the amount due towards such losses, damages, expenses, from any amount due to the Supplier in respect of any other Contract (s) placed on him/it by any department/office/Unit/Division of the said Company.

10. Arbitration & Conciliation:

a) In case amicable settlement is not reached between the Parties, in respect of any dispute
or

difference or claim or controversy arising out of the formation, breach, termination, validity or execution of the Contract(or Agreement) or the respective rights and liabilities of the parties or in relation to interpretation of any provision of the Contract or in any manner touching upon the Contract, then, either Party may, by a notice in writing to the other Party refer such dispute or difference or controversy or claim, (except as to any matters, the decision of which is specifically provided for therein) to the sole arbitration by the arbitrator appointed by Head/In-Charge of the Unit/Division/Region.

b) The Arbitrator shall pass a reasoned award and the award of the Arbitrator shall be final and binding upon the parties to the dispute.

c) Subject as aforesaid, the provisions of Arbitration and Conciliation Act 1996 (India), or other statutory modifications or re enactments thereof and the rules made thereunder and for

the time being in force shall apply to the arbitration proceedings under this clause. The seat of arbitration shall be at ----- **(Insert the name of the city/town of the concerned BHEL Unit/Division).**

d) In case of Contract with Public Sector Enterprise (PSE) or a Government Department, the following shall be applicable:

In the event of any dispute or difference relating to the interpretation and application of the provisions of the Contract, such dispute or difference shall be referred to by either party to the arbitration of one of the arbitrators in the department of public enterprises to be nominated by the Secretary to the Government of India in-charge of the Department of Public Enterprises. The Arbitration and Conciliation Act, 1996 shall not be applicable to arbitration under this clause. The award of the arbitrator shall be binding upon the parties to the dispute, provided, however, any party aggrieved by such award may make further reference for setting aside or revision of the award to the Law Secretary, Department of Legal Affairs, Ministry of Law and Justice, Government of India. Upon such reference the dispute shall be decided by the Law Secretary or the Special Secretary or Additional Secretary when so authorized by the Law Secretary, whose decision shall bind the parties hereto finally and conclusively.

e) Notwithstanding the existence or any dispute or differences and/or reference for the arbitration, the Supplier shall proceed with and continue without hindrance the performance of its obligations under this Contract with due diligence and expedition in a professional manner.

11. Governing Law & Jurisdiction:

This Agreement shall be governed by and be construed as per applicable Indian Laws in force at the relevant time.

Subject to clauses 10(a) and 10(d) hereinabove, all matters in connection with the subject agreement shall be subject to exclusive jurisdiction of Courts situated at -----**(insert the name of the place where the BHEL Unit/Division is located)**

SIGNATURE

WITNESSES

1.

Name

Address:

2.

Name:

Address:

NON-DISCLOSURE AGREEMENT

All Drawing and Technical Documents relating to the product or it's manufacture submitted by one party to the other, prior or subsequent to the formation of contract, shall remain property of the submitting party. Drawing, technical documents or other technical information received by one party, shall not without the consent of the other party, be used for any other purpose than that, for which they were provided. Such technical information shall not without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party. Patterns supplied by BHEL will remain BHEL's property which shall be returned by the bidder on demand to BHEL. Bidder shall in no way share or use such intellectual property of BHEL to promote his own business with others. BHEL reserves the right to claim damages from the bidder, or take appropriate penal action as deemed fit against the bidder.

Signature with stamp

Quality Requirement will be as follows: -

Vendor approval from NPCIL/ End customer is required. For unapproved vendors to provide desired Data & Credentials as per NPCIL format for NPCIL approval.

Vendors has to confirm for inspection by BHEL/ BHEL nominated Inspection agency **(M/s. INTERTEK)** and NPCIL/End customer as per NPCIL approved QAP for Gas based Thermometers. Vendors to submit endorsed copy of this QAP. Vendors have to follow inspection T&C as per NPCIL/ End customer approved QP. Vendors also confirm to follow General Quality Requirements of NPCIL project.

Item details are as follows –

MATERIAL CODE- W96414906972

INERT GAS ACTUATED DIAL
THERMOMETER, TYPE A, M18X1.5
RANGE 0-100 DEG.C
SPEC. NO: - TG60745
SPEC: TG60745 REV: 00
QTY- 14 Nos.

MATERIAL CODE W96414906956

INERT GAS ACTUATED DIAL
THERMOMETER, TYPE C, M18X1.5
RANGE 0-250 DEG.C
SPEC. NO: - TG60745
SPEC: TG60745 REV: 00
QTY- 02 Nos.

NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

CHECKLIST & RECOMMENDATION FOR EVALUATION OF VENDORS

Tender No :

Item/Package : TG Island

Name of Main Contractor : BHEL, Haridwar

Address and contact details of Main Contractor : Heavy Electrical Equipment Plant, BHEL
Ranipur, Haridwar, Uttarakhand-249403,
Contact:- 01334-281363

Name of Sub-contractor/Vendor :

Business address of Sub-contractor :

Factory address of Sub-contractor :

Items for which approval is sought :

1.0 General:

- 1.1) Key Personnel contacted :
- a) Senior Management :
- b) Quality Co-ordinator :
- c) Others (Production, Planning etc.) :

FOLLOWING ARE TO BE COMMENTED

- 1.2) Recognition details if any code Stamps like U1, U2, ASME N, NPI or certification Like ISO :
9001, 14000 etc. (Verify the records)
- 1.3) Floor space availability for present Activities/for future expansion :
- a) Indoor :
- b) Outdoor :

- 1.4) Level of House keeping :
- 1.5) Whether NPC jobs executed earlier :
- Whether BHEL jobs executed earlier for same item :
- Whether BHEL jobs executed earlier for similar item :
- Other than BHEL/NPC experience :
- 1.6) Delivery Performance (Schedule vs Actual) (Verify records) :

2.0 Technical

- 2.1) Quality Control
 - (a) Incoming Material Inspection :
 - (b) Process Inspection :
 - (c) Final Inspection :
 - (d) Manufacturing flow chart in detail along with outsourcing of items/operations :
- 2.2) Plant & Machinery :
 - (a) General condition & Age :
 - (b) Confirms to the details submitted in application :
- 2.3) Calibration facilities :
- 2.4) Calibration records :
- 2.5) NDE Qualification records :
- 2.6) Is there a system of selecting/short listing Sub-vendors? :
- 2.7) Availability of Testing facilities (details to be submitted) :

- 2.8) Whether working of following are satisfactory?
 - (a) Production :
 - (b) Quality control :
- 2.9) Understanding of scope of work :
- 2.9.1) Understanding of technical requirement of Job :
- 2.10) Availability and understanding of related standards. :
- 2.11) Capacity of the Vendor to fabricate and inspect :
- 2.12) Understanding of special Examination/ Testing (like ultrasonic Examination/ Helium Leak testing, Optical alignment testing etc.) :
- 2.13) Availability of special facilities :
- 2.14) Facilities/Machineries/testing equipment available in the shop floor to meet technical requirement of the job :
- 2.15) Qualified and experience Manpower in the shop floor to execute the specified job :

3.0 Quality System :

- 3.1) If ISO certified, check the availability and accessibility of Quality system manual :
- 3.2) Validity of ISO certification :
- 3.3) Whether Quality Control plan and Procedures are prepared? :
- 3.4) Whether organisation chart is available? :

- 3.5) What is the level of Quality Control in the organisation? :
- 3.6) Whether working of following are Satisfactory?
- (a) Document control :
- (b) Process Control :
- (c) Non-conformances control :
- 3.7) Whether Internal Quality Audits are carried out? :
- 3.8) Whether non-conformities during Internal Audits are recorded and disposed off following laid down procedure? :
- 4.0 Financial Details (Previous three years) :

5.0 Assessment

5.1 Understanding and interpretation by vendor

Sl No	Area of Assessment	Observation	Remark
1	Scope of work		
2	Related standard		
3	Construction features		
4	Functional Requirement		

5.2 Capability of Vendor

Sl No	Area of Assessment	Observation	Remark
1	To design/develop		
2	To fabricate		
3	To inspect		
4	Specify remark on the capability of vendor to execute the job		

5.3 Comments if any w.r.t. delivery schedules: NA

5.4 Comments if any on quality of product: NA

6.0 Conclusion: Vendor is capable for meeting the requirement, hence acceptable to BHEL.

Signatures of BHEL evaluation Team Members

Sl No	Name (Mr.)	Designation	Signature & Date
1			
2			
3			

GENERAL QUALITY REQUIREMENTS FOR 2X700MW GHAVP UNIT#1 & 2

Vendors to confirm the followings points for enquired items/materials pertaining to NPCIL (GHAVP-TURBINE ISLAND PKG) project.

S. No.	Clause	Descriptions	Vendor's response (Yes/No/Not applicable)
1	5.1	All material shall be procured from the manufacturer and not from Trader.	
2	5.1	All material used or supplied under this contract shall carry suitable identification marks.	
3	5.2	All fabrication processes are controlled and accomplished by qualified personnel using BHEL/NPCIL approved qualified procedures.	
4	5.2	Supplier to maintain a weld book for all welding related activities for records.	
5	5.2	WPS/PQR/WPQ shall be verified/approved by BHEL & NPCIL before start of the welding activity.	
6	5.4	Record of stage wise inspection record (surface preparation, primer application, each coat of paint) shall be maintained. Paint thickness shall be within 10% of the dry film thickness specified.	
7	5.7	WPS/WPQR/Welder qualification/NDE procedure/Heat Treatment/Hydrostatic pressure test/Vacuum Test/Painting/Special process/Test procedure (if any) shall be verified/approved by BHEL & NPCIL (if required) before start of activity.	
8	6.0	Chemicals used for LPT shall be from NPCIL approved brands only (attached).	
9	6.0	Welding consumables shall be from NPCIL approved brand list (attached). However, lot testing of each batch of welding consumables shall have to be carried out separately before use in the job for meeting the requirements of respective specification and code. Vendor to provide TC for the same.	
10	6.0	Brazer and Brazing procedure qualification shall be BHEL and NPCIL verified/approved (if applicable).	
11	6.0	Casting shall be procured from NPCIL/BHEL approved foundries (if applicable).	

In case vendor gives response as "No", vendor to provide reason/justification of same for BHEL review. If above activity/clause is not relevant to any item/product, vendor to provide response as "Not applicable". In case of ambiguity, vendor to comment and take clarification from BHEL during offer evaluation.

LIST OF APPROVED PENETRANT TESTING MATERIALS

(As on 28-06-2022)

Sr. No.	Manufacturers	Brand name	Description	Valid up to
1.	ORIENTAL CHEMICAL WORKS (P) LTD.KOLKATA	Orion 119 P	Red Dye Penetrant	FEB-2026
2.	ORIENTAL CHEMICAL WORKS (P) LTD.KOLKATA	Orion 119 PR	Penetrant Remover	FEB-2026
3.	ORIENTAL CHEMICAL WORKS (P) LTD.KOLKATA	Orion 119 D	Developer (Non-Aqueous)	FEB-2026
4.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-SP 1	Red Coloured Solvent Removable Penetrant	July2024
5.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKC-1	Solvent Cleaner	July2024
6.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKD-S2	Solvent Base Developer	July2024
7.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-WP2	Red Coloured Water Washable Penetrant	July2024
8.	MAGNAFLUX ITW INDIA PVT.LTD.SECUNDERABAD	SKL-SP2	Red Coloured Solvent Removable Penetrant.	July2024
9.	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Penetrant (NP Grade)	Red Coloured Solvent Removable Penetrant.	Oct2024
10	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Cleaner (NP Grade)	Solvent Cleaner	Oct2024
11	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Developer (NP Grade)	Solvent Base Developer	Oct2024
12	PRADEEP METAL TREATMENT CHEMICALS PVT. LTD., THANE	Flaw Guide Red Dye Penetrant-W	Water Washable Dye Penetrant	Oct2024
13	3AK Chemie India Pvt.Ltd. (Formerly known as MR Chemie India Pvt. Ltd.),Hyderabad	MR ^(R) 62	Solvent Removable Penetrant–Red	Dec2026
14	3AK Chemie India Pvt.Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 68 NF	Solvent Removable and Water Washable Penetrant–Red	Dec2026
15	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 67	Solvent Removable and Water Washable Penetrant–Red	Dec2026
16	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 672 F	Solvent Removable and Water Washable Penetrant–Fluorescent	Dec2026
17	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 85	Solvent Remover suitable for MR ^(R) 68NF, MR ^(R) 67, MR ^(R) 672F and MR ^(R) 62.	Dec2026
18	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 70	Non-Aqueous Developer suitable for MR ^(R) 68 NF, MR ^(R) 67 and MR ^(R) 672F	Dec2026

Dept. Document No. 4555 GHP/12S/.....100--GS50/EC
 Type MA 2022-10-19
 Rev. Released EN
 Log. Status Approved

Sr. No.	Manufacturers	Brand name	Description	Valid up to
19	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR ^(R) 70 I	Non-Aqueous Developer suitable for MR ^(R) 62.	Dec2026
20	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	SP-10,SC-20, SD30	Solvent Removable Penetrant, Solvent Remover, Non - Aqueous Developer	April2027
21	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	WP-15, SC20, SD30	Water Washable Penetrant, Solvent Remover, Non - Aqueous Developer	April2027
22	3AK Chemie India Pvt. Ltd. (Formerly known as MR Chemie India Pvt. Ltd.), Hyderabad	MR311-R, MR85,MR70I	Water Washable & Solvent Removable Penetrant, Solvent Remover, Non - Aqueous Developer	April2027
23	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-15/PP-15B	Red Coloured Solvent Removable Penetrant	AUG2026
24	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-19/PP-19B	Red Coloured Water Washable Penetrant	AUG2026
25	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PC-21/PC-21B	Solvent Cleaner	AUG2026
26	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PD-31/PD-31B	Solvent Base Developer	AUG2026
27	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PP-110/ PP110B	Red Coloured Solvent Removable Penetrant	AUG2026
28	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PC 120/ PC-120B	Solvent Cleaner	AUG2026
29	P-MET HIGH TECH CO. PVT. LTD., VADODARA	PD 130 /PD-130B	Solvent Base Developer	AUG2026
30	P-MET HIGH TECH CO. PVT. LTD., VADODARA	FPS46/FPS46B	Solvent Removable Fluorescent Penetrant	AUG2026
31	P-MET HIGH TECH CO. PVT. LTD., VADODARA	FPS49/FPS49B	Water Washable Fluorescent Penetrant	AUG2026
32	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-911, FC-811 FC-711	Solvent Removable (Visible)	JAN2027
33	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-931, FC-811	Water Washable (Visible)	JAN2027
34	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-941, FC-821	Water washable (Fluorescent)	JAN2027
35	FERROCHEM NDT SYSTEM PVT. LTD. PUNE	FC-921, FC-821, FC-721	Solvent removable (Fluorescent)	JAN2027
36	DYEGLO PVT. LTD, PUNE	RP-81	Red Coloured Solvent Removable Penetrant	DEC2023
37	DYEGLO PVT. LTD, PUNE	RP-90	Red Coloured Water Washable Penetrant	DEC2023
38	DYEGLO PVT. LTD, PUNE	CL-01	Solvent Cleaner	DEC2023
39	DYEGLO PVT. LTD, PUNE	RD-01	Solvent Base Developer suitable for RP-81 & RP-90	DEC2023
40	DYEGLO PVT. LTD, PUNE	FP-01	Fluorescent Solvent Removable Penetrant	DEC2023
41	DYEGLO PVT. LTD, PUNE	WD-01	Solvent Base Developer suitable for FP-01.	DEC2023

Note:-

1. Halogen content in Penetrant, Cleaner and Developer is 25ppm (max) and Sulphur content is 500ppm (max). However when using penetrant materials for Austenitic Stainless Steel, Titanium, Nickel base or other high temperature alloys, Halogen and Sulphur content shall not exceed 25ppm. Manufacture has to mention for each batch, the Sulphur and Halogen content in the label of each container for selection of Penetrant materials for the stated application.
2. Developer is to be used in Aerosol Cane to get the best results.

Anoop Singh
28/06/2022

(Anoop Singh)
Head QA (Baroda & Dehej)

Through: ~~Shri Sundar Singh, AD (QA, M-1 &4)~~

Sundar Singh
28.06.2022

→ ~~Shri A.K. Deshmukh, AD (QA Group-2)~~

A.K. Deshmukh
28.6.2022

→ ~~Executive Director (QA)~~

Madhew
28.06.2022

Dept.	Document No.	Type	Rev./Released	Eng.	Status
4555	GHP12S.....100--GS50	EC	MA 2022-10-19	EN	Approved

NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

Directorate of Quality Assurance

Phone: 022 – 2599 5045, Fax 022 – 2556 5354

1) LIST OF APPROVED CARBON STEEL & LOW ALLOY STEEL WELDING ELECTRODES (2 pages)

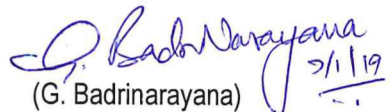
As on 07-01-2019

Sr. No.	Manufacturers	Brand name	AWS No.	Valid up to
1.	ADOR Welding Ltd., Silvassa	SUPABASE X PLUS	E7018	FEB2019*
2.	ADOR Welding Ltd., Silvassa	MOLYTEN	E7018-A1	APR2020
3.	ADOR Welding Ltd., Silvassa	TENALLOY Z PLUS	E7018-1	JUN2022
4.	ADOR Welding Ltd., Silvassa	CHROMOTEN	E8018 B2	APR2020
5.	ADOR Welding Ltd., Silvassa	CHROMOTEN-C	E9018 B3	APR2020
6.	D&H SECHERON, Indore	MOLYTHERME	E7018-A1	JUN2022
7.	D&H SECHERON, Indore	MEDIO	E6013	JUN2020
8.	D&H SECHERON, Indore	EXOBEL	E6013	JUN2020
9.	D&H SECHERON, Indore	SUPERTHERME	E7018	JUN2020
10.	D&H SECHERON, Indore	SUPERTHERME(SPL)	E7018-1	NOV2023
11.	D&H India Ltd., Indore	SUPER -LH (SPL)	E7018-1 (DCEP Only)	FEB2021
12.	D&H India Ltd., Indore	STANDARD	E6013	FEB2021
13.	D&H India Ltd., Indore	SUPER LH	E7018 (DCEP Only)	FEB2021
14.	D&H India Ltd., Indore	SUPER -CR-1	E8018 B2	DEC2020
15.	D&H India Ltd., Indore	SUPER -CR-2	E9018 B3	DEC2020
16.	ESAB INDIA LTD, AMBATTUR, CHENNAI	ESAB 28	E6013	SEP2019
17.	ESAB INDIA LTD, AMBATTUR, CHENNAI	ESAB 36H	E7018	SEP2019
18.	ESAB INDIA LTD, AMBATTUR, CHENNAI	ESAB 36H(SPL)	E7018-1	SEP2019
19.	ESAB INDIA LTD, AMBATTUR, CHENNAI	ESAB PIPEWELD 6010R	E6010	SEP2019
20.	HONAVAR ELECTRODES, THANE	REGULAR S	E6013	JAN2020
21.	HONAVAR ELECTRODES, THANE	ULTIMATE - 18	E7018	JAN2020
22.	HONAVAR ELECTRODES, THANE	ULTIMATE – 18 SPL	E7018-1	JAN2020
23.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -13R	E6013	SEP2020
24.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -18	E7018	SEP2020
25.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -18 PLUS	E7018-1	SEP2020
26.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -1 CR	E8018-B2	DEC2018*
27.	MAILAM INDIA LTD., PUDUCHERRY	MAILARC -2 CR	E9018-B3	DEC2018*
28.	ROYAL ARC ELECTRODES, VASAI	ROYAL THERME	E7018	SEP2018*
29.	ROYAL ARC ELECTRODES, VASAI	ROYAL S	E6013	SEP2018*
30.	ROYAL ARC ELECTRODES, VASAI	ROYAL THERM SPL.	E7018-1	SEP2021
31.	ROYAL ARC ELECTRODES, VASAI	ROYAL THERM MOLY	E7018-A1	MAR2023
32.	ROYAL ARC ELECTRODES, VASAI	ROYAL CHROM 1	E8018-B2	FEB2023
33.	ROYAL ARC ELECTRODES, VASAI	ROYAL CHROM 2	E9018-B3	FEB2023
34.	RAJ KESARI ELECTRODES, UDAIPUR	SUPERLET 18	E7018	AUG2022
35.	RAJ KESARI ELECTRODES, UDAIPUR	SUPERLET 18 (SPL.)	E7018-1	AUG2022
36.	RAJ KESARI ELECTRODES, UDAIPUR	RAJCORD 13S	E6013	AUG2022
37.	RAJRATNA ELECTRODES, AHMEDABAD	RATNA 7018	E7018	NOV2023

Sr. No.	Manufacturers	Brand name	AWS No.	Valid up to
38.	RAJRATNA ELECTRODES, AHMEDABAD	RATNA 7018 SPL.	E7018-1	MAR2020
39.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	GARANT MO	E7018-A1	SEP2020
40.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	SUPERCITO	E7018	SEP2019
41.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	SUPERCITO 7018-S	E7018-1	SEP2019
42.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	OVERCORD S	E6013	SEP2019
43.	SUPERON SCHWEISSTECHNIK INDIA LTD., DELHI	SUPER CROMO 1B	E8018-B2	DEC2020
44.	SUPERON SCHWEISSTECHNIK INDIA LTD., DELHI	SUPER CROMO 2B	E9018-B3	DEC2020
45.	VIJAY ELECTRODES & WIRES PVT. LTD., CHENNAI	VJ 6013 X	E6013	SEP2020
46.	VIJAY ELECTRODES & WIRES PVT. LTD., CHENNAI	VJ 7018	E7018	SEP2020
47.	VIJAY ELECTRODES & WIRES PVT. LTD., CHENNAI	VJ 7018 - 1	E7018-1	SEP2020
48.	WELD FAST ELECTRODES, NAGPUR	WELDFAST LH 18	E-7018	MAR2020
49.	WELD FAST ELECTRODES, NAGPUR	WELDFAST LH-18-1	E-7018-1	MAR2020
50.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 0500	E7018-A1	FEB2023
51.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 1500	E8018-B2	FEB2023
52.	WELD FAST ELECTRODES, NAGPUR	WELDFAST CROMO 2251	E9018-B3	FEB2023

The approvals are granted in conformance to the requirements stipulated in latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

* Indicates renewal of approval is under progress.


(G. Badrinarayana) 2/1/19
Associate Director (QA), Gr.3

NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

Directorate of Quality Assurance

Phone: 022 – 2599 5045, Fax 022 – 2556 5354

2) LIST OF APPROVED STAINLESS STEEL & OTHER NI ALLOY ELECTRODES (2 Pages)

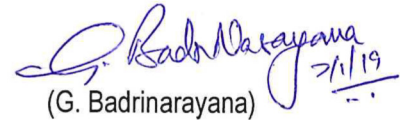
AS ON 07-01-2019

Sr. No.	MANUFACTURERS	BRAND NAME	AWS No.	VALID UPTO
1.	ADOR WELDING LTD., SILVASSA	BETANOX-DL	E 309L-16	SEP2020
2.	ADOR WELDING LTD., SILVASSA	SUPERINOX-2C	E 316-16	SEP2020
3.	ADOR WELDING LTD., SILVASSA	SUPERINOX-1C	E 308L-16	SEP2020
4.	D&H INDIA LTD., INDORE	SV-308L	E 308L-15	DEC2022
5.	D&H INDIA LTD., INDORE	SV-309L	E 309L-15	DEC2022
6.	D&H INDIA LTD., INDORE	CROMALLOY-B	E 308L-16	DEC2022
7.	D&H INDIA LTD., INDORE	CROMALLOY 309L	E 309L-16	DEC2020
8.	ADOR FONTECH, BENGALURU	LH 511	E Ni Cu7	OCT2020
9.	ADOR FONTECH, BENGALURU	LH 521	E Ni Cr Fe 3	OCT2020
10.	D&H SECHERON, INDORE	CRONITHERME 25/12	E 309-16	JUN2022
11.	D&H SECHERON, INDORE	RUTOX-D	E 316L-16	JUN2022
12.	D&H SECHERON, INDORE	BATOX-B	E 308L-15	JUN2020
13.	D&H SECHERON, INDORE	RUTOX-B	E 308L-16	JUN2020
14.	D&H SECHERON, INDORE	D&H 309L	E 309L-16	NOV2023
15.	D&H SECHERON, INDORE	D&H 1250	E NiCu-7	JAN2021
16.	D&H SECHERON, INDORE	D&H 1212NS	E NiCr Fe-3	JAN2021
17.	D&H SECHERON, INDORE	RUTOX-A	E 308-16	NOV2023
18.	D&H SECHERON, INDORE	RUTOX-A St	E 347-16	NOV2023
19.	D&H SECHERON, INDORE	RUTOX-Mo	E 316-16	NOV2023
20.	HONAVAR ELECTRODES, THANE	SILVER SHINE 308L-15	E 308L-15	SEP2018*
21.	HONAVAR ELECTRODES, THANE	SILVER SHINE 308L	E 308L-16	SEP2019
22.	HONAVAR ELECTRODES, THANE	SILVER SHINE 309L	E 309L-16	SEP2019
23.	HONAVAR ELECTRODES, THANE	SILVER SHINE 316L	E 316L-16	NOV2018*
24.	RAJRATNA ELECTRODES, AHMEDABAD	RATNA 308L	E 308L-16	MAR2020
25.	RAJRATNA ELECTRODES, AHMEDABAD	RATNA 316 L	E 316L-16	MAR2020
26.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	SUPER OPTIMAL 309L	E 309L-16	OCT2019
27.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	SUPER OPTIMAL 316L	E 316L-16	OCT2019
28.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	SUPER OPTIMAL 309 MoL	E 309MoL	OCT2019
29.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	SUPER STAINLESS 347	E 347-16	OCT2019
30.	SUPERON SCHWEISSTECHNIK INDIA LTD. DELHI	SUPER OPTIMAL 308L	E 308L-16	OCT2019
31.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-A	E 308-16	DEC2018*
32.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-AL	E 308L-16	DEC2018*
33.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-AL-15	E 308L-15	DEC2018*

Sr. No.	MANUFACTURERS	BRAND NAME	AWS No.	VALID UPTO
34.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12	E 309-16	DEC2018*
35.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12-L	E 309L-16	DEC2018*
36.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX-25/12-Mo	E 309 Mo-16	DEC2018*
37.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX Mo	E 316-16	DEC2018*
38.	MAILAM INDIA LTD., PUDUCHERRY	MAILEX MoL	E 316L-16	DEC2018*
39.	ROYAL ARC ELECTRODES, VASAI,	ROYAL 1C	E 308L-16	SEP2019
40.	ROYAL ARC ELECTRODES, VASAI,	ROYAL 2C	E 316L-16	SEP2019
41.	ROYAL ARC ELECTRODES, VASAI,	ROYAL-D2L	E 309L-16	SEP2019
42.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 308L	E 308L-16	JAN2021
43.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 316L	E 316L-16	JAN2021
44.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 309L	E 309L-16	JAN2021
45.	WELD FAST ELECTRODES, NAGPUR	WELDFAST 309MoL	E 309LMo-16	JAN2021

The approvals are granted in conformance to the requirements stipulated in latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

* Indicates renewal of approval is under progress.


(G. Badrinarayana)

Associate Director (QA), Gr.3

NUCLEAR POWER CORPORATION OF INDIA LTD.

(A Government of India Enterprise)

Directorate of Quality Assurance

Phone: 022 – 2599 5045, Fax 022 – 2556 5354

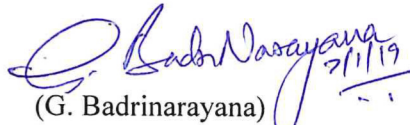
3) LIST OF APPROVED BRANDS OF WIRE AND WIRE FLUX COMBINATION (1 Page)

AS ON 07-01-2019

Sr. No.	MANUFACTURERS	BRAND NAME	AWS No.	VALID UPTO
1.	ANAND ARC, THANE	ANAND TIG-308L	ER 308L	SEP2019
2.	ANAND ARC, THANE	ANAND TIG-309L	ER 309L	SEP2019
3.	ADOR FONTECH, BENGALURU	TIG 120	ER 308L	JUL2019
4.	ADOR FONTECH, BENGALURU	TIG 121	ER 316L	JUL2019
5.	ADOR FONTECH, BENGALURU	TIG 123	ER 309L	JUL2019
6.	ADOR FONTECH, BENGALURU	TIG 120S	ER 347	JUL2019
7.	ADOR FONTECH, BENGALURU	TIG 521	ER NiCr3	JUL2019
8.	ADOR WELDING LTD., SILVASSA	TIGFIL 70S-2	ER 70S-2	FEB2022
9.	ADOR WELDING LTD., SILVASSA	TIGFILL 90S-B3	ER 90SB3	JUL2019
10.	ADOR WELDING LTD., SILVASSA	TIGINOX-308L	ER 308L	SEP2020
11.	ADOR WELDING LTD., SILVASSA	TIGINOX-309L	ER309L	SEP2020
12.	ADOR WELDING LTD., SILVASSA	AUTOMIG 70-S6	ER 70S-6	DEC2023
13.	ADOR WELDING LTD., SILVASSA	AUTOMELT-B71 AUTOMELT-EH 14 WIRE	F7A2-EH14	DEC2018*
14.	DWEKAM ELECTRODES, INDORE	MERGE ARC GRADE A	F7AZ/PZ-EL8	JUL2019
15.	DWEKAM ELECTRODES, INDORE	MERGE ARC GRADE C	F7AZ/PZ- EH14	JUL2019
16.	D&H INDIA LTD., INDORE	SUPER TIG 308L	ER 308L	DEC2020
17.	D&H INDIA LTD., INDORE	SUPER TIG 309L	ER 309L	DEC2020
18.	D&H SECHERON, INDORE	FILLER WIRE FW 308L	ER 308L	FEB2021
19.	D&H SECHERON, INDORE	FILLER WIRE FW 309L	ER 309L	FEB2021
20.	D&H SECHERON, INDORE	F 70 S2	ER 70S-2	JUN2022
21.	RAJRATNA ELECTRODES, AHMEDABAD	RAAJTIG ER 308L	ER 308L	MAR2020
22.	RAJRATNA ELECTRODES, AHMEDABAD	RAAJTIG ER 316L	ER 316L	MAR2020
23.	VENUS WIRES, KHOPOLI	VENUS 308L	ER 308L	SEP2021
24.	VENUS WIRES, KHOPOLI	VENUS 316L	ER 309L	SEP2021
25.	VENUS WIRES, KHOPOLI	VENUS 309L	ER 316L	SEP2021
26.	VENUS WIRES, KHOPOLI	VENUS 347	ER 347	SEP2021
27.	WELD FAST ELECTRODES, NAGPUR	TIG FAST-3	ER 70S-2	JAN2021
28.	WELD FAST ELECTRODES, NAGPUR	MIG FAST-1	ER 70S-6	JAN2021

The approvals are granted in conformance to the requirements stipulated in latest edition of ASME Section II Part C. However, batch qualification wherever called for in specific cases, will have to be carried out separately.

* Indicates renewal of approval is under progress


(G. Badrinarayana)
Associate Director (QA), Gr.3

NUCLEARPOWERCORPORATIONOFINDIALIMITED		
GORAKHPUR HARYANA ANU VIDYUT PARIYOJANA-1,2		
GHAVP-1,2/40000/ PROCUREMENT SPECIFICATION-MS-1	VOLUME-II- Section-C PART-2 C-2: SPECIFIC TECHNICALREQUIREMENTS	SECTION-C-2-4-9-46
August 2018 Revision-R0	SPECIFICATIONOFINSTRUMENTATION ITEMS-TEMPERATURE GAUGE – GAS FILLED TYPE	SHEET6 of 10

SAMPLE QUALITY ASSURANCE PLAN

Sl. No.	Component/ Operation	CHARACTERISTIC	TYPE OF CHECK	CLASS IFICAT ION	QUNATUM OF CHECK	REF. DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY (P)(W)(V)	REMARKS
1.0	RAW MATERIAL/ BOUGHT OUT COMPONEN TS									
1.1	SS 316 CAPILLARY	Dimensions	Vernier, Dial Gauge, Micrometer etc.	MA	100%	Relevant ASTM standard	Relevant ASTM standard	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	
1.2	Case & Bezel	Visual dimensions	Vernier, Dial Gauge, Micrometer etc.	MA	100%	As per approved drawings	Visual finish & dimensions as per approved drawings	IQC Records	3 2 1	
1.3	SS Bulb	Visual dimensions	Vernier, Dial Gauge, Micrometer etc.	MA	100%	As per approved drawings	Relevant ASTM Standard	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	
1.4	Bourdon Tube SS 316	Dimensions	Measurement	Critical	100%	As per IS-3624	Visual finish	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	
1.5	Socket SS 316	Dimensions,	Vernier, Plug gauge	MA	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
		Thread Connection	by Go-NO-GO check	MA	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	

NUCLEARPOWERCORPORATIONOFINDIALIMITED		
GORAKHPUR HARYANA ANU VIDYUT PARIYOJANA-1,2		
GHAVP-1,2/40000/ PROCUREMENT SPECIFICATION-MS-1	VOLUME-II- Section-C PART-2 C-2: SPECIFIC TECHNICALREQUIREMENTS	SECTION-C-2-4-9-46
August 2018 Revision-R0	SPECIFICATIONOFINSTRUMENTATION ITEMS-TEMPERATURE GAUGE – GAS FILLED TYPE	SHEET7 of 10

Sl. No.	Component/ Operation	CHARACTERISTIC	TYPE OF CHECK	CLASS IFICAT ION	QUNATUM OF CHECK	REF. DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY (P)(W)(V)	REMARKS
1.6	Movement SS 304	Visual dimensions	Vernier, Suitable gauge	Critical	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
		Chemical Composition	Chemical Analysis	MA	One sample from a lot	Relevant ASTM standard	Relevant ASTM standard	Test report of approved lab	3 2 1	
1.7	Aluminum (Powder coated) Dial	Visual dimensions	Vernier, Suitable gauge	MA	Random	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
1.8	Thermowell Single piece solid Hexagonal bar stock	a) Internal flaws	Ultrasonic Test	MA	100%	Relevant standard	As per Relevant Standard	Test report of approved lab	3 2 1	
		b) Material Composition	Chemical Analysis	MA	One sample from a lot	Relevant standard	As per Relevant Standard	Test report of approved lab	3 2 1	
		c) Physical Properties	Tensile Strength	MA	One sample from a lot	Relevant standard	As per Relevant Standard	Test report of approved lab	3 2 1	
1.9	Aluminum Pointer	Visual dimensions	Vernier, Suitable gauge	MA	Random	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
1.10	Front Glass Window (Toughened glass)	Visual dimensions	Vernier, Suitable gauge	MA	Random	As per approved drawings/relevant code/standard	As per approved drawings/relevant code/standard	IQC Records	3 2 1	
1.11	Rubber Parts/ 'O'ring	Dimensions	Dimensions	MA	Random	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
2.0	STAGE INSPECTION									
2.1	Socket SS	Thread/ Dimensions	Vernier/ Thread gauge	MA	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
2.2	Case & Bezel	Thread/ Dimensions	Thread/ Dimensions	MA	100%	As per approved drawings	As per approved drawings	IQC Records	3 2 1	
2.3	Silver Brazing/ Welding of Tube and Socket	Brazing and Welding	i) Leak Test	Critical	100%	Test Procedure	No leakage	IQC Records	3 2 1	5% Random check by NPC QA
2.4	Dial Test	Printing	Visual	MA	100%	----	Good painting & neat	IQC Records	3 2 1	

NUCLEARPOWERCORPORATIONOFINDIALIMITED		
GORAKHPUR HARYANA ANU VIDYUT PARIYOJANA-1,2		
GHAVP-1,2/40000/ PROCUREMENT SPECIFICATION-MS-1	VOLUME-II- Section-C PART-2 C-2: SPECIFIC TECHNICAL REQUIREMENTS	SECTION-C-2-4-9-46
August 2018 Revision-R0	SPECIFICATION OF INSTRUMENTATION ITEMS-TEMPERATURE GAUGE – GAS FILLED TYPE	SHEET 8 of 10

Sl. No.	Component/ Operation	CHARACTERISTIC	TYPE OF CHECK	CLASS IFICAT ION	QUANTUM OF CHECK	REF. DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY (P)(W)(V)	REMARKS
							printing			
2.5	Assembly & Calibration	Appearance & Accuracy	Clean & dust free, proper pointer motion and Accuracy	MA	100%	PC-E-614	Accuracy as per requirement	Calibration Report	3 2 1	
3.0	TESTING OF FINISHED PRODUCT									
	ROUTINE TESTS									
3.1	Pneumatic Test	Air leak test at 7kg/cm ² or Full Scale Range (FSR) whichever is less	Air leak test with soap solution	Critical	100%	Approved test procedure/relevant ASME standard	No leakage	IQC Records	3/2 1 1	
3.2	Over- Range/Hydrosta tic test	Hydrostatic pressure test for pressure holding time of 10 min	Hydrostatic pressure test at 150% FSR	Critical	100%	As per Approved test procedure/relevant ASME standard	Calibration within accuracy limits	Test Reports	3/2 1 1	
3.3	Calibration repeatability and Accuracy checks	5 point calibration (before and after over-range test)	Calibration test as per approved procedure	Critical	100%	As per Approved test procedure/relevant ASME standard	As per Approved test procedure	Test Reports	3/2 1 1	
3.4	Helium Leak Test	Helium leak test at 1kg/cm ² or Ma. Working Pressure whichever is less	Helium Leak Test with Spectrometer	Critical	100%	Approved test procedure/relevant ASME standard	As per Approved test procedure	IQC Records	3/2 1 1	5% Random check by NPC QA
	TYPE TESTS									
3.5	IP Rating Test	Enclosure Class	Enclosure Protection	Critical	One sample of each type	Test Procedure & IS- 12063/IEC 60529	Test Procedure & IS- 12063/IEC 60529	Test Reports	3/2 1 1	One sample basis (1 instrument per lot)
3.6	Pressure Cycling test	Mechanical properties		Critical	Random	Test Procedure and relevant ASME/ANSI standard	Test Procedure and relevant ASME/ANSI standard	Test Reports	3/2 1 1	One sample basis (1 instrument per lot)
3.7	Seismic test	Seismic acceleration sustainability	Seismic withstand capability	Critical	One no. of each type	Approved test procedure & PB-P- 1819	Approved test procedure & PB-P-541	Test Reports	3/2 1 1	One sample basis (1 instrument per lot)

NUCLEARPOWERCORPORATIONOFINDIALIMITED		
GORAKHPUR HARYANA ANU VIDYUT PARIYOJANA-1,2		
GHAVP-1,2/40000/ PROCUREMENT SPECIFICATION-MS-1	VOLUME-II- Section-C PART-2 C-2: SPECIFIC TECHNICAL REQUIREMENTS	SECTION-C-2-4-9-46
August 2018 Revision-R0	SPECIFICATION OF INSTRUMENTATION ITEMS-TEMPERATURE GAUGE – GAS FILLED TYPE	SHEET 9 of 10

LEGENDS:

P	Performed by	1.	NPCIL
W	Witnessed by	2.	Prime Supplier
V	Verified by	3.	Sub-Vendor/External Laboratory
MA	Major		
MI	Minor		

NOTES:

- 1 Test reports on the bought out components for all the NPCIL specified tests shall be obtained from the manufacturers and submitted for the verification of NPCIL.
- 2 The purpose of QAP is to streamline NPCIL Quality Surveillance activities and identifying CHP on un-ambiguous terms.
- 3 All test reports, the certificates and inspection reports shall be reviewed by Prime Supplier/Sub-Vendor/Manufacturer, before submitting the same to verification by purchaser.